

California High-Speed Rail Authority



RFP No.: HSR 14-32

**Request for Proposals for Design-Build
Services for Construction Package 4**

**Reference Material, Part C.8
Right-of-Way Requirements Report**

Note: Southern limit of CP4 ends just north of Poplar Ave, at approximately station WS1 5880+00, even though this document shows the limit just north of 7th Standard Road. Work south of the contract limit of WS1 5880+00 should not be considered as part of the contract

CALIFORNIA HIGH-SPEED TRAIN

Engineering Report

RECORD SET 15%
DESIGN SUBMISSION

Fresno to Bakersfield Preliminary Right-of-Way Requirements Report

January 2014



**Fresno to Bakersfield
Record Set 15% Design Submission
Preliminary Right-of-Way
Requirements Report**

Prepared by:

URS/HMM/Arup Joint Venture

January 2014

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List of Abbreviations

Authority	California High-Speed Rail Authority
BNSF	BNSF Railway
CHSTP	California High-Speed Train Project
EIR/EIS	Environmental Impact Report/Statement
FB	Fresno to Bakersfield
HMF	heavy maintenance facility
HST	high-speed train
RC	Regional Consultant
Uniform Act	State and Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act
UPRR	Union Pacific Railroad

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Section 1.0

Introduction

1.0 Introduction

1.1 Project Overview

In 1996, the state of California established the California High-Speed Rail Authority (Authority). The Authority is responsible for studying alternatives to construct a rail system that will provide intercity high-speed train (HST) service on over 800 miles of track throughout California. This rail system will connect the major population centers of Sacramento, the San Francisco Bay Area, the Central Valley, Los Angeles, the Inland Empire, Orange County, and San Diego. The Authority is coordinating the project with the Federal Railroad Administration. The California High-Speed Train Project (CHSTP) is envisioned as a state-of-the-art, electrically powered, high-speed, steel-wheel-on-steel-rail technology that will include state-of-the-art safety, signaling, and automated train-control systems.

The statewide CHSTP has been divided into a number of sections for the planning, environmental review, coordination, and implementation of the project. This Preliminary Right-of-Way Requirements Report is focused on the section of the CHSTP between Fresno and Bakersfield, specifically between the CHSTP stations in downtown Fresno and downtown Bakersfield. During the initial planning process, the CHSTP alignment alternatives are dynamic and subject to revision.

1.2 Project Description

1.2.1 Fresno to Bakersfield High-Speed Train Section

The proposed Fresno to Bakersfield (FB) Section of the CHSTP is approximately 114 miles long and traverses a variety of land uses, including farmland, large cities, and small cities. The FB Section includes viaducts and segments where the HST will be on embankment or in cut. The route of the FB Section passes by or through the rural communities of Bowles, Laton, Armona, and Allensworth and the cities of Fresno, Hanford, Selma, Corcoran, Wasco, Shafter, McFarland, and Bakersfield.

The FB Section extends southeast from north of Stanislaus Street in Fresno, paralleling the south side of the BNSF railroad. The FB Section meets the northernmost limit of the Bakersfield to Palmdale Section of the HST at Oswell Street in Bakersfield.

1.2.2 Alignments

The FB Section, shown in Figure 1.2-1, is a critical link connecting the northern HST sections of Merced to Fresno and the Bay Area to the southern HST sections of Bakersfield to Palmdale and Palmdale to Los Angeles. The FB Section includes HST stations in the cities of Fresno and Bakersfield, with a third potential station in the vicinity of Hanford. The Fresno and Bakersfield stations are this section's project termini.

The FB Section of the HST is divided into the 26 subsections. Table 1.2-1 and Figure 1.2-1 illustrate the subsections and their corresponding alignments.

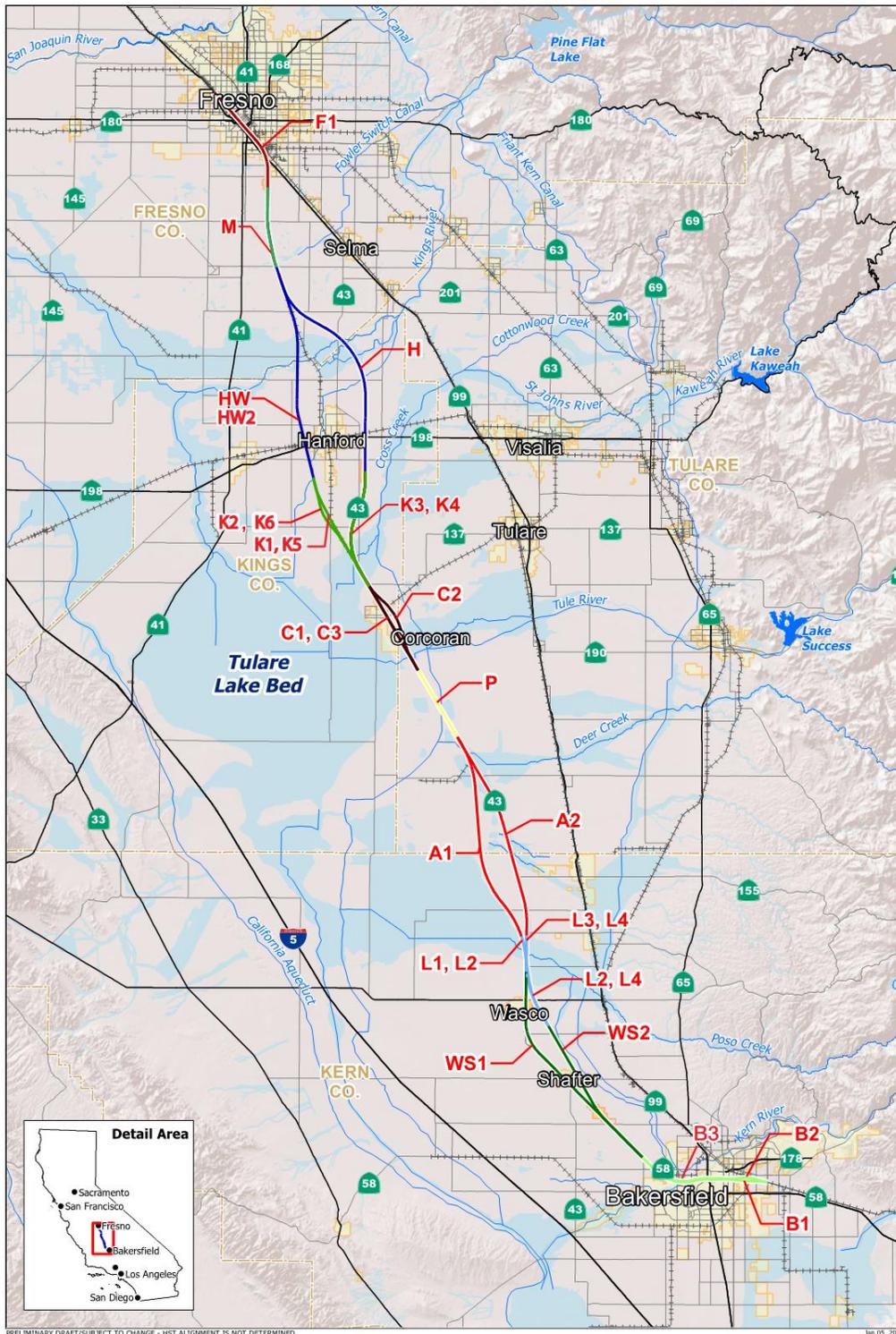


Figure 1.2-1
 Overview of Alignments

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Table 1.2-1
 FB Alignment Subsections

Alignment Prefix	Alignment Subsection Name	Location		County	Corresponding EIR/EIS Name
		Begin	End		
F1	Fresno	San Joaquin St	E Lincoln Ave	Fresno	BNSF
M	Monmouth	E Lincoln Ave	E Kamm Ave	Fresno	BNSF
H	Hanford East	E Kamm Ave	Iona Ave	Fresno and Kings	BNSF (Hanford East)
HW	Hanford West Bypass	E Kamm Ave	Idaho Ave		Hanford West Bypass 1 & 2
HW2	Hanford West Bypass	E Kamm Ave	Iona Ave		Hanford West Bypass 1 & 2 Modified
K1	Kaweah	Idaho Ave	Nevada Ave	Kings	Hanford West Bypass 2 (at-grade) (connects to C1 [Corcoran Elevated] or C2 [Corcoran Bypass])
K2		Idaho Ave	Nevada Ave		Hanford West Bypass 1 (at-grade) (connects to C3 [BNSF through Corcoran])
K3		Iona Ave	Nevada Ave		BNSF (Hanford East) (connects to C3 [BNSF through Corcoran])
K4		Iona Ave	Nevada Ave		BNSF (Hanford East) (connects to C1 [Corcoran Elevated] or C2 [Corcoran Bypass])
K5		Iona Ave	Nevada Ave		Hanford West Bypass 2 Modified (below-grade) (connects to C1 [Corcoran Elevated] or C2 [Corcoran Bypass])
K6		Iona Ave	Nevada Ave		Hanford West Bypass 1 Modified (below-grade) (connects to C3 [BNSF through Corcoran])
C1	Corcoran	Nevada Ave	Ave 128	Kings and Tulare	Corcoran Elevated
C2	Corcoran Bypass	Nevada Ave	Ave 128		Corcoran Bypass
C3	Corcoran	Nevada Ave	Ave 128		BNSF (through Corcoran)
P	Pixley	Ave 128	Ave 84	Tulare	BNSF
A1	Allensworth Bypass	Ave 84	Elmo Hwy	Tulare and Kern	Allensworth Bypass
A2	Through Allensworth	Ave 84	Elmo Hwy		BNSF (through Allensworth)
L1	Poso Creek	Elmo Hwy	Whisler Rd	Kern	Allensworth Bypass (connects to BNSF [through Wasco-Shafter])
L2		Elmo Hwy	Poplar Ave		Allensworth Bypass (connects to Wasco-Shafter Bypass)

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Alignment Prefix	Alignment Subsection Name	Location		County	Corresponding EIR/EIS Name
		Begin	End		
L3	Poso Creek	Elmo Hwy	Whisler Rd		BNSF (through Allensworth) (connects to BNSF [through Wasco-Shafter])
L4		Elmo Hwy	Poplar Ave		BNSF (through Allensworth) (connects to Wasco-Shafter Bypass)
WS1	Through Wasco-Shafter	Whisler Rd	Hageman Rd	Kern	BNSF (through Wasco-Shafter)
WS2	Wasco-Shafter Bypass	Poplar Ave	Hageman Rd		Wasco-Shafter Bypass
B1	Bakersfield Urban	Hageman Rd	Baker St	Kern	BNSF (Bakersfield North)
B2	Bakersfield Urban	Hageman Rd	Baker St		Bakersfield South
B3	Bakersfield Urban	Hageman Rd	Baker St		Bakersfield Hybrid

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1.3 Purpose and Scope

This assessment of right-of-way impacts is based upon the 15% design of the FB Section. The Regional Consultant (RC) completed the 15% design based primarily on topography developed by aerial photogrammetry. Where this information was not available limited-accuracy satellite survey information was used and based on aerial photography with a pixel size of about 3 feet. As the project progresses, the team will refine the design to reflect the increased precision of the updated survey information. Subsequent right-of-way evaluations will be further refined as the design upon which they are based is refined.

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Section 2.0

Analysis

2.0 Analysis

2.1 Impacted Area Methodology

The footprint of the CHSTP used to assess the right-of-way impacts detailed in this report consists of the HST track corridor and associated roadway relocations and crossings. There are both permanent and temporary right-of-way impacts associated with the CHSTP. Temporary impacts occur in areas outside of the permanent right-of-way for the project that are required for construction. These areas may include utility relocations, contractor staging areas, or concrete casting facilities.

Permanent impacts occur within the project's permanent right-of-way, which includes aerial, at-grade, and depressed tracks; roadways; stations; traction power substations; radio communication sites; interlocking houses; maintenance of infrastructure facilities (MOIF); and a heavy maintenance facility (HMF). There was a requirement to include two options for each traction power substation and radio communication site in the footprint and analyzed in the environmental document. Only one of the options will be constructed for the project and is included in the calculation of the right-of-way impacts. The footprint for the track is defined as 60 feet wide in aerial sections. For the at-grade sections, the footprint varies between 100 feet and 150 feet wide, depending on the height of the fill required. For depressed sections, the footprint varies between 60 feet and 340 feet, depending on the depth of cut required. The footprints for the roadways are defined by the outer limits of the embankments of the grade separations. The areas denoted as CHSTP stations are included in the footprint. Only one of the several proposed options for the location of the HMF in the FB Section will be built. The right-of-way impact for the HMF has been included in this report, but the environmental impact will be assessed separately once a location has been chosen.

The RC compared the resulting overall CHSTP impact footprint to existing parcel lines to determine right-of-way impacts.

The RC gathered existing right-of-way information from the counties within this section in the form of digital assessor's parcel map data. The primary information used from the data was the assessor's parcel number and the parcel size. The parcel information and CHSTP footprint were displayed in a geographic information system format, and the overlapping area was recorded as the necessary right-of-way for each alignment of the CHSTP section.

The majority of parcels will require a partial acquisition of their total area, resulting in a remainder that is not needed for the project. In some cases, a full acquisition of the parcel was determined to be necessary. This will be the case if the RC observed that either (a) the remainder is not a viable economic unit that retains its highest and best use or (b) the impact to remaining land and improvements is too great to continue to function. In other cases, damages to an area of a parcel were determined to be necessary. An area was classified to be damaged if the RC observed that there will be no legal access, in addition to the criteria used for full acquisitions.

2.2 Cost Methodology

The formal valuation/appraisal and acquisition of property under eminent domain is a complex process to ensure all of the elements of the state and federal Uniform Relocation Assistance and Real Property Acquisition Policies Act (Uniform Act) as amended are considered. The Uniform Act requires that an appraisal be prepared and that no less than the appraised fair market value be offered to the owner. An appraisal requires a personal inspection of the property, as well as a review and analysis of the title elements to the property. The formal appraisal process will begin once the alignment alternatives to be constructed are noted in the Record of Decision.

Before the formal appraisal process, an estimator usually prepares an estimate of the property. An estimate is a much abbreviated process that considers similar elements of compensation. A formal estimate would include a drive-by inspection of each property along with a preliminary property profile including preliminary land and improvement information. A preliminary estimate groups similar types of properties together and uses mass valuation methods. The final costs are the result of the estimator's professional experience.

To prepare this preliminary estimate of the costs of right-of-way impacts, each parcel was placed into a classification based on land use and whether any structures were impacted. Unit values for land and site improvements were assigned to each classification. Publicly available satellite imagery was used to ascertain the current land use and relative quality and condition of improvements on each impacted parcel. Field observations were made in the cities of Fresno and Bakersfield for the purpose of validating some of the determinations made via the publicly available satellite imagery, particularly improvement quality, condition, and value. These field observations serve as the basis of values for improved properties.

Relocation and severance costs were also included in the analysis. Severance damages are the loss in value to the remainder parcel resulting from severance and construction in the manner proposed. Under the Uniform Act, additional costs accrue to the project for the relocation and reestablishment of displaced residential and business occupants. Costs estimated for relocation/reestablishment represent additional costs based on the observed use and occupancy of the property. For this estimate, the estimator employed a lump sum method for relocation costs based on historical experience. In the preparation of a Right-of-Way Certification to allow the project to be advertised, the acquired area must be free of improvements. Therefore, demolition costs were also identified as a lump sum based on the size of the parcel improvement and potential for having any hazardous material. The final components of the estimate include escrow costs and potential reimbursement for the owner to secure their own appraisal. Under California Senate Bill 1210, which became effective January 1, 2007, an owner is eligible to receive up to \$5,000 reimbursement to secure their own appraisal. A contingency is provided within the parcel unit costs for potential administrative settlements, adverse court awards, outdoor advertising relocation costs, and minor environmental mitigation costs.

Values for the various land uses and improvements were estimated from local real estate listings obtained from the LoopNet website. A summary of land and improvement base unit values, denoted by parcel land use classifications, is included in Table 2.2-1. In some instances, land unit values were further arrayed within a classification based on a range in size of the land. Land unit values were applied directly to the areas required for acquisition as estimated for the various alignments, on a parcel basis. Site improvements and possible severance damages were also included as a percentage of the acquisition costs.

An existing rail corridor is generally considered to have a land value that reflects the assemblage of the corridor area with the adjacent parcel. The existing railroad corridors through large and small urban areas related to the CHSTP generally are zoned for industrial uses. In downtown Fresno, Union Pacific Railroad (UPRR) owns the majority of the land bounded by G Street, H Street, State Route 180, and SR 41. In some cases, the railroad owns more property than it uses for operations. This is the case near the proposed HST station in downtown Fresno. The area required to build the HST tracks and station is outside of UPRR's operating right-of-way. The existing BNSF Railway (BNSF) corridor in the rural areas is through land generally zoned for agricultural uses. In all areas, the nonoperating railroad right-of-way that is within the footprint of the CHSTP has been assigned a land use classification equivalent to the adjacent parcels. It has been assumed that easements will be granted for the aerial crossings of the existing rail. The potential cost for those easements has not been included in this analysis.

The unit value for all land classifications is derived by dividing listing prices by the assumed size of the larger parcel. When property is bought and sold on the open market, it includes the income stream into the future based on the economic life of the item creating the income stream (land, improvements, planting, etc.). The price per acre for farmland includes land, outbuildings, irrigation systems, turnrows, and plantings. Additionally, the soil classification and quality of plantings provide for crop yields that result in the income stream. All of this is included in the price per acre. The utility of the remainder can be based on the appraiser's consideration of size, shape, irrigation, and ownership. In some cases the utility can be partially or wholly restored, provided the restoration costs are considered feasible as established by case law. An owner is entitled to declare his/her remainder an "uneconomic remnant" and request the acquiring agency to acquire the remainder.

The RC derived the base unit value for industrial and commercial improvements by dividing the price of local real estate listings by the size of the improvements for the respective improved parcel classifications, except for residential improvements. The size of the improvements located in or straddling the right-of-way was estimated using publicly available aerial imagery. The appropriate improvement base unit value was applied to the estimated size, and the resultant value was adjusted upward or downward for observed size, age, condition, and quality of construction of the improvement. The lump sum costs for single-family and multifamily residential improvements were derived by direct comparison to real estate listings of similarly improved properties and adjusted for observed age, quality of construction, and condition. The total cost for individual parcels was estimated by totaling the land value, improvement value, severance damages, demolition, and relocation assistance.

The Authority hired an outside consultant to assess the costs associated with the impacts of the CHSTP on oil wells along the Wasco-Shafter alignment alternatives (WS1 and WS2; Cook 2013).

Table 2.2-1
 Parcel Land Use Classifications Base Value Information

Classification	Description	Size	Unit Value		
			(\$/ac)	Site Improvements	Severance
LAND ONLY					
A1, A1.1	Ag w/ & w/o Imp	<10 Ac	\$35,000	20%	40%
		>10 Ac	\$25,000	20%	40%
	Ag Farm Ind	All	\$100,000	10%	40%
A1 & A1.1 Blend	HMF and Mainline Through HMF Site	All	\$54,950	20%	20%
C1, C1.1, O1, O1.1, M	Com, Office, & Motel w/ & w/o Imp	<0.75 Ac	\$900,000	20%	10%
		0.75–2.00 Ac	\$525,000	20%	10%
		>2.00 Ac	\$435,000	20%	10%
I1,I1.1,I2,I2.1	Light & Heavy Ind w/ & w/o Imp	<5 Ac	\$305,000	15%	10%
		>5 Ac	\$250,000	15%	10%
R1, R1.1	SF Residential w/ & w/o Imp	All	\$200,000	25%	20%
R2, R2.1	MF Residential w/ & w/o Imp	All	\$250,000	25%	20%
MH	Mobile Home Park	All	\$1,000,000	20%	10%
OS	Open Space/Park	All	\$350,000	—	20%
P	Pasture/Fallow	All	\$20,000	—	10%
IMPROVEMENTS ONLY					
I1.1 & I2.1	Ind Buildings	All	\$50/ft ² plus or minus*		
C1.1 & O1.1	Com Buildings	All	\$75/ft ² plus or minus*		
A1.1 & R1.1, R2.1, MH	Res Improvements	All	Lump Sum Based on Comparable Listings		

*Cost was adjusted for quality, condition, and age of the improvement.

Ag = agricultural
 Imp = improvements
 Ind = industrial

MF = multifamily
 Com = commercial
 HMF = heavy maintenance facility

Res = residential
 SF = single family

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Section 3.0

Right-of-Way Impacts

3.0 Right-of-Way Impacts

3.1 Area

The RC tabulated the total area in acres of estimated right-of-way impacts, including full and partial takes, by land use classification, CHSTP alignment, and proposed use within each of the alignments. Different alignments can be combined to compare different complete CHSTP FB Section alternatives. Refer to Appendix A for the estimated impacted permanent right-of-way area and cost for each alignment. Appendix B relates to temporary right-of-way impacts. Refer to Appendix C for the estimated impacted right-of-way required for the proposed uses for each alignment. Appendix D contains the number of parcels by land use for each alignment.

3.2 Land and Improvement Cost

The costs for land, improvements, relocation, and severances were calculated for each parcel and tabulated by land use classification and CHSTP alignment. The costs associated with the impacts of the CHSTP on oil wells along the Wasco-Shafter alignment alternatives (WS1 and WS2; Cook 2013) are also included.

The totals are presented in the appendices.

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Section 4.0

References

4.0 References

Cook, Alan D. 2013. Draft 15% Design Submission Fresno to Bakersfield, Assessment of Oil, Gas, and Disposal Well Relocation Costs, Wasco-Shafter Alignment Alternatives. April 2013.

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Appendix A
Preliminary Permanent Right-of-Way
Cost Estimate Table



**California High-Speed Train Project-Fresno to Bakersfield Section
Preliminary Permanent Right-of-Way Cost Estimate**

Parcel Classification	HST Alignment Prefix																										
	F1	M	H	HW	HW2	K1	K2	K3	K4	K5	K6	C1	C2	C3	P	A1	A2	L1	L2	L3	L4	WS1	WS2	B1	B2	B3	HMF
	Area (ac)																										
A1 - Agriculture w/o Improvement	60.15	287.44	739.21	461.03	823.88	306.49	280.28	313.39	333.38	327.09	332.77	120.92	350.14	225.99	208.93	481.06	341.59	105.80	239.23	57.60	197.30	628.37	489.22	0.99	0.99	0.99	
A1.1 - Agriculture w/ Improvement	22.34	66.64	199.25	103.56	161.89	19.44	77.39	24.25	0.91	50.08	135.12	18.85	19.67	20.52	29.99	20.22	24.64		18.38		19.23	11.58	65.59				
C1 - Commercial w/o Improvement	0.53	0.06		3.69										1.40		0.30							9.00	14.80	10.70		
C1.1 - Commercial w/ Improvement	5.63													3.80								2.21	2.21	10.66	10.66	12.34	
HMF - Heavy Maintenance Facility																											154.00
I1 - Light Industrial w/o Improvement	53.58	0.57	8.42	15.42	11.05	0.83	0.22			1.18	2.49		31.70	2.91	40.43				0.27		0.24	29.21	3.53	67.26	73.82	57.14	
I1.1 - Light Industrial w/ Improvement	69.61	3.33	1.56	4.90	4.90							16.04	11.06	30.46	7.34							54.26	17.78	49.25	53.73	70.44	
I2 - Heavy Industrial w/o Improvement		2.16																				12.79	0.05	0.05	0.05		
I2.1 - Heavy Industrial w/ Improvement	1.04																					23.74	4.09	4.09	4.09		
M - Motel	0.12																										
MH - Mobile Home Park				0.11	0.02									1.03													
O1 - Office w/o Improvement																							1.22	5.11	3.65		
O1.1 - Office w/ Improvement																							9.28	14.06	4.33		
OS - Open Space/Park	0.72					10.48			10.63	30.92												13.26	9.62	10.61			
P - Pasture/Fallow				10.48	11.35	8.39	0.96	22.44	6.98	9.34	20.60	23.48	29.07	7.26		1,567.31	247.55	0.31	0.31	0.31	0.01	9.04					
R1 - SF Residential w/o Improvement	0.22	1.01	1.18	3.80	2.38	1.65	0.65			2.42	0.76	3.04	0.55	3.37								0.61	0.05	11.73	13.44	12.31	
R1.1 - SF Residential (w/ House)	5.00	3.57	14.47	12.66	8.70			4.29	2.86	0.95	2.39	6.68		3.87			1.25					5.89	2.33	66.16	75.17	69.19	
R2 - MF Residential w/o Improvement														7.03									2.10	0.60			
R2.1 - MF Residential w/ Improvement														0.14									3.89	5.16	5.13		
RR - Railroad	1.12	71.10	14.84	41.06	41.07	9.85		5.67	7.55	9.57	0.59	16.48	11.92	12.66	42.83	0.19			2.52	0.02	1.28	48.64	4.78	113.06	38.84	41.67	
TOTAL Acres	220.05	435.87	978.94	656.70	1,065.25	357.12	363.79	368.61	360.40	433.00	499.02	230.50	440.17	357.96	289.08	2,068.78	615.32	106.10	260.70	57.93	218.05	826.34	585.47	361.98	320.13	302.64	154.00
Parcel Classification	Land & Improvements Cost																										
A1 - Agriculture w/o Improvement	\$2,240,500	\$20,548,675	\$63,647,196	\$32,756,618	\$58,537,935	\$19,537,209	\$17,886,652	\$21,316,524	\$22,341,292	\$20,897,607	\$22,102,790	\$8,133,016	\$23,995,829	\$14,384,273	\$13,292,008	\$30,674,963	\$22,038,091	\$6,733,351	\$16,319,526	\$3,684,676	\$14,221,844	\$39,715,539	\$31,127,690	\$400,727	\$399,919	\$254,360	
A1.1 - Agriculture w/ Improvement	\$1,900,363	\$4,356,399	\$20,875,593	\$6,694,683	\$10,161,029	\$1,265,895	\$4,945,664	\$1,527,977	\$57,613	\$1,770,586	\$12,966,990	\$1,443,325	\$718,463	\$1,292,749	\$1,891,236	\$5,401,303	\$1,572,040		\$1,166,990		\$1,219,515	\$737,307	\$4,163,224				
C1 - Commercial w/o Improvement	\$622,867	\$40,469		\$1,908,057										\$1,397,945		\$28,906							\$1,420,521	\$4,914,366	\$2,088,319		
C1.1 - Commercial w/ Improvement	\$13,621,041													\$1,703,790								\$959,611	\$87,210	\$4,478,046	\$15,595,314	\$7,140,156	
HMF - Heavy Maintenance Facility																											\$8,462,300
I1 - Light Industrial w/o Improvement	\$19,502,680	\$200,773	\$2,218,485	\$3,916,099	\$3,373,935	\$71,277	\$18,883			\$428,563	\$882,720	\$11,179,077	\$1,037,095	\$14,255,882					\$26,899		\$18,341	\$7,374,131	\$123,376	\$23,914,174	\$23,215,102	\$18,261,047	
I1.1 - Light Industrial w/ Improvement	\$150,051,541	\$2,044,332	\$1,036,200	\$2,700,323	\$2,699,937							\$5,895,914	\$3,882,764	\$13,264,689	\$3,082,395							\$25,699,269	\$668,948	\$39,590,857	\$44,892,874	\$59,354,697	
I2 - Heavy Industrial w/o Improvement		\$993,870																				\$3,996,683	\$25,846	\$29,549	\$35,000		
I2.1 - Heavy Industrial w/ Improvement	\$283,179																					\$7,426,876	\$1,128,693	\$994,154	\$1,130,271		
M - Motel	\$76,790																										
MH - Mobile Home Park				\$39,034	\$10,650											\$1,072,179											
O1 - Office w/o Improvement																							\$367,520	\$2,074,170	\$2,337,369		
O1.1 - Office w/ Improvement																							\$4,561,010	\$10,382,558	\$4,417,867		
OS - Open Space/Park	\$184,829					\$3,678,782			\$383,681	\$1,115,862													\$3,665,336	\$2,775,747	\$2,525,902		
P - Pasture/Fallow				\$656,551	\$1,461,493	\$368,606	\$34,717	\$1,440,661	\$260,695	\$371,267	\$884,872	\$1,491,391	\$1,866,432	\$479,315		\$41,110,342	\$15,892,944	\$24,751	\$28,474	\$29,269	\$574	\$865,919					
R1 - SF Residential w/o Improvement	\$150,961	\$314,880	\$346,471	\$858,095	\$192,196	\$83,282	\$32,651	\$197,470	\$166,797	\$43,656	\$537,772	\$1,456,055		\$4,702,917	\$1,008,935		\$88,644					\$229,668	\$53,166	\$6,867,630	\$5,015,843	\$5,765,175	
R1.1 - SF Residential (w/ House)	\$3,436,101	\$3,075,854	\$4,145,276	\$2,628,486	\$2,963,610																	\$3,650,032	\$140,132	\$51,535,100	\$49,922,134	\$46,147,273	
R2 - MF Residential w/o Improvement														\$4,404,301									\$695,932	\$282,028			
R2.1 - MF Residential w/ Improvement														\$36,984									\$2,623,525	\$4,566,144	\$3,210,376		
RR - Railroad	\$345,123	\$2,508,010	\$3,731,199	\$1,457,106	\$1,474,687	\$344,599		\$198,595	\$267,040	\$335,108	\$30,206	\$584,738	\$2,392,855	\$2,551,993	\$1,528,186	\$14,368			\$168,723	\$11,390	\$80,847	\$15,209,089	\$174,276	\$26,260,078	\$9,970,508	\$10,238,941	
Oil Well Relocation																						\$8,000,000	\$48,000,000				
TOTAL Cost	\$192,415,976	\$34,083,261	\$96,000,420	\$53,615,050	\$80,875,472	\$25,349,650	\$23,116,038	\$24,650,555	\$23,353,978	\$26,016,919	\$38,466,564	\$32,557,111	\$38,747,846	\$56,577,250	\$19,793,825	\$77,200,976	\$39,620,625	\$6,758,102	\$17,710,612	\$3,725,335	\$15,541,121	\$113,864,124	\$84,538,022	\$167,534,994	\$175,030,411	\$162,906,753	\$8,462,300
Rounded Average Cost/Acre Incl. Improvements, Severance, Relocation	\$875,000	\$79,000	\$99,000	\$82,000	\$76,000	\$71,000	\$64,000	\$67,000	\$65,000	\$61,000	\$78,000	\$142,000	\$89,000	\$159,000	\$69,000	\$38,000	\$65,000	\$64,000	\$68,000	\$65,000	\$72,000	\$138,000	\$145,000	\$463,000	\$547,000	\$539,000	\$55,000

Unit Costs in 2013 Dollars
Last Updated: 1/13/2014

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Appendix B
Preliminary Temporary Right-of-Way
Cost Estimate Table



**California High-Speed Train Project-Fresno to Bakersfield Section
Preliminary Temporary Construction Easement Cost Estimate**

Parcel Classification	HST Alignment Prefix																									
	F1	M	H	HW	HW2	K1	K2	K3	K4	K5	K6	C1	C2	C3	P	A1	A2	L1	L2	L3	L4	WS1	WS2	B1	B2	B3
	Area (ac)																									
A1 - Agriculture w/o Improvement	0.46	4.72	469.83	38.53	41.63	40.18	29.18	50.85	50.99	109.40	27.86	163.29	188.27	159.89	4.05	147.36	99.88	27.20	43.61	25.61	42.07	347.32	291.88			
A1.1 - Agriculture w/ Improvement	0.03	0.19	1.48	18.94	18.57	2.70	1.95	0.41		1.53	1.89	167.82	167.85	167.82	0.82	1.18	39.04				0.45	168.85	0.31			
C1 - Commercial w/o Improvement	0.33	0.04		0.86																				164.62	156.01	160.38
C1.1 - Commercial w/ Improvement																								0.38	0.42	0.34
I1 - Light Industrial w/o Improvement	29.57		0.52	0.04		0.12					0.13	12.29	0.52	1.03							0.07	18.60	0.60	24.07	25.38	27.38
I1.1 - Light Industrial w/ Improvement	63.74		0.02									20.98	0.07	0.29									43.14	0.98	1.83	3.65
I2 - Heavy Industrial w/o Improvement		0.09		0.70	0.70																					
I2.1 - Heavy Industrial w/ Improvement	0.86																									
M - Motel																										
MH - Mobile Home Park																										
O1 - Office w/o Improvement																								0.27	0.86	0.41
O1.1 - Office w/ Improvement																							0.42	0.45	0.19	
OS - Open Space/Park	0.09					21.13			12.77	0.69													12.34	9.17	9.46	
P - Pasture/Fallow				0.37	0.40	1.64	1.49	1.38	0.25	2.18	0.71	1.97	1.69	0.24		8.05	8.13	0.19	0.19	0.10	0.10	0.85				
R1 - SF Residential w/o Improvement	0.07	0.08	0.05	0.18	0.14	0.19				0.04	0.08		0.21										11.87	11.67	11.77	
R1.1 - SF Residential (w/ House)		0.04	0.08										0.01									0.40	0.02	0.20	0.08	
R2 - MF Residential w/o Improvement																							0.32	0.02		
R2.1 - MF Residential w/ Improvement																							0.17	0.08		
RR - Railroad	0.25	0.07	2.60		0.09	0.55	1.32	2.18	0.68	4.03	0.61	4.31	1.44		2.12				0.63		0.01	3.13	3.60	0.95	0.94	6.04
TOTAL Acres	95.39	5.22	474.58	59.61	61.53	66.51	33.94	54.82	64.69	117.87	31.28	370.66	360.06	329.28	6.99	156.59	147.04	27.39	44.43	25.71	42.70	582.30	296.38	216.43	207.03	219.62
Parcel Classification	Land & Improvements Cost																									
A1 - Agriculture w/o Improvement	\$15,424	\$224,652	\$11,430,637	\$1,400,278	\$1,518,472	\$1,406,305	\$1,021,163	\$1,802,009	\$1,803,669	\$3,877,232	\$992,083	\$2,936,352	\$3,343,978	\$2,834,426	\$141,751	\$5,191,770	\$3,505,770	\$636,192	\$1,651,095	\$576,449	\$1,569,238	\$6,730,226	\$10,299,540			
A1.1 - Agriculture w/ Improvement	\$1,050	\$3,255	\$51,629	\$673,243	\$650,062	\$94,533	\$68,321	\$14,411	\$673,243	\$62,013	\$35,808	\$2,943,588	\$2,957,092	\$3,016,499	\$28,665	\$41,687	\$1,376,274				\$15,890	\$2,954,983	\$10,897			
C1 - Commercial w/o Improvement	\$65,821	\$25,293		\$187,204																			\$18,094,457	\$11,820,214	\$11,174,287	
C1.1 - Commercial w/ Improvement																							\$91,037	\$92,909	\$12,921,560	
I1 - Light Industrial w/o Improvement	\$4,563,693		\$87,771	\$10,156		\$10,035					\$54,631	\$215,111	\$180,608	\$361,764							\$2,453	\$2,336,046	\$20,972	\$2,684,253	\$3,108,201	\$2,288,332
I1.1 - Light Industrial w/ Improvement	\$9,786,240		\$4,028									\$367,144	\$1,309	\$102,212								\$5,402,402	\$283,245	\$361,798	\$491,066	
I2 - Heavy Industrial w/o Improvement		\$43,174		\$322,834	\$322,793																					
I2.1 - Heavy Industrial w/ Improvement	\$133,529																									
M - Motel																										
MH - Mobile Home Park																										
O1 - Office w/o Improvement																								\$29,512	\$188,301	\$60,350
O1.1 - Office w/ Improvement																							\$102,741	\$109,759	\$43,997	
OS - Open Space/Park	\$14,025					\$318,456			\$192,492	\$10,326													\$1,852,789	\$1,146,776	\$1,088,893	
P - Pasture/Fallow				\$23,149	\$25,066	\$28,679	\$52,277	\$87,021	\$15,461	\$78,110	\$45,047	\$124,570	\$33,761	\$15,212		\$281,691	\$284,467	\$11,712	\$11,717	\$6,211	\$3,450	\$53,761				
R1 - SF Residential w/o Improvement	\$30,320	\$65,769	\$12,789	\$17,738	\$13,923	\$19,212				\$1,327	\$3,033		\$56,359										\$1,487,274	\$1,474,966	\$1,456,819	
R1.1 - SF Residential (w/ House)		\$31,312	\$15,218										\$1,336									\$126,483	\$7,107	\$50,808		
R2 - MF Residential w/o Improvement																							\$50,046	\$4,968		
R2.1 - MF Residential w/ Improvement																							\$39,991	\$16,582		
RR - Railroad	\$39,629	\$1,295	\$91,037		\$13,185	\$83,990	\$23,105	\$76,627	\$23,857	\$141,223	\$21,524	\$93,182	\$288,617		\$74,274				\$22,190		\$351	\$391,634	\$125,991	\$135,963	\$205,236	\$775,498
TOTAL Cost	\$14,649,731	\$394,751	\$11,693,110	\$2,634,602	\$2,543,500	\$1,961,210	\$1,164,865	\$1,980,068	\$2,035,478	\$4,170,229	\$1,152,126	\$6,679,947	\$6,863,059	\$6,330,113	\$244,690	\$5,515,148	\$5,166,511	\$647,903	\$1,685,002	\$582,660	\$1,591,382	\$17,995,534	\$10,457,401	\$24,858,415	\$18,580,517	\$30,300,802
Rounded Average Cost/Acre Incl. Improvements, Severance, Relocation	\$154,000	\$76,000	\$25,000	\$45,000	\$42,000	\$30,000	\$35,000	\$37,000	\$32,000	\$36,000	\$37,000	\$19,000	\$20,000	\$20,000	\$36,000	\$36,000	\$36,000	\$24,000	\$38,000	\$23,000	\$38,000	\$31,000	\$36,000	\$115,000	\$90,000	\$138,000

Unit Costs in 2013 Dollars
Last Updated: 1/13/2014

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Appendix C
Preliminary Right-of-Way Classifications
by Alignment and Proposed Use



**California High-Speed Train Project-Fresno to Bakersfield Section
Preliminary Right-of-Way Classification by Alignment and Proposed Use**

Proposed Use	HST Alignment Prefix																											
	F1	M	H	HW	HW2	K1	K2	K3	K4	K5	K6	C1	C2	C3	P	A1	A2	L1	L2	L3	L4	WS1	WS2	B1	B2	B3	HMF	
	Area (ac)																											
Canal Relocation	1.74	10.11	9.60	6.01	13.67	53.53	51.59	15.41	27.12	85.53	42.91	41.37	24.47	40.41	55.34	52.05	33.55	0.13	0.32	0.30			7.03	3.95	7.57	4.50	6.77	
Damaged	5.92	29.29	307.00	50.03	458.42	5.37	26.43	46.46	55.89	21.33	115.30	18.89	199.70	23.13	4.42	1,552.17	100.97	54.46	91.58		39.83	56.07	124.44	3.27	1.44	4.14		
HST Mainline Track	132.34	154.27	298.87	274.51	299.59	191.21	164.20	151.74	162.27	203.58	192.06	122.56	161.52	137.17	131.36	298.80	311.92	48.54	124.39	56.05	131.47	319.98	186.26	200.03	197.62	193.19		
HST Station	14.74		30.26	76.31	75.96																			27.45	29.09	24.81		
Heavy Maintenance Facility																											154.00	
Roadway Improvement	24.15	129.83	283.17	164.46	136.34	96.62	86.21	114.11	97.99	104.77	114.45	42.44	41.59	137.22	67.35	102.94	112.20		19.35		24.51	224.23	200.25	5.08	22.61	13.62		
Wayside Items	41.17	16.80	39.96	39.98	36.33	10.39	35.36	40.91	17.13	17.80	34.31	5.24	12.89	4.22	30.61	62.82	56.68	2.97	25.06	1.58	22.26	91.31	68.49	22.42	26.90	22.44		
Freight Rail Relocation		95.57	10.09	45.41	44.95									15.82									127.73	2.08	96.17	37.97	37.67	
Temporary Construction	95.39	5.22	474.58	59.61	61.53	66.51	33.94	54.82	64.69	117.87	31.28	370.66	360.06	329.28	6.99	156.59	147.04	27.39	44.43	25.71	42.70	582.30	296.38	216.43	207.03	219.62		
TOTAL Acres	315.45	441.09	1,453.52	716.32	1,126.78	423.63	397.73	423.43	425.09	550.87	530.30	601.16	800.23	687.24	296.08	2,225.37	762.36	133.49	305.13	83.64	260.76	1,408.64	881.85	578.41	527.16	522.27	154.00	

Last Updated: 1/13/2014

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Appendix D
**Preliminary Right-of-Way Impacted
Parcels**



**California High-Speed Train Project-Fresno to Bakersfield Section
Preliminary Right-of-Way Impacted Parcels**

Parcel Classification	HST Alignment Prefix																									
	F1	M	H	HW	HW2	K1	K2	K3	K4	K5	K6	C1	C2	C3	P	A1	A2	L1	L2	L3	L4	WS1	WS2	B1	B2	B3
	Number of Parcels Impacted																									
A1- Agriculture w/o Improvement	22	110	136	135	122	52	46	49	44	58	47	22	36	22	25	84	33	10	25	10	26	105	81	4	4	4
A1.1 - Agriculture w/ Improvement	8	12	21	22	18	4	6	2	1	6	10	5	8	2	1	2	5		1		1	5	7			
C1 - Commercial w/o Improvement	9	2		3										2			1						18	32	13	
C1.1 - Commercial w/ Improvement	8													7								1	1	12	40	16
I1 - Light Industrial w/o Improvement	69	1	13	5	5	1	1			1	3	25	3	18				1		2	45	3	97	90	91	
I1.1 - Light Industrial w/ Improvement	64	2	2	1	1							7	2	13	2							50	7	101	92	132
I2 - Heavy Industrial w/o Improvement		6		1	1																	1	1	1	1	1
I2.1 - Heavy Industrial w/ Improvement	1																					14	1	1	1	1
M - Motel	3																									
MH - Mobile Home Park				1	1									3												
O1 - Office w/o Improvement																							2	17	8	
O1.1 - Office w/ Improvement																						9	22	14		
OS - Open Space/Park	2					3			3	3													16	16	17	
P - Pasture/Fallow				11	6	3	4	6	3	3	4	15	10	7		59	57	1	1	1	1	4				
R1 - SF Residential w/o Improvement	6	9	4	11	10	5	4			8	7	1	7	14								4	3	98	89	81
R1.1 - SF Residential (w/ House)	6	7	13	9	8		1	2	2	1	2		17	4			1				12	8	152	147	127	
R2 - MF Residential w/o Improvement														13									8	3		
R2.1 - MF Residential w/ Improvement														1									13	12	7	
RR - Railroad	13	25	4	8	8	3	2	2	2	3	2	8	4	7	3	1			1	1	1	22	3	30	19	42
TOTAL Parcels	211	174	193	207	180	71	64	61	55	83	75	83	87	113	31	146	97	11	29	12	31	263	113	562	585	554

Last Updated: 1/13/2014

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