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April 21, 2011

Mr. Zachary Simmons
Regulatory Project Manager
U.S. Army Corps of Engineers
1325 J Street
Sacramento, CA 95814

Ms. Jennifer Blonn
High-Speed Rail, NEPA Lead
U.S. Environmental Protection Agency, Region 9
75 Hawthorne Street, CED-2
San Francisco, CA 95104

Dear Mr. Simmons and Ms. Blonn:

During the past year, representatives of the California High-Speed Rail Authority (Authority), Federal Railroad Administration (FRA), U.S. Environmental Protection Agency (USEPA), and U.S. Army Corps of Engineers (USACE) discussed the HST Fresno to Bakersfield Section of the High-Speed Train (HST) Program on several occasions. Meetings were held on May 19, 2010, November 27, 2010, January 28, 2011, and March 17, 2011. The primary purpose of these meetings was to review Tier 1 decisions, discuss progress in Tier 2, project-level planning, to assess alternatives in the BNSF and UPRR corridors, and ultimately to determine which alternatives would be evaluated in the Tier 2, project-specific EIR/EIS for the Fresno to Bakersfield Section.

The FRA, Authority, USEPA, and USACE entered into a Memorandum of Understanding (MOU) on integration of the NEPA, Clean Water Act Section 404, and Rivers and Harbors Act Section 14 processes in December 2010. On December 22, 2010, in compliance with MOU Checkpoint A, the Authority and FRA provided USEPA and USACE a statement of project purpose and need. USEPA provided agreement on this statement on January 20, 2011, and USACE provided agreement on February 2, 2011.

In February 2011, the Authority and FRA provided to USEPA and USACE a Checkpoint B package. The package included a project description, a summary presentation of environmental constraints of the UPRR and BNSF alternatives, and a discussion of the reasons for eliminating the UPRR alternative from further consideration. After discussing the information on January 28, 2011, and at the request of USEPA and USACE, the Authority and FRA submitted a revised Checkpoint B package in March 2011. The revised package included supplemental information regarding logistical and legal issues associated with a UPRR alignment alternative.

During the January 28, 2011 meeting, the possibility of a modification to the BNSF Alternative north of Corcoran to avoid over 4 acres of seasonal wetlands was discussed. Following that meeting, engineering analyses were done to confirm the practicability of this modification, and it was included in the revised Checkpoint B package as the Kaweah Bypass. The BNSF Alternative with this Kaweah Bypass and the Allensworth Bypass were presented in the revised Checkpoint B package as an "avoidance" alternative in the BNSF corridor that would further reduce potential project impacts to aquatic resources. Since preparation of the revised Checkpoint B

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package, the Authority and FRA have modified the original BNSF Alternative to include the Kaweah Bypass.

The revised March 2011 Checkpoint B package was discussed at a coordination meeting on March 17, 2011. During that meeting, USEPA and USACE requested clarification, in writing, from the Authority and FRA about several issues and receipt of a letter formally requesting agreement on the range of alternatives to carry forward – Checkpoint B. A further request for information was provided by the U.S. EPA on March 24, 2011.

The Authority and FRA intend to carry the following alternatives for the Fresno to Bakersfield Section of the HST Program to be evaluated in the Tier 2, Fresno to Bakersfield HST Draft Project EIR/EIS:

- BNSF Alignment Alternative with two station alternatives in Fresno (Mariposa and Kern), the Kings/Tulare Regional Station, and a station in Bakersfield (Bakersfield North)
- Corcoran Elevated Alternative
- Corcoran Bypass Alignment Alternative
- Allensworth Bypass Alignment Alternative
- Wasco-Shafter Bypass Alignment Alternative
- Bakersfield South Alignment Alternative with a Bakersfield South station alternative
- Fresno Works – Fresno Heavy Maintenance Facility (HMF) Site Alternative
- Kings County – Hanford HMF Site Alternative
- Kern Council of Governments – Wasco HMF Site Alternative
- Kern Council of Governments – Shafter East HMF Site Alternative
- Kern Council of Governments – Shafter West HMF Site Alternative

These alternatives are described in an Attachment A to this letter. Additional attachments to this letter containing information requested by the USEPA and USACE are:

- Attachment B - Table of Alternatives. Table of project alternative alignments considered and eliminated that provides the present and past names of the alternatives, the reasons for their elimination, and references for where the screening evaluation of each alternative can be found.
- Attachment C - Alternatives Maps. Maps with all alternatives carried forward displayed as solid lines and all alternatives removed displayed as dotted lines.
- Attachment D - Aerial Imagery Memorandum. Memorandum discussing the selection of June 2005 aerial photography for the preliminary evaluation of aquatic resources.
- Attachment E - Practicability Issues for UPRR. Additional requested information on practicability of an HST alignment in the UPRR corridor.
- Attachment F - Comparison of Alternatives in the Hanford, Corcoran, Wasco, and Shafter Areas. Comparison of alignment alternatives in the Hanford, Corcoran, and Wasco/Shafter areas with regard to Checkpoint B standard criteria (page 2-3 to 2-5 of the June 2010 AA Report); impacts to special status wildlife habitat, national wildlife refuge, and other similar areas; agricultural

resources (number of crossings and acres of impacts to streams/ creeks/canals, lakes/ponds/swamps/reservoirs, wetlands/vernal pools, and other features).

- Attachment G Other Information on Alternatives. Information on vertical alignment alternatives, shared right-of-way, and the West Hanford and East Hanford alternatives.

In accordance with the integration MOU of December 2010, the Authority and FRA request concurrence from the USEPA and USACE on the range of alternatives provided above for Checkpoint B. Should you have any questions, please contact Bryan Porter at (916) 384-9522 or via email at porter@pbworld.com.

Sincerely,

Dan Leavitt
Deputy Director, CHSRA

Enclosures

cc: David Valenstein and Melissa DuMond, FRA
Connell Dunning, USEPA
Veronica Chan, Los Angeles District, USACE
Ann Koby and Tom Tracy, CHSRA PMT

Attachment A

Description of Alternatives Carried Forward

Fresno to Bakersfield Description of Alternatives Carried Forward

BNSF Alternative

The BNSF Alternative would be approximately 114 miles in length, beginning at the northern end of the Fresno station tracks in the vicinity of Amador Street and ending at the southern end of the Bakersfield station tracks in the vicinity of Baker Street. The BNSF Alternative would be at grade through Fresno and run southeast adjacent to the western side of the UPRR right-of-way. At East Jensen Avenue, the alignment would become elevated, curve to the south over State Route (SR) 99, and return to grade to join the BNSF Railway right-of-way on its western side at East Malaga Avenue south of Fresno.

There are two alternative station sites under consideration in Fresno. The Fresno Station–Mariposa Alternative is located in downtown Fresno, less than 0.5 mile east of SR 99 on the BNSF Alternative. The station would be centered on Mariposa Street and bordered by Fresno Street on the north, Tulare Street on the south, H Street on the east, and G Street on the west. The Fresno Station–Kern Alternative is similarly situated in downtown Fresno, and would be located on the BNSF Alternative, centered on Kern Street between Tulare Street and Inyo Street. This alternative station site would also be bordered by H Street on the east and G Street on the west. Both of the Fresno station alternatives would occupy approximately 13 acres and include similar facilities such as a bus transit center, surface parking lots, and nearby parking structures.

The BNSF Alternative would continue through Fresno County along the BNSF Railway right-of-way in an area composed mostly of agricultural land. The alignment would cross from the western side to the eastern side of the BNSF Railway right-of-way near East Conejo Avenue and then cross over Cole Slough and the Kings River into Kings County.

The BNSF Alternative would pass east of the city of Hanford, parallel to and approximately ½-mile east of SR 43 (Avenue 8). The alignment would be elevated just east of the city of Hanford, beginning just south of Fargo Avenue and ending just north of Hanford Armona Road. This portion of the alignment would pass over the San Joaquin Valley Railroad (Cross Valley Rail Line) and SR 198. The potential Kings/Tulare Regional Station would be located along this structure, east of SR 43 (Avenue 8) and north of the Cross Valley Rail Line. The entire station site would be approximately 28 acres and would include facilities such as a bus transit center and a surface parking lot.

South of Hanford in the vicinity of Idaho Avenue, the BNSF Alternative would curve to the west to avoid special aquatic features north of Corcoran and would then rejoin the BNSF Railway right-of-way just north of Corcoran. The alignment would travel through the eastern edge of the city of Corcoran at grade along the west side of the BNSF Railway right-of-way.

The alignment would continue at-grade south of Hanford Armona Road, where it would again ascend onto an elevated structure over Cross Creek and the BNSF Railway right-of-way. The alignment would return to grade just before Nevada Avenue north of Corcoran. The BNSF Alternative would continue through Tulare County at grade and adjacent to the western side of the BNSF Railway right-of-way. The alignment would cross over the Tule River and then the Alpaugh railroad spur. This alignment would also cross over Lakeland Canal.

Within Kern County, the alignment would pass through the cities of Wasco and Shafter on its way to Bakersfield. It would closely follow the western side of the BNSF Railway until just south of Wasco, where it would cross over to the eastern side of the BNSF Railway tracks. The alignment would continue on the eastern side of the BNSF Railway right-of-way through Shafter and then cross over once more to the western side of the BNSF Railway right-of-way. The alignment would generally follow the BNSF Railway Corridor through Bakersfield to the southern end of the Bakersfield station tracks.

There would be four elevated sections of the BNSF Alternative in Kern County. The first would cross Poso Creek north of Wasco. The other three sections would be within the cities of Wasco, Shafter, and Bakersfield. The elevated structure crossing Poso Creek would begin at Sherwood Avenue and return to grade at Whisler Road. The second elevated structure would begin at Margalo Street, pass through Wasco for a distance of about 3 miles, and return to grade just south of Prospect Avenue. From Prospect Avenue, the alignment would continue at grade for approximately 4.5 miles to near Madera Avenue, where it would again ascend onto an elevated structure. The alignment would be on an elevated structure through Shafter between Madera Avenue and Cherry Avenue. After returning to grade at Cherry Avenue, the alignment would travel approximately 10 miles to Palm Avenue, where it would ascend onto another elevated structure through Bakersfield to its terminus at the southern end of the Bakersfield station tracks.

The Bakersfield Station–North Alternative would be located on the BNSF Alternative at the corner of Truxtun and Union Avenue/SR 204. The station site would consist of approximately 19 acres and include facilities such as a bus transit center and parking structures.

CORCORAN ELEVATED ALTERNATIVE

The Corcoran Elevated Alternative would start diverging from the BNSF Alternative north of Cross Creek, cross over to the east side of the BNSF Railway north of Newark Avenue, and pass through Corcoran on the east side of the BNSF Railway on an elevated structure. This alignment would return to grade and rejoin the BNSF Alternative south of Avenue 144. The Corcoran Elevated Alternative would not be more than about 150 feet east of the BNSF Alternative. The principal difference between the two alternatives is that the BNSF Alternative crosses Corcoran on the west side of the BNSF Railway at grade, and the Corcoran Elevated Alternative crosses Corcoran on the east side of the BNSF Railway on an elevated structure.

CORCORAN BYPASS ALTERNATIVE

The Corcoran Bypass Alternative would be the same as the BNSF Alternative from approximately Idaho Avenue south of Hanford to approximately Nevada Avenue north of Corcoran. The Corcoran Bypass Alternative would then diverge from the BNSF Alternative and swing east of Corcoran, rejoining the BNSF Railway route at Avenue 136. The total length of the Corcoran Bypass would be approximately 21 miles. The alignment would be elevated over Cross Creek and the Tule River.

ALLENSWORTH BYPASS ALTERNATIVE

The Allensworth Bypass Alternative would pass west of the BNSF Alternative, avoiding Allensworth Ecological Reserve and the Allensworth State Historic Park. The total length of the Allensworth Bypass Alternative would be approximately 19 miles, beginning at Avenue 84 and rejoining the BNSF Alternative at Elmo Highway. The Allensworth Bypass Alternative would be constructed on an elevated structure only where the alignment crosses the Alpaugh railroad spur. The majority of the alignment would pass through Tulare County at grade.

WASCO-SHAFTER BYPASS ALTERNATIVE

The Wasco-Shafter Bypass Alternative would diverge from the BNSF Alternative between Sherwood Avenue and Fresno Avenue north of Wasco, crossing over to the eastern side of the BNSF Railway tracks and bypassing Wasco and Shafter to the east. It would rejoin the BNSF Alternative at 7th Standard Road. The total length of the alternative alignment would be 23 miles, and the alignment would be at grade.

BAKERSFIELD SOUTH ALTERNATIVE

From the Rosedale Highway (SR 58) in Bakersfield, the Bakersfield South Alternative parallels the BNSF Alternative to the south at varying distances. At Chester Avenue, the Bakersfield South Alternative curves

south, and parallels California Avenue. As with the BNSF Alternative, the Bakersfield South Alternative would begin at grade but then be elevated starting at Palm Avenue through to the southern end of the station tracks. The Bakersfield South Alternative would be approximately 9 miles in length and includes the Bakersfield Station–South Alternative.

The Bakersfield Station–South Alternative would be located in the same general area as the Bakersfield Station–North Alternative, but would be situated along Union and California avenues, south of the BNSF Railway right-of-way. The station site would consist of approximately 20 acres and include the same facilities as the Bakersfield Station–North Alternative.

Heavy Maintenance Facility Alternatives

The Authority is studying five heavy maintenance facility (HMF) sites for the Fresno to Bakersfield Section. The sites vary in size and physical factors. However, all five proposed locations under consideration are accessible to all the alternatives under study. The HMF would be situated on a parcel of approximately 154 acres within proximity of the HST alignment. The facility would also have connections to highways and utilities on a parcel zoned for heavy industrial activities.

FRESNO WORKS–FRESNO HMF SITE

The Fresno Works–Fresno site is located within the southern limits of the city of Fresno adjacent to and east of the BNSF Railway right-of-way between SR 99 and Adams Avenue. A total of 590 acres are available at this site.

KINGS COUNTY–HANFORD HMF SITE

The Kings County–Hanford site is located southeast of the city of Hanford, adjacent to and east of SR 43, between Houston and Idaho Avenues. A total of 510 acres are available at this site.

KERN COUNCIL OF GOVERNMENTS–WASCO HMF SITE

The Kern Council of Governments–Wasco site, which would be accessed by either the BNSF or Wasco-Shafter Bypass alternatives, would lie east of Wasco between SR 46 and Filburn Street. A total of 420 acres are available at this site.

KERN COUNCIL OF GOVERNMENTS-SHAFTER EAST HMF SITE

The Kern Council of Governments–Shafter site, which could be accessed by either the BNSF or Wasco-Shafter Bypass alternatives, would be located on the eastern side of the BNSF Railway right-of-way in the city of Shafter between Burbank Street and 7th Standard Road. A total of 490 acres are available at this site.

KERN COUNCIL OF GOVERNMENTS-SHAFTER WEST HMF SITE

This proposed site, which would be accessed by the BNSF Alternative, would be located on the western side of the BNSF Railway right-of-way in the city of Shafter between Burbank Street and 7th Standard Road. A total of 480 acres are available at this site.

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Attachment B

Table of Alternatives Considered for Fresno to Bakersfield Section

FRESNO TO BAKERSFIELD TABLE OF PROJECT ALTERNATIVES

Alignment Subsection	Visalia-Tulare-Hanford Station Feasibility Study Aug 2007		FB Preliminary Alternatives Analysis Report June 2010				Supplemental Alternatives Analysis Report Sept 2010		Checkpoint B Summary Report March 2011	Project EIR/EIS
			Initial Screening		Detailed Screening					
FRESNO SUBSECTION	NA	NA	Alternative Family 1: HST on east side of UPRR Right-of-way	Alternative 1-1 carried forward and **RENAMED B2 and B5**	**B2** UPRR East elevated through Fresno to BNSF Corridor	**CARRIED FORWARD**	NA	NA	**ELIMINATED** UPRR East RENAMED Fresno East. This alternative would result in the demolition or relocation of the Southern Pacific Railroad Depot, a Section 4(f) property. (See p. 3-2)	
					B5 UPRR East elevated through Fresno to UPRR Corridor	**ELIMINATED** Would affect historic Southern Pacific depot, also infeasible due to elimination of UPRR route in Rural Subsection. (See pp. 4-1 - 4-20)				
				Alternative 1-2 carried forward and **RENAMED B8 and B11**	**B8** UPRR East at grade through Fresno to BNSF Corridor	**ELIMINATED** Would affect historic Southern Pacific depot, disrupt existing infrastructure, and affect the most sensitive noise and vibration receptors. (See pp. 4-1 - 4-20)				
					B11 UPRR East at grade through Fresno to UPRR Corridor	**ELIMINATED** Would affect historic Southern Pacific depot, also infeasible due to elimination of UPRR route in Rural Subsection. (See pp. 4-1 - 4-20)				
				ELIMINATED Alternative 1-3 would require 7 miles of tunnel through Fresno and an underground station, making this alternative cost prohibitive. (See pp. 3-9 - 3-12)						
				ELIMINATED Alternative 1-4 would require complex design and disruption of street grid. (See pp. 3-9 - 3-12)						
				ELIMINATED Alternative 1-5 would require complex design and disruption of street grid. (See pp. 3-9 - 3-12)						

NA = Not applicable. Report did not include analysis of the alternative or family of alternatives listed.

FRESNO TO BAKERSFIELD TABLE OF PROJECT ALTERNATIVES

Alignment Subsection	Visalia-Tulare-Hanford Station Feasibility Study Aug 2007		FB Preliminary Alternatives Analysis Report June 2010				Supplemental Alternatives Analysis Report Sept 2010		Checkpoint B Summary Report March 2011	Project EIR/EIS
			Initial Screening		Detailed Screening					
FRESNO SUBSECTION	NA	NA	Alternative Family 2: HST on the west side of UPRR Right-of-way	Alternative 2-1 carried forward and **RENAMED B1 and B4**	**B1** UPRR West elevated through Fresno to BNSF Corridor	**CARRIED FORWARD**	NA	NA	**ELIMINATED** UPRR West RENAMED as part of the BNSF Alternative. Cost of elevated structure through Fresno ($500 Million) would make the project infeasible.	
					B4 UPRR West elevated through Fresno to UPRR Corridor	**ELIMINATED** Infeasible due to elimination of UPRR route in Rural Subsection. (See pp. 4-1 - 4-20)				
				Alternative 2-2 carried forward and **RENAMED B7 and B10**	**B7** UPRR West at grade through Fresno to BNSF Corridor	**ELIMINATED** Would sever SJVR connections, disrupt existing infrastructure, and result in direct impacts to Roeding Park. (See pp. 4-1 - 4-20)			**REINTRODUCED as a result of the Value Engineering Study of February 2011.** Impacts to Roeding Park would be avoided as HST would be constructed within the Golden State Boulevard right-of-way. Engineering design has been modified to include bridges for the SJVR connections, with HST traveling below grade in an approximately 1.5 mile trench. Authority and City of Fresno developed plan to minimize impacts to local road network.	**BNSF ALTERNATIVE ALIGNMENT**
					B10 UPRR West at grade through Fresno to UPRR Corridor	**ELIMINATED** Infeasible due to elimination of UPRR route in Rural Subsection. (See pp. 4-1 - 4-20)				
				ELIMINATED Alternative 2-3 would require 7 miles of tunnel through Fresno and an underground station, making this alternative cost prohibitive. (See pp. 3-9 - 3-12)						
				ELIMINATED Alternative 2-4 would require complex design and disruption of street grid. (See pp. 3-9 - 3-12)						
				ELIMINATED Alternative 2-5 would require complex design and disruption of street grid. (See pp. 3-9 - 3-12)						

NA = Not applicable. Report did not include analysis of the alternative or family of alternatives listed.

FRESNO TO BAKERSFIELD TABLE OF PROJECT ALTERNATIVES

Alignment Subsection	Visalia-Tulare-Hanford Station Feasibility Study Aug 2007		FB Preliminary Alternatives Analysis Report June 2010				Supplemental Alternatives Analysis Report Sept 2010		Checkpoint B Summary Report March 2011	Project EIR/EIS
			Initial Screening		Detailed Screening					
FRESNO SUBSECTION	NA	NA	Alternative Family 3: Golden State Boulevard	Alternative 3-1 carried forward and **RENAMED B3, B6, B9, and B12**	**B3** Golden State Boulevard elevated through Fresno to BNSF Corridor	**ELIMINATED** Would result in greatest impact to Roeding Park, involve complex design and construction, and sever SJVR or require costly realignment to a new route. Also located farthest from preferred station location. (See pp. 4-1 - 4-20)				
					B6 Golden State Boulevard elevated through Fresno to UPRR Corridor	**ELIMINATED** Infeasible due to elimination of UPRR route in Rural Subsection. (See pp. 4-1 - 4-20)				
					B9 Golden State Boulevard at grade through Fresno to BNSF Corridor	**ELIMINATED** Would result in greatest impact to Roeding Park and involve complex design and construction. The four-track cross-section for the station is approximately twice as long as Alts B1 and B2. Also located farthest from preferred station location. (See pp. 4-1 - 4-20)				
					B12 Golden State Boulevard at grade through Fresno to UPRR Corridor	**ELIMINATED** Infeasible due to elimination of UPRR route in Rural Subsection. (See pp. 4-1 - 4-20)				
				ELIMINATED Alternative 3-2 would require more than 7 miles of tunnel through Fresno and an underground station, making this alternative cost prohibitive. Also could affect subsurface cultural resources in Chinatown. (See pp. 3-9 - 3-12)						
	NA	NA	NA	NA	**B13** UPRR West/UPRR East Crossover Alternative (Hybrid of Alts B1 and B2)	**CARRIED FORWARD** Alternative was carried forward in MF EIR/EIS and subsequently eliminated because it is not viable with an at-grade alternative through Fresno.				
	NA	NA	Alternative 4: State Route 99	**ELIMINATED** Would traverse Roeding Park and require station farthest from central business district. Also least consistent with local planning objectives. (See pp. 3-9 - 3-12)						
	NA	NA	Option 2: Fresno Western Bypass Option	**ELIMINATED** Would impact agricultural lands west of Fresno, add design/construction complexity, and was opposed by both the City and County of Fresno. (See pp. 3-9 - 3-12)						

NA = Not applicable. Report did not include analysis of the alternative or family of alternatives listed.

FRESNO TO BAKERSFIELD TABLE OF PROJECT ALTERNATIVES

Alignment Subsection	Visalia-Tulare-Hanford Station Feasibility Study Aug 2007		FB Preliminary Alternatives Analysis Report June 2010				Supplemental Alternatives Analysis Report Sept 2010		Checkpoint B Summary Report March 2011	Project EIR/EIS
			Initial Screening		Detailed Screening					
RURAL SUBSECTION	**A** BNSF Refined (through central Hanford on BNSF)	**Alternative through Hanford ELIMINATED.** Alt D-2 incorporated as new baseline alternative A.	**A** Baseline BNSF Hanford West Bypass	**CARRIED FORWARD and RENAMED CPAA**	**CPAA** Hanford West Bypass (No Station)	**ELIMINATED** Would not maximize use of exisiting transportation corridors, would not provide a potential station in the Visalia-Tulare-Hanford area, inconsistent with local land use plans, and was not supported by the City of Hanford or Kings County. (See pp.4-21 - 4-49)				
	B UPRR Refined (entire alignment follows UPRR with the exception of the entrance to Bakersfield)	**ELIMINATED** Alternative B was eliminated as a stand-alone alternative, but combined with portions of other alternatives to form New B-1, B-2, D-1, D-2, E-1, and E-2. (See pp. 31 - 44)								
	C-1 UPRR diverted west (from Kingsburg to Fowler)	**C-1, B, D-3, and E COMBINED to form New B-1, D-1, and E-1**	**B-1** UPRR Fresno South Below Grade	**ELIMINATED** Would require trench construction, greater community impacts, and UPRR cooperation. (See pp. 3-16 - 3-23)						
			D-1 UPRR to BNSF (198 Station) - Fresno South Below Grade	**ELIMINATED** Would require trench construction and UPRR cooperation. (See pp. 3-16 - 3-23)						
			E-1 UPRR to BNSF (99 Station) - Fresno South Below Grade	**ELIMINATED** Would result in major adverse environmental impacts to vernal pools and Allensworth Ecological Reserve, and require trench construction and UPRR cooperation. (See pp. 3-16 - 3-23)						
	C-2 UPRR diverted east (from Kingsburg to Fowler)	**ELIMINATED** Would Impact high-value agricultural area known as Golden Triangle. (See pp. 31 - 44)								

NA = Not applicable. Report did not include analysis of the alternative or family of alternatives listed.

FRESNO TO BAKERSFIELD TABLE OF PROJECT ALTERNATIVES

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			Initial Screening		Detailed Screening					
RURAL SUBSECTION	**C-3** UPRR below grade (below grade from Kingsburg to Fowler)	**C-3 below-grade segment COMBINED with B, D-3, and E to form new B-2, D-2, and E 2**	**B-2** UPRR Fresno South Bypass	**ELIMINATED** Fewer construction and community impacts than Alt B-1, but greater impacts to agricultural land. Would require UPRR cooperation. (See pp. 3-16 - 3-23)						
			D-2 UPRR to BNSF (198 Station) - Fresno South Bypass	**Alternative D-2 CARRIED FORWARD and RENAMED C4, C5, and C6**	**C4** UPRR to BNSF, Visalia Station - Shared Right-of-way	**ELIMINATED** Would travel longer route than BNSF Alts resulting in longer travel time, only partially follows the Authority's objective to maximize use of exisiting transportation corridors. (See pp. 4-21 - 4-49)				
					C5 UPRR to BNSF, Visalia Station - Separate Side Alignment	**ELIMINATED** Would travel longer route than BNSF Alts resulting in longer travel time, does not maximize use of exisiting transportation corridors. (See pp. 4-21 - 4-49)				
					C6 UPRR to BNSF, Visalia Station - East Side Alignment	**ELIMINATED** Would travel longer route than BNSF Alts resulting in longer travel time, does not maximize use of exisiting transportation corridors. (See pp. 4-21 - 4-49)				
			E-2 UPRR to BNSF (99 Station) - Fresno South Bypass	**ELIMINATED** As with Alt E-1, Alt E-2 would result in major adverse environmental impacts to vernal pools and Allensworth Ecological Reserve. (See pp. 3-16 - 3-23)						
	D-1 BNSF Hanford East Bypass via SR 43	**CARRIED FORWARD and RENAMED A-1**	**A-1** BNSF Hanford East Bypass, at grade	**Alternative A-1 CARRIED FORWARD and RENAMED C1, C2, and C3**	**C1** BNSF Hanford East Bypass, Hanford Station - Shared Right-of-way	**CARRIED FORWARD**	**Alternative C1**	**CARRIED FORWARD**	**POTENTIAL OPTION** Agreement with BNSF for shared right-of-way may not be accomplished in this area. Separate side alignment reintroduced for purpose of EIR/EIS. The Authority continues to work with BNSF to utilize a shared right-of-way.	
					C2 BNSF Hanford East Bypass, Hanford Station - Separate Side Alignment	**ELIMINATED** Similar to Alt C1 but with greater land use impacts. (See pp. 4-21 - 4-49)			**Reintroduced as Alignment A-1 (formerly C1)** **RENAMED BNSF ALTERNATIVE ALIGNMENT**	**BNSF ALTERNATIVE ALIGNMENT** (The potential Kings/Tulare Regional Station would be located east of the City of Hanford along the BNSF Alternative, to the east of SR 43 and north of the Cross Valley Rail Line.)
					C3 BNSF Hanford East Bypass, Hanford Station - East Side Alignment	**ELIMINATED** Increased impacts to Allensworth Ecological Reserve and does not maximize use of existing transportation corridors. (See pp. 4-21 - 4-49)				
	D-2 BNSF Hanford West Bypass (generally same bypass of Hanford in programmatic EIR/EIS)	**ELIMINATED** Incorporated as baseline A (See pp. 31 - 44)								

NA = Not applicable. Report did not include analysis of the alternative or family of alternatives listed.

FRESNO TO BAKERSFIELD TABLE OF PROJECT ALTERNATIVES

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			Initial Screening	Detailed Screening				
RURAL SUBSECTION	**D-3** BNSF Hanford Far-East Bypass (SR - 198 Station)	**ELIMINATED** Reconfigured to merge into UPRR corridor on north end and combined with C-1 and C-3. **RENAMED D-1 and D-2** (See FB Preliminary Alternatives Analysis Report)						
	E UPRR to BNSF 99 (SR 99 Station)	**ELIMINATED** Combined with C-1 and C-3 on north end and **RENAMED E-1 and E-2.** (See FB Preliminary Alternatives Analysis Report)						
	F UPRR to BNSF 198 (SR 198 Station)	**ELIMINATED** Potential station location too remote and located in floodplain. (See pp. 31 - 44)						
	F-1 BNSF to BNSF (Center of Valley)	**ELIMINATED** Potential station location too remote and located in floodplain. (See pp. 31 - 44)						
	G-1 BNSF to UPRR 99 (SR 99 Station)	**ELIMINATED** Alignment similar to new Alt B-1 (formerly Alt C-1) but would impact more farmland. (See pp. 31 - 44)						
	G-2 BNSF to UPRR 198 (SR 198 Station)	**ELIMINATED** Potential station location too remote and located in floodplain. (See pp. 31 - 44)						
	NA	NA	**3-B** BNSF Straight South of Corcoran West	**ELIMINATED** Inconsistent with Purpose and Need objective to combine transportation corridors and minimize impacts on agricultural land. (See pp. 3-16 - 3-23)				
	NA	NA	**3-C** BNSF Straight South of Corcoran East	**ELIMINATED** Would result in major adverse environmental impacts to Pixley National Wildlife Refuge and Allensworth Ecological Reserve. As with Alt 3-B, inconsistent with Project Purpose and Need. (See pp. 3-16 - 3-23)				

NA = Not applicable. Report did not include analysis of the alternative or family of alternatives listed.

FRESNO TO BAKERSFIELD TABLE OF PROJECT ALTERNATIVES

Alignment Subsection	Visalia-Tulare-Hanford Station Feasibility Study Aug 2007		FB Preliminary Alternatives Analysis Report June 2010				Supplemental Alternatives Analysis Report Sept 2010		Checkpoint B Summary Report March 2011	Project EIR/EIS
			Initial Screening		Detailed Screening					
RURAL SUBSECTION Rural Subsection: Local Options	NA	NA	NA	NA	NA	NA	**H1** Hanford Through-town/Downtown Station	**ELIMINATED** Increased residential, business, and noise impacts compared to Alt C-1. Reduced connectivity for potential regional station. (See Supplemental AA Report)		
	NA	NA	NA	NA	NA	NA	**H2** Hanford Through town/Southern Station	**ELIMINATED** Increased residential, business, and noise impacts compared to Alt C-1. Reduced connectivity for potential regional station. (See Supplemental AA Report)		
	NA	NA	NA	NA	**CTT1A** Corcoran at grade through town	**ELIMINATED** Would impact existing road network and BNSF tracks. (See pp. 4-21 - 4-49)			**REINTRODUCED as a result of the Value Engineering Study of March 2011.**	**BNSF ALTERNATIVE ALIGNMENT**
	NA	NA	NA	NA	**CTT1B** Corcoran elevated through town	**CARRIED FORWARD**	NA	NA	**ELIMINATED** Cost of elevated structure through Corcoran may be excessive.	**REINTRODUCED AS CORCORAN ELEVATED ALTERNATIVE ALIGNMENT**
	NA	NA	NA	NA	NA	NA	NA	NA	**KAWEAH BYPASS** At-grade alignment developed to avoid special aquatic resources in the Cross Creek Complex north of Corcoran.	**BNSF ALTERNATIVE ALIGNMENT**
	NA	NA	NA	NA	NA	NA	NA	NA	**KAWEAH-CORCORAN BYPASS** At-grade alignment developed to avoid both the special aquatic resources in the Cross Creek Complex as well as community impacts to the City of Corcoran.	**CORCORAN BYPASS ALTERNATIVE ALIGNMENT**
	NA	NA	NA	NA	**CTT1C** Corcoran Bypass at grade	**CARRIED FORWARD**	NA	NA	Alternative CTT1C **RENAMED CORCORAN BYPASS ALTERNATIVE ALIGNMENT**	**ELIMINATED** This original Corcoran Bypass was eliminated and replaced by the New Corcoran Bypass (above) in order to avoid special aquatic resources in the Cross Creek Complex as well as community impacts to the city of Corcoran (referred to as the "Kaweah-Corcoran Bypass" in the Checkpoint B Summary Report of March 2011).
	NA	NA	NA	NA	**CBPA** Fowler, Selma, Kingsburg Bypass via Greenfield west of towns	**ELIMINATED** Infeasible due to elimination of Alts C4, C5, and C6. (See pp. 4-21 - 4-49)				
	NA	NA	NA	NA	**CBPB** Fowler, Selma, Kingsburg Bypass just west of town limits	**ELIMINATED** Infeasible due to elimination of Alts C4, C5, and C6. (See pp. 4-21 - 4-49)				
	NA	NA	NA	NA	**CVSA** Visalia Station Alignment 198 East	**ELIMINATED** Would require longer travel time, greater impacts to agricultural land, and inconsistent with Program EIR/EIS Preferred Alignment. (See pp. 4-21 - 4-49)				

NA = Not applicable. Report did not include analysis of the alternative or family of alternatives listed.

FRESNO TO BAKERSFIELD TABLE OF PROJECT ALTERNATIVES

Alignment Subsection		Visalia-Tulare-Hanford Station Feasibility Study Aug 2007		FB Preliminary Alternatives Analysis Report June 2010				Supplemental Alternatives Analysis Report Sept 2010		Checkpoint B Summary Report March 2011	Project EIR/EIS
				Initial Screening		Detailed Screening					
RURAL SUBSECTION	Rural Subsection: Local Options	NA	NA	NA	NA	**CVSB** Visalia Station Alignment 99 Center (South of SR 198)	**ELIMINATED** Would require longer travel time, greater impacts to agricultural land, and inconsistent with Program EIR/EIS Preferred Alignment. (See pp. 4-21 - 4-49)				
		NA	NA	NA	NA	**CVSC** Visalia Station 99 North (Goshen)	**ELIMINATED** Would require longer travel time, greater impacts to agricultural land, and inconsistent with Program EIR/EIS Preferred Alignment. (See pp. 4-21 - 4-49)				
		NA	NA	NA	NA	**CAAA** Allensworth Bypass at grade	**CARRIED FORWARD**	NA	NA	Alternative CAAA **RENAMED ALLENSWORTH BYPASS ALTERNATIVE ALIGNMENT**	**ALLENSWORTH BYPASS ALTERNATIVE ALIGNMENT**
		NA	NA	NA	NA	**CTT2A** Wasco and Shafter at grade	**ELIMINATED** Major impacts to the existing road networks and BNSF operations in both Wasco and Shafter. (See pp. 4-21 - 4-49)				
		NA	NA	NA	NA	**CTT2B** Wasco and Shafter elevated	**CARRIED FORWARD**	NA	NA	Alternative CTT2B **RENAMED as part of the BNSF ALTERNATIVE ALIGNMENT** (Alignment elevated only through Wasco and Shafter, at grade between the two cities)	**BNSF ALTERNATIVE ALIGNMENT**
		NA	NA	NA	NA	**CTT2C** Bypass of Wasco, at grade through Shafter	**ELIMINATED** Major impacts to the existing road network and BNSF operations and facilities in Shafter. (See pp. 4-21 - 4-49)				
		NA	NA	NA	NA	**CTT2D** Bypass of Wasco and Shafter at grade	**CARRIED FORWARD**	NA	NA	Alternative CTT2D **RENAMED WASCO-SHAFTER BYPASS ALTERNATIVE ALIGNMENT**	**WASCO-SHAFTER BYPASS ALTERNATIVE ALIGNMENT**
		NA	NA	NA	NA	**CTT2E** Elevated through Wasco, at grade through Shafter	**ELIMINATED** Major impacts to the existing road network and BNSF operations and facilities in Shafter. (See pp. 4-21 - 4-49)				
		NA	NA	NA	NA	**CTT2F** At grade through Wasco, elevated through Shafter	**ELIMINATED** Major impacts to the existing road network and BNSF operations in Wasco. Major community impacts and possible environmental justice issues on the eastern side of the city. (See pp. 4-21 - 4-49)				
		NA	NA	NA	NA	**CTT2G** 7th Standard Road East Bypass	**ELIMINATED** Major impacts on agricultural land and planned mixed use development. Possible impact on planned 7th Standard Road reconstruction. Opposed by City of Bakersfield. (See pp. 4-21 - 4-49)				

NA = Not applicable. Report did not include analysis of the alternative or family of alternatives listed.

FRESNO TO BAKERSFIELD TABLE OF PROJECT ALTERNATIVES

Alignment Subsection	Visalia-Tulare-Hanford Station Feasibility Study Aug 2007		FB Preliminary Alternatives Analysis Report June 2010				Supplemental Alternatives Analysis Report Sept 2010		Checkpoint B Summary Report March 2011	Project EIR/EIS
			Initial Screening		Detailed Screening					
BAKERSFIELD SUBSECTION	NA	NA	Alternative Family 1: Circumventing Flying-J Refinery	Alternative 1A carried forward and **RENAMED D1-N and D1-S**	**D1-N** Elevated alignment north of UPRR, reduced speed	**ELIMINATED** Numerous displacements including environmental justice community residential uses, commercial properties, school facilities, and possibly a power transmission substation. Costly and complex construction. (See pp. 4-50 - 4-59)				
					D1-S Elevated alignment south of UPRR, reduced speed	**CARRIED FORWARD**	NA	NA	Alternative 1A (formerly D1-S) **RENAMED as part of the BNSF ALTERNATIVE ALIGNMENT**	**BNSF ALTERNATIVE ALIGNMENT**
				ELIMINATED Alternative 1B would not maintain reasonable operating speeds and would result in substantial land use impacts. (See pp. 3-28 - 3-32)						
				ELIMINATED Alternative 1C would not maintain reasonable operating speeds and would result in substantial land use impacts. (See pp. 3-28 - 3-32)						
				Alternative 1D carried forward and **RENAMED D2-N and D2-S**	**D2-N** Elevated alignment north of BNSF in Central Bakersfield, optimal speed	**CARRIED FORWARD**	NA	NA	Alternative 1D (formerly D2-N) **RENAMED BAKERSFIELD SOUTH ALTERNATIVE ALIGNMENT**	**BAKERSFIELD SOUTH ALTERNATIVE ALIGNMENT**
					D2-S Elevated alignment over BNSF in Central Bakersfield, optimal speed	**ELIMINATED** Numerous displacements of commercial properties and school facilities. Costly and complex construction. (See pp. 4-50 - 4-59)				
				ELIMINATED Alternative 1E would result in business displacements, impacts to Bakersfield High and California Avenue, and require complex construction to access downtown station. (See pp. 3-28 - 3-32)						

NA = Not applicable. Report did not include analysis of the alternative or family of alternatives listed.

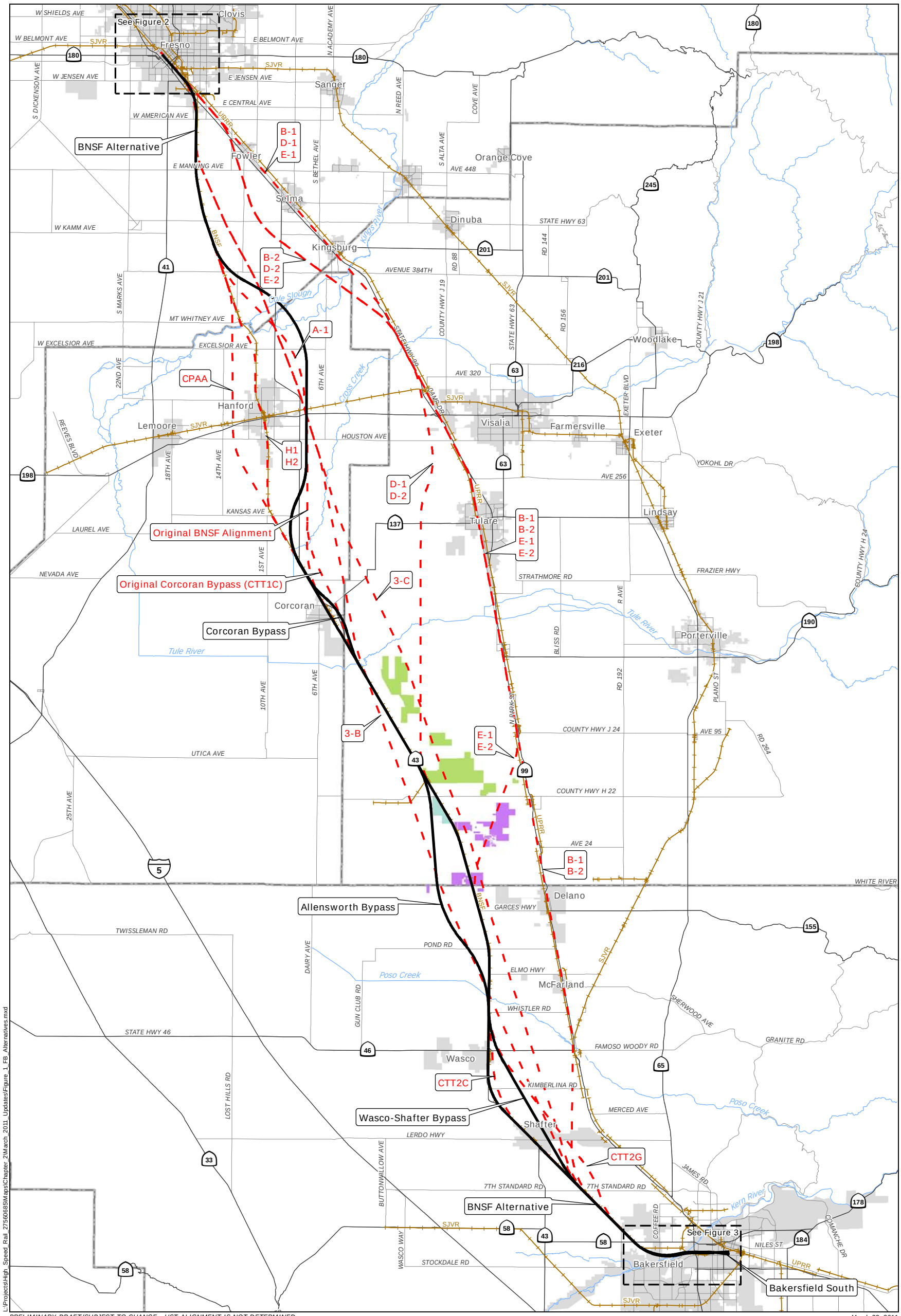
FRESNO TO BAKERSFIELD TABLE OF PROJECT ALTERNATIVES

Alignment Subsection	Visalia-Tulare-Hanford Station Feasibility Study Aug 2007		FB Preliminary Alternatives Analysis Report June 2010			Supplemental Alternatives Analysis Report Sept 2010		Checkpoint B Summary Report March 2011	Project EIR/EIS
			Initial Screening		Detailed Screening				
BAKERSFIELD SUBSECTION	NA	NA	Alternative Family 2: Most closely followed path of Program EIR/EIS Preferred Alignment	**ELIMINATED** Alternative 2A would travel through the Flying-J Refinery and result in potential impacts to a Section 4(f) property. (See pp. 3-28 - 3-32)					
				ELIMINATED Alternative 2B would travel through the Flying-J Refinery and fail to maintain reasonable operating speeds. (See pp. 3-28 - 3-32)					
				ELIMINATED Alternative 2C would travel through the Flying-J Refinery and displace the most residential parcels of all alternatives, with the least favorable station placement. (See pp. 3-28 - 3-32)					
	NA	NA	Alternative 3: Centennial Corridor	**ELIMINATED** Failed to maintain required speeds along this corridor without cutting through established residential communities. (See pp. 3-28 - 3-32)					
	NA	NA	Alternative 4: Avoid downtown Bakersfield	**ELIMINATED** Would not meet the Project Purpose and Need of providing a downtown station. (See pp. 3-28 - 3-32)					

NA = Not applicable. Report did not include analysis of the alternative or family of alternatives listed.

Attachment C

Maps of Alternatives Considered for Fresno to Bakersfield Section



L:\Projects\High_Speed_Rail_27560685\Maps\Chapter_2\March_2011_Updates\Figure_1_FB_Alternatives.mxd

PRELIMINARY DRAFT/SUBJECT TO CHANGE - HST ALIGNMENT IS NOT DETERMINED
Source: URS, 2011.

March 23, 2011

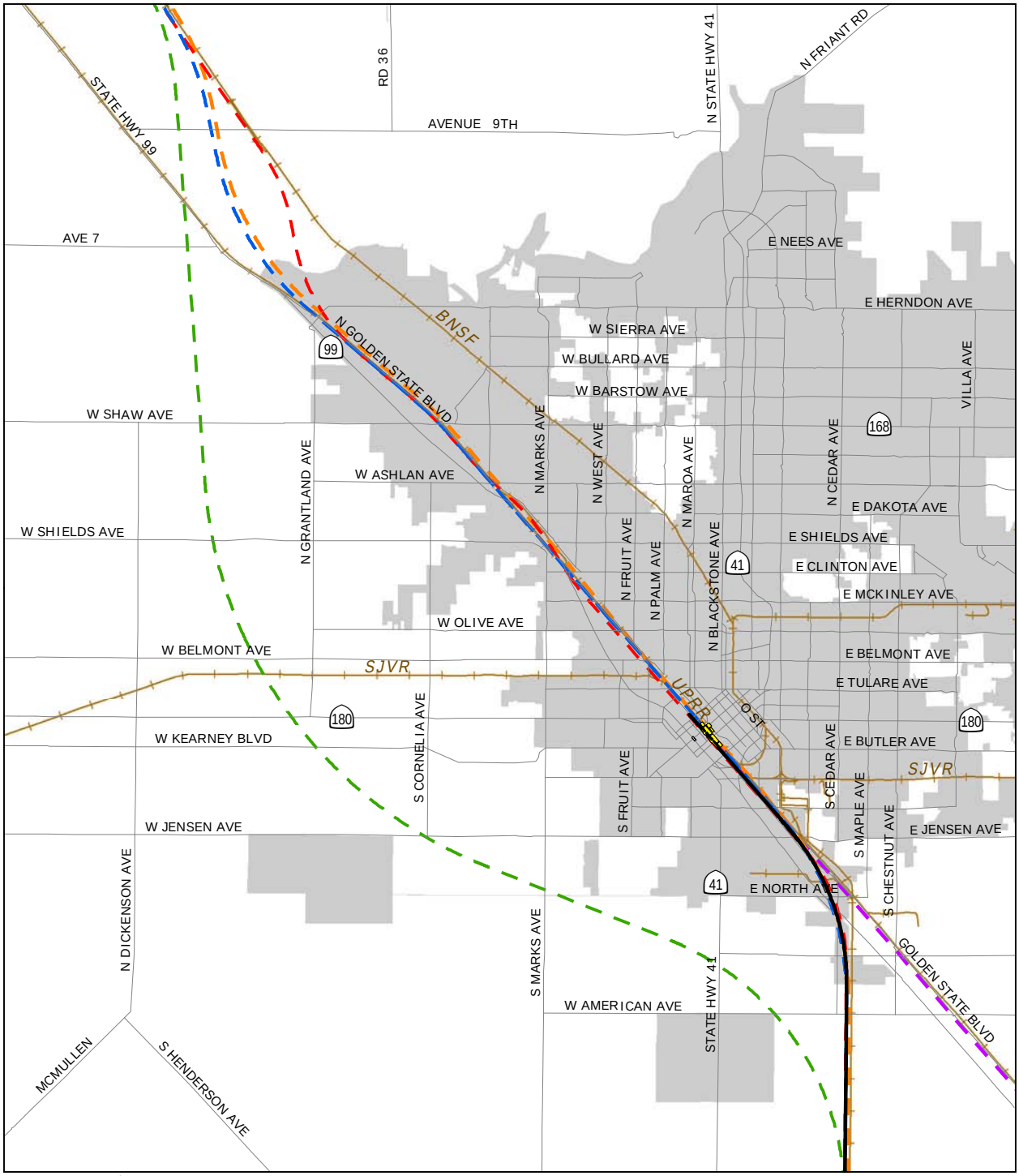
- Alternatives carried forward
- Alternatives not carried forward
- Existing rail line
- Major road
- County boundary
- Allensworth State Historic Park
- Allensworth Ecological Reserve
- Pixley National Wildlife Refuge
- Community/Urban area

N

0 5 10 Miles

0 10 20 Kilometers

Figure C-1
Fresno to Bakersfield Alignment Alternatives



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HST ALIGNMENT IS NOT DETERMINED

March 23, 2011

Source: URS, 2011.

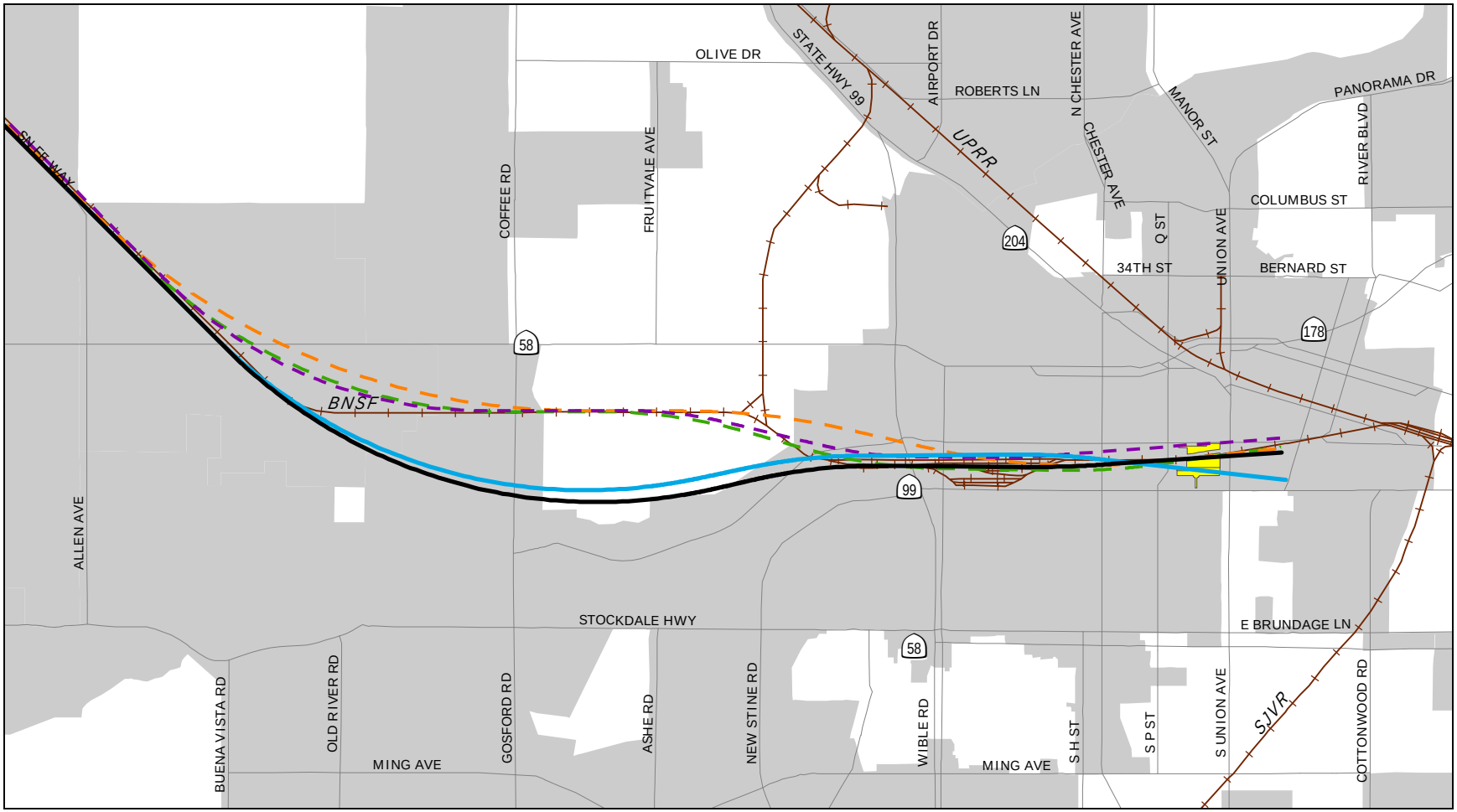
- BNSF Alternative (UPRR West/Alt 2)
- UPRR East (Alt 1)
- Fresno Western Bypass (Opt 2)
- Programmatic EIR/EIS Preferred Alignment
- State Route 99 Alternative (Alt 4)
- Golden State Boulevard Alternative (Alt 3)
- Existing rail line
- Major road
- Potential station area

N

0 1 2 Miles

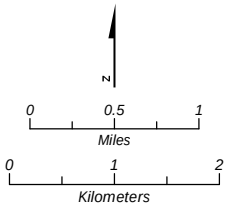
0 2 4 Kilometers

Figure C-2
Fresno detail map



PRELIMINARY DRAFT/SUBJECT TO CHANGE - HST ALIGNMENT IS NOT DETERMINED
Source: URS, 2011.

March 23, 2011



- *BNSF Alternative (Option 1A)*
- *Bakersfield South Alternative (Option 1D)*
- *Option 2A*
- *Option 2C*
- *Programmatic EIR/EIS Preferred Alignment*
- *Existing rail line*
- *Community/Urban area*
- *Potential station area*

Figure C-3
Bakersfield detail map

Attachment D

Memorandum on Aerial Imagery

URS/HMM/Arup Joint Venture
1333 Broadway, Suite 800
Oakland, CA 94612
Tel: 510.893.3600
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MEMORANDUM

To: Bryan Porter, Program Management Team
From: Alexandra Fraser and Christian Raumann, JV Environmental Team
Date: March 1, 2011
Subject: Selection of Aerial Imagery for Checkpoint B Remote Sensing Analysis

This memorandum explains the selection of aerial imagery for the remote sensing analysis performed as part of the Checkpoint B deliverable submitted to USEPA and USACE on December 28, 2010.

The URS/HMM/Arup Joint Venture (JV) used color-infrared orthoimagery produced by the USDA National Agricultural Imagery Program (NAIP) acquired by aircraft in June 2005 as the digital-image-processing base for mapping Special Aquatic Resources (SAR) for Checkpoint B. We extracted four types of SAR features directly from this 2005 NAIP imagery: canal/ditch, retention/detention basin, riverine, and riparian. To supplement this extracted data, we incorporated the Great Valley Vernal Pool Distribution dataset (Holland, 2009), National Wetlands Inventory (NWI) dataset, and USGS National Hydrography Dataset to inform and improve the classification. Lastly, we manually reviewed the entire study area and added, deleted, and edited SAR polygons based on visual examination of 2005 color-infrared and natural-color NAIP imagery in conjunction with other imagery sources (e.g., Google Earth and 2009 NAIP) and our biology team's knowledge of the study area.

As with any imagery-based wetlands mapping effort, we considered several criteria during the imagery selection process (in no particular order):

1. **Imagery type** – NAIP 2005 imagery is available as a color-infrared product, which is ideal for extracting SAR features. Color-infrared imagery essentially shows the energy intensity of ground features (i.e., healthy vegetation is bright red, water is black).
2. **Scale** – NAIP 2005 imagery has a 1-square-meter cell size which is a relatively high resolution and is suitable for this application.
3. **Geographic coverage** – NAIP 2005 imagery covers the entire study area as 33 imagery tiles based on USGS 7.5-minute quadrangles in JPEG 2000 format.
4. **Image quality** – NAIP 2005 imagery quality is consistent from tile-to-tile and contains 0% cloud cover.
5. **Acquisition year** – NAIP imagery acquired in 2005 provides a relatively recent snapshot of the land surface. Although color-infrared NAIP imagery is also available from 2009, 2005 was a much wetter year than 2009 and SAR features identified in selected field surveys conducted in spring 2010 were more visible in the 2005 imagery.

6. **Acquisition season** – NAIP 2005 imagery was acquired in early summer (June), which is considered the peak-leaf period of the growing season. Although an acquisition date nearer the peak wet season would be ideal for extracting some types of SAR features, we found the 2005 NAIP imagery adequate for extracting certain SAR features (canal/ditch, retention/detention basin, riverine, riparian) while relying on ancillary data to map the remaining SAR features. To our knowledge, complete coverage of color-infrared imagery from March, April, or May were not available.
7. **Access and cost** – 2005 NAIP imagery is available for free download from the Cal-Atlas Geospatial Clearinghouse.
8. **Previous applications** – 2005 NAIP imagery has been used at varying degrees for previous wetland mapping efforts conducted by The Watershed Institute (Casagrande and Watson, 2008) and San Francisco Estuary Institute (2009).

Many of the above criteria are interrelated, which adds to the challenge of imagery selection. For example, high-resolution imagery products with a relatively large geographic coverage are typically acquired in the summer months in order to avoid cloud and fog cover which obscures ground features.

During the imagery selection process, we evaluated several alternatives from imagery providers such as GeoEye, DigitalGlobe, HJW Geospatial, and the USGS. To our knowledge, no other existing imagery source provided the unique combination of favorable characteristics as that of the NAIP 2005 imagery. Another option would be to a hire an aerial imagery company such as GeoEye or DigitalGlobe to acquire a custom imagery product for the study area based on our specific criteria including acquisition date, cloud-cover threshold, scale, and imagery type. The estimated cost for a custom imagery product such as this would be in the $300,000 to $500,000 range. Based on our professional experience, the aerial imagery used to support this submittal is sufficient for assessing wetlands at this stage of project development.

Sources

Casagrande, J.M., and Watson, F., 2008. National Wetlands Inventory (NWI): Wetland and deepwater habitat mapping, digitizing, and analysis in California's Central Coast: Methods and Progress to Data. The Watershed Institute, U.S. Fish and Wildlife Service, WI-2008-07.

Holland, R.F., 2009. Great Valley Vernal Pool Distribution, Placer Land Trust, GIS data acquired from http://www.dfg.ca.gov/biogeodata/wetlands/.

San Francisco Estuary Institute, 2009. Bay Area Base Map: What is being mapping and not mapped?, Technical poster acquired from http://www.wrmp.org/docs/No582_WRMP_8pg_BayAreaBaseMap.pdf.

Attachment E
Practicability Information

Practicability of UPRR Alignment in the Fresno to Bakersfield Section of the California High-Speed Train Project

Introduction

Regulations at 40 CFR 230 (commonly known as the Section 404(b)(1) Guidelines, and referred to herein as the Guidelines) require the analysis of practicable alternatives to the discharge of dredged or fill material to waters of the United States. An alternative is considered practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

Technology is not an issue with the construction and operation of a high-speed train (HST) on the alternative alignments evaluated for the Fresno to Bakersfield Section. While the project is complex, existing technology is adequate for its construction and operation.

Project design has not progressed to the point that an accurate cost estimate can be made for alignment alternatives. However, preliminary engineering has shown that the UPRR alignment would cost at least $600 million more than an alternative in the BNSF corridor.[1] This increased cost is associated primarily with complex construction issues in the Visalia to Tulare area and reconstruction of 5 interchanges on SR 99.

The UPRR alignment is not a practicable alternative for the Fresno to Bakersfield Section primarily for logistical reasons. There are substantial construction complexities on all alternative alignments in the Central Valley sections of the HST system. The UPRR alignment in the Fresno to Bakersfield Section has several unique construction challenges that, in combination, present substantial logistical constraints that make it impracticable.

UPRR POSITION ON HST AND ITS PROTECTION AS A COMMON CARRIER

It is UPRR's position that it is not in its best interest to allow the HST project to be placed in or near its rights-of-way. UPRR has stated this position in correspondence with the Authority on many occasions.[2] On the other hand, the BNSF has stated its willingness to partner with the Authority in the Fresno to Bakersfield Section.

UPRR also notes that it has a common carrier obligation to provide service to its customers along its railroad lines and cannot be forced to abandon or discontinue freight service over its main or branch lines without authority from the Surface Transportation Board (STB).[3] "Common carrier" status was established by the Interstate Commerce Act of 1887 (ICA), and it grants "common carrier" railroads certain rights and protections; in return, "common carriers" are obliged to serve the public without discrimination. The ICA also created the Interstate

[1] The Statewide Program EIR/EIS for the California High-Speed Train Program estimated that an HST in the UPRR corridor would cost $590 to $800 million more than in the BNSF corridor. Preliminary engineering estimates for the Fresno to Bakersfield Section fall within this range.
[2] See *Checkpoint B Summary Report*, Appendix E, Attachment A (March 2011) for UPRR correspondence to the Authority.
[3] See *Checkpoint B Summary Report*, Appendix E, Attachment C (March 2011) for STB abandonment procedures.

Commerce Commission (ICC) to regulate the railroads. In 1995, Congress passed Public Law 104-88, which abolished the ICC and replaced it with the Surface Transportation Board (STB).[4]

State and local governmental entities may acquire rights to use railroad property either by negotiated agreement or condemnation (eminent domain). In practice, public entities rarely file condemnation actions. Instead, rights to use railroad property, whether in easement or fee, are usually acquired through negotiated agreements. This is largely due to the fact that under the ICA and successor laws, and based on 100 years of case law, railroads have established a very high level of property protection.

LOGISTICAL ISSUES UNIQUE TO UPRR CORRIDOR IN FRESNO TO BAKERSFIELD SECTION

Logistical issues – HST adjacent to UPRR between Fresno and Bakersfield: In letters to the Authority, the UPRR has characterized the location of the HST adjacent to its Fresno Subdivision line as creating a "railroad desert" through a region where railroad service is important to the efficient movement of agricultural products. State Route (SR) 99 already blocks off the UPRR from serving potential customers on one side of its Fresno Subdivision line in the southern San Joaquin Valley. Locating the HST adjacent to the UPRR right-of-way would block off the other side of its line for over 56 miles and cross 15 major spurs.

In many cases, the HST alignment would be adjacent to the UPRR through agricultural land that is not likely to require rail access in the near future. However, the UPRR serves industrial and agricultural-related storage and processing facilities between Fresno and Bakersfield in the communities of Fowler, Selma, Kingsburg, Tulare, Tipton, Pixley, Delano, and McFarland that would be disrupted by the HST alignment. In addition, opportunities for the UPRR to serve other businesses in these communities would be hampered with the presence of the HST alignment.

In the BNSF corridor, the HST would be adjacent to the BNSF right-of-way for about 59 miles and cross 10 major spurs. However, the BNSF is not flanked on one side by a four- to six-lane freeway. The BNSF is flanked by SR 43, a two-lane rural highway, from Corcoran to Bakersfield, a distance of about 54 miles. In addition, the BNSF only crosses through three communities (Corcoran, Wasco, and Shafter) with industrial areas requiring rail service. The BNSF has not indicated to the Authority that the proximity of the HST to its right-of-way would create a problem for the BNSF to serve its customers.

Logistical issues - Visalia Municipal Airport: The SR 99 and SR 198 interchange in Visalia represents a significant constraint to constructing the HST in the UPRR corridor. The HST alignment would go through this interchange, which is located adjacent to the Visalia Municipal Airport. If the interchange was raised to allow the HST to pass through at grade, the freeway would interfere with the Precision Instrument Approach Surface of the airport as defined in the Caltrans Highway Design Manual.[5] To avoid this interference, the HST alignment would have to be placed in a 2- to 3-mile-long trench passing under the interchange.

[4] See *Checkpoint B Summary Report*, Appendix E, Attachment B (March 2011) for pertinent excerpts from Public Law 104-88.
[5] See Figure 8 in Appendix D of the *Checkpoint B Summary Report* (March 2011).

There are no planned HST or existing freight rail sections outside of cities in the Central Valley that are located in a trench. This is not a preferable method of rail construction in non-urban agricultural areas. It is expensive and can cause substantial maintenance difficulties. Much of the south San Joaquin Valley, including this section of the UPRR corridor, is located in a 100-year floodplain. Placing the HST in a trench at this location could lead to flooding of the trench section in a 100-year event, closing the entire line. This possibility would undermine the safety and reliability of the HST, thereby failing to meet the purpose and need.

The HST alignment in the BNSF corridor would not encroach on the protected airspace of any public use airport. Alignments being considered for other sections of the HST program in the Central Valley do not encroach on the protected airspace of a public use airport.

Logistical issues – UPPR track relocation between Visalia and Tulare: The UPRR tracks are located west of and adjacent to SR 99 between Visalia and Tulare. With this layout, the HST alignment would be on the east side of SR 99, bounding the freeway between two rail facilities. For purposes of highway maintenance and future capacity improvements on the freeway, this is not possible. Therefore, the UPRR tracks would need to be relocated on newly acquired right-of-way for a length of 4 to 5 miles in this area. This would allow the HST to be located between SR 99 and the UPRR tracks. Such an extensive relocation of railroad track owned by any of the common carriers operating in the Central Valley is not planned at any other location.

To relocate the UPRR tracks if UPRR continues to be unwilling to share any portions of its right-of-way, the Authority would be required to pursue condemnation proceedings that have major risk as indicated above. The jurisdiction of the STB would very likely be triggered, resulting in numerous additional procedures and uncertain outcomes. The timing and outcome of such legal and administrative proceedings is highly uncertain, creating added risk to this project of delays that could result in considerable increased cost.

Relocation of the UPRR tracks in the Visalia to Tulare area would result in significant infrastructure impacts. All of the existing rail spurs would need to be reconstructed along with all of the rail infrastructure and a substantial number of state and local roads. The resulting project footprint (including relocations) would increase the loss of agricultural lands and result in adverse impacts to local businesses.

Logistical issues – Straddle Bents: Construction of the HST in any of the alternative alignments from Fresno to Bakersfield would require four straddle bents to cross either the UPRR or the BNSF. These straddle bent sections would vary from 500 feet to 2,500 feet long with 5 to 25 bents. Three of the four straddle bents on the UPRR alignment would be 2,000 to 2,500 feet long. If UPRR continues to be unwilling to share any portions of its right-of-way, construction of the straddle bents on the UPRR alignment would have to be accomplished from either end outside of the UPRR right-of-way. Constructing structures spanning hundreds to thousands of feet with this limitation on access is not practicable.

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Attachment F

Comparison of Alternatives in the Hanford, Corcoran, Wasco and Shafter Areas

Comparison of Alternatives Considered in the Hanford, Corcoran, Wasco, and Shafter Area

Alternatives[a]				Hanford West	Hanford East	Corcoran Bypass	Kaweah Bypass	Kaweah/Corcoran Bypass	BNSF - Through Wasco and Shafter	Wasco-Shafter Bypass	Wasco-Shafter-7th Standard Road Bypass
				(Blue Line on Figure F-1, Alternative Eliminated)	*(Red Line North of Houston Avenue on Figure F-1 is Part of BNSF Alternative Carried Forward)*	*(Green Line on Figure F-1 which Represents Alignment from Approximately Houston Avenue South to Avenue 136, Alternative Eliminated)*	*(Purple Line on Figure F-1 is Part of BNSF Alternative Carried Forward)*	*(Orange Line on Figure F-1 from Approximately Houston Avenue South to Avenue 136, Corcoran Bypass Carried Forward)*	*(Green Line on Figure F-2 is Part of BNSF Alternative Carried Forward)*	*(Purple Line on Figure F-2 is Wasco-Shafter Bypass Alternative Carried Forward)*	*(Orange Line on Figure F-2 is Wasco-Shafter-7th Standard Bypass, Alternative Eliminated)*
Category	**Measurement**										
	Total Footprint Impact Acreage			**429.74**	**332.24**	**407.05**	**401.85**	**409.79**	**168.33**	**236.38**	**250.45**
Impacts to Special Aquatic Resources				**Impact Acreage**							
	Seasonal Wetlands			0.31	0	0	0.02	0	0.35	0	0
	Vernal Pools			0	3.79[b]	5.6	0	0	0	0	0
	Riverine			0.84	0.4	0.51	0.8	0.82	0	0	0
	Riparian			0.85	0.84	0.97	0.97	0.86	0	0	0
	Lacustrine			0	0	0	0	0	0	0	0
	Canals/Ditches			4.06	2.57	2.83	8.66	2.36	3.57	0.46	1.38
	Retention/Detention Basins			0.62	0.26	0.3	0.26	0.27	0.13	0.25	0.08
				Number of features intersected by alignment							
	Seasonal Wetlands			3	1	0	1	0	2	0	0
	Vernal Pools			0	6	5	0	0	0	0	0
	Riverine			9	6	11	14	10	0	0	0
	Riparian			16	10	19	20	12	0	0	0
	Lacustrine			0	0	0	0	0	0	0	0
	Canals/Ditches			42	35	40	47	43	7	17	16
	Retention/Detention Basins			3	3	4	3	4	5	4	2
Impacts to Potential Habitat for Federal and State Endangered and Threatened Species and		**Federal Status**	**State Status**								
	Plants			**Impact Acreage**							
	California jewel-flower *(Caulanthus californicus)*	FE	SE/1B.1	3.39	1.02	12.42	0	0	0.13	0.01	2.64
	Hoover's spurge (Chamaesyce hooveri)	FT	1B.2	0.31	3.79	5.6	0.02	0	0.35	0	0
	Hoover's spurge (*Chamaesyce hooveri*) *CRITICAL HABITAT*	D	--	0	0	0	0	0	0	0	0
	Kern mallow (*Eremalche kernensis*)	FE	1B.1	3.39	1.02	12.42	0	0	0.13	0.01	2.64
	San Joaquin woolly threads (*Monolopia congdonii*)	FE	1B.2	3.39	1.02	12.42	0	0	0.13	0.01	2.64
	Bakersfield cactus (*Opuntia basilaris var. treleasei*)	FE	1B.1	3.39	1.02	12.42	0	0	0.13	0.01	2.64
	San Joaquin Valley Orcutt grass (*Orcuttia inaequalis*)	FT	1B.1	0.31	3.79	5.6	0.02	0	0.35	0	0
	San Joaquin Valley Orcutt grass (*Orcuttia inaequalis*) *CRITICAL HABITAT*	D	--	0	0	0	0	0	0	0	0
	San Joaquin adobe sunburst (*Pseudobahia peirsonii*)	FT	SE/1B.1	3.39	1.02	12.42	0	0	0.13	0.01	2.64
	Invertebrates			**Impact Acreage**							
	VERNAL POOL FAIRY SHRIMP (*Branchinecta lynchi*)	FT	--	0	3.79	5.60	0	0	0	0	0.00
	VERNAL POOL FAIRY SHRIMP (*Branchinecta lynchi*) *CRITICAL HABITAT*	D	--	0	0	0	0	0	0	0	0
	VALLEY ELDERBERRY LONGHORN BEETLE (*Desmocerus californicus dimorphus*)	FT	--	0.85	0.84	0.97	0.97	0.86	0	0	0.00
	VERNAL POOL TADPOLE SHRIMP (*Lepidurus packardi*) VERNAL POOL TADPOLE SHRIMP	FE	--	0	3.79	5.60	0	0	0	0	0.00
	VERNAL POOL TADPOLE SHRIMP (*Lepidurus packardi*) *CRITICAL HABITAT*	D	--	0	0	0	0	0	0	0	0

Comparison of Alternatives Considered in the Hanford, Corcoran, Wasco, and Shafter Area

Alternatives[a]				Hanford West	Hanford East	Corcoran Bypass	Kaweah Bypass	Kaweah/Corcoran Bypass	BNSF - Through Wasco and Shafter	Wasco-Shafter Bypass	Wasco-Shafter-7th Standard Road Bypass
				(Blue Line on Figure F-1, Alternative Eliminated)	*(Red Line North of Houston Avenue on Figure F-1 is Part of BNSF Alternative Carried Forward)*	*(Green Line on Figure F-1 which Represents Alignment from Approximately Houston Avenue South to Avenue 136, Alternative Eliminated)*	*(Purple Line on Figure F-1 is Part of BNSF Alternative Carried Forward)*	*(Orange Line on Figure F-1 from Approximately Houston Avenue South to Avenue 136, Corcoran Bypass Carried Forward)*	*(Green Line on Figure F-2 is Part of BNSF Alternative Carried Forward)*	*(Purple Line on Figure F-2 is Wasco-Shafter Bypass Alternative Carried Forward)*	*(Orange Line on Figure F-2 is Wasco-Shafter-7th Standard Bypass, Alternative Eliminated)*
Category	**Measurement**										
California Fully Protected Species	**Amphibians**			**Impact Acreage**							
	CALIFORNIA TIGER SALAMANDER (*Ambystoma californiense*) - **Aquatic**	FT	CSC/C€	0	2.75	5.70	0	0	0	0	0.00
	CALIFORNIA TIGER SALAMANDER (*Ambystoma californiense*) - **Upland**	FT	CSC/C€	3.39	0	8.45	0	0	0	0	0.00
	CALIFORNIA TIGER SALAMANDER (*Ambystoma californiense*) *CRITICAL HABITAT*	D	P	0	0	0	0	0	0	0	0
	Reptiles			**Impact Acreage**							
	BLUNT-NOSED LEOPARD LIZARD (*Gambelia (=Crotaphytus) sila*)	FE	SE/FP	0	0	0	0	0	0	0	0
	Birds			**Impact Acreage**							
	SWAINSON'S HAWK (*Buteo swainsoni*)	--	ST	311.74	282.23	362.96	347.25	373.98	134.68	216.87	246.24
	MOUNTAIN PLOVER (*Charadrius montanus*)	FPT*	--	72.50	28.34	50.36	79.79	84.02	0	0	0.00
	WHITE-TAILED KITE (*Elanus leucurus*)	--	FP	311.74	282.23	362.96	347.25	373.98	134.68	216.87	246.24
	Mammals			**Impact Acreage**							
	NELSON'S (SAN JOAQUIN) ANTELOPE SQUIRREL (*Ammospermophilus nelsonii*)	--	ST	0	0	0	0	0	0.13	0.01	2.64
	FRESNO KANGAROO RAT (*Dipodomys nitratoides exilis*)	FE	SE	1.44	0	0	0	0	0	0	0.00
	FRESNO KANGAROO RAT (*Dipodomys nitratoides exilis*) *CRITICAL HABITAT*	D	--	0	0	0	0	0	0	0	0
	TIPTON KANGAROO RAT (*Dipodomys nitratoides nitratoides*)	FE	SE	0	0	0	0	0	0.13	0.01	2.64
	SAN JOAQUIN KIT FOX (*Vulpes macrotis mutica*)	FE	ST	423.91	311.80	377.94	392.11	406.35	164.28	235.66	248.99
	Natural Preserves and Biologically Sensitive Habitat Areas			**Number of Protected lands within 500 feet; impacted acreage**							
Parklands, State and Federal Protected Lands	City Parks: number within a 500 foot radius			0	0	0	1	0	0	0	0
	City Parks: acres impacted			0	0	0	0	0	0	0	0
	Special District Areas within a 500 foot radius			0	0	0	0	0	1	0	0
	Special District Areas within a 500 foot radius			0	0	0	0	0	0	0	0
	State Wildlife Reserves : impacted acres			0	0	0	0	0	0	0	0
	State Wildlife Reserves: acres impacted			0	0	0	0	0	0	0	0
	State Parks of Historical Significance: within a 500 foot radius			0	0	0	0	0	0	0	0
	State Parks of Historical Significance: acres impacted			0	0	0	0	0	0	0	0
	National Wildlife Refuges within a 500 foot radius			0	0	0	0	0	0	0	0
	National Wildlife Refuge: acres impacted			0	0	0	0	0	0	0	0
Designated Recovery Areas per USFWS Recovery Plans				**Impact Acreages**							
	San Joaquin Upland Species Linkage Areas			0	0	0	0	0	37.65	47.68	46.66
	San Joaquin Upland Species Satellite Areas (Pixley/Allensworth)			33.00	16.48	41.13	32.77	39.47	0	0	0
California Missing Linkages Areas	**General Wildlife Linkages**			**Alignment crosses Linkage**							
	Kings River			yes	yes	yes	yes	yes	no	no	no
	St. John's River–Cross Creek			no	yes	yes	yes	yes	no	no	no
	Highway 43–Garces Highway			yes	yes	yes	yes	yes	no	no	no
	Tule River			no	no	no	no	no	no	no	no
	Deer Creek–Sand Ridge			no	no	no	no	no	no	no	no
	Poso Creek			no	no	no	no	no	yes	yes	yes
	Kern River			no	no	no	no	no	no	no	no
Agricultural Lands	**Farmland Mapping and Monitoring Program Status**			**Impact Acreage**							
	Prime farmland			121.29	89.46	89.58	92.78	98.33	125.70	222.09	242.06
	Farmland of statewide importance			133.40	143.81	219.25	173.71	204.51	0	0	0
	Unique farmland			60.59	37.60	39.25	57.31	57.83	0	0	0.18
	Farmland of local importance			2.44	0	0	0	0	0	0	0

Comparison of Alternatives Considered in the Hanford, Corcoran, Wasco, and Shafter Area

Alternatives[a]		Hanford West	Hanford East	Corcoran Bypass	Kaweah Bypass	Kaweah/Corcoran Bypass	BNSF - Through Wasco and Shafter	Wasco-Shafter Bypass	Wasco-Shafter-7th Standard Road Bypass
		(Blue Line on Figure F-1, Alternative Eliminated)	*(Red Line North of Houston Avenue on Figure F-1 is Part of BNSF Alternative Carried Forward)*	*(Green Line on Figure F-1 which Represents Alignment from Approximately Houston Avenue South to Avenue 136, Alternative Eliminated)*	*(Purple Line on Figure F-1 is Part of BNSF Alternative Carried Forward)*	*(Orange Line on Figure F-1 from Approximately Houston Avenue South to Avenue 136, Corcoran Bypass Carried Forward)*	*(Green Line on Figure F-2 is Part of BNSF Alternative Carried Forward)*	*(Purple Line on Figure F-2 is Wasco-Shafter Bypass Alternative Carried Forward)*	*(Orange Line on Figure F-2 is Wasco-Shafter-7th Standard Bypass, Alternative Eliminated)*
Category	**Measurement**								
Additional Standard Criteria		**Impacts as reported in June 2010 Alternatives Analysis Report**							
Disruption to Communities	**Residential Displacements (parcels)**	13	13	0	2	9	3	2	0
	Commercial/ Industrial Displacements (parcels)	10	13	0	0	0	44	4	3
	Properties with access affected	Would affect properties in Armona	Would affect properties in Corcoran	None	Would affect properties in Corcoran	None	Would affect properties in Wasco and Shafter	None	None
	Local traffic effects around stations	Convenient and direct access to SR-198	Convenient and direct access to SR-198	NA	NA	NA	NA	NA	NA
	Local traffic effects at grade separations	Change in level of service not expected to have large impact on local traffic							
Design Objectives	**Travel time**	No Significant Difference Among Alternatives							
	Route length	35.44	36.81	36.61	37.42	37.55	21.6	20.71	20.65
	Intermodal connections	Potential opportunity to establish connection with future commuter service on Cross Valley Railroad	Potential opportunity to establish connection with future commuter service on Cross Valley Railroad	None	None	None	None	None	None
	Capital costs	Requires elevated structure over San Joaquin Valley Railroad and	Requires 1 BNSF crossing	Requires crossing Tulare Lake Mitigation Site, possibly on	Requires 1 BNSF crossing	Requires 2 BNSF crossings	Requires elevated structure through Wasco and Shafter	Requires 1 BNSF crossing	Requires 1 BNSF crossing
	Operating costs	Similar among alternatives							
	Maintenance costs	At-grade in separate right-of-way. Does not parallel existing roads.	At-grade in separate right-of-way. Does not parallel existing roads.	At-grade in separate right-of-way. Does not parallel existing roads. Passes through wetlands increasing off-track maintenance difficulties.	At-grade in separate right-of-way. Does not parallel existing roads.	At-grade in separate right-of-way. Does not parallel existing roads.	Highest maintenance cost due to length of viaducts.	Low maintenance cost	Low maintenance cost
Land Use	**Potential for transit oriented development**	Armona Community Plan and Kings County General Plan designate the area in the vicinity of the alignment as agriculture, limited agriculture, residential, and residential commercial.	Hanford General Plan designates over 160 acres near the station site as Planned Highway Development, which anticipates development oriented to higway travelers. Conversely, Kings County has zoned the unincorporated portion of the station site as agriculture.	NA	NA	NA	NA	NA	NA

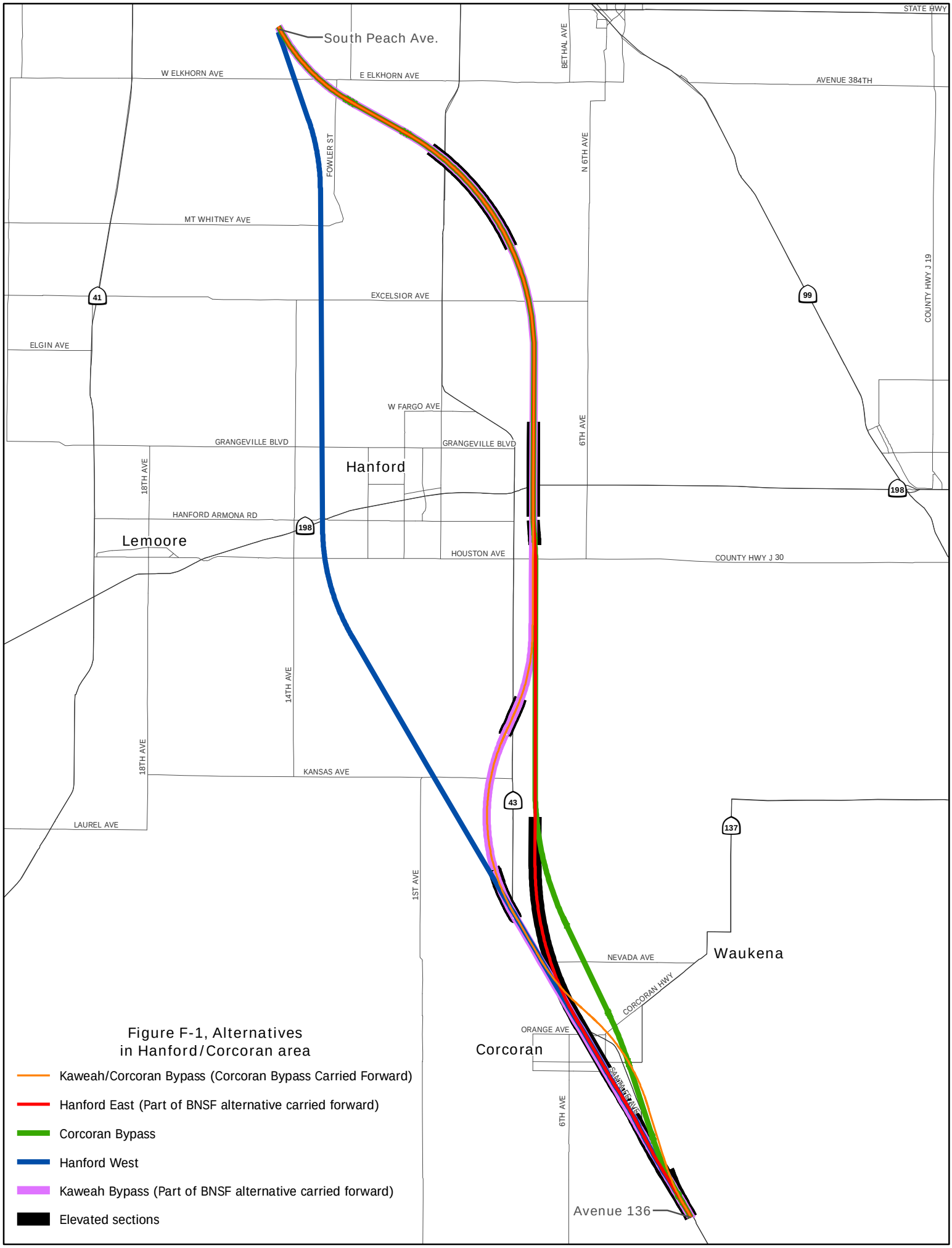
Comparison of Alternatives Considered in the Hanford, Corcoran, Wasco, and Shafter Area

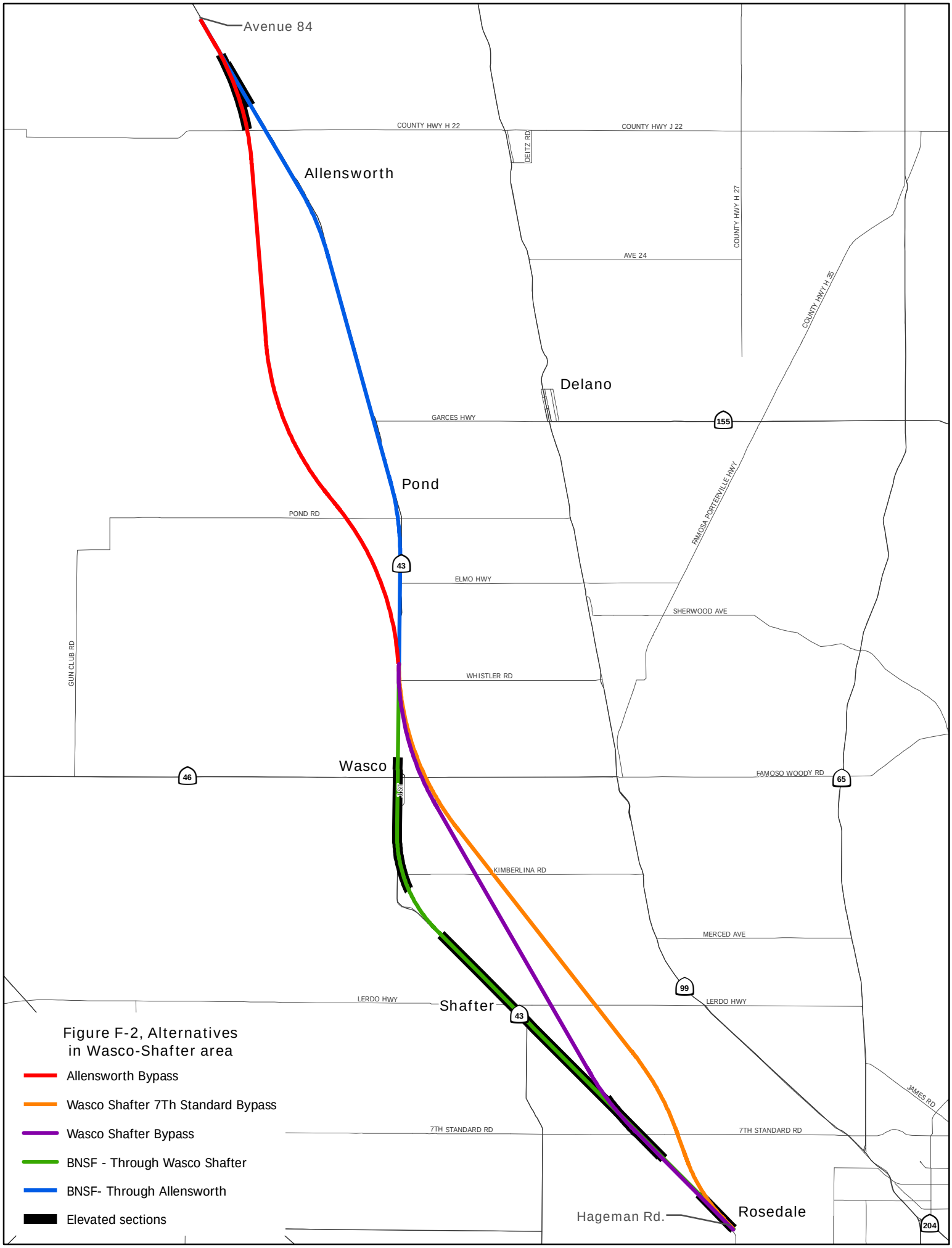
Alternatives[a]		Hanford West	Hanford East	Corcoran Bypass	Kaweah Bypass	Kaweah/Corcoran Bypass	BNSF - Through Wasco and Shafter	Wasco-Shafter Bypass	Wasco-Shafter-7th Standard Road Bypass
		(Blue Line on Figure F-1, Alternative Eliminated)	*(Red Line North of Houston Avenue on Figure F-1 is Part of BNSF Alternative Carried Forward)*	*(Green Line on Figure F-1 which Represents Alignment from Approximately Houston Avenue South to Avenue 136, Alternative Eliminated)*	*(Purple Line on Figure F-1 is Part of BNSF Alternative Carried Forward)*	*(Orange Line on Figure F-1 from Approximately Houston Avenue South to Avenue 136, Corcoran Bypass Carried Forward)*	*(Green Line on Figure F-2 is Part of BNSF Alternative Carried Forward)*	*(Purple Line on Figure F-2 is Wasco-Shafter Bypass Alternative Carried Forward)*	*(Orange Line on Figure F-2 is Wasco-Shafter-7th Standard Bypass, Alternative Eliminated)*
Category	**Measurement**								
	Consistency with other planning efforts	Traverse designated agricultural land except in vicinity of Hanford and Armona.	Traverses designated agricultural land.	Traverses designated agricultural land.	Traverses designated agricultural land except in Corcoran.	Traverses designated agricultural land.	Traverses designated agricultural land except in Wasco and Shafter.	Traverses designated agricultural land.	Traverses primarily designated agricultural land except for entitled Rosedale Ranch master-planned community covering 1,650 acres.
Constructability	**Constructability**	Access difficult as alignment is away from ready access.	Access difficult as alignment is away from ready access.	Alignment within 2 miles of SR 43. Most construction unconstrained by BNSF operations.	Alignment within 2 miles of SR 43. Most construction unconstrained by BNSF operations.	Alignment within 2 miles of SR 43. Most construction unconstrained by BNSF operations.	Requires construction of long viaducts through towns. Construction access difficult through Wasco and Shafter.	Simple to construct. Construction access would be straightforward.	Simple to construct. Construction access would be straightforward.
	Disruption to existing railroads	Conflicts with freight facilities at Corcoran.	Conflicts with freight facilities at Conejo and Corcoran.	No major conflicts with existing railroads.	Conflicts with freight facilities at Corcoran.	Conflicts with freight facilities at Corcoran.	Impacts to BNSF operations during construction. Remodeling of sidings in Wasco.	Sever 3 sidings at Crome.	No disruption to existing railroad operations.
	Disruption to and relocation of utilities reported as number of major electric transmission lines intersected	6	9	8	7	8	3	3	3
	Noise and Vibration (number of sensitive receptors)	63 residences	62 residences	13 residences	30 residences	18 residences	552 residences, 12 churches, 1 library, 1 city hall, 2 schools	198 residences	145 residences
	Visual/scenic resources	94 residential parcels within 1/4 mile of elevated structures.	762 residential parcels within 1/4 mile elevated structures.	No residential parcels within 1/4 mile of elevated structures	No residential parcels within 1/4 mile of elevated structures	No residential parcels within 1/4 mile of elevated structures	655 residential parcels within 1/4 mile of elevated structures.	No residential parcels within 1/4 mile of elevated structures	No residential parcels within 1/4 mile of elevated structures
	Geotechnical constraints	No major geotechnical constraints							
	Hazardous materials (number of sites)	3	3	0	3	3	2	0	0

Federal Status	**State Status**
FE – Endangered	SE – Endangered
FT – Threatened	ST – Threatened
D = Designated critical habitat	C(E) – Candidate for Endangered listing status
FD = Delisted. Status to be monitored for 5 years.	CSC – California Species of Special Concern
FPT – Proposed for Federal Threatened status	FP – California Fully Protected species
-- = No status designation.	-- = No status designation.

[a]See Figure F-1 and F-2 for location of alternatives.

[b]These vernal pools are located east of the BNSF Railway tracks just north of Corcoran in the vicinity of the Tulare Lake Mitigation Site. This is a portion of the original BNSF Alternative Alignment that has since been dropped in favor of the Kaweah Bypass. That bypass avoids these wetlands.


South Peach Ave.
W ELKHORN AVE
E ELKHORN AVE
BETHAL AVE
STATE HWY
AVENUE 384TH
FOWLER ST
N 6TH AVE
MT WHITNEY AVE
COUNTY HWY J 19
41
EXCELSIOR AVE
99
ELGIN AVE
W FARGO AVE
6TH AVE
GRANGEVILLE BLVD
GRANGEVILLE BLVD
Hanford
18TH AVE
198
HANFORD ARMONA RD
198
Lemoore
HOUSTON AVE
COUNTY HWY J 30
14TH AVE
18TH AVE
KANSAS AVE
43
LAUREL AVE
137
1ST AVE
NEVADA AVE
Waukena
CORCORAN HWY
ORANGE AVE
Corcoran
SANTA FE AVE
6TH AVE
Avenue 136
Figure F-1, Alternatives
in Hanford/Corcoran area
Kaweah/Corcoran Bypass (Corcoran Bypass Carried Forward)
Hanford East (Part of BNSF alternative carried forward)
Corcoran Bypass
Hanford West
Kaweah Bypass (Part of BNSF alternative carried forward)
Elevated sections


Avenue 84
COUNTY HWY H 22
COUNTY HWY J 22
DEITZ RD
Allensworth
COUNTY HWY H 27
AVE 24
COUNTY HWY H 35
Delano
GARCES HWY
155
Pond
POND RD
FAMOSA PORTERVILLE HWY
43
ELMO HWY
SHERWOOD AVE
GUN CLUB RD
WHISTLER RD
Wasco
46
FAMOSO WOODY RD
65
BNSF
KIMBERLINA RD
MERCED AVE
99
LERDO HWY
Shafter
43
JAMES RD
7TH STANDARD RD
Hageman Rd.
Rosedale
204
Figure F-2, Alternatives in Wasco-Shafter area
Allensworth Bypass
Wasco Shafter 7Th Standard Bypass
Wasco Shafter Bypass
BNSF - Through Wasco Shafter
BNSF- Through Allensworth
Elevated sections

Attachment G

Other Information on Alternatives

Additional Information on Alternatives for the Fresno to Bakersfield Section of the California High-Speed Train Program

VERTICAL PROFILE ALTERNATIVES

City of Fresno

At the beginning of the project analysis in the Fresno area, the Authority and FRA considered high-speed train (HST) alignment options at grade, below grade, and on an elevated structure. A combined at-grade and aerial option was also considered for the 6,000 feet of station tracks with the through tracks at-grade and elevated station tracks above them (stacked tracks).

Based on conceptual designs, at-grade and below-grade options through Fresno were eliminated during the initial analysis of alternatives to avoid infrastructure conflicts and traffic impacts. The use of a stacked track arrangement in the station area was also eliminated because it did not substantially reduce right-of-way requirements or project impacts and was substantially more expensive than other alternatives.

Preliminary engineering of an elevated design for the project resulted in a 14-mile-long elevated structure through Fresno that needed to be 65 to 70 feet above grade to cross existing infrastructure, such as State Route (SR) 180 and SR 41. The City of Fresno expressed strong concern regarding the impacts of this design because of its height and mass. This structure would visually dominate the city landscape, and potential noise from the train could extend out as much as 3,300 feet from the elevated alignment. City staff is concerned that this scale of structure could substantially change the character of downtown Fresno.

The Authority has worked with the City of Fresno over the past four months to resolve this concern. This effort has focused on developing a plan to bring the HST through Fresno largely at grade with minimal disruption to the existing transportation network. The Authority and the City have completed this plan. A modified at-grade HST design through Fresno has been developed with only 1 mile of lower elevated structure to cross existing roads and rail lines and a trench approximately 1.5 miles long to cross beneath other rail lines and SR 180. This plan maintains an efficient roadway network in downtown Fresno. The attached Figure G-1 shows where the HST alignment would be below-grade, at-grade, and elevated through Fresno.

City of Corcoran

The initial evaluation of the vertical alignment options adjacent to the BNSF through Corcoran also favored an elevated structure to minimize infrastructure conflicts, right-of-way requirements, and traffic impacts. The elevated guideway design through Corcoran would be approximately 40 feet high and would be located on the east side of the BNSF.

The Authority is also considering a design crossing through Corcoran at grade on the west side of the BNSF Railway tracks. The Authority is working with the City of Corcoran to develop an at-grade alignment that would avoid major disruption to the local roadway network or interference with industry that uses the BNSF. Both of these vertical alignment alternatives, which are shown in Figure G-2, are being carried forward in the EIR/EIS.

Cities of Wasco and Shafter

An at-grade alignment would conflict with and cut off numerous BNSF rail spurs to customers in Wasco and Shafter, and would require substantial disruption of the local road network during project construction. For these reasons, the HST alignment through these two communities would be elevated.

City of Bakersfield

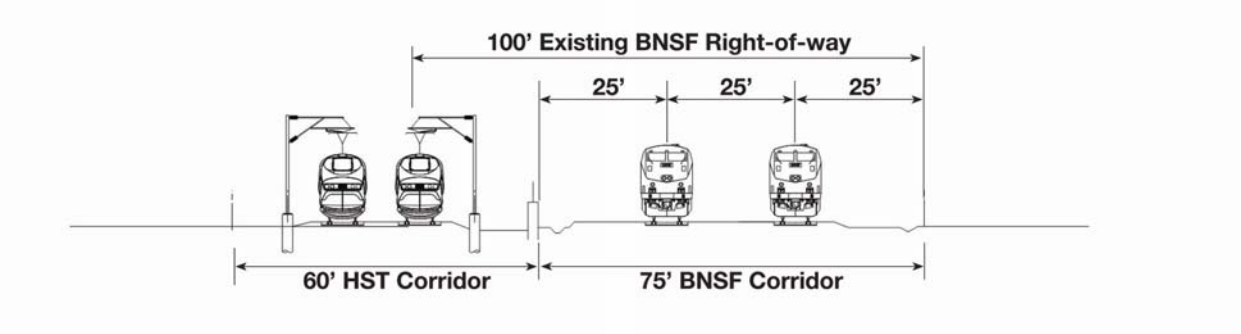
To enter downtown Bakersfield along the BNSF alignment, it is necessary to cross the Kern River, SR 99, and several major local roads on an elevated structure. Once across SR 99, it is only 2 miles to the proposed Bakersfield station location adjacent to the existing Amtrak station. Bringing the alignment back down to grade before the station would require twice the right-of-way as an elevated structure, resulting in the removal of numerous commercial and government buildings in the downtown area. It is not practicable to develop an entirely at-grade design in Bakersfield and as a result a modified elevated alignment will be carried forward.

In the initial design, the elevated structure through Bakersfield began at Rudd Avenue, about 2 miles northwest of Rosedale on the outskirts of Metropolitan Bakersfield. To reduce costs and minimize visual impacts to surrounding residential neighborhoods, the elevated structure has been moved approximately 4.5 miles south of this point to Palm Avenue. Figure G-3 shows the location of these elevated structures.

SHARED VERSUS ADJACENT RIGHT-OF-WAY

The Authority evaluated the shared use of the BNSF right-of-way where the HST alignment runs parallel with the BNSF tracks. In this concept of shared right-of-way, the BNSF tracks would be moved to one side of the right-of-way, retaining enough width for future provision of two BNSF tracks in locations where there currently is only one track. The HST alignment would be placed in a combined right-of-way made up of a portion of the BNSF right-of-way, and new right-of-way. A typical cross section of this concept is provided below.

Typical Cross Section for Shared Right-of-Way



Locating the HST less than 100 feet from a freight rail requires construction of a barrier between the two sets of tracks to avoid a train-to-train collision in the event of a derailment. When the HST and freight tracks are about 33 feet apart or less, a substantial engineered wall would be required to safely separate the two. While it is technically feasible to construct a barrier that can contain a derailed train, freight rail operators continue to be concerned with the safety and liability issues associated with potential accidents in a shared right-of-way.

As indicated above, in most places where the HST alignment runs parallel to the BNSF tracks, it would be necessary to move those tracks to one side of the right-of-way in order to make room for the HST and a safety barrier. This creates substantially more complex construction staging requirements for the project.

A combination of safety and liability concerns and increased construction complexity could make a shared right-of-way between BNSF and the HST undesirable. While the Authority continues to explore the possibility of shared right-of-way with BNSF (particularly through very sensitive areas), the potential to reach an agreement with BNSF to utilize portions of their right-of-way remains uncertain. Therefore, the Fresno to Bakersfield Section Draft EIR/EIS assumes there would be no shared right-of-way, and the HST alignment would be located at least 100 feet from the BNSF railbed where the two lines would be

parallel. This would provide a worse-case estimate of the potential environmental impacts associated with the project.

HANFORD WEST AND HANFORD EAST ALIGNMENT ALTERNATIVES

An HST alignment west of Hanford would not only forego the opportunity to provide a station for the Hanford/Visalia/Tulare region, it is also not consistent with local land use planning, and would result in greater environmental impacts than an alignment east of Hanford.

A good portion of the residential growth in the incorporated cities of Hanford and Lemoore and the unincorporated "Community District" of Armona is filling in the area between the two cities with residential development centered on SR 198. An HST alignment alternative west of Hanford would split this residential growth pattern and therefore is not consistent with local land use planning. In contrast, the "Hanford East Alternative" being carried forward is located on the eastern edge of the Hanford sphere of influence, and the proposed station site is located near the SR 43 and SR 198 interchange on land that is zoned by Kings County as Light Industrial (ML) (Kings County Zone Map No. 302.047).

An alignment alternative west of Hanford would result in greater impacts to waters of the U.S., habitat for threatened or endangered plants and animals, and farmland than the Hanford East alternative. Both alternatives would have approximately the same number of residential, commercial, and industrial displacements and urban impacts (e.g., noise and aesthetics). The Hanford West alternative would impact 2 acres of seasonal wetlands, waters of the U.S., and riparian habitat. This alternative would also impact 4.7 acres of canals, ditches, and retention/detention basins. The Hanford East Alternative would impact no seasonal wetlands, about 0.9 acre of waters of the U.S. and riparian habitat, and about 2.8 acres of canals, ditches, and retention/detention basins. The Hanford West alternative would impact 5 acres more of habitat for threatened or endangered plants and 210 acres more of habitat for threatened or endangered animals than the Hanford East alternative. Finally, the Hanford West alternative would impact 47 acres more important farmland, including 32 acres of prime farmland, than the Hanford East alternative. Please see Attachment F, which provides a comparison of these and other alignment alternatives based on the selection criteria for the project.

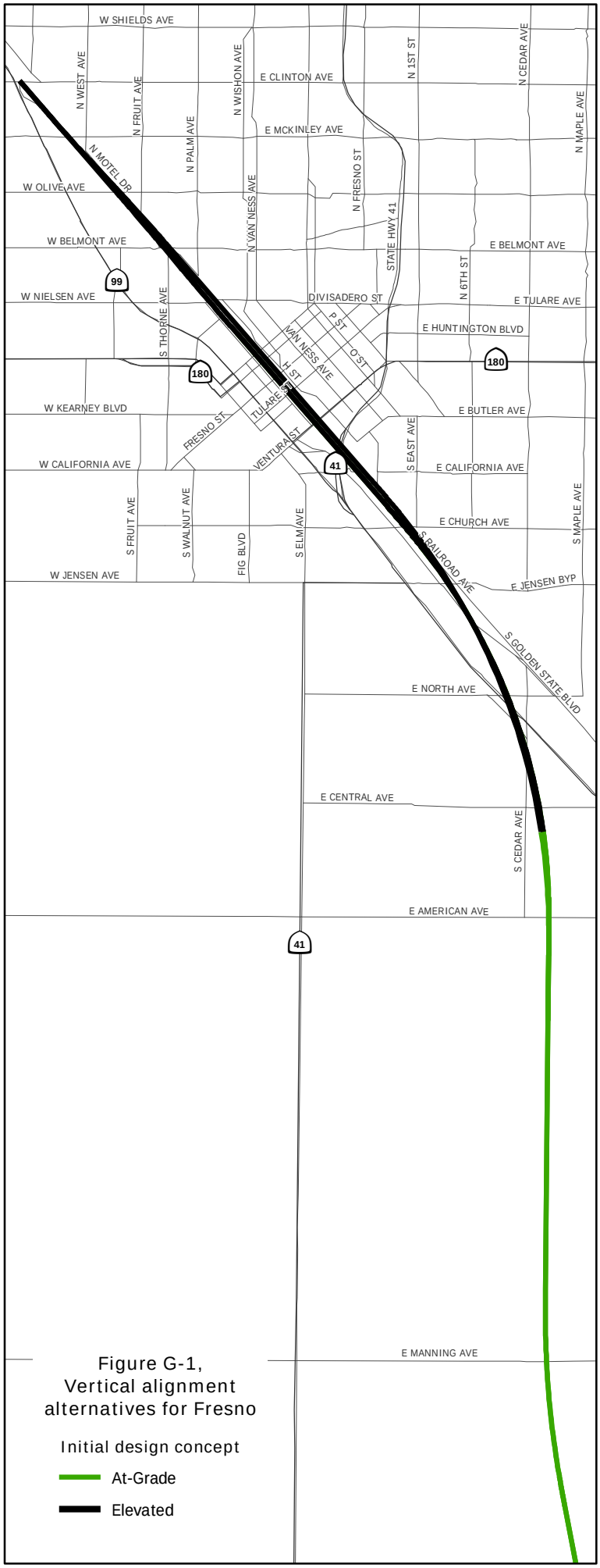


Figure G-1,
Vertical alignment
alternatives for Fresno

Initial design concept

At-Grade

Elevated

Figure G-1,
Vertical alignment
alternatives for Fresno

Current design concept

At-Grade

Elevated

Trench

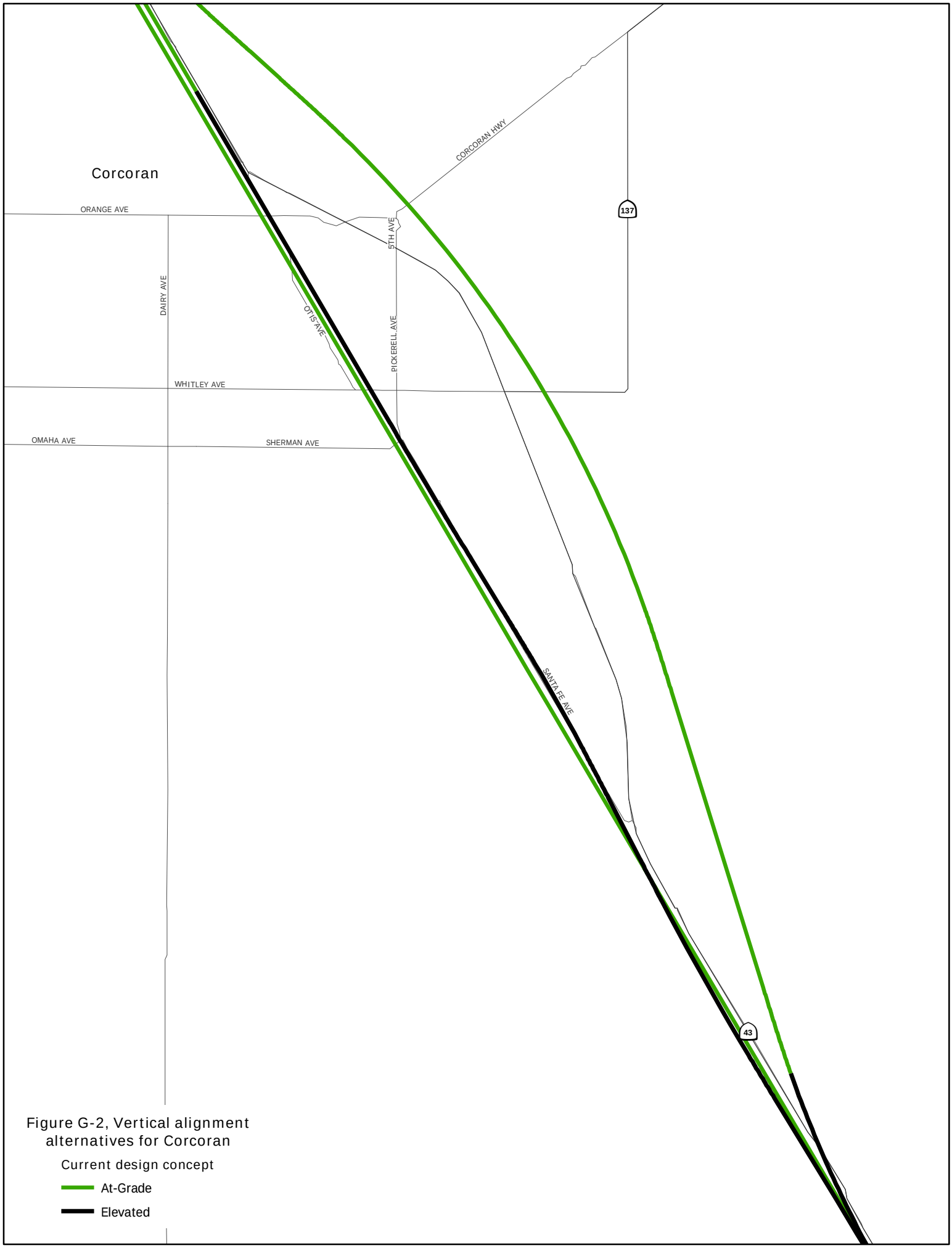


Figure G-2, Vertical alignment alternatives for Corcoran

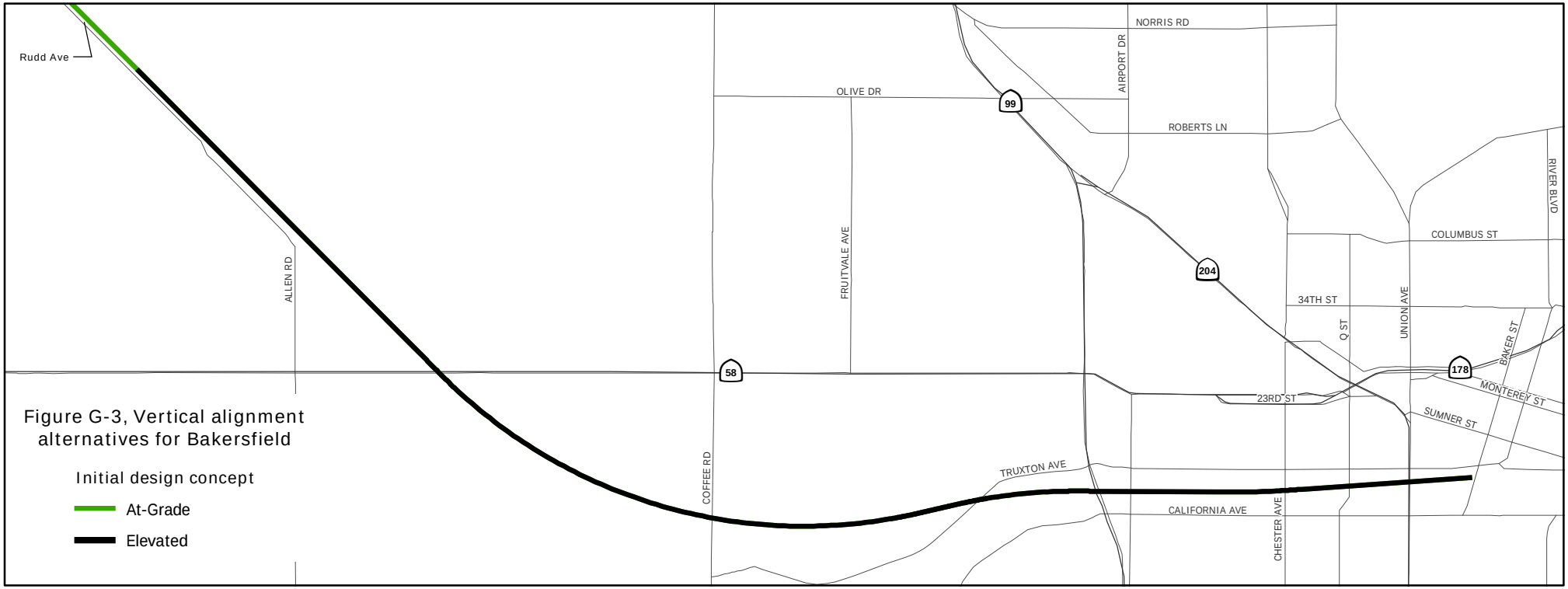


Figure G-3, Vertical alignment alternatives for Bakersfield

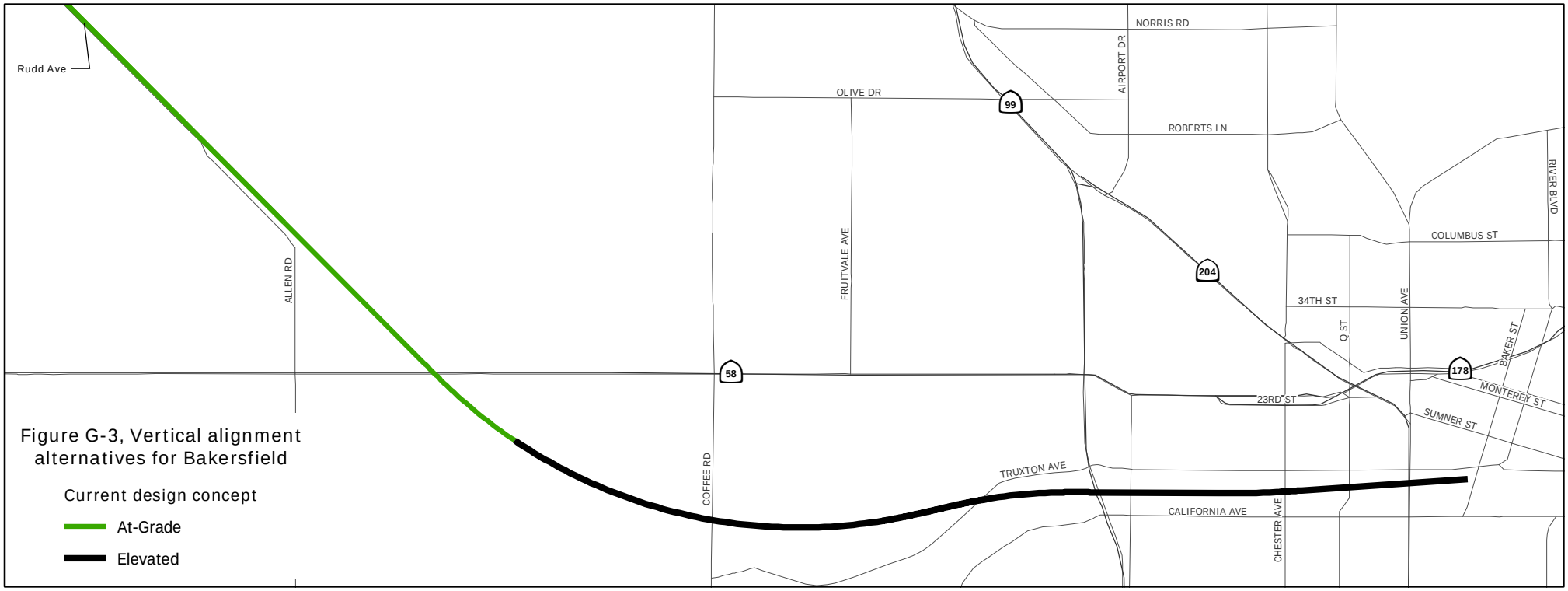


Figure G-3, Vertical alignment alternatives for Bakersfield