

METROPOLITAN BAKERSFIELD
HIGH SPEED GROUND
TRANSPORTATION SYSTEM
TERMINAL STUDY

March 1994



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of Governments**

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**METROPOLITAN BAKERSFIELD HIGH SPEED GROUND
TRANSPORTATION SYSTEM TERMINAL STUDY**

FINAL REPORT

**PREPARED FOR
KERN COUNCIL OF GOVERNMENTS**

**PREPARED BY
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MARCH 1994

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EXECUTIVE SUMMARY

The need for a high speed ground transportation (HSGT) system to serve Bakersfield and points north and south has been discussed for many years. A number of studies considering the feasibility of such a rail line have already been conducted. These analyses have culminated in the preparation of an engineering study which is now being undertaken by Caltrans. The purpose of the Caltrans investigation is to determine the most appropriate technology/alignment combinations for a HSGT system between Bakersfield and Los Angeles.

Caltrans originally identified the Amtrak Station in the vicinity of F Street as the only site to be considered for the Bakersfield terminus of the high speed rail line. Development of a station in an appropriate location is important for a number of reasons. The terminal will become a major center of traffic and business activities, and a site in a suitable location has the opportunity to positively shape urban land use and transportation development patterns. The terminal must also be compatible with the surrounding existing land use as well as with future plans for the area in which it is located.

For these reasons, the Kern Council of Governments (Kern COG) has conducted a study which investigated several alternative sites for a terminal to serve the needs of the Bakersfield metropolitan area. The analysis looked at all of the sites with regard to engineering and operational constraints; ridership issues; public/private development potential; and environmental considerations. The information collected was used by the Technical Advisory Committee (TAC) to aid in making their recommendations to Kern COG for the most suitable terminal locations. This summary highlights the findings and recommendations of the site selection study.

S.1 ALTERNATIVES CONSIDERED

A total of six terminal sites were considered and include: Amtrak, Downtown, East Bakersfield, Fruitvale, Olive Drive, and Westside Freeway. Locations of these sites are presented in Figure S-1. Also shown in this figure are the high speed rail alternative alignments now being considered in the Caltrans study.

S.2 ENGINEERING/OPERATIONAL AND SITE SUITABILITY CONSIDERATIONS

Several factors were examined. They include:

- Technology and service requirements
- Required on-site facilities and circulation
- Site support of patronage and revenue
- Site geology and engineering
- Feasibility of site acquisition

Table S-1 provides a comparison of how well each of the sites fares with regard to these issues.

**TABLE S-1
ENGINEERING/OPERATIONAL AND SITE SUITABILITY COMPARISONS**

Factors Considered	TERMINAL SITE					
	Amtrak	Down-town	East Bakersfield	Fruitvale	Olive Drive	Westside Freeway
Technology and service requirements						
Guideway considerations	+	+	+	+	0	+
Support for efficient operations & service	0	0	-	-	0	-
Required on-site facilities and circulation						
Facility access	-	+	0	+	0	0
Pedestrian on and off-site circulation	0	+	0	0	-	-
Vehicular on and off-site movement	-	+	0	0	0	+
Drop-off, short and long term parking	-	-	0	+	+	+
Off-site parking and circulation	-	-	-	0	-	0
Intermodal transit connectivity	+	+	+	0	0	0
Site visibility from roads and tracks	-	0	0	0	0	+
On-site commercial development	-	0	0	+	+	0
Aesthetics	0	+	0	0	0	0
Public safety	-	-	-	0	+	0
Site support of patronage and revenue						
Adjacency to major access routes	-	0	+	0	0	0
Location near population and commercial centers	+	+	+	0	0	-
Development potential on-site	-	0	0	+	+	+

**TABLE S-1
ENGINEERING/OPERATIONAL AND SITE SUITABILITY COMPARISONS (CONTINUED)**

Factors Considered	Terminal Site					
	Amtrak	Down-Town	East Bakersfield	Fruit-Vale	Olive Drive	Westside Freeway
Development potential adjacent to site	-	0	0	-	-	0
Development potential near site	-	+	0	0	+	+
Vehicular and pedestrian links	0	+	0	0	-	0
Capacity to reinforce activity centers	+	+	+	+	0	-
Consistency with local plans and ordinances	+	0	+	0	0	-
Support of general plan goals	+	+	+	0	0	0
Potential for pedestrianization of surrounding areas	0	+	+	0	0	+
Unusual site development constraints	0	0	0	0	0	0
Site geology and engineering						
Seismicity	Fault rupture potential in a strong earthquake (7.0)					
Drainage and utilities	+	+	0	0	0	-
Topography and elevation	+	+	+	+	+	+
Feasibility of site acquisition						
Site availability	0	0	0	0	0	0
Demolition and/or relocation requirements	-	-	0	0	0	+
Potential for site expansion	-	-	-	-	-	+
+ = Positive effect 0 = Neutral or both positive and negative effects - = Negative effect						

S.3 RIDERSHIP ISSUES

Four levels of HSGT operational scenarios were recommended by the California High Speed Rail Corridor Study Group, under AB791 in a previous statewide HSGT study prepared in 1990. Table S-2 displays the four levels considered. As the speed of the HSGT increases under the four operational scenarios, the market share for HSGT also increases. Generally speaking, when the maximum speed is at the 100 mph level, the mode share for HSGT is in the range of 10 to 15 percent. When the speed is increased to 125 mph, the share will increase to 16 to 20 percent. When the system is upgraded to a TGV type of technology with maximum speed of 185 mph, the market share of HSGT will be further increased to 35 to 43 percent. If the technology is upgraded to a Maglev type system with maximum speed of 300 mph, the market share will reach 50 percent for some of the alternatives. Induced trips due to HSGT also increase with speed. The total intercity trips increase from 0.8 to 1.5 percent, when the maximum speed is only at the 110 to 125 mph range, to 3 to 5 percent, when high level technology such as TGV or Maglev is introduced.

Operational Scenario	Maximum Speed (MPH)	Linehaul Time (Min.)	Cost Per Mile (€)	No. Trains Per Day
LEVEL 2	110	93	12.5	22
LEVEL 2A	125	70	15	22
LEVEL 3	185	56	22.5	27
LEVEL 4	300	38	26.25	27

Source: Subtask 2.1, Working Paper on Ridership Analysis of Alternative Stations Sites; November 1993.

The base (1991) and future (2020) ridership for the four operational scenarios are presented in Table S-3. Ridership varies with the speed of the train and the location of the terminal station. The suburban sites such as Westside Freeway and Fruitvale will attract the lowest ridership. The stations in the central city, such as the Downtown or the present Amtrak terminal, will attract the highest ridership. The 2020 ridership is predicted to be more than twice the ridership of the base year. This is mainly due to the 120 percent population increase expected in Kern County and the 67 percent employment increase anticipated in Los Angeles County in the next 30 years.

S.4 PUBLIC/PRIVATE DEVELOPMENT POTENTIAL CONSIDERATIONS

The station sites and surrounding areas were analyzed for their joint development potential. The study addressed the area within 0.25 miles of the urbanized sites (Amtrak, Downtown, East Bakersfield) and 0.5 miles of the rural or less developed sites (Fruitvale, Olive Drive, Westside Freeway). A comparison of some of the major factors studied is presented in Table S-4.

It has also been estimated that if a nine acre site is developed with a terminal center and supporting office structures and parking facilities, about 500 to 600 jobs would be generated. According to the Bakersfield Intermodal Transit Facility Plan, the revenue generating potential of a transit center would be about

\$133,800 per year. This includes an estimated \$97,800 per year for transit leases and concession rents; \$28,800 per year for automobile parking fees; and \$7,200 per year which is likely to be pledged to the Bakersfield Parking Authority to reduce the capital costs and to clean the parking lot.

Year	Level	Terminal Site					
		Amtrak	Downtown	East Bakersfield	Fruitvale	Olive Drive	Westside Freeway
1991	2	5,325	5,310	5,092	4,500	4,859	3,993
	2A	7,567	7,545	7,254	6,457	6,941	5,770
	3	16,035	16,003	15,538	14,219	15,028	13,021
	4	18,888	18,852	18,363	16,957	17,821	15,659
2020	2	11,440	11,403	10,931	10,876	10,737	10,376
	2A	16,424	16,378	15,734	15,659	15,472	14,969
	3	36,167	36,088	34,981	34,864	34,522	33,653
	4	43,125	43,044	41,849	41,718	41,358	40,410

Factor	Terminal Site					
	Amtrak	Downtown	East Bakersfield	Fruitvale	Olive Drive	Westside Freeway
Available Undeveloped Land (Acres)	23	2	64	530	180	836
Land Use (Acres)						
Commercial	65	60	37	43	17	
Industrial	52	75	91	226	664	
Residential	50	5	28	54	5	
Agricultural				79	118	837
Future				80 ¹		6,458 ²
Consistency With Plans and Policies ³	2	1	4	3	5	6

¹ Three properties in the area were recently approved for changed land uses.
² Includes the 2,071 acre McAllister Ranch and 4,387 acre Castle & Cooke Planned Community.
³ Ranked in order of consistency (1 = most consistent) with the *Metropolitan Bakersfield 2010 General Plan* and the *Second Draft Technical Memorandum for the G.E.T. District Long Range Transportation Systems Plan*.

S.5 ENVIRONMENTAL CONSIDERATIONS

An environmental significance checklist was prepared for each of the six candidate sites. Of the 56 factors that were assessed, one or more sites could have potential adverse effects on 18 of those factors. Table S-5 provides a comparison of the sites for those areas where adverse impacts are possible. It was determined that in none of the cases would the adverse effects definitely be significant. For two factors, further study would be necessary to determine the effects.

TABLE S-5 ENVIRONMENTAL SIGNIFICANCE CHECKLIST COMPARATIVE ANALYSIS						
Will the station site (directly or indirectly) affect or cause:	Terminal Site					
	Amtrak	Down-town	East Bakersfield	Fruitvale	Olive Drive	Westside Freeway
Increases in air pollution	Maybe	Maybe	Maybe	Maybe	Maybe	Maybe
Increases in noise levels or vibration	Maybe	No	No	No	No	Maybe
Noise criteria to be exceeded	Maybe	No	No	No	No	Maybe
Light glare or shadow	Maybe	Maybe	Maybe	Maybe	Yes	Maybe
Reduction in farmland or timber acres or affect important farmland	No	No	No	No	No	Yes
Disruption of planned development	No	No	No	No	No	Maybe
Population location, distribution, density or growth rate	No	No	No	No	No	Maybe
Employment, industry or commerce or require displacement of businesses or farms	No	Maybe	No	Maybe	Yes	No
Community facilities	Maybe	No	No	No	No	No
Public utilities, police, fire or other public services	Maybe	No	No	No	No	No
Affect transportation systems or alter circulation patterns	No	Maybe	No	No	No	No
Generation of additional traffic	Yes	Yes	Yes	Yes	Yes	Yes
Existing parking facilities or result in demand for new parking	Yes	Yes	Yes	Yes	Yes	Yes
Risk of explosion, release of hazardous substances, or other safety concerns	No	No	Maybe	Maybe*	No	Maybe*
Changes to waterborne, rail or air traffic	Yes	Maybe	Yes	Yes	Yes	Yes
Support large commercial or residential development	No	No	Yes	Yes	Yes	Yes
Archaeological or historic resources	No	Maybe*	No	Maybe*	Maybe*	Maybe*
Aesthetic concerns	No	No	No	No	No	Maybe

* Further study required to determine effects.

Source: Working Paper Subtask 4.2, Terminal Site Environmental Analysis; November 8, 1993.

S.6 CONCLUSIONS

Based on the results of the Metropolitan Bakersfield HSGT Terminal Study and the evaluation process undertaken by the Technical Advisory Committee (TAC), the Downtown site should be the first choice for development of a terminal. If this site proves infeasible, then the Amtrak site should be the second choice. Only if the Caltrans alignment/technology study determines that the high speed rail line should bypass the downtown area should the Fruitvale site be considered for development. The evaluation process and rationale for the conclusions reached are summarized in the following discussion.

The TAC completed an evaluation process which ranked and rated each of the alternative sites for each of the four categories of criteria (engineering/operations and site suitability; ridership; development potential; and environment). The six sites were first ranked for each of the criteria categories. Each site was assigned a unique ranking. Then each site was rated in terms of how well a site satisfied the objectives of each evaluation category. The same score could be assigned to different sites for the same category.

In terms of ranking, the Downtown site received the best score. This site was considered to be the best candidate for the location of a HSGT terminal. For each of the four criteria categories, this site received the highest ranking. The East Bakersfield site was assigned the second highest ranking score. The Amtrak and Fruitvale sites tied for third place ranking. The Olive Drive and Westside Freeway sites were ranked in fifth and sixth place, respectively.

The Downtown site also received the highest rating of any of the sites. It received a rating of over ten points higher than the next highest rated site (East Bakersfield). The Fruitvale site (third highest rating) scored slightly higher than the Amtrak site which scored in fourth place. Again, the fifth and sixth place rated sites were Olive Drive and Westside Freeway, respectively.

Based on both the results of the scoring process and further discussion, the TAC decided that the Downtown site would be the most preferable location for the Bakersfield HSGT terminal. The reasons cited include: the site is located near a future path for a light rail system; is close to the government and downtown commercial core which allows for revitalization potential; has expansion potential to the east with about two to three miles of available land to avoid conflicts with the library; and has access to two arterial roadways. The TAC further determined that, since the Downtown and Amtrak sites are close to each other, development could occur at the existing Amtrak terminal as a second choice should it not prove feasible to build at the Downtown site. The Amtrak site would also provide revitalization potential and is located on a proposed light rail line and near a possible future freeway. Expansion to the west and north to Truxtun Avenue will increase possibilities for development of a transit center and will provide access to Truxtun Avenue. After further discussion, it was decided that the East Bakersfield site should be eliminated from consideration because a terminal at that location would preclude two of the high speed alignment options now being considered in the Caltrans study. In addition, Caltrans plans to use that site as a possible storage yard.

The TAC also selected one of the suburban sites as a third choice, however, they indicated that this site should be developed only in the event that Caltrans decides that the Los Angeles to Bakersfield high speed rail line should bypass the downtown area of the City of Bakersfield. In that case, the TAC determined that the Fruitvale site would be the most suitable location for a suburban station. This site is near the Westside Freeway Corridor; has adequate vacant land available for expansion and accessibility; and is located closer to a larger residential population than the downtown areas. However, the Committee also expressed their concern that this site would not be as compatible as the two urban sites with regard to infill, redevelopment, and land use policies and that, although the site could be served by light rail in the future, it would not provide access to the proposed light rail line (being studied as part of the GET Long-Range Public Transportation Systems Study).

The Consultant also agrees with the findings of the TAC. In addition to the reasons that were cited by the TAC for selecting the Downtown or Amtrak site, there are a number of other factors that makes these alternatives the most desirable for development of a terminal. The major considerations are summarized as follows. Both sites would produce better ridership than any of the suburban sites. The two sites are also located in the heart of downtown Bakersfield and would offer the most direct accessibility to primary Bakersfield civic, commercial, and intercity business destinations. Either location would reinforce the urban identity of downtown Bakersfield and could significantly enhance the aesthetics of the station vicinity. In addition, a station in the downtown area would provide good potential for bringing activity back to downtown. The Downtown and Amtrak sites would also provide a good opportunity for intermodal transit connections. While any of the suburban sites would have space available for a regional transit center, all of the systems would need to establish new goals to relocate from the downtown area. Site support services now exist near both downtown sites, but there may be a need to provide additional services. Support services for the Fruitvale site are remote (at Coffee Road/Stockdale Highway) and will require additional development.

The Downtown site has other advantages over the Amtrak site which make it the more desirable of the two downtown locations. Access to the Amtrak site would be limited, and both on- and off-site pedestrian and vehicular movements would not be as good as for the Downtown site. Although limited by size, the Downtown site would have good potential for on-site commercial development; however, the Amtrak site would have poor potential due to both size constraints and adjacent land uses such as the hospital and high school. However, this potential could be improved by purchasing adjacent housing for commercial development.

There are reasons, other than the two major concerns already cited by the TAC, for elimination of the East Bakersfield site. This location has limited support services because the area contains older industrial uses and some commercial uses which are not appropriate for the services of a transit center. A high crime rate exists in the area, and pedestrian movement through surrounding areas could pose a public endangerment. This site would also have the lowest ridership of any of the urban sites. In addition, the East Bakersfield location is adjacent to an area considered to be a problem drainage area which is sometimes prone to moderate ponding and accumulation of water along roadsides during severe storm events.

**METROPOLITAN BAKERSFIELD HIGH SPEED GROUND
TRANSPORTATION SYSTEM TERMINAL STUDY**

0 - INTRODUCTION

1.0 INTRODUCTION

For at least a decade there has been considerable discussion about high speed rail in California. General studies have been conducted by agencies, universities, and others on the subject. In March 1993, Caltrans issued a Request for Proposal (RFP) which invited consultants to conduct an engineering feasibility study to identify the most appropriate technology/alignment combinations for a high speed ground transportation (HSGT) system between Los Angeles and Bakersfield.

Recent planning studies prepared by Kern COG, the City of Bakersfield, and Kern County including the *1990 Regional Transportation Plan* and *Metropolitan Bakersfield 2010 General Plan* have defined numerous short range and long range programs in economic development, housing, land use, transportation, environmental protection, and other areas. These studies and plans all have identified the need for an HSGT system. Each recognized that a new HSGT terminal station will inevitably become a major center of traffic and business activities, providing a major force for shaping the urban development pattern. Thus, there is the clear recognition that the location of the HSGT terminal station must be selected with great care so that future land use and transportation development patterns influenced by the HSGT investment will be compatible with the development strategies specified in current and future plans.

The Caltrans RFP identified the Amtrak Depot in Bakersfield in the vicinity of F Street as the only site to be considered for the northern terminal. However, given the importance of the location for a terminal, it is critical for the decision makers of Kern COG, the City of Bakersfield, Kern County, GET, and other public agencies to carefully study the most promising HSGT terminal station sites in the Bakersfield area. The study is needed now to be able to provide credible input to Caltrans and to reach a consensus on the most promising site during an early stage of the Caltrans project.

The initial step in this study involved a preliminary analysis by Kern COG which resulted in the selection of six candidate sites to be examined in greater detail. Analyses of the six sites were then undertaken by the project consultant. The Technical Advisory Committee (TAC), which had been previously formed for the *Long-Range Public Transportation Systems Study* prepared for the Golden Empire Transit District, met several times during the course of this site selection study to review the interim findings. Ultimately, the TAC made their recommendations to Kern COG.

This report presents the findings and recommendations of the terminal site selection study. This study was undertaken to satisfy three specific objectives:

- To identify the most promising alternative station sites for the HSGT in the Bakersfield Metropolitan Area.
- To perform extensive analyses of and evaluate the alternative sites in a multi-disciplinary manner.
- To recommend the most promising or preferred terminal station site(s) for the HSGT in the Bakersfield Metropolitan Area.

Toward this end, a number of working papers and technical memoranda (listed in Appendix A) were prepared during the course of the study and are summarized in this report. The proceedings of the TAC site selection panel and their recommendations are also presented.

This report consists of seven chapters. This introduction constitutes Chapter 1. Information regarding the specific station sites being considered and engineering and operational considerations are presented in Chapter 2. Chapter 3 addresses ridership issues while Chapter 4 discusses the public-private development potential. The environmental analysis for each site is addressed in Chapter 5. Chapter 6 describes the process used to analyze and compare each of the sites. Finally, Chapter 7 presents the findings and recommendations.

**METROPOLITAN BAKERSFIELD HIGH SPEED GROUND
TRANSPORTATION SYSTEM TERMINAL STUDY**

**20 - SITE SUITABILITY/ENGINEERING AND OPERATIONAL
CONSIDERATIONS**

2.0 SITE SUITABILITY/ENGINEERING AND OPERATIONAL CONSIDERATIONS

The criteria developed to assess the suitability of the location for a station site as well as the engineering and operational advantages and disadvantages of each alternative site are discussed in this chapter. An analysis of how well each site satisfies the criteria is also presented.

A total of six sites were considered in this study. They included:

- Amtrak
- Downtown
- East Bakersfield
- Fruitvale
- Olive Drive
- Westside Freeway

Figure 2-1 provides a location map for all six sites. The high speed ground transportation alternative alignments being considered in the Caltrans study are presented in Figure 2-2. In addition, the light rail transit priority corridors being considered in the Golden Empire Transit District, *Long-Range Public Transportation Systems Study*, are shown in Figure 2-3.

2.1 EVALUATION CRITERIA

The criteria developed for this study included the engineering and operational requirements for two high-speed technologies: steel wheel/rail and Maglev. The rapid development of high speed technology and the current lack of specific Federal and State regulations and standards for high speed technology, necessitated that this criteria be considered dynamic in nature. The criteria developed falls into five major categories: vehicle characteristics, station design, right-of-way, operational, and alignment design.

2.1.1 Vehicle Characteristics

Table 2-1 presents typical characteristics for the two types of technologies under consideration.

2.1.2 Station Design

Several station design characteristics need to be considered including: station functions, platform and trackway requirements, station amenities, handicapped accessibility, vertical circulation, fare collection, and site design.

- A. Station Functions - The efficient processing of patrons from station entry to train boarding is important. The station should be able to easily orient patrons with respect to use of the station, the system and supporting transportation modes and should also be able to provide a safe, attractive, and comfortable environment.

The site should be capable of accommodating fire protection and communications systems as well as the necessary electrical and mechanical equipment for the operation and maintenance of the station and system's functioning.

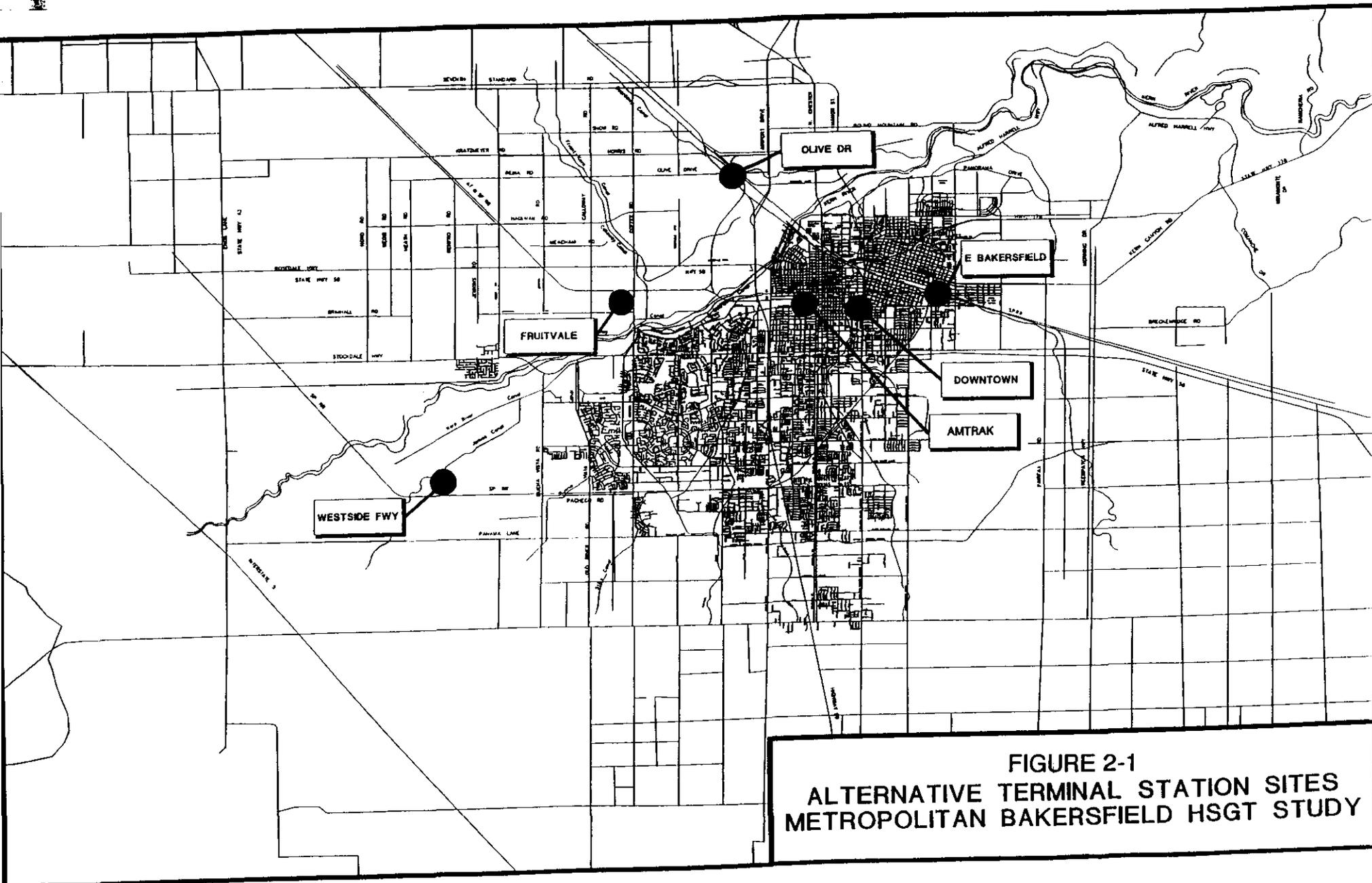


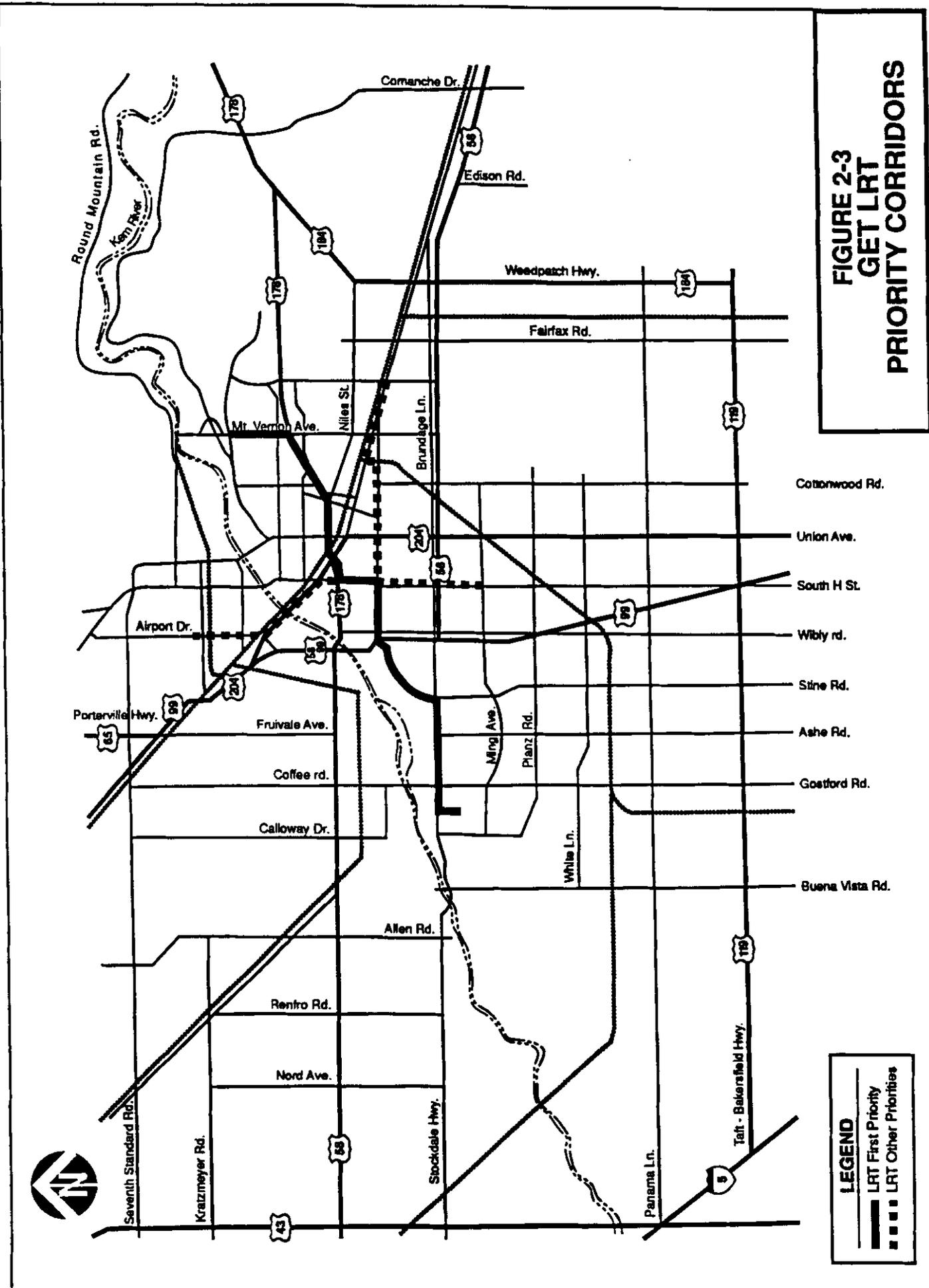
FIGURE 2-1
ALTERNATIVE TERMINAL STATION SITES
METROPOLITAN BAKERSFIELD HSGT STUDY



LEGEND

- High Speed Rail 2D
- High Speed Rail 2E
- High Speed Rail 2G
- High Speed Rail 2H
- Station Sites

**FIGURE 2-2
CALTRANS HIGH SPEED
RAIL ALTERNATIVES**



**FIGURE 2-3
GET LRT
PRIORITY CORRIDORS**

Characteristic	Steel Wheel	Maglev
Typical Technology Example	TGV-Atlantique	MAGLEV-TR-07
Design Speed	186 MPH (300 KPH)	250 MPH (400 KPH)
Train Capacity (passengers)	500	400
Vehicle Size (Feet)		
- Length	61.5 - 71.7	88.5
- Width	9.5	12.2
- Height	11.4	13.4
Platform Length Typical (Feet)	800	500
Normal Trainset Size	Two Power Cars Ten Coaches	Five Cars
Vehicle Weight (loaded)	68 Tons (power car)	66 Tons (end car)
Electrification	Catenary	Electromagnetic
Control System	Operator	Operator or Automated
Switching System	Railroad Switch	Movable Guideway
Maximum Grade	3.5%	10%
* Design speed is restricted by existing track condition and alignment (FRA Standard Class 5 Track)		
<small>Source: Working Paper, Subtask 6.1, Alignment/Operational Criteria; August 6, 1993.</small>		

- B. Platform and Trackway Requirements - A center platform station configuration is preferred over side-platform configurations. The platform length should accommodate the longest train with provision for expansion to accommodate the longest future train, if necessary. Platforms should be high level, flush with the vehicle floor, in order to accommodate disabled patrons and for the easy and safe loading and unloading of trains. The guideway should extend a minimum of 75 feet beyond the platform on both horizontal and vertical tangents. Security should be provided to prevent access to restricted station areas and to the track or guideway.
- C. Station Amenities - The stations should provide amenities such as public restrooms, lighting, benches, route maps, train schedules, trash receptacles, telephones, public address system, and protection from adverse weather conditions. Additional amenities, including restaurants, shops, etc. could be provided as part of private sector investment in station area joint development.
- D. Handicapped Accessibility - Stations should be designed to be fully accessible by elderly and handicapped passengers. The Americans with Disabilities Act and all the State of California regulations pertaining to barrier-free design will need to be satisfied. In addition, the needs of patrons with infants in strollers, carrying hand luggage, etc. should also be considered.
- E. Vertical Circulation - The system should be grade-separated at all proposed station locations. All vertical circulation elements (i.e., escalators, stairways, elevators) should be located to reinforce clear and direct patron movement patterns within each station.

Characteristic	Steel Wheel	Maglev
Typical Technology Example	TGV-Atlantique	MAGLEV-TR-07
Design Speed	186 MPH (300 KPH)	250 MPH (400 KPH)
Train Capacity (passengers)	500	400
Vehicle Size (Feet)		
- Length	61.5 - 71.7	88.5
- Width	9.5	12.2
- Height	11.4	13.4
Platform Length Typical (Feet)	800	500
Normal Trainset Size	Two Power Cars Ten Coaches	Five Cars
Vehicle Weight (loaded)	68 Tons (power car)	66 Tons (end car)
Electrification	Catenary	Electromagnetic
Control System	Operator	Operator or Automated
Switching System	Railroad Switch	Movable Guideway
Maximum Grade	3.5%	10%
* Design speed is restricted by existing track condition and alignment (FRA Standard Class 5 Track)		
<small>Source: Working Paper, Subtask 6.1, Alignment/Operational Criteria; August 6, 1993.</small>		

- B. Platform and Trackway Requirements - A center platform station configuration is preferred over side-platform configurations. The platform length should accommodate the longest train with provision for expansion to accommodate the longest future train, if necessary. Platforms should be high level, flush with the vehicle floor, in order to accommodate disabled patrons and for the easy and safe loading and unloading of trains. The guideway should extend a minimum of 75 feet beyond the platform on both horizontal and vertical tangents. Security should be provided to prevent access to restricted station areas and to the track or guideway.
- C. Station Amenities - The stations should provide amenities such as public restrooms, lighting, benches, route maps, train schedules, trash receptacles, telephones, public address system, and protection from adverse weather conditions. Additional amenities, including restaurants, shops, etc. could be provided as part of private sector investment in station area joint development.
- D. Handicapped Accessibility - Stations should be designed to be fully accessible by elderly and handicapped passengers. The Americans with Disabilities Act and all the State of California regulations pertaining to barrier-free design will need to be satisfied. In addition, the needs of patrons with infants in strollers, carrying hand luggage, etc. should also be considered.
- E. Vertical Circulation - The system should be grade-separated at all proposed station locations. All vertical circulation elements (i.e., escalators, stairways, elevators) should be located to reinforce clear and direct patron movement patterns within each station.

- F. Fare Collection - Fare collection can be based on the honor system or utilize collection turnstiles.
- G. Site Design - The station should accommodate access by all movement modes, with special emphasis on access by bus, private automobiles, and taxis. Kiss-and-Ride and Park-and-Ride facilities should be also be provided. Interfaces with other transportation systems should be as clear and direct as possible. Pedestrian movement should be separated from auto-bus traffic wherever feasible. Station areas should be designed as pleasant and safe pedestrian-oriented environments. The minimum size requirements for a station accommodating any technology are shown in Table 2-2.

TABLE 2-2 MINIMUM STATION SIZE¹	
<u>Length</u> Terminal Platform Ramp Extensions	800 feet <u>150 feet each end</u> Total 1100 feet
<u>Width²</u> Terminal Platform and Tracks	100 feet
<u>Parking³</u> 220 cars 300 cars	120 feet X 800 feet = 2.2 acres 120 feet X 1100 feet = 3.0 acres
<u>Bus Loading/Unloading</u> 3 buses	15 feet X 500 feet
<p>¹ Total station template size developed for this study is about 240 feet X 1100 feet. ² Terminal width is based on a 30-35 foot platform and 20-25 feet of rail area between two platforms. ³ Parking is based on an assumption of 100 cars per acre. Actual requirements will be based on further in-depth study.</p> <p style="text-align: right; font-size: small;">Source: Working Paper, Subtask 6.3, Perform Engineering and Operational Analysis: October, 1993.</p>	

2.1.3 Right-of-Way

The right-of-way for Maglev trains must be totally grade separated. Right-of-way for steel wheel/rail trains should be totally grade separated, if at all possible. The right-of-way should be protected from thrown or dropped objects and from intrusion by automobiles and other railroad equipment. Seismic and high wind alarm capability should also be provided. Signage and graphics warning trespassers of the danger of high speed trains and high voltage should be posted prominently and frequently along any at-grade right-of-way.

2.1.4 Operational

Terminal stations need to have main line trackage or guideway extended beyond the station for sufficient distance to provide safe braking distance for station stopping and for tail tracks or guideway of sufficient length to temporarily store the longest train on each track or guideway. The tail tracks or guideway will become part of the main line when the system is extended in the future. Crossover trackage or guideway is needed in front of the station to allow trains to cross over from the inbound to the outbound direction.

High speed steel wheel/rail turnouts and Maglev switching guideways on the main line need to allow the fastest practical operating speeds for trains negotiating the special work.

2.1.5 Alignment Design

Table 2-3 presents a summary of the alignment design criteria.

TABLE 2-3 SUMMARY OF ALIGNMENT DESIGN CRITERIA		
Characteristics	Steel Wheel	Maglev
Typical Technology Example	TGV-Atlantique	MAGLEV-TR-07
Desirable R/W Width	64'	64'
Minimum R/W Width	44'	50'
Horizontal Clearance - To An Obstruction - To Adjacent Track Centerline	6'0" Tangent 7'0" Curve 8'0" Preferred 14'0" Side Catenary 16'0" Center Catenary	8'0" Tangent 9'0" Curve 10'0" Preferred 18'0"
Vertical Clearance - Top of High Rail - Under Structure	Typical 20' Minimum 17' Railroad 23'6" Highway 16'6"	Typical 12' (Top of Guideway) Minimum 12' (Top of Guideway) Railroad 23'6" Highway 16'6"
Horizontal Alignment - Tangent - Stations - Circular Curves - Spiral Transition - Superelevation	100' min 75' beyond platform R = 1000' min R = 13000' max speed LS = 100E (100' min) 10° max (E=7°, U=3°) E+U = $3.84V^2/R$	100' min 75' beyond platform R = 1000' min R = 16000' max speed LS = 140α (100' min) α** = 12° max Tan α + .05 = $.067V^2/R$
Vertical Alignment - Vertical Tangents - Stations - Grades - Vertical Curves	100' min 75' beyond platform 3.5% limit 1.5% max speed 1% stations 1% yard R = 46,000' max speed R = $1.34V^2$	100' min 75' beyond platform 10% limit 3.5% max speed 1% stations 1% yard R = 84,000' max speed R = $1.34V^2$
** α = Guideway tilt angle		
Source: Working Paper, Subtask 6.1, Alignment/Operational Criteria; August 6, 1993.		

2.2 ANALYSIS

The analysis begins with a general comparison between sites located in urban areas versus sites located in suburban areas. This section concludes with a comparison of how well each site accommodates specific criteria.

Each of the terminal sites proposed may be characterized generally within either an urban context (Amtrak, Downtown, East Bakersfield) or a suburban context (Fruitvale, Olive Drive, Westside Freeway). The major differences between the urban and suburban sites are presented below.

Urban - Any of the sites, developed or expanded as a terminal facility can:

- Reinforce urban identity
- Offer direct accessibility to primary civic, commercial, and intercity business destinations and intermodal transportation centers
- Stimulate revitalization of infrastructure and maximize vehicular and pedestrian circulation linkages
- Reinforce existing activity centers, stimulate surrounding development, encourage pedestrianization
- Greater traffic congestion likely; off-site parking demand will likely increase demand upon presently available land
- Design will need careful attention to pedestrian and vehicular safety due to train approach speeds and difficult visibility of some approach alignments
- Unavailability of surrounding land may preclude future transit facility expansion

Suburban - Development of a terminal at one of the suburban sites can offer the following advantages:

- Expanded technical planning options, design flexibility
- Creation of new focus/activity center for westerly growth of urban area
- Maximized potential for future rail transit center development
- On-site flexibility for short and long-term parking
- Relieve auto and bus traffic congestion in the CBD; shorter access times from some residential areas may be likely
- Development will require significant improvement/extension of infrastructure and development of routinely required off-site support services

The following discussion presents a comparison of the suitability of each site with regard to the following factors: technology and service requirements; required on-site facilities and circulation; site support of patronage and revenue; site geology and engineering; and feasibility of acquisition.

2.2.1 Technology and Service Requirements

A. Guideway Gradients, Geometry, Dimensions, and Other Characteristics

- Amtrak - No significant concerns except there is a switching yard on the site, and the track curves in a northerly direction west of the Oak Street overpass.
- Downtown - No significant concerns except there is a spur curve to the south on the site.
- East Bakersfield - No significant concerns except that several spur lines enter from south of Edison Highway.

- Fruitvale - No significant concerns except there appears to be an abandoned spur curve on the north side of the tracks leading to the power plant.
- Olive Drive - No significant concerns except there is an existing curve to the tracks from the south and north of the site.
- Westside Freeway - No significant concerns

B. Support for Efficient Operations and Service

- Amtrak - Support exists, but not known if adequate.
- Downtown - Same as Amtrak.
- East Bakersfield - Limited support; area contains older industrial uses and some commercial uses not appropriate for services of a transit center.
- Fruitvale - Limited support; many of the services are located at the intersection of Coffee Road and Stockdale Highway and along Rosedale Highway; not known if adequate.
- Olive Drive - Same as Amtrak.
- Westside Freeway - No support exists; no improved roadways or development within one mile of site.

2.2.2 Required On-Site Facilities and Circulation

A. Facility Access

- Amtrak - Accessible from east via Truxton Avenue and F Street, but limited by high school parking and traffic. Access from south via California Avenue. Access from north limited by Mercy Hospital, and the Oak Street pass over the switching yard limits access from the west.
- Downtown - Accessible from Truxton Avenue via Q or S Streets.
- East Bakersfield - Accessible from Edison Highway or Kentucky Street; if improved, Haley Street could provide access to Highway 178.
- Fruitvale - Accessible from Coffee Road with improvements; future extension of Langley Road will offer access to Calloway Drive and ultimately Rosedale Highway, the future Westside Freeway, and Brimhall Road; El Toroviejo Road could be extended south to provide access to Rosedale Highway.
- Olive Drive - Easily accessible from Olive Drive. Future extension of Landco Drive will provide access to Rosedale Highway. Operating oil refineries, State Highway 99, agricultural lands, and the North of the River Sanitation District site limit access from the east and west.
- Westside Freeway - Easy access from east; access otherwise limited by Kern River, agricultural lands, City of Bakersfield recharge areas, and railroad.

B. Pedestrian On and Off-Site Circulation

- Amtrak - No access to bike paths. Fair potential for pedestrian movement on and off-site. Downtown sidewalks exist.
- Downtown - Accesses Class II Bike Lanes on Q Street and Truxtun Avenue. Good potential for pedestrian movement on and off the site with pathway improvements along roadways and to the Convention Center.
- East Bakersfield - Accesses Class II Bike Lanes on Kentucky Street, Haley Street, and 21st to Edison Highway; good pedestrian movement potential with pathway improvements; area does not lend itself well to pedestrian movement at night.
- Fruitvale - No access to pedestrian circulation systems; bike paths are planned along Coffee Road; a bikeway is located along the Kern River about one mile south.

- Olive Drive - No access to pedestrian circulation systems; bike paths are planned south of the AT&SF rail line and Landco Road to Rosedale Highway; a Class II bike lane exists along Olive Drive to the northwest.
- Westside Freeway - No access to pedestrian circulation systems; Kern River Parkway bike path is about two miles north; residential sidewalks and streets are located about one mile east.

C. Vehicular On and Off-Site Movement

- Amtrak - Poor movement. F Street is a heavily traveled collector street. Truxton Avenue passes the site, however, available land for terminal construction is limited.
- Downtown - Good movement.
- East Bakersfield - Off-site movement good; on-site movement restricted due to site depth.
- Fruitvale - Coffee Road can be easily accessed but road has significant congestion; Langley and El Toroviejo Roads would need to be improved to access Calloway Drive and Rosedale Highway, respectively; on-site movement is unlimited.
- Olive Drive - Limited movement on- and off-site; Olive Drive and the Highway 99 interchange area are congested; access could be gained with a canal crossing and road improvements of Landco Drive.
- Westside Freeway - No improved roadways on or adjacent to the site; Buena Vista Road is closest paved road (one mile east); potential for movement is good—only concern is the railroad crossings to the south.

D. Drop-Off, Short and Long Term Parking for Vehicles

- Amtrak - Restricted amounts of land available to satisfy requirements. Long-term parking limited due to site size constraints and land availability.
- Downtown - Restricted amounts of land available due to a split in the site by S Street. However, the site could be consolidated by closing S Street. Site is not long enough to accommodate the terminal and parking on the western parcels. Eastern parcels can only accommodate a platform on the south side of the track unless structures along Truxton Avenue are purchased. Area available for parking is significant for a downtown parcel.
- East Bakersfield - Restricted amounts of land available due to site depth.
- Fruitvale - Sufficient land available.
- Olive Drive - Same as Fruitvale.
- Westside Freeway - Same as Fruitvale.

E. Off-Site Parking and Circulation

- Amtrak - Limited potential; residential housing would need to be purchased for parking facilities.
- Downtown - Limited potential; some limited on-street parking may be permitted with roadway improvements; shared parking with adjacent land uses may also be a possibility.
- East Bakersfield - Limited potential. Off-street parking limited due to high-density residential uses and Edison Highway traffic.
- Fruitvale - No potential for off-site parking; no improved roadways for street parking and no off-site parking facilities exist.
- Olive Drive - No existing potential for off-site parking; there are no improved roadways for street parking; future extension of Landco Drive could provide potential off-site parking.
- Westside Freeway - Land needs to be purchased to provide parking; no improved roadways exist for street parking or access.

F. Intermodal Transit Connectivity

- Amtrak - Good opportunity for connectivity.
- Downtown - Good opportunity for connectivity.
- East Bakersfield - Good opportunity for connectivity.
- Fruitvale - Space available for a regional transit center; would require all systems to establish new goals to relocate from the downtown area.
- Olive Drive - Same as Fruitvale.
- Westside Freeway - Same as Fruitvale; however, with increased population in the area, this possibility should be considered.

G. Site Visibility from Roads and Tracks

- Amtrak - Limited due to existing structures.
- Downtown - Visibility limited from the tracks but good from major roadways. Visibility could be improved with the removal of obstructions near the site.
- East Bakersfield - Good visibility.
- Fruitvale - Same as East Bakersfield.
- Olive Drive - Visibility to southbound Highway 99 travelers is limited until after crossing the Olive Drive overpass; otherwise visibility is good.
- Westside Freeway - Same as East Bakersfield.

H. On-Site Commercial Development

- Amtrak - Limited potential due to size constraints and adjacent land uses (hospital, high school, etc.). However, adjacent housing could be purchased and used for commercial development.
- Downtown - Good potential but limited by site size.
- East Bakersfield - Same as Downtown.
- Fruitvale - Good potential to develop retail or tourist commercial uses.
- Olive Drive - Good potential to develop a highway commercial center focused on the traveling public.
- Westside Freeway - Limited to terminal use only; development of planned residential and commercial uses in surrounding areas could enhance potential for commercial uses on-site.

I. Public Safety

- Amtrak - Significant concern due to location of high school. Hospital pedestrian traffic has some potential for public safety hazards with vehicular traffic.
- Downtown - Concern limited to library patrons and industrial traffic; may be potential for transient injuries along tracks since the site will provide a public use that will attract a larger population.
- East Bakersfield - High crime rate; pedestrian movement through surrounding areas could pose a public endangerment.
- Fruitvale - Limited concern since the area is primarily focused on industrial areas; school-designated areas are within one-half mile; residential areas buffer school from site; areas may create some public safety concerns which could be mitigated.
- Olive Drive - Limited concern since the area is focused on industrial uses; no residential or school areas are located nearby.
- Westside Freeway - Limited concern due to remoteness of site; a high school and residential areas are within one mile of site.

2.2.3 Site Support of Patronage and Revenue

A. Adjacency to Major Access Routes

- Amtrak - Direct access available only to Truxton Avenue.
- Downtown - Primary access routes are Q and S Streets linking Truxton to California Ave; Union Avenue is a possibility on the eastern boundary.
- East Bakersfield - Primary access is via Kentucky Street and Edison Highway which link to Beale Avenue (an arterial).
- Fruitvale - With future road extensions could access Rosedale Highway, Calloway Drive, and Brimhall Road; Coffee Road realignment will provide closer access.
- Olive Drive - Access to Olive Drive and Highway 99; Landco Drive extension will access Rosedale Highway; southern routes limited by railroad and canal crossings.
- Westside Freeway - Not located adjacent to a major access route; however, several routes are located within a few miles, and the proposed Westside Freeway alignment would be about one-half mile west of site.

B. Location Near Population and Commercial Centers

- Amtrak - Downtown Bakersfield; residential areas are north and south of site; commercial offices are north of site; retail commercial is located about four blocks east of site.
- Downtown - Heart of downtown Bakersfield; centrally located between eastern and western Bakersfield residential areas; commercial area located north and west while industrial uses are located south and east.
- East Bakersfield - Adjacent to residential area to north; mixture of industrial and residential areas to south; East Hills Mall is about two miles to the northeast.
- Fruitvale - Within five miles of downtown Bakersfield; nearest residential is one-half mile west-southwest; commercial areas are along Coffee Road near Brimhall Road; retail commercial facilities focused on residential users are near the intersection of Coffee Road and Stockdale Highway; Rosedale Highway corridor contains a mix of uses.
- Olive Drive - Within eight miles of downtown Bakersfield; nearest residential areas are one-half mile east of Highway 99 and one-half mile northwest along Olive Drive; commercial center and service stations exist along Olive Drive near the Highway 99 interchange.
- Westside Freeway - Within seven miles of downtown Bakersfield; nearest populated area is one mile east; commercial activities (targeted for residential users) are two miles from site; two commercial centers are planned along Buena Vista Road; Valley Plaza is six miles from site.

C. Vehicular and Pedestrian Links

- Amtrak - Potential for vehicular links with improvements; pedestrian links will need to be improved to the central downtown area and surrounding residential areas.
- Downtown - Optimum potential for vehicular links; pedestrian links will need to be improved to central downtown; links to surrounding residential areas limited.
- East Bakersfield - Optimum potential for vehicular links; pedestrian links to residential areas need to be improved. Links to industrial areas limited.
- Fruitvale - Vehicular links limited by existing land uses and rights-of-way; pedestrian links are limited but could be improved.
- Olive Drive - Vehicular links limited by existing land uses and rights-of-way; pedestrian links are limited and it appears that there are no plans to improve the pattern; Landco Drive extension will provide a vehicular link between Rosedale Highway and Olive Drive.
- Westside Freeway - Limited potential to link with existing vehicular and pedestrian ways due to distance; circulation will be possible as growth occurs in the area.

Table 2-4 shows the approximate travel times and distances to various destinations from each of the station sites.

TABLE 2-4 TRAVEL TIME/DISTANCE TO MAJOR DESTINATIONS					
Site	Downtown	Airport	Residential	Commercial	Freeways
Amtrak	1 min./1 mile	10 min./5 miles	1 min./1 mile	1 min./1 mile	1 min./1 mile to Hwy 99 25 min./17 miles to I-5
Downtown	1 min./ ¼ mile	12 min./8 miles	1 min./1 mile	1 min./1/2 mile	4 min./2 miles to Hwy 99 25 min./18 miles to I-5
East Bakersfield	4 min./2 miles	15 min./10 miles	1 min./½ mile	4 min./2 miles	4 min./2 miles to Hwy 178 5 min./8 miles to Hwy 99 30 min./21 miles to I-5
Fruitvale	4 min./5 miles	8 min./5 miles	2 min./½ mile	2 min./1 mile	4 min./3 miles to Hwy 99 30 min./15 miles to I-5 2 min./½ mile to Westside Freeway
Olive Drive	8 min./4 miles	5 min./2 miles	5 min./3miles	1 min./½ mile	1 min./½ mile to Hwy 99 40 min./30 miles to I-5
Westside Freeway	15 min./7 miles	20 min./8 miles	2 min./1 mile	5 min./3 miles	10 min./6 miles to I-5 10 min./6 miles to Hwy 99

Source: Working Paper, Subtask 8.3, Perform Engineering and Operational Analysis; October, 1993

D. Capacity to Reinforce Activity Centers

- Amtrak - Great potential to bring activity back to downtown.
- Downtown - Same as Amtrak.
- East Bakersfield - Great potential to provide redevelopment opportunities.
- Fruitvale - With extension and improvement of accessing roadways, the site could support the commercial activity along Coffee Road and Rosedale Highway.
- Olive Drive - Could support commercial activity at Olive Drive and Highway 99 interchange; extension of Landco Drive could support activity on Rosedale Highway and, with transit service improvements, the downtown area.
- Westside Freeway - No capacity to reinforce existing centers; however, once planned development in the area occurs, this potential will increase dramatically.

E. Potential for Pedestrianization of Surrounding Areas

- Amtrak - Potential exists but requires improvements to pedestrian ways.
- Downtown - Good potential to government and commercial uses; industrial uses to the south are limiting; linkages to western areas would require path improvements.
- East Bakersfield - Could be accomplished with improvement of adjacent neighborhoods and sidewalks. Primary link to East Hills Mall should be investigated.
- Fruitvale - Limited potential due to scattering of dissimilar land uses; no commercial or tourist facilities exist that would draw pedestrian traffic.
- Olive Drive - Limited potential due to industrial and highway transportation uses; linkages to western areas may be possible.

- Westside Freeway - The centers concept goals encourage a land use link with the Kern River and promotes pedestrian activity within the center; development of adjacent master planned communities will lead to development of efficient pedestrian circulation.

F. Unusual Site Development Constraints

- Amtrak - Accessibility and size.
- Downtown - Canal and size.
- East Bakersfield - Canal, neighborhood, and size.
- Fruitvale - Oil production facilities and power plant.
- Olive Drive - Oil production facilities and Highway 99 interchange.
- Westside Freeway - Distance to existing infrastructure and improved roadways.

2.2.4 Site Geology and Engineering

A. Seismicity

- Amtrak - Potential problem should a strong earthquake (7.0) occur along faults located in the area.
- Downtown - Same as Amtrak.
- East Bakersfield - Same as Amtrak.
- Fruitvale - Same as Amtrak.
- Olive Drive - Same as Amtrak.
- Westside Freeway - Same as Amtrak.

B. Drainage and Utilities

- Amtrak -
Drainage: No problems outlined in 2010 General Plan. Storm drainage systems along Truxtun Avenue.
Water Resources: Domestic water available on-site.
Domestic Water: Kern Co. Water Agency Improvement District No. 4; California Water Service.
Sewer: City of Bakersfield.
Gas and Electricity: PG&E.
Law Enforcement: City of Bakersfield.
Fire Protection: City of Bakersfield.
Hazards On-site: Switching yard, large numbers of high school students adjacent to site.
- Downtown -
Drainage: Same as Amtrak.
Water Resources: Kern Island Canal.
Domestic Water: Same as Amtrak.
Sewer: Same as Amtrak.
Gas and Electricity: Same as Amtrak.
Law Enforcement: Same as Amtrak.
Fire Protection: Same as Amtrak.
Hazards On-site: Kern Island Canal.
- East Bakersfield -
Drainage: Adjacent to a problem area.
Water Resources: East Kern Canal.
Domestic Water: Same as Amtrak.

Sewer: Same as Amtrak.
Gas and Electricity: Same as Amtrak.
Law Enforcement: Same as Amtrak.
Fire Protection: Same as Amtrak.
Hazards On-site: East Kern Canal.

- **Fruitvale -**
Drainage: No problems outlined in the 2010 General Plan.
Water Resources: Agricultural water improvements.
Domestic Water: Available with improvements; Kern County Water Agency Improvement District No. 4; California Water Service.
Sewer: CSA 71.
Gas and Electricity: Southern California Edison and PG&E.
Law Enforcement: Kern County Sheriff and City of Bakersfield.
Fire Protection: Kern County Fire Department and City of Bakersfield.
Hazards On-site: Oil wells.
- **Olive Drive -**
Drainage: Same as Fruitvale.
Water Resources: Irrigation canals scattered throughout site.
Domestic Water: North of the River Municipal Water District; no domestic improvements on the site.
Sewer: CSA 71 south of railroad; North of the River Sanitation District west of site; no current improvements on site; improvements located at Olive Drive.
Gas and Electricity: Same as Fruitvale.
Law Enforcement: Kern County Sheriff.
Fire Protection: Kern County Fire Department.
Hazards On-site: Oil wells, irrigation canals.
- **Westside Freeway -**
Drainage: Located at south end of a problem area.
Water Resources: James Canal; various irrigation canals; depth to groundwater is 200-300 feet.
Domestic Water: Kern County Water Agency Improvement District No. 4.
Sewer: No sewer connection near site; no current wastewater services on-site.
Gas and Electricity: PG&E.
Law Enforcement: Same as Olive Drive.
Fire Protection: Same as Olive Drive.
Hazards On-site: PG&E gas transmission lines; irrigation canals.

C. Topography

- Amtrak - Flat and has been leveled by construction of structures and a railroad line.
- Downtown - Same as Amtrak.
- East Bakersfield - Same as Amtrak.
- Fruitvale - Flat or gently sloping and has been leveled through cultivation and power plant improvements.
- Olive Drive - Flat or gently sloping and has been leveled through cultivation.
- Westside Freeway - Same as Olive Drive.

2.2.5 Feasibility of Site Acquisition

A. Site Availability

- Amtrak - Currently developed with an Amtrak rail and bus terminal.
- Downtown - Currently under several ownerships, and portions are undeveloped.
- East Bakersfield - Currently developed as a railroad yard and fruit storage facility.
- Fruitvale - Currently contains some buildings, oil producing structures, and a power plant and is also under agricultural production; availability limited to harvest times, termination of agricultural leases, and acquisition of power plant and/or oil refinery, as required.
- Olive Drive - Not developed with structures; limited agricultural production and oil production; availability limited to harvest times and termination of agricultural leases.
- Westside Freeway - Not developed; currently under agricultural production and availability is limited to harvest times and termination of agricultural leases.

B. Demolition and/or Relocation Requirements

- Amtrak - Demolition or relocation of existing structures required.
- Downtown - Same as Amtrak.
- East Bakersfield - Limited demolition or relocation of existing structures required.
- Fruitvale - Demolition or relocation of oil producing facilities and power plant may be necessary depending on the site chosen.
- Olive Drive - Demolition or relocation of oil producing facilities may be required.
- Westside Freeway - No demolition or relocation of structures required; oil producing equipment or lines may need to be relocated.

C. Potential for Site Expansion

- Amtrak - Restricted due to transportation corridors and existing development.
- Downtown - Restricted due to existing development.
- East Bakersfield - Same as Downtown.
- Fruitvale - Same as Amtrak.
- Olive Drive - Same as Amtrak.
- Westside Freeway - Unlimited potential due to lack of existing development.

3.0 RIDERSHIP ISSUES

This chapter discusses the model used to estimate patronage and the results of the patronage analysis.

3.1 RIDERSHIP MODEL

The intercity demand model from a recent Florida Department of Transportation (FDOT) sponsored High Speed Rail Study was transferred to this project for use in preparing ridership projections. This section discusses the model and how it was adapted for use in the Metropolitan Bakersfield HSGT Terminal Study.

3.1.1 Florida Intercity Ridership Forecast Model

The model has two stages. The first stage estimates the total intercity trip volume for any city pair in Florida. The total intercity trip volume includes the trips of all possible modes serving the city pair.

The second stage is a mode choice model. It is used to estimate the market share among all available travel modes in the given pair of cities. The market share model is in a nested logit structure which contains five modes:

- Air Jet
- Air Commuter
- Ground Automobile
- Ground Conventional Rail
- Ground High Speed Train

The model takes into account the trip purpose (i.e., business/commute and recreation/other). Each market share model contains five utility functions, one for each mode. In each utility function, there are 12 variables and 12 parameters. The 12 variables are two alternative specific dummy variables, four traveler characteristic variables, and six level of service variables.

When transferring the two Florida intercity travel demand models to California, the parameters for the mode specific dummy variables were adjusted to reflect the base year situation in California. Because there are two trip purposes (business/commute vs. recreational/other), five travel modes, and two mode specific dummies in each utility function, there are a total of $2 \times 5 \times 2 = 20$ parameters to be adjusted.

Four total demand models were estimated for the Florida Study and are distinguished by trip purpose as discussed previously. The models consider:

- Total Trips between Cities
- Total Composite Utilities for Composite Air Modes
- Total Composite Utilities for Composite Ground Transportation Modes
- Three Variables
 - Population in Trip Origin Zone
 - Employment in Trip Destination Zone
 - Hotel Rooms in Destination Zone

3.1.2 Adaptation of the FDOT Model to this Study

Due to the differences in modal share between the Los Angeles/Bakersfield travel market and the Florida intercity travel market, and due to the availability of socioeconomic and transportation level of service variables to this study, the FDOT models were simplified to suit the Los Angeles/Bakersfield situation. The

High Speed Rail Patronage Forecast Between Los Angeles and Bakersfield (2020 Ridership)

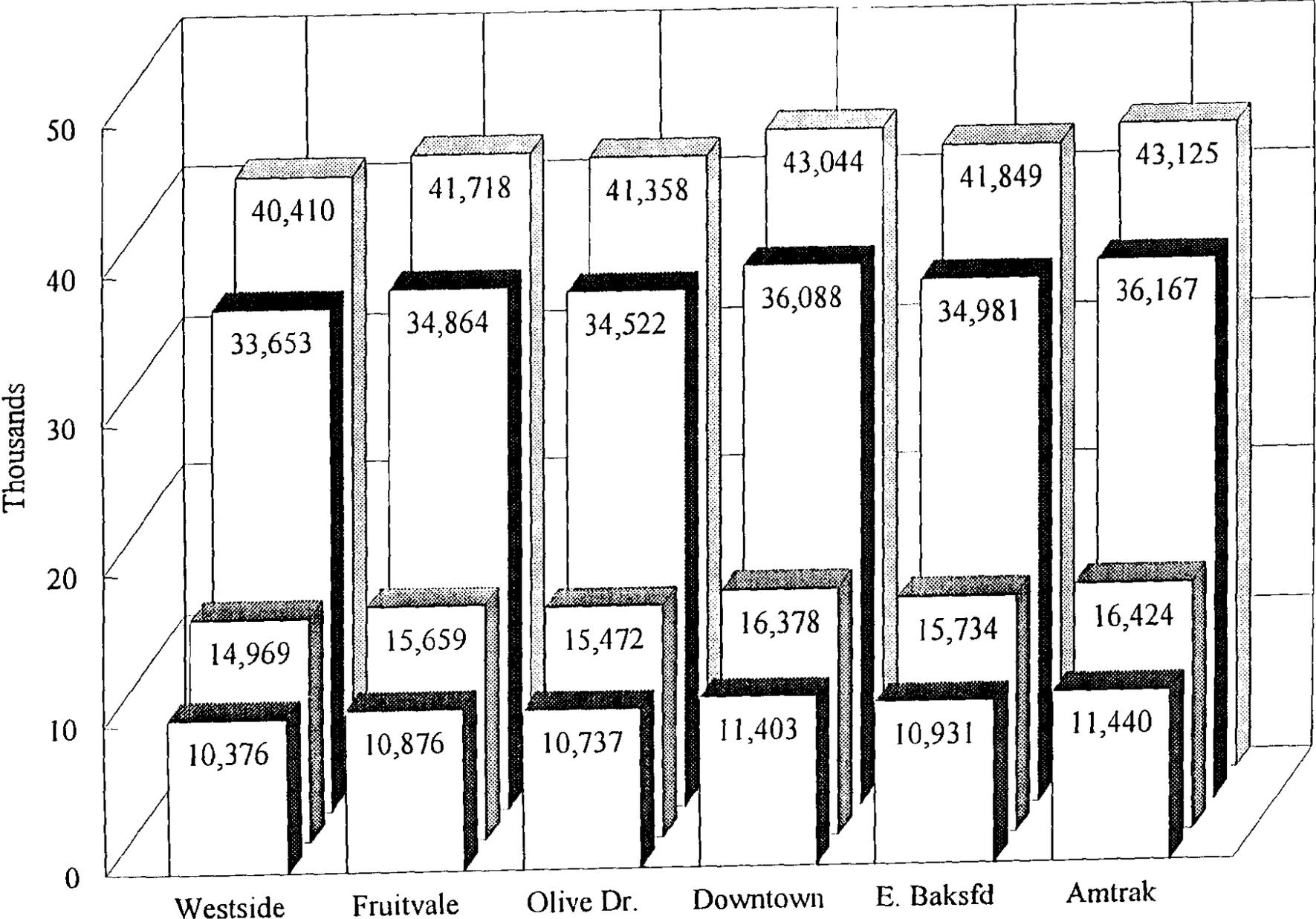


FIGURE 3-2

Land Use Policy 80: Encourage recycling of dilapidated and economically-depressed areas where preservation is not achievable or desirable.

Transit Goal 5: Enhance rail service capacities and usage in the planning area.

Table 4-3 presents a matrix showing the consistency of the six sites to the 2010 General Plan and the GET Plan.

TABLE 4-3 A COMPARISON OF POLICY CONSISTENCY FOR THE ALTERNATIVE TERMINAL SITES						
PLAN OR DOCUMENT Principle, Goal, Policy, or Alternative	Site Number					
	1	2	3	4	5	6
2010 GENERAL PLAN						
Centers Principle	+	+		+		
Resources Principle				+	-	+
Infill Principle	+	+				-
Rehabilitation Principle	+	+	+			-
Land Use Goal 1	+	+	+	+	+	+
Land Use Goal 4	+	+	+	+	+	
Land Use Policy 10		+				
Land Use Policy 37	+	+		+	+	+
Land Use Policy 38	+	+			+	
Land Use Policy 39,40	+	+				
Land Use Policies 42, 43, 44				+		+
Land Use Policies 50, 51	+	+		+	+	+
Land Use Policies 72, 73	+	+	+	+	+	+
Land Use Policy 79	+	+				-
Land Use Policy 80	+	+	+			
Transit Goal 5	+	+	+	+	+	+
GET LONG RANGE TRANSPORTATION SYSTEM PLAN						
LRT/Enhanced Bus Service Alternative	+	+	+	+		-
SCORE:	14	15	7	10	6	4
LEGEND:						
**+ = Strongly consistent (supports)		**+ = 1		1 = Amtrak		4 = Fruitvale
**-- = Strongly inconsistent (conflicts)		**-- = -1		2 = Downtown		5 = Olive Drive
** = Neutral, or does not apply		** = 0		3 = E. Bkrfid.		6 = Westside Fwy.

Source: Working Paper Subtask 5.6, Station Area Development Zones; December, 1993.

4.7 JOB GENERATION POTENTIAL

It is estimated that a nine acre site developed with a terminal center and supporting office structures and parking facilities will employ approximately 500 to 600 persons.

4.8 TAX GENERATION POTENTIAL

According to the *Bakersfield Intermodal Transit Facility Plan* prepared by Parsons Brinkerhoff and Economic Research Associates, Inc., the revenue generating potential of a transit center is as follows:

<u>Transit Providers Lease/Rent Payments</u>	
Amtrak (including buses)	Say \$ 750 /month
Greyhound	Say 950 /month
Airport Bus	Say 300 /month
Other Carriers	Say 300 /month
	\$2,600 /month or \$31,200/year
 <u>Concessionaires</u>	
Vending Machines	Say \$ 300 /month
Newsstand/ Sundries	Say 500 /month + % of gross
Telephones	Say 250 /month
Cafeteria/ Coffee Shop/	
Snack Shop	Say \$2,000 /month + % of gross
Sub-Total	
Transit Center Activities	\$3,050 /month or \$ 36,600/year
Package Delivery and Courier Services ¹	\$2,500 /month or \$ 30,000/year
 Sub-Total: Transit Leases and Concession Rents	 \$ 97,800/year
 <u>Auto Parking Lot Meters</u>	
300 Spaces, principally daytime use (8 hrs)	Say \$2,400 /month or \$28,800/year
at \$0.25/ 2 hours	Say \$ 120 /day
 These funds are likely to be pledged to the Bakersfield Parking Authority to reduce the capital costs and to clean the parking lot. Assume one-half of meter receipts are for parking lot maintenance.	 \$ 7,200 /year
 Total On-Site Revenue	 \$133,800 /year

¹ There may be additional lease opportunities, depending on the scale of package delivery and courier traffic which may be generated in the central city. It is believed that courier dispatch functions, the bus-carried small package services, and possible Federal Express and UPS vehicle parking may represent additional possible revenues. A target of an additional \$2,500 per month from such users would be realistic, yielding roughly \$30,000 more per year. The additional of auto rental agencies and additional food services will increase the above numbers by approximately \$2,000+ per added use.

5.0 ENVIRONMENTAL CONSIDERATIONS

This chapter discusses the approach used to prepare the environmental analysis of the six station sites and presents the results of the environmental analysis.

5.1 APPROACH

The approach followed is consistent with NEPA/CEQA guidelines and is designed to address important environmental categories pertinent to this type of project and setting. The environmental analysis process included a description of the existing environment or setting in sufficient detail to allow Kern COG staff and the TAC to understand fully the environment of the alternative station sites and the potential adverse impacts. The assessment was conducted using the California Environmental Quality Act (CEQA) checklist format, focusing on various environmental factors. Environmental categories analyzed concentrated on the following 8 factors:

- Hazardous waste sites
- Archaeological sites
- Major transportation impacts/disruptions
- Endangered species
- Section 4(f) lands
- Historic structures
- Social/economic
- Land use

To complete the CEQA checklist, the following work tasks were accomplished:

- Walked the alternative stations sites and area of potential effect to determine baseline conditions
- Coordinated with project team during the development of alternative site plans
- Met with agency staff to scope out any local environmental concerns
- Coordinated with appropriate personnel/agencies/departments where necessary

The following was contained in the Initial Study analysis:

- A description of the project including the location of the terminal site
- An identification of the environmental setting
- An identification of environmental effects by use of a checklist, matrix, or other method
- A discussion of ways to mitigate the significant effects identified, if any
- An examination of whether the project would be consistent with existing zoning, plans, and other applicable land use controls

Environmental impacts were assessed employing a standard environmental initial study checklist for each alternative utilizing field observations, aerial photography, and existing local documentation. This information was then condensed and transferred into a matrix format comparing alternative sites.

The checklist shown in Appendix B was used to identify physical, biological, social, and economic factors which might be affected by the proposed alternatives being studied for the Kern COG High Speed Ground Transportation System Terminal study. The checklist was prepared for each site as the result of field and plan review, and the review of existing data. Background technical studies of the standard environmental categories were not performed for this level of environmental analysis.

5.2 ANALYSIS

An environmental significance checklist was prepared for each of the six candidate sites. Of the 56 factors that were assessed, one or more sites would have potential adverse effects on 18 of those factors. Table 5-1 provides a comparison of the sites for those areas where adverse impacts are possible. It was determined that in none of the cases would the adverse effects definitely be significant. For two factors, further study would be necessary to determine the effects. For the Fruitvale and Westside Freeway sites, additional study is needed to determine if there would be a risk of explosion, release of hazardous substances, or other safety concerns. Further study would also be necessary to ascertain if impacts to archaeological or historic sites would occur with development of a terminal at the Downtown, Fruitvale, Olive Drive, and Westside Freeway sites.

**TABLE 5-1
ENVIRONMENTAL SIGNIFICANCE CHECKLIST
COMPARATIVE ANALYSIS**

Will the station site (directly or indirectly) affect or cause:	Terminal Site					
	Amtrak	Downtown	East Bakersfield	Fruitvale	Olive Drive	Westside Freeway
Increases in air pollution	Maybe	Maybe	Maybe	Maybe	Maybe	Maybe
Increases in noise levels or vibration	Maybe	No	No	No	No	Maybe
Noise criteria to be exceeded	Maybe	No	No	No	No	Maybe
Light glare or shadow	Maybe	Maybe	Maybe	Maybe	Yes	Maybe
Reduction in farmland or timber acres or affect important farmland	No	No	No	No	No	Yes
Disruption of planned development	No	No	No	No	No	Maybe
Population location, distribution, density or growth rate	No	No	No	No	No	Maybe
Employment, industry or commerce or require displacement of businesses or farms	No	Maybe	No	Maybe	Yes	No
Community facilities	Maybe	No	No	No	No	No
Public utilities, police, fire or other public services	Maybe	No	No	No	No	No
Affect transportation systems or alter circulation patterns	No	Maybe	No	No	No	No
Generation of additional traffic	Yes	Yes	Yes	Yes	Yes	Yes
Existing parking facilities or result in demand for new parking	Yes	Yes	Yes	Yes	Yes	Yes
Risk of explosion, release of hazardous substances, or other safety concerns	No	No	Maybe	Maybe*	No	Maybe*
Changes to waterborne, rail or air traffic	Yes	Maybe	Yes	Yes	Yes	Yes
Support large commercial or residential development	No	No	Yes	Yes	Yes	Yes
Archaeological or historic resources	No	Maybe*	No	Maybe*	Maybe*	Maybe*
Aesthetic concerns	No	No	No	No	No	Maybe
Summary:	No 6 3	10 6 2	11 3 4	9 5 4	10 2 6	4 9 5

* Further study required to determine effects.

6.0 SITE SELECTION ANALYSIS PROCESS

The data developed for the site selection analysis includes information presented in the previous chapters and includes site suitability, operational requirements, ridership, environmental impacts, development potential, etc. Each of these categories of information are different in character and, therefore, it can be complicated to compare the six site alternatives under consideration across a diverse set of evaluation criteria in an evaluation process. To provide a meaningful method for determining the best site for the HSGT terminal which considers the whole variety of site selection factors, a systematic ranking and rating approach was used. The ranking and rating evaluation process is a valuable technique for comparing alternatives and for consolidating professional judgments on a wide range of issues. A technical panel, composed of all the members of the Technical Advisory Committee, completed the evaluation process. The process resulted in the selection of a preferred alternative which will be referred to the Kern Council of Governments for final approval.

To initiate the evaluation process, the consultant prepared an evaluation notebook which provides a summary of the information produced in the technical analysis. That information was grouped by each of the major evaluation criteria. The notebook served as the primary reference source for the evaluation process.

A two-tier evaluation process was used. The first tier required each member of the evaluation panel to individually evaluate the alternative sites. The first step involved a ranking of each of the sites for each of the evaluation categories (i.e., site suitability, operations and engineering, ridership, environmental issues, and development potential). Each panel member ranked the six sites from one to six for each of the evaluation criteria. For example, site 1 could have been given a rank of 1 for the environmental category. This would mean that site was the best performing (would have the least negative impacts or the most positive impacts of the six sites) in that category in the view of the evaluator. The second best site was ranked number 2 and so on to the last site. Each site was assigned a unique ranking.

The second step involved rating each of the sites for each of the evaluation criteria using a scale of 0 to 100. A rating of 100 indicated that a given site perfectly satisfied the objectives of that evaluation category (i.e., no adverse environmental impacts); a rating of 0 reflected that the site satisfied none of the objectives of the evaluation criteria (i.e., it would have adverse environmental impacts that are totally unacceptable). Any value on the scale could be assigned to any site. The same score could be assigned to two different sites for the same evaluation category.

After each individual panel member completed the ranking and rating process, the second tier of the process was undertaken. A meeting was held where the consultant compiled the results of the individual rankings and ratings, and the results were discussed by the panel members. At the meeting, the consultant team was present to assist in providing any additional information and to respond to questions or issues raised by the panel members. Panel members shared their individual rankings and ratings with the rest of the panel and discussed their reasoning involved in the individual evaluations of each terminal site. Once the discussion was completed, the chair of the panel then asked if the panel was satisfied with the results or wanted to rank and rate each of the alternative sites again. A consensus on the preferred alternative station site was then obtained. The findings of the evaluation process are discussed in the next chapter.

7.0 FINDINGS AND RECOMMENDATIONS

The Technical Advisory Committee (TAC) completed the evaluation process as described in the preceding chapter. Each of the members completed the ranking and rating forms for each of the categories of criteria. Table 7-1 presents the combined results for all of the TAC members.

In terms of ranking, the Downtown site received the best score. This site was considered to be the best candidate for the location of a HSGT terminal. For each of the four criteria categories, this site received the highest ranking. The East Bakersfield site was assigned the second highest ranking score. The Amtrak and Fruitvale sites tied for third place ranking. The Olive Drive and Westside Freeway sites were ranked in fifth and sixth place, respectively.

The Downtown site also received the highest rating of any of the sites. It received a rating of over ten points higher than the next highest rated site (East Bakersfield). The Fruitvale site (third highest rating) scored slightly higher than the Amtrak site which scored in fourth place. Again, the fifth and sixth place rated sites were Olive Drive and Westside Freeway, respectively. The Westside Freeway site received a rating of about ten points less than the Olive Drive site.

Based on both the results of the scoring process and further discussion, the TAC decided that the Downtown site would be the most preferable location for the Bakersfield HSGT terminal. The reasons cited include: the site is located near a future path for a light rail system; is close to the government and downtown commercial core which allows for revitalization potential; has expansion potential to the east with about two to three miles of available land to avoid conflicts with the library; and has access to two arterial roadways. The TAC further determined that, since the Downtown and Amtrak sites are close to each other, development could occur at the existing Amtrak terminal as a second choice should it not prove feasible to build at the Downtown site. The Amtrak site would also provide revitalization potential and is located on a proposed light rail line and near a possible future freeway. Expansion to the west and north to Truxtun Avenue will increase possibilities for development of a transit center and will provide access to Truxtun Avenue. After further discussion, it was decided that the East Bakersfield site should be eliminated from consideration because a terminal at that location would preclude two of the high speed alignment options now being considered in the Caltrans study. In addition, Caltrans plans to use that site as a possible storage yard.

The TAC also selected one of the suburban sites as a third choice, however, they indicated that this site should be developed only in the event that Caltrans decides that the Los Angeles to Bakersfield high speed rail line should bypass the downtown area of the City of Bakersfield. In that case, the TAC determined that the Fruitvale site would be the most suitable location for a suburban station. This site is near the Westside Freeway Corridor; has adequate vacant land available for expansion and accessibility; and is located closer to a larger residential population than the downtown areas. However, the Committee also expressed their concern that this site would not be as compatible as the two urban sites with regard to infill, redevelopment, and land use policies and that, although the site could be served by light rail in the future, it would not provide access to the proposed light rail line (being studied as part of the *GET Long-Range Public Transportation Systems Study*).

The Consultant also agrees with the findings of the TAC. In addition to the reasons that were cited by the TAC for selecting the Downtown or Amtrak site, there are a number of other factors that make these alternatives the most desirable for development of a terminal. The major considerations are summarized in the following discussion. Both sites would produce better ridership than any of the suburban sites. The two sites are also located in the heart of downtown Bakersfield and would offer the most direct accessibility to primary Bakersfield civic, commercial, and intercity business destinations. Either location would reinforce the urban identity of downtown Bakersfield and could significantly enhance the aesthetics

of the station vicinity. In addition, a station in the downtown area would provide good potential for bringing activity back to downtown. The Downtown and Amtrak sites would also provide a good opportunity for intermodal transit connections. While any of the suburban sites would have space available for a regional transit center, all of the systems would need to establish new goals to relocate from the downtown area. Site support services now exist near both downtown sites, but there may be a need to provide additional services. Support services for the Fruitvale site are remote (at Coffee Road/Stockdale Highway) and will require additional development.

The Downtown site has other advantages over the Amtrak site which make it the more desirable of the two downtown locations. Access to the Amtrak site would be limited, and both on- and off-site pedestrian and vehicular movements would not be as good as for the Downtown site. Although limited by size, the Downtown site would have good potential for on-site commercial development; however, the Amtrak site would have poor potential due to both size constraints and adjacent land uses such as the hospital and high school. However, the potential could be improved by purchasing adjacent housing for commercial development.

There are reasons, other than the two major concerns already cited by the TAC, for elimination of the East Bakersfield site. This location has limited support services because the area contains older industrial uses and some commercial uses which are not appropriate for the services of a transit center. A high crime rate exists in the area, and pedestrian movement through surrounding areas could pose a public endangerment. This site would also have the lowest ridership of any of the urban sites. In addition, the East Bakersfield location is adjacent to an area considered to be a problem drainage area which is sometimes prone to moderate ponding and accumulation of water along roadsides during severe storm events.

Based on the results of the Metropolitan Bakersfield HSGT Terminal Study and the evaluation process undertaken by the TAC, the Downtown site should be the first choice for development of a terminal. If this site proves infeasible, then the Amtrak site should be the second choice. Only if the Caltrans study determines that the high speed rail line should bypass the downtown area should the Fruitvale site be considered for development. These recommendations will be referred to the Kern Council of Governments for final approval.

TABLE 7-1 COMPOSITE RANKING AND RATING FORM AVERAGE CRITERIA CATEGORY SCORE						
Criteria Category	Terminal Site					
	Amtrak	Down- Town	East Bakersfield	Fruit- Vale	Olive Drive	Westside Freeway
ENGINEERING/OPERATIONS AND SITE SUITABILITY						
Rank	3.7	1.7	3.1	2.9	4.7	4.9
Rate	67.1	85.0	70.7	73.6	65.0	59.3
RIDERSHIP						
Rank	1.7	1.3	3.6	3.9	4.6	6.0
Rate	90.7	93.4	78.6	76.4	73.6	60.0
ENVIRONMENTAL						
Rank	2.7	1.9	2.7	4.4	3.4	5.7
Rate	66.1	72.9	70.7	57.1	60.7	47.1
DEVELOPMENT POTENTIAL						
Rank	5.3	1.9	3.0	2.3	3.9	4.7
Rate	51.4	82.9	70.7	70.7	65.7	57.9
AVERAGE TOTAL SCORE						
Rank	3	1	2	3	5	6
Rate	68.9	83.5	72.7	69.5	66.3	56.1

APPENDIX A - WORKING PAPERS AND TECHNICAL MEMORANDA

For more information about a particular technical issue that is not covered in this report, please refer to the listed working papers and technical memoranda that were prepared for this study:

<u>Subtask</u>	<u>Name</u>
2.1	<i>Description of Florida Intercity Ridership Forecast</i>
2.1	<i>Working Paper on Ridership Analysis of Alternative Station Sites</i>
3.1	<i>Site Selection Analysis: Develop Evaluation Criteria</i>
3.2	<i>Site Evaluation</i>
4.1	<i>Environmental Analysis Approach</i>
4.2	<i>Terminal Site Environmental Analysis</i>
5.1	<i>Development Policy Identification and Analysis</i>
5.6	<i>Station Area Development Zones</i>
6.1	<i>Alignment/Operational Criteria</i>
6.3	<i>Perform Engineering and Operational Analysis</i>
7.1	<i>Site Selection Analysis Process</i>
8.1	<i>Decision Notebook</i>

**APPENDIX B
ENVIRONMENTAL SIGNIFICANCE CHECKLIST**

	<u>Yes or No</u>	<u>If yes, is it significant? Yes or No</u>
<u>PHYSICAL.</u> Will the station site (directly or indirectly):		
1. Appreciably change the topography or ground/surface relief features?		
2. Destroy, cover, or modify any unique geological or physical features?		
3. Result in unstable earth surfaces or increase the exposure of people or property to geologic or seismic hazards?		
4. Result in or be affected by soil erosion or siltation (whether by water or wind)?		
5. Result in the increased use of fuel or energy in large amounts or in a wasteful manner?		
6. Result in an increase in the rate of use of any natural resource?		
7. Result in substantial depletion of any non-renewable resource?		
8. Violate any published Federal, State, or local standards pertaining to hazardous waste, solid waste, or litter control?		
9. Modify the channel of a river or stream or the bed of the ocean or any bay, inlet, or lake?		
10. Encroach upon a floodplain or result in or be affected by floodwaters?		
11. Adversely affect the quantity or quality of surface water, groundwater, or public water supply?		
12. Result in the use of water on large amounts or in a wasteful manner?		
13. Affect wetlands or riparian vegetation?		
14. Violate or be inconsistent with Federal, state, or local water quality standards?		
15. Result in changes in air movement, moisture, or temperature, or any climatic condition?		
16. Result in an increase in air pollution emissions, adverse effects on or deterioration of ambient air quality?		

- | | Yes or
<u>No</u> | If yes, is it
significant?
<u>Yes or No</u> |
|--|---------------------|---|
| 17. Result in the creation of objectionable odors? | | |
| 18. Violate or be inconsistent with Federal, State, or local air standards or control plans? | | |
| 19. Result in an increase in noise levels or vibration for adjoining areas? | | |
| 20. Result in any Federal, State, or local noise criteria being equalled or exceeded? | | |
| 21. Produce new light glare or shadow? | | |

NATURAL ENVIRONMENT. Will the station site result in (either directly or indirectly):

- 22. Change in the diversity of species or number of any species of plants (including trees, shrubs, grass, microflora, and aquatic plants)?
- 23. Reduction in the numbers of or encroachment upon the critical habitat of any unique, threatened, or endangered species of plant?
- 24. Introduction of new species of plants into an area, or result in a barrier to the normal replenishment or existing species?
- 25. Reduction in acreage of any agricultural crop or commercial timber stand or affect prime, or unique or other farmland of State or local importance?
- 26. Removal or deterioration of existing fish or wildlife habitat?
- 27. Change in the diversity of species, or numbers of any species of animals (birds, land animals including reptiles, fish and shellfish, benthic organisms, insects or microfauna)?
- 28. Reduction of the numbers of or encroachment upon the critical habitat of any unique, threatened, or endangered species of animals?
- 29. Introduction of new species of animals into an area, or result in a barrier to the migration or movement of animals?

Yes or
No

If yes, is it
significant?
Yes or No

SOCIOECONOMIC. Will the proposal (directly or indirectly):

- 30. Cause disruption of orderly planned development?
- 31. Be inconsistent with any elements of adopted community plans, policies, or goals, the California Urban Strategy?
- 32. Be inconsistent with a Coastal Zone Management.
- 33. Affect the location, distribution, density, or growth rate of the human population of an area?
- 34. Affect life-styles, or neighborhood character or stability?
- 35. Affect minority, elderly, handicapped, transit-dependent, or other specific interest groups?
- 36. Divide or disrupt an established community?
- 37. Affect existing housing, require the acquisition of residential improvements or the displacement of people or create a demand for additional housing?
- 38. Affect employment, industry or commerce, or require the displacement of businesses or farms?
- 39. Affect property values or the local tax base?
- 40. Affect any community facilities (including medical, educational, scientific, recreational, or religious institutions, ceremonial sites, or sacred shrines)?
- 41. Affect public utilities, or police, fire, emergency, or other public services? If so, underground public utilities?
- 42. Have substantial impact on existing transportation systems or alter present patterns of circulation?
- 43. Generate additional traffic?
- 44. Affect or be affected by existing parking facilities or result in demand for new parking?

- | | Yes or
<u>No</u> | If yes, is it
significant?
<u>Yes or No</u> |
|--|---------------------|---|
| 45. Involve a substantial risk of explosion or the release of hazardous substances in the event of an accident or otherwise adversely affect overall public safety? | | |
| 46. Result in alternations to waterborne, rail, or air traffic? | | |
| 47. Support large commercial or residential development? | | |
| 48. Affect a significant archaeological or historic site, structure, object, or building? | | |
| 49. Affect wild or scenic rivers or natural landmarks? | | |
| 50. Affect any scenic resources or result in the obstruction of any scenic vista or view open to the public, or creation of an aesthetically offensive site open to public view? | | |
| 51. Result in substantial impacts associated with construction activities (e.g., noise, dust, temporary drainage, traffic detours and temporary access, etc.)? | | |
| 52. Result in the use of any publicly-owned land from a park, recreation area, or wildlife and waterfowl refuge? | | |

MANDATORY FINDINGS OF SIGNIFICANCE

53. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major period of California history or prehistory?
54. Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals? (A short-term impact on the environment is one which occurs in a relatively brief, definitive period of time, while long-term impacts will endure well into the future.)

	Yes or <u>No</u>	If yes, is it significant? <u>Yes or No</u>
55. Does the project have environmental effects which are individual limited, but cumulatively considerable? Cumulatively considerable means that the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effect of other current projects, and the effects of probable future projects. It includes the effects of other projects which interact with this project and, together, are considerable.		
56. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?		