



Kern Council  
of Governments

## GRADE SEPARATION PRIORITIZATION REPORT

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## TABLE OF CONTENTS

Table of Contents .....	ii
List of Tables .....	iv
List of Figures.....	iv
Executive Summary .....	v
Introduction.....	1
Study Background.....	1
Kern County Crossing Treatment Overview .....	1
Grade Separation.....	2
Active Warning Devices (Two-Quadrant Gates).....	4
Active Warning Devices (Flashing Light Signals).....	5
Passive Warning Devices .....	6
Additional At-Grade Safety Improvements .....	6
Four-Quadrant Gates.....	6
Roadway Closure .....	7
Grade Separation Guidance .....	7
Methodology .....	9
Initial Screening .....	9
Screening Criteria .....	10
Screening Results.....	11
Prioritization .....	14
Prioritization Criteria .....	14
Scoring .....	16
Prioritization Results .....	17
Group A – High Priority.....	17
Group B – Medium Priority .....	20
Group C –Low Priority .....	20
Group D – Other .....	23
Grade Separation Concepts.....	25
Group A – High Priority.....	26
Group B – Medium Priority .....	29
Group C – Low Priority.....	32

Group D – Other .....	34
Funding Sources .....	37
SAFETEA-LU: Projects of National and Regional Significance (PNRS).....	37
SAFETEA-LU: Congestion Mitigation and Air Quality Improvement (CMAQ).....	37
SAFETEA-LU: Surface Transportation Program (STP) .....	38
CPUC Section 190 Grade Separation Fund .....	38
Proposition 1B Bond Initiative.....	38
Greater Bakersfield Separation of Grade District Fees .....	39
Transportation Impact Fees .....	39
Summary.....	39
Appendix A: Crossing Summary Sheets.....	1
Appendix B: Conceptual Designs (High and Medium Priority Crossings).....	1

## LIST OF TABLES

Table 1: Kern County Crossing Summary .....	2
Table 2: Crossing Device Treatments (Public, Open, At-Grade Crossings).....	2
Table 3: Industry Criteria Compared to Kern County Study Criteria .....	9
Table 4: Initial Screening Criteria .....	11
Table 5: Priority 1 Screened Crossings (in alphabetical order) .....	13
Table 6: Prioritization Criteria .....	14
Table 7: Prioritization Criteria Measures (Crossing Delay Criteria).....	15
Table 8: Prioritization Criteria Measures (Other Criteria).....	15
Table 9: Traffic Volume, Train Volume and Accident Scoring Ranges.....	16
Table 10: Traffic Delay Criterion Scoring Ranges .....	16
Table 11: High Priority Crossings.....	17
Table 12: Prioritized List of Crossings.....	18
Table 13: Medium Priority Crossings.....	20
Table 14: Low Priority Crossings.....	20
Table 15: Other Crossings.....	23
Table 16: Grade Separation Funding Sources .....	37
Table 17: Cost Summary by Priority Level.....	39

## LIST OF FIGURES

Figure 1: Kern County Crossing Inventory .....	3
Figure 2: Two-Quadrant Gate.....	4
Figure 3: Two-Quadrant Gate with Cantilever Flashing Lights.....	4
Figure 4: Two-Quadrant Gates with Median Treatments (with and without cantilever lights) .....	5
Figure 5: Flashing Lights .....	5
Figure 6: Passive Treatment (crossbucks) .....	6
Figure 7: Four-Quadrant Gates with Lights .....	7
Figure 8: Top 40 Candidate Crossings (Initial Screening Results).....	12
Figure 9: High Priority Crossings.....	19
Figure 10: Medium Priority Crossings .....	21
Figure 11: Low Priority Crossings .....	22
Figure 12: “Other” Crossings .....	24
Figure 13: Basic Grade Separation Concept .....	25
Figure 14: Underpass with Bike and Pedestrian Separation .....	25

## EXECUTIVE SUMMARY

At-grade roadway-rail crossings pose a significant safety hazard for motorists, bicyclists and pedestrians who traverse rail corridors. In addition, significant impacts on operations for all modes traversing these locations are experienced daily. Grade separation of roadway-railroad crossings is the optimal safety improvement and an effective way to improve operations for vehicle, transit, bicycle, pedestrian and rail traffic.

The goal of the Kern County Grade Separation Prioritization Report is to identify and prioritize the most promising at-grade roadway-rail crossings in the County to be grade separated by the year 2035. Prioritization of these crossings was done to allow investments in Kern County to focus on projects which will provide the greatest benefit in terms of traffic improvements, freight and passenger movement and safety.

The methodology used a two-stage process to identify the prioritized list of crossing. Established methodologies and guidance by the California Public Utilities Commission (CPUC)<sup>1</sup> and the Federal Highway Administration (FHWA)<sup>2</sup> were used as the starting point for the study-specific methodology. The first stage used evaluation criteria to screen down all open, public at-grade crossings to the top 40 candidate crossings. The second stage prioritized the top crossings using a more detailed evaluation process. The prioritized list of crossings, and their scores within each of the evaluation criteria, is presented in Table ES2 on the following page.

The top 10 crossings in the list were identified as “high priority” crossings and should be the focus for implementation in the next 5-10 years (by 2020). Crossing ranking 11-20 were identified as “medium priority” crossings and are recommended for implementation in the next 10-20 years (by 2030). “Low priority” crossings were those ranked 21-30 and are suggested for implementation in the next 20-25 years (by 2035). Low Priority crossings demonstrate the lowest need and may not warrant grade separation treatment. The use of safety improvements such as four-quadrant gates in lieu of a full separation should be evaluated for these crossings.

Timelines identified for each priority level do not assume all crossings would be complete within that timeframe. These tiers simply show where efforts should be focused based on 2010 conditions. Ratings should be monitored and updated as shifts occur in funding and traffic conditions. Conceptual costs were developed for each of the top 40 crossings. The total costs for each of the grade separation priority levels are shown in Table ES1.

**Table ES1: Cost Summary by Priority Level**

Priority Level	Estimated Cost (millions)	# of Crossings Included*
High	\$ 276	13
Medium	\$ 235	10
Low	\$155	8
Other	\$ 177	9

\* Some grade separation concepts suggest multiple crossings to be included as one project; thus more than 10 crossings may be included in each priority level. Lower priority crossings included with a higher priority crossing will be included in the higher level's cost estimate and not included in the lower level's cost estimate.

<sup>1</sup> Formulas for prioritization of funds for grade separations under Section 190 of the State of California's Streets and Highways Code (S&H) as outlined in the CPUC's Grade Separation Program Rail Crossings and Engineering Section.

<sup>2</sup> *Railroad-Highway Grade Crossing Handbook*, US Department of Transportation: Federal Highway Administration, Washington, DC, 2007 (rev 2).

Table ES2: Prioritized List of Crossings

Rank	Name	Traffic Score	Train Score	Accident Score	Crossing Delay	Other Score	Final Score	Priority
1	Morning Drive (SR 184)	12	20	8	14	16	70	High Priority
2	Kratzmeyer Road	0	20	20	0	16	56	
3	Comanche Drive	0	20	14	2	14	50	
4	Rosedale Highway (SR 58)	20	4	0	8	18	50	
5	Lerdo Highway	10	20	0	2	18	50	
6	Kimberlina Road	2	20	12	2	12	48	
7	Merced Avenue	0	20	20	0	8	48	
8	East Truxtun Avenue	4	14	0	8	20	46	
9	Baker Street	2	14	0	10	18	44	
10	Rosamond Boulevard	14	6	4	0	18	42	
11	Sumner / Miller Street	2	14	0	14	10	40	Medium Priority
12	Vineland Road	0	20	10	0	10	40	
13	Olive Drive	10	6	4	0	18	38	
14	Tehachapi Blvd/Old State Hwy	0	20	10	0	8	38	
15	Reina Road	0	20	10	0	8	38	
16	Dennison Road	0	20	2	2	12	36	
17	Arroyo Avenue	0	20	0	2	14	36	
18	N. Green Street	0	20	0	2	14	36	
19	Snow Road	8	8	0	2	18	36	
20	Cecil Avenue	6	6	6	0	16	34	
21	Pepper Drive	0	20	2	2	10	34	Low Priority
22	Hayes Street	0	20	0	0	14	34	
23	Bealville Road	2	20	0	10	2	34	
24	Garces Hwy (SR 155) (Ex 4th Ave)	6	6	10	2	8	32	
25	Peterson Road	0	20	10	0	2	32	
26	L Street	2	20	0	2	8	32	
27	Caliente Bodfish Road	2	20	0	6	2	30	
28	Gosford Road	12	2	2	4	10	30	
29	Sonora Street	0	14	0	6	10	30	
30	N Street	0	20	0	2	8	30	
31	Patterson Road	0	6	20	0	2	28	Other
32	Cameron Canyon Road	0	20	2	0	6	28	
33	Neumarkel Road – Landfill	0	20	0	0	8	28	
34	Union Avenue	10	2	0	0	14	26	
35	Williamson Road	0	20	2	0	2	24	
36	Wible Road	10	2	0	4	6	22	
37	Tulare Street	0	14	0	4	4	22	
38	Burbank Street	0	20	0	0	2	22	
39	Q Street	4	6	0	0	10	20	
40	Ashe Road	8	2	0	4	6	20	

## INTRODUCTION

The goal of the Kern County Grade Separation Prioritization Report is to identify and prioritize the most promising at-grade roadway-rail crossings in the County to be grade separated by the year 2035. Prioritization of these crossings was done to allow the County to best allocate financial resources to projects which will provide the greatest benefit to traffic improvements, freight and passenger movement and safety. Conceptual drawings of the highest rated crossings are included to begin discussions of the best strategies and to provide order of magnitude cost estimates for programming purposes.

### STUDY BACKGROUND

Rail transportation in Kern County is an important part of the history and the economy of the region. Tehachapi Pass is a major connector of goods traveling between the Port of Oakland and destination to the east including Texas and Chicago. On average, 50 daily freight trains operate on Union Pacific Railroad (UP), BNSF Railway and San Joaquin Valley Railway (SJVR) trackage in Kern County and another 12 passenger trains are operated by Amtrak as far south as Bakersfield. This traffic will continue to expand as the economy grows and service is added.

Kern County is also at the center of the proposed California high-speed rail corridor. The high speed trains will operate on their own exclusive right-of-way which will have grade separated crossing of streets and highways. Continued investment and expansion of these freight and passenger rail corridors are essential to promoting the economic viability of the County and supporting the sustainability principles outlined in the Kern Blueprint.

Also important to the transportation and economic goals of the County are preservation and expansion of roadway corridors and capacity. These facilities provide for the movement of goods and people in the County. They will continue to take on increases in demand as growth continues within the County.

As continued expansion and development of railways and roadways continue in Kern County, at-grade crossings of roadway and rail will become more congested and less safe. At-grade roadway-rail crossings pose a significant safety hazard for motorists, bicyclists and pedestrians who traverse rail corridors. In addition, significant impacts on operations for all modes traversing these locations are experienced daily. Grade separation of roadway-railroad crossings is the optimal safety improvement and an effective way to improve operations for vehicle, transit, bicycle, pedestrian and rail traffic. Roadway-rail grade separation refers to the physical separation of the crossing where two transportation facilities (roadways and railways) cross via an overpass or underpass structure. As used in this report, the term overcrossing refers to streets bridging above railroad tracks and undercrossing refers to streets and highways tunneling under railroad tracks.

### KERN COUNTY CROSSING TREATMENT OVERVIEW

Countywide, Kern County has 301 locations where, at some point in time, roadways and rail have crossed to create an at-grade crossing. Over time, 60 (20%) of these crossings have been closed, primary due to rail abandonment. Of the remaining 241 crossings, another 52 (17%) have been improved with grade-separation treatments due to increasing train and/or automobile volumes and rising safety concerns. Another 16 crossing are located along industrial

railroad leads serving private property. The remaining 176 locations are classified as active, public, at-grade roadway-rail crossings and desirably should be grade separated. Table 1 shows a summary of the current state of these 301 crossings.

**Table 1: Kern County Crossing Summary**

Status	Crossing Type	Ownership	Total in Kern County
Open	Grade Separated	Public	52
Open	At-Grade	Public	176 <sup>1</sup>
Open	At-Grade	Private	16
Closed	At-Grade	Public and Private	57
			301

1. Candidate crossing for grade-separation in this study

Three types of general crossing treatments are currently in place at the 176 public, at-grade open crossings. These include grade separation, active detection (gates and/or lights), lights, and passive detection (signage and pavement markings). Table 2 shows a breakdown of the open, public at-grade crossings by crossing treatment.

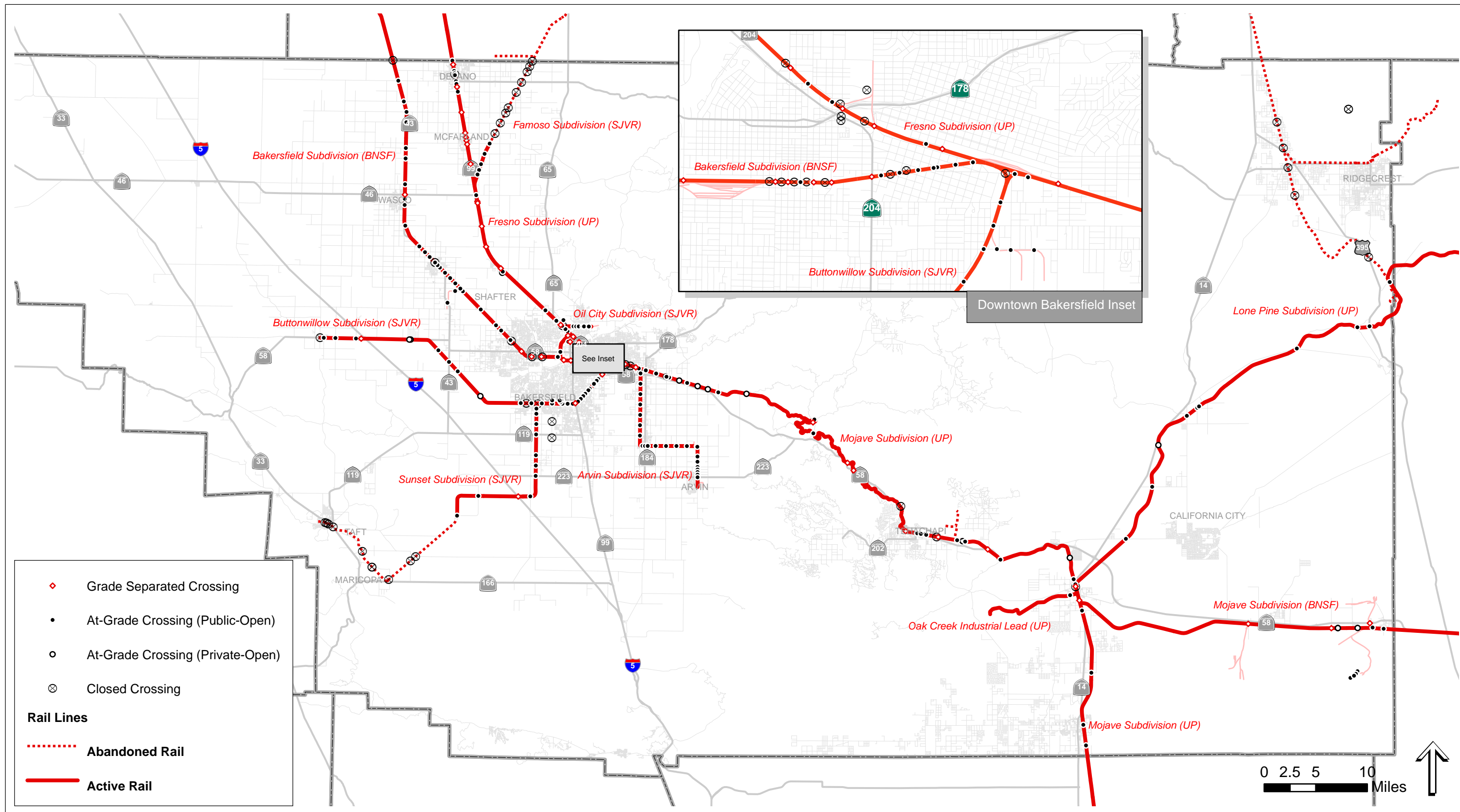
**Table 2: Crossing Device Treatments (Public, Open, At-Grade Crossings)**

Status	Crossing Type	Ownership	Crossing Treatments in Kern County			
			Two-Quadrant Gates (Active)	Light Signals (Active)	Passive	Total
Open	At-Grade	Public	140	8	28	176

## GRADE SEPARATION

Grade separation is the most effective way to improve safety of an at-grade crossing. This treatment physically separates the roadway and railway using an underpass or bridge structure. This configuration allows independent movements by rail traffic and roadway users, eliminating the dangerous point of conflict. In Kern County, 52 crossings are currently grade separated.

Since this treatment is financially intensive, determining when and where to focus these improvements is often challenging. Prior to grade-separation, crossings tend to include a tiered range of treatments that have different levels of safety and protection. Once these crossings reach a certain threshold of risk through changing conditions at or around the crossing, a separation becomes the appropriate treatment.



## ACTIVE WARNING DEVICES (TWO-QUADRANT GATES)

The most common crossing treatment in Kern County is two-quadrant gates. This treatment provides a gate device for traffic in the oncoming approach lanes and typically includes side flashing lights. Since gates block traffic when trains are detected, these are considered “active” treatments. Two-quadrant gates, without other crossing improvements, are effective at notifying motorists of trains but do allow motorists to make an unsafe maneuver and drive around the gates. In Kern County, over 80% of all open, public at-grade crossings include some form of gate treatment. An example of two-quadrant gates without cantilever lights or medians is shown in Figure 2.



**Figure 2: Two-Quadrant Gate**

Two-quadrant gates can also include additional features to improve their effectiveness and reduce risk of accidents. Gates plus cantilever flashing light signals provide an additional visual cue for motorists and makes the crossing itself more visual. An example of this treatment is shown in Figure 3.



**Figure 3: Two-Quadrant Gate with Cantilever Flashing Lights**

Another element to improve safety at locations with active gates is the addition of a median or channelization device at the crossing. Gates with medians or channelization devices are installed on both roadway approaches to deny the roadway user the ability to circumvent the approach lane gate by switching into the opposing traffic lane and driving around the lowered gates to cross the tracks. Adding medians increase the safety of the crossing but can lead to property and roadway access issues for nearby intersections and driveways. Figure 4 shows an example of a two-quadrant gate and median configuration with and without overhead cantilever flashing light signals.



**Figure 4: Two-Quadrant Gates with Median Treatments (with and without cantilever lights)**

#### ACTIVE WARNING DEVICES (FLASHING LIGHT SIGNALS)

Another level of crossing protection used in Kern County is a flashing light signal without gates. This treatment is classified as an active treatment since the lights are activated by the presence of a train. Although more visual than the passive crossbuck signage, this treatment is still quite low in terms of safety and protection. Only 3% of all open, public at-grade crossings contain this treatment, and all are found along the San Joaquin Valley Railroad's (SJVR) Buttonwillow and Sunset Subdivisions. An example of this treatment is shown in Figure 5.



**Figure 5: Flashing Lights**

## PASSIVE WARNING DEVICES

The most basic and lowest protection crossing treatment is a passive device. A passive highway-rail grade crossing is described as a having sign and pavement markings (if appropriate to the roadway surface) that are not activated by trains. A number of different signs can be used at passive crossings, but the most popular tends to be a crossbuck warning signage. Passive treatments are used on 16% of all open, public at-grade crossings in the County, and all located on SJVR's Famoso, Buttonwillow, Sunset and Arvin divisions. An example of this is crossing with the crossbuck signage is shown in Figure 6.



**Figure 6: Passive Treatment (crossbucks)**

## ADDITIONAL AT-GRADE SAFETY IMPROVEMENTS

In addition to the current treatments used in Kern County, safety at crossings which are not already grade-separated can also be improved through implementation of other FRA approved safety measures. These measures include:

- Four-quadrant gates
- Roadway closure

## FOUR-QUADRANT GATES

Four-quadrant gates fully block highway traffic from entering the crossing when the gates are lowered including at least one gate for each direction of traffic on each approach. This treatment is recognized by the FRA as one of the most secure and safe crossing treatments short of grade separation. Either new, or upgraded from two-quadrant gates, four-quadrant gates are typically equipped with vehicle presence detection. A lump sum conceptual cost estimate for four gates and flashing lights would be \$1,495,000, inclusive of engineering and contingencies. Figure 7 shows an example of a four-quadrant gate with lights.



**Figure 7: Four-Quadrant Gates with Lights**

## ROADWAY CLOSURE

Closure of the public highway-rail grade crossing is typically the least desired due to access issues but it is a feasible option at locations with low traffic volumes. Closures must completely block highway traffic from entering the grade crossing; it is typically required by the CPUC that the crossing surface also be removed. A lump sum cost estimate per crossing would be \$50,000, a total sufficient to cover removal of existing warning devices and installation of traffic barriers, e.g. Jersey barriers.

## GRADE SEPARATION GUIDANCE

At the federal level, the FHWA is responsible for public grade crossings of highways and railways which impact safety. The *Railroad-Highway Grade Crossing Handbook* and *Guidance of Traffic Control Devices at Highway-Rail Grade Crossings* provide conditions to use as guidance for when a grade separation is appropriate. At the state level, the CPUC ensures that highway-rail grade crossings are designed, constructed and properly maintained to ensure public safety. The CPUC's Grade Separation Program provides \$15 million in financing for grade separations through the State's annual budget. Section 2450 et seq. of the California Streets and Highways Code sets the procedures for administer these funds, and Section 2452 establishes criteria to be used in determining priority of nominated crossings.

These references, along with the National Cooperative Highway Research Program Report 288, *Evaluating Grade-Separated Rail and Highway Crossing Alternatives*, and Transportation Research Record 1754 Paper No.01-3051, *Methodology for Evaluating Highway-Railway Grade Separations*, formed the baseline for the development of criteria to be used in the screening and prioritization process for this study. This process ensures some level of consistency was maintained between this effort and parallel efforts at the federal and state level.

Perhaps the most precise tool for evaluating and prioritizing potential grade separations is the CPUC's formula to score and prioritize criteria for new and existing separations. The formula for new crossings nominated for separation or elimination is:

$$P = \frac{V * (T + 0.1 * LRT) * (AH + 1)}{C} + SCF$$

Where:

P	=	Priority Index
V	=	Average Daily Vehicle Traffic
T	=	Average Daily Freight/Commuter Train Traffic
LRT	=	Average Daily Light Rail Train Traffic
C	=	Project Cost Share to be Allocated from Grade Separation Fund
AH	=	Accident History
SCF	=	Special Conditions Factors

Special Conditions Factors include crossing blocking delay, vehicular speed limits, railroad prevailing maximum speed, crossing geometrics, passenger trains and other factors.

The scoring process conducted for this study, which is described in the Methodology section below, uses similar criteria but puts less of an emphasis on light rail transit and costs. This is due to the conditions in Kern County which currently do not have LRT and the desire to keep funding and cost neutral in this effort.

A summary of the FHWA and CPUC primary evaluation criteria and its application in this study's two stages of effort are shown in Table 3 below. The table shows the overlap and consistency between this effort and those at the federal and state level. The two stages of this analysis are:

- Stage 1: Screening process to identify the top candidate crossing for separation; and
- Stage 2: Process of prioritizing these crossing into tiered groups.

**Table 3: Industry Criteria Compared to Kern County Study Criteria**

Criteria	Source Cited	Stage 1: Screening Criteria?	Stage 2: Prioritization Criteria? / Category
Accidents	FHWA, CPUC	Yes	Yes-Accidents
Auto Traffic	FHWA, CPUC	Yes	Yes-Traffic
Train Traffic <sup>1</sup>	FHWA, CPUC	Yes	Yes-Trains
Crossing Exposure (Trains per day x ADT)	FHWA	No	No
Passenger Exposure (PAX trains per day and ADT)	FHWA	No	No
Vehicle Delay	FHWA	No	Yes – Traffic Delay
Traffic Speed Limit	FHWA, CPUC	No	Yes – Traffic Delay
Train Speed	FHWA, CPUC	No	Yes – Traffic Delay
Crossing Blocking Delay	CPUC	No	Yes – Traffic Delay
Crossing Geometrics	CPUC	No	Yes – Other
Passenger Trains	CPUC	No	Yes – Traffic Delay
School Buses	CPUC	No	Yes – Other
Passenger Buses	CPUC	No	Yes – Other
Hazardous Materials Trucks	CPUC	No	Yes – Other

1. Includes freight and passenger trains

## METHODOLOGY

The following methodology was employed for the Kern County Grade Separation Prioritization Report to obtain a prioritized list of candidate grade separations at existing highway-rail crossings in Kern County. This methodology was developed by the project team to achieve the goal of the study effort and remain consistent with industry and peer organization prioritization methods. Established methodologies and guidance by the CPUC<sup>3</sup> and the FHWA<sup>4</sup> were used as the starting point for the study-specific methodology.

The process developed for this study was done in two stages: initial screening and prioritization.

### INITIAL SCREENING

The initial screening process began by using the CPUC database, as updated by the Kern Council of Governments (Kern COG) and the project team, of all highway-rail crossings in Kern County. The database includes 301 discrete crossings comprising public, private, at-grade, grade-

<sup>3</sup> Formulas for prioritization of funds for grade separations under Section 190 of the State of California's Streets and Highways Code (S&H) as outlined in the CPUC's Grade Separation Program Rail Crossings and Engineering Section.

<sup>4</sup> *Railroad-Highway Grade Crossing Handbook*, US Department of Transportation: Federal Highway Administration, Washington, DC, 2007 (rev 2).

separated, active, and closed crossings. Refinement began by first excluding all closed crossings—those crossings classified in the “status” attribute of the database as being closed or out of service, or as having road removed, track disconnected, or track removed. The resulting list was further narrowed by eliminating crossings that are already grade separated, as indicated in the crossing database. Since the focus of this task was on identifying highway-rail grade separation projects for public investment, private and bicycle/pedestrian-only crossings were removed from consideration. (Note: all bicycle/pedestrian-only crossings were coincidentally already excluded through the at-grade and public screening processes.) This process generated a list of 176 active, public, at-grade highway-rail crossings in Kern County.

The next step was to identify those crossing which experience a certain minimal level rail activity ( $\geq 4$  trains per day) today and are expected to continue to see growth in rail activity in the future. Those crossing which do not meet this criteria ( $n = 66$ ) were not included in the prioritization process. These 66 crossings were located along various railroad spurs and the following branchlines:

- Lone Pine Subdivision – UP
- Oak Creek Industrial Lead - UP
- Arvin Subdivision - SJVR
- Sunset Subdivision - SJVR
- Buttonwillow Subdivision (west of Gosford) - SJVR
- Oil City Subdivision - SJVR
- Famoso Subdivision - SJVR

## SCREENING CRITERIA

The initial screening process utilized existing crossing evaluations completed by Kern COG, the Greater Bakersfield Separation of Grade District (GBSGD), the CPUC and local jurisdictions, as well as three quantifiable criteria: number of current daily trains, current (2010) average daily automobile trips (ADT) at the crossing, and automobile-train accidents at the crossing. These seven criteria were applied to the 110 candidate crossings to identify those with the most promising conditions for inclusion in the prioritization step of the crossings. If the candidate crossings met one or more of these criteria, they were advanced into the next stage of evaluation. Table 4 lists these criteria and shows the number of crossing which met each. These criteria carry significant weighting by overseeing agencies including the CPUC, FHWA, and FRA, and provide a good indicator for estimating the need to separate.

The final screening step in this initial stage of evaluation was to eliminate any crossing with a grade separation project observed to be under construction or with construction funds allocated during field inventory.<sup>5</sup> This resulted in a total of 40 crossings for advancement to the prioritization stage.

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<sup>5</sup> These crossings include Hageman Road (BNSF), 7<sup>th</sup> Standard Road (BNSF) and Mohawk Street (BNSF)

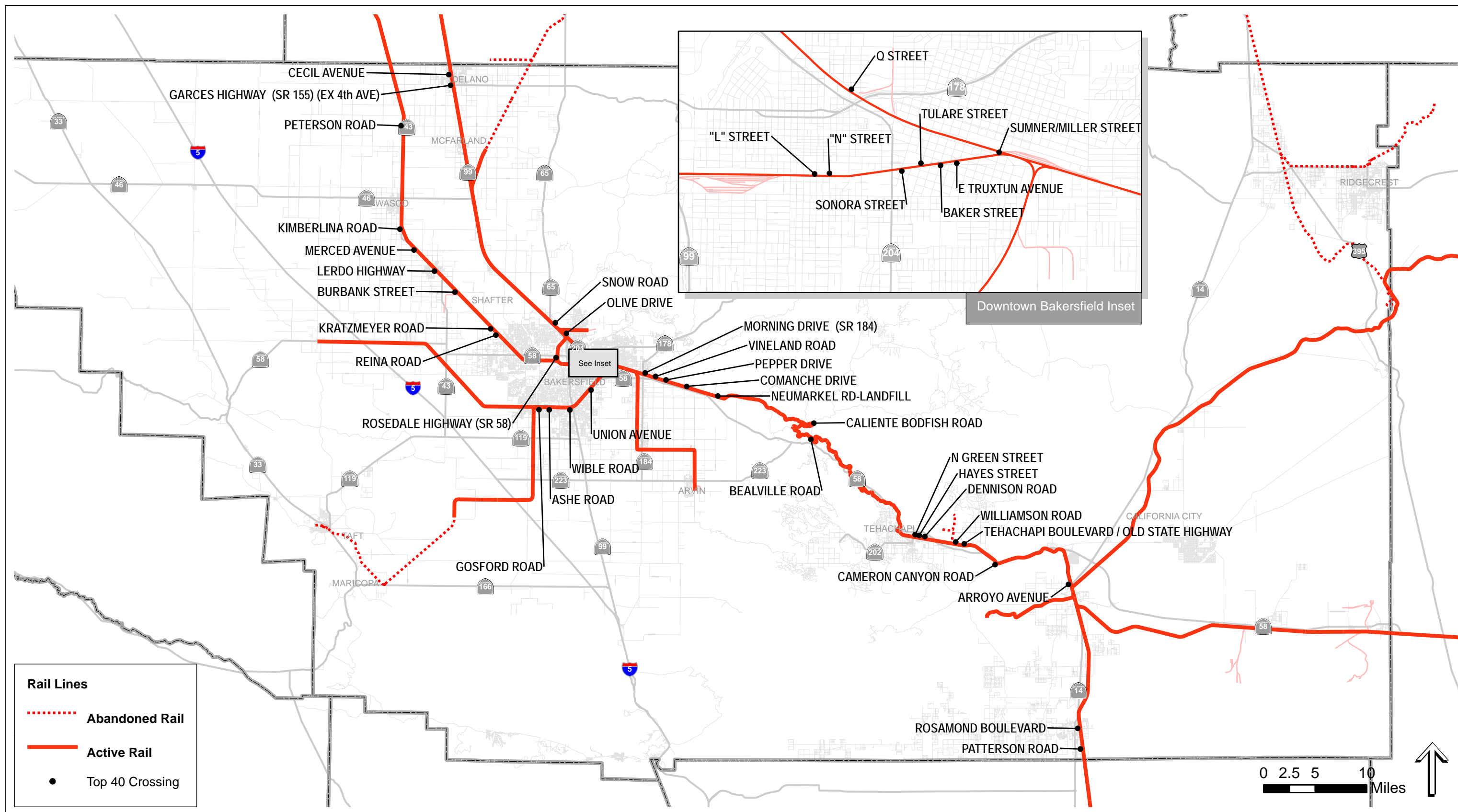
**Table 4: Initial Screening Criteria**

ID	Criteria	Measure	# in Kern County <sup>1</sup>
1	Regional Transportation Plan (RTP)	Included as a financially constrained or unconstrained project in RTP- does not already have funds allocated for construction	16
2	GBSGD	Nominated grade separation by the GBSGD (2010)	16
3	CPUC	Included in the CPUC Grade Separation Priority List for FY 2010-2011	16
4	General Plans	Specifically mentioned in any of the local government's General Plan documents	2
5	Accidents	Three or more accidents observed at the crossing within the past 10 years	11
6	Average Daily Traffic (ADT)	Greater than 15,000 ADT as reported by the 2010 Kern County travel demand model or greater than 20,000 ADT as reported by the 2035 Kern County travel demand model	11
7	Daily Trains <sup>2</sup>	Greater than 36 trains per day or more than 1.5 trains per hour, on average	24

1. Universe of crossings included all crossings in Kern County. Those with less than 4 trains per day were not eligible for consideration in the next step of prioritization.
2. Daily average trains estimates were developed based on conversations with UP, BNSF Railway, SJVR, Trona Railway, and WSA estimates.

## SCREENING RESULTS

Table 5 lists these 40 crossings and Figure 8 shows there location within the county. The “criteria met” references the criteria ID field in Table 4 above.



**Table 5: Priority 1 Screened Crossings (in alphabetical order)**

Street	CPUC Number	DOT Number	Municipality	Railroad	Criteria Met*
Arroyo Avenue	001B-379.40	757244C	Unincorporated	UP	7
Ashe Road	103BT-321.50	912096L	Bakersfield	SJVR	6
Baker Street	002-885.95	028285V	Bakersfield	BNSF	2, 3, 7
Bealville Road	001B-340.50	757430D	Unincorporated	UP	7
Burbank Street	002-902.30	028383L	Unincorporated	BNSF	1
Caliente Bodfish Road	001B-335.50	757428C	Unincorporated	UP	7
Cameron Canyon Road	001B-369.20	757258K	Unincorporated	UP	7
Cecil Avenue	001B-280.20	757271Y	Delano	UP	4
Comanche Drive	001B-321.70	757418W	Unincorporated	UP	1, 5, 7
Dennison Road	001B-361.40	757247X	Tehachapi	UP	1, 4, 7
East Truxtun Avenue	002-885.77	028284N	Bakersfield	BNSF	2, 3, 7
Garces Hwy (SR 155) (Ex 4 <sup>th</sup> Ave)	001B-281.20	757262A	Delano	UP	1, 4
Gosford Road	103BT-322.50	750966K	Unincorporated	SJVR	6
Hayes Street	001B-360.90	757246R	Tehachapi	UP	4, 7
Kimberlina Road	002-910.40	028397U	Unincorporated	BNSF	1, 5
Kratzmeyer Road	002-897.30	028380R	Bakersfield	BNSF	1, 2, 3, 5
L Street	002-887.20	028354B	Bakersfield	BNSF	7
Lerdo Highway	002-905.10	028390W	Shafter	BNSF	1, 3, 6
Merced Avenue	002-908.00	028395F	Unincorporated	BNSF	5
Morning Drive (SR 184)	001B-317.50	757413M	Unincorporated	UP	1, 2, 3, 5, 6, 7
N Street	002-887.10	028351F	Bakersfield	UP	7
North Green Street	001B-317.50	757413M	Unincorporated	UP	4, 7
Neumarkel Road – Landfill	001B-324.80	757421E	Unincorporated	UP	7
Olive Drive	001B-308.90	756945M	Unincorporated	UP	1, 2, 3, 6
Patterson Road	001B-396.00	750636E	Unincorporated	UP	5
Pepper Road	001B-319.90	757416H	Unincorporated	UP	7
Peterson Road	002-920.50	028310B	Unincorporated	BNSF	5
Q Street	001B-311.80	757241G	Bakersfield	UP	1
Reina Road	002-896.60	028379W	Unincorporated	BNSF	1, 2, 3, 5
Rosamond Boulevard	001B-393.90	750635X	Unincorporated	UP	6
Rosedale Highway (SR 58)	103Q-113.20	029473N	Unincorporated	SJVR	1, 2, 3, 6
Snow Road	001B-307.40	756948H	Unincorporated	UP	2, 3, 6
Sonora Street	002-886.40	028289X	Bakersfield	BNSF	2, 3, 7
Sumner / Miller Street	002-885.40	028280L	Bakersfield	BNSF	7
Tehachapi Blvd/Old State Hwy	001B-365.20	757255P	Unincorporated	UP	5, 7
Tulare Street	002-886.20	028288R	Bakersfield	BNSF	2, 3, 7
Union Avenue	103BT-316.70	750993G	Unincorporated	SJVR	6
Vineland Road	001B-318.50	757414U	Unincorporated	UP	7
Wible Road	103BT-319.50	750962H	Bakersfield	SJVR	6
Williamson Road	001B-364.40	757253B	Unincorporated	UP	7

\* See Table 4 for description of evaluation criteria

## PRIORITIZATION

The second stage of the process was prioritization of the 40 crossings identified in the initial screening process. This was done by comparing the crossings using a quantitative scoring assessment of the initial screening criteria and additional criteria to highlight differences in the potential safety and operations at the crossings.

## PRIORITIZATION CRITERIA

Table 6 shows the four quantitative criteria and one (“other”) qualitative criterion used in the scoring assignment. A short description of each follows.

**Table 6: Prioritization Criteria**

Criteria Name	Measure
Traffic	Existing (2010) traffic volume
Trains	Existing (2010) train volume
Accidents	Historic (2000-2010) safety issues at crossing
Traffic Delay	Average vehicle delay and queue length experienced at crossing
Other <sup>1</sup>	<i>Other measures which support need to grade-separate crossing</i>

1. See table below for details on what measures are included in the “other” category.

### ***Traffic***

“Traffic” is a measure of the total average number of daily vehicles which cross the railroad from all directions. This measure is a quantitative measure and obtained using the 2010 Kern County Travel Demand Model. The model volumes were generated through an iterative process which used existing traffic counts to calibrate the model to reflect actual conditions. Since actual, current traffic counts were not available for all crossings locations, the model was determined to be the most accurate source for traffic volume information for the widest range of crossings. In the few locations where the model did not include roadway links and volumes were unattainable, the FRA database was used and historic counts were factored up to achieve 2010 estimates.

### ***Trains***

“Trains” is a quantitative measure of the total average number of daily trains, from both directions, which cross the roadway at the crossing<sup>6</sup>. This measure was obtained through consultation with the rail operators which use the tracks for freight shipments and review of the Amtrak *San Joaquin* passenger service timetable. These volumes were estimated for 2010 conditions.

### ***Accidents***

“Accidents” is a quantitative measure of recent documented incidents which have occurred at a crossing over the past 10 years (2000-2010)<sup>7</sup>. This measure was obtained using the FRA’s accident database. Accidents include both fatal and non-fatal reports.

<sup>6</sup> Train volume does not account for switching movements at the crossing

<sup>7</sup> Many crossings have undergone safety improvements to the crossings over the past 10 years as a result of previous incidents. Included in these improved crossing are Kratzmeyer, Kimberlina and Merced. Accident scores may reflect incidents which occurred prior to these improvements.

### **Traffic Delay**

“Traffic Delay” is a quantitative measure of the impact to vehicular (personal, emergency, transit, etc.) operations as a result of blockages caused by trains at the crossing. Four components are included in this criterion which are shown in Table 7 below. The measures for each were estimated using the 2010 traffic volumes estimates from the Regional Travel Demand Model, geometric configurations from aerial images and field visits and equations from the Highway Capacity Manual, the National Highway Cooperative Research Program (NCHRP) and the Transportation Research Record (TRR).<sup>8</sup>

**Table 7: Prioritization Criteria Measures (Crossing Delay Criteria)**

Crossing Delay Components	Measure
Total Vehicles Impacted	Total number of vehicles at impacted at crossing (those which experience some form of delay)
Traffic Delay	The average delay (minutes per vehicle) experienced at the crossing
Level of Service (LOS)	Traffic LOS is a measure based on average vehicle delay
Queue Length	Average vehicle queue length, per lane, experienced during a crossing delay occurrence

### **Other**

The “other” criterion is a qualitative measure which captures the detailed aspects of the crossings that are not focused on pure volumes (train and vehicles) or historic safety issues. Measures for these criteria were gathered through already documented sources (including the FRA crossing database) and then confirmed through a field visit at each of the crossings.

**Table 8: Prioritization Criteria Measures (Other Criteria)**

Other Categories	Measure
Constructability	Feasibility of grade separation (estimated)
Traffic Growth	Total growth in vehicular traffic at crossing between 2010 and 2035 (estimated)
Train Growth	Total growth in train traffic at crossing between 2010 and 2030 (estimated)
Geometrics	Safety issues presented by the geometric design of crossing (estimated)
Vehicle Speed	Posted vehicular speed of primary roadway at crossing
Train Speed	Maximum train speed at crossing
Passenger Trains	Total number of weekday passenger trains in service at crossing
School Bus Routes	Determination if school bus service is in operated over crossing
Transit Routes	Determination if regular fixed route transit service is in operated over crossing
Emergency Vehicle Routes	Determination if crossing is along a pre-defined emergency vehicle access route
Quiet Zone Potential	Determination if grade separation of crossing would allow quiet zone designation (estimated)
High Speed Rail	Determination if crossing is along proposed high speed rail alignment and would potentially benefit from area improvements or funding (estimated)

<sup>8</sup> NCHRP Report 288, *Evaluating Grade-Separated Rail and Highway Crossing Alternatives* and TRR 1754 Paper No.01-3051, *Methodology for Evaluating Highway-Railway Grade Separations*.

## SCORING

Once evaluation criteria were identified for the prioritization stage, scores were developed for each of the crossings using the evaluation criteria. The scores were calculated using a range of 0-100 points. Each of the five criteria were given an equal weighting (20% the total score) which created a total of 20 points from each of the criterion.

Traffic volumes, train volumes, accidents and traffic delay criteria were all scored quantitatively based on actual or calculated numeric values. A total of 20 points were assigned to each of these criteria based on ranges of values which are shown in Table 9 and Table 10.

**Table 9: Traffic Volume, Train Volume and Accident Scoring Ranges**

Score	Traffic Volumes	Train Volumes	Accidents
	Average Daily Traffic	Average Daily Trains	# in last 10 years
0	0-2,500	0-3	0
2	2,501-5,000	4-6	1
4	5,001-7,500	7-10	2
6	7,501-10,000	11-13	3
8	10,001-15,000	14-17	4
10	15,001-20,000	18-20	5
12	20,001-25,000	21-24	6
14	25,001-30,000	25-27	7
16	30,001-35,000	28-31	8
18	35,001-40,000	32-34	9
20	> 40,000	> 34	> 9

**Table 10: Traffic Delay Criterion Scoring Ranges**

Score	Traffic Delay	
	Average Vehicle Delay (sec/veh.)	Average Queue Length Per Lane (ft.)
0	0-60	0-25
2	61-120	26-50
4	121-180	51-75
6	181-240	76-100
8	241-300	101-150
10	> 300	> 150

Scoring for the “other” category used the 12 measures shown in Table 8 and professional engineering judgment by the project team to assign each crossing a 0-20 score. Due to the complexity of the measures and the wide range of variations in the crossings, this score was done more qualitatively than quantitatively.

## PRIORITIZATION RESULTS

Applying the scoring calculations described in the Methodology section above, each of the 40 crossings received a total point value between 0-100. The crossings were then sorted from high to low by this crossing score which represents the individual prioritization of each crossing with the other crossings in the County. The prioritized list is shown in Table 12.

The prioritized list was then further tiered into four groups to show relative priority. The top 10 crossings were classified as “high priority” crossings; crossings 11-20 were classified as “medium priority” crossings; crossings 21-30 were classified as “low priority” crossings; and the final 10 crossings were termed “other” crossings. A description of each of the priority groups follows below.

Timelines identified for each priority level do not assume all crossings would be complete within that timeframe. These tiers simply show where efforts should be focused based on 2010 conditions. Ratings should be monitored and updated as shifts occur in funding and traffic conditions.

### GROUP A – HIGH PRIORITY

High priority crossings are those which should be the focus for grade-separation in the near term (5-10 years). These crossings currently have conditions where safety risk is high due to high traffic or train volumes. The high priority crossings are listed in Table 11 below and shown in Figure 9.

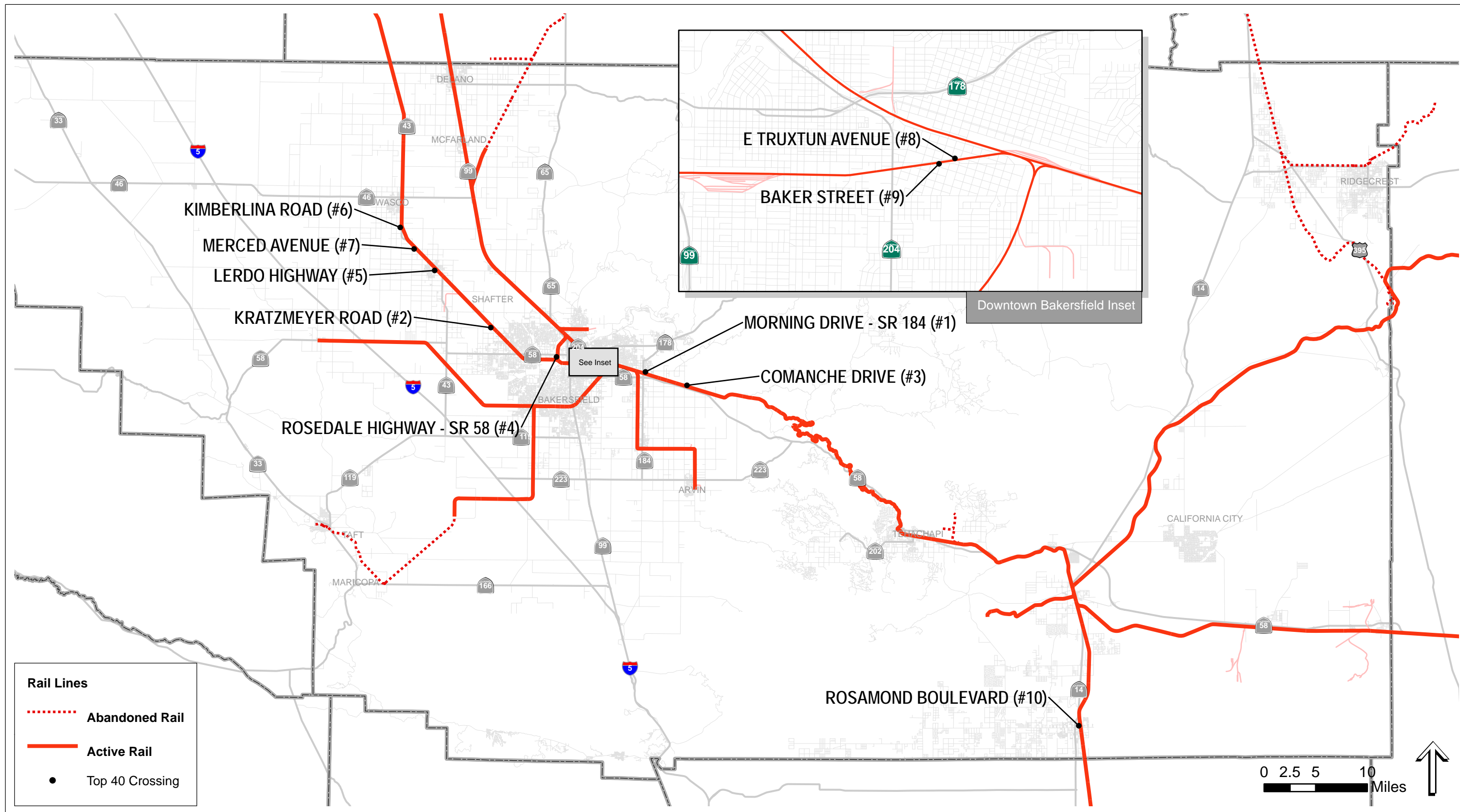
**Table 11: High Priority Crossings**

Overall Rank	Name	Jurisdiction	Railroad Owner
1	Morning Drive (SR 184)	Kern County	UP
2	Kratzmeyer Road	City of Bakersfield	BNSF
3	Comanche Drive	Kern County	UP
4	Rosedale Highway (SR 58)	Kern County	SJVR
5	Lerdo Highway	City of Shafter	BNSF
6	Kimberlina Road	Kern County	BNSF
7	Merced Avenue	Kern County	BNSF
8	East Truxtun Avenue	City of Bakersfield	BNSF
9	Baker Street	City of Bakersfield	BNSF
10	Rosamond Boulevard	Kern County	UP

Six of the 10 high priority crossings are already included in the Kern County Regional Transportation Plan as candidates for grade-separation. Five of the 10 are included in the GBSGD’s 2010-2011 list of nominated grade separations, and six are included in the CPUC’s 2010-2011 grade separation priority list. The only two high priority crossings which are not included in one of these three lists are Merced Avenue and Rosamond Boulevard.

**Table 12: Prioritized List of Crossings**

Rank	Name	Traffic Score	Train Score	Accident Score	Crossing Delay	Other Score	Final Score	Priority
1	Morning Drive (SR 184)	12	20	8	14	16	<b>70</b>	High Priority
2	Kratzmeyer Road	0	20	20	0	16	<b>56</b>	
3	Comanche Drive	0	20	14	2	14	<b>50</b>	
4	Rosedale Highway (SR 58)	20	4	0	8	18	<b>50</b>	
5	Lerdo Highway	10	20	0	2	18	<b>50</b>	
6	Kimberlina Road	2	20	12	2	12	<b>48</b>	
7	Merced Avenue	0	20	20	0	8	<b>48</b>	
8	East Truxtun Avenue	4	14	0	8	20	<b>46</b>	
9	Baker Street	2	14	0	10	18	<b>44</b>	
10	Rosamond Boulevard	14	6	4	0	18	<b>42</b>	
11	Sumner / Miller Street	2	14	0	14	10	<b>40</b>	Medium Priority
12	Vineland Road	0	20	10	0	10	<b>40</b>	
13	Olive Drive	10	6	4	0	18	<b>38</b>	
14	Tehachapi Blvd/Old State Hwy	0	20	10	0	8	<b>38</b>	
15	Reina Road	0	20	10	0	8	<b>38</b>	
16	Dennison Road	0	20	2	2	12	<b>36</b>	
17	Arroyo Avenue	0	20	0	2	14	<b>36</b>	
18	N. Green Street	0	20	0	2	14	<b>36</b>	
19	Snow Road	8	8	0	2	18	<b>36</b>	
20	Cecil Avenue	6	6	6	0	16	<b>34</b>	
21	Pepper Drive	0	20	2	2	10	<b>34</b>	Low Priority
22	Hayes Street	0	20	0	0	14	<b>34</b>	
23	Bealville Road	2	20	0	10	2	<b>34</b>	
24	Garces Hwy (SR 155) (Ex 4th Ave)	6	6	10	2	8	<b>32</b>	
25	Peterson Road	0	20	10	0	2	<b>32</b>	
26	L Street	2	20	0	2	8	<b>32</b>	
27	Caliente Bodfish Road	2	20	0	6	2	<b>30</b>	
28	Gosford Road	12	2	2	4	10	<b>30</b>	
29	Sonora Street	0	14	0	6	10	<b>30</b>	
30	N Street	0	20	0	2	8	<b>30</b>	
31	Patterson Road	0	6	20	0	2	<b>28</b>	Other
32	Cameron Canyon Road	0	20	2	0	6	<b>28</b>	
33	Neumarkel Road – Landfill	0	20	0	0	8	<b>28</b>	
34	Union Avenue	10	2	0	0	14	<b>26</b>	
35	Williamson Road	0	20	2	0	2	<b>24</b>	
36	Wible Road	10	2	0	4	6	<b>22</b>	
37	Tulare Street	0	14	0	4	4	<b>22</b>	
38	Burbank Street	0	20	0	0	2	<b>22</b>	
39	Q Street	4	6	0	0	10	<b>20</b>	
40	Ashe Road	8	2	0	4	6	<b>20</b>	



## GROUP B – MEDIUM PRIORITY

Medium priority crossings are crossings which should be strongly considered for grade-separation but demonstrate less of a need to separate than the high priority crossings. As financial resources allow, these crossing should receive grade separation in the next 10-20 years. The medium priority crossings are listed in Table 13 and shown in Figure 10.

**Table 13: Medium Priority Crossings**

Overall Rank	Name	Jurisdiction	Railroad Owner
11	Sumner / Miller Street	City of Bakersfield	BNSF
12	Vineland Road	Kern County	UP
13	Olive Drive	Kern County	UP
14	Tehachapi Blvd/Old State Hwy	Kern County	UP
15	Reina Road	Kern County	BNSF
16	Dennison Road	City of Tehachapi	UP
17	Arroyo Avenue	Kern County	UP
18	N. Green Street	City of Tehachapi	UP
19	Snow Road	Kern County	UP
20	Cecil Avenue	City of Delano	UP

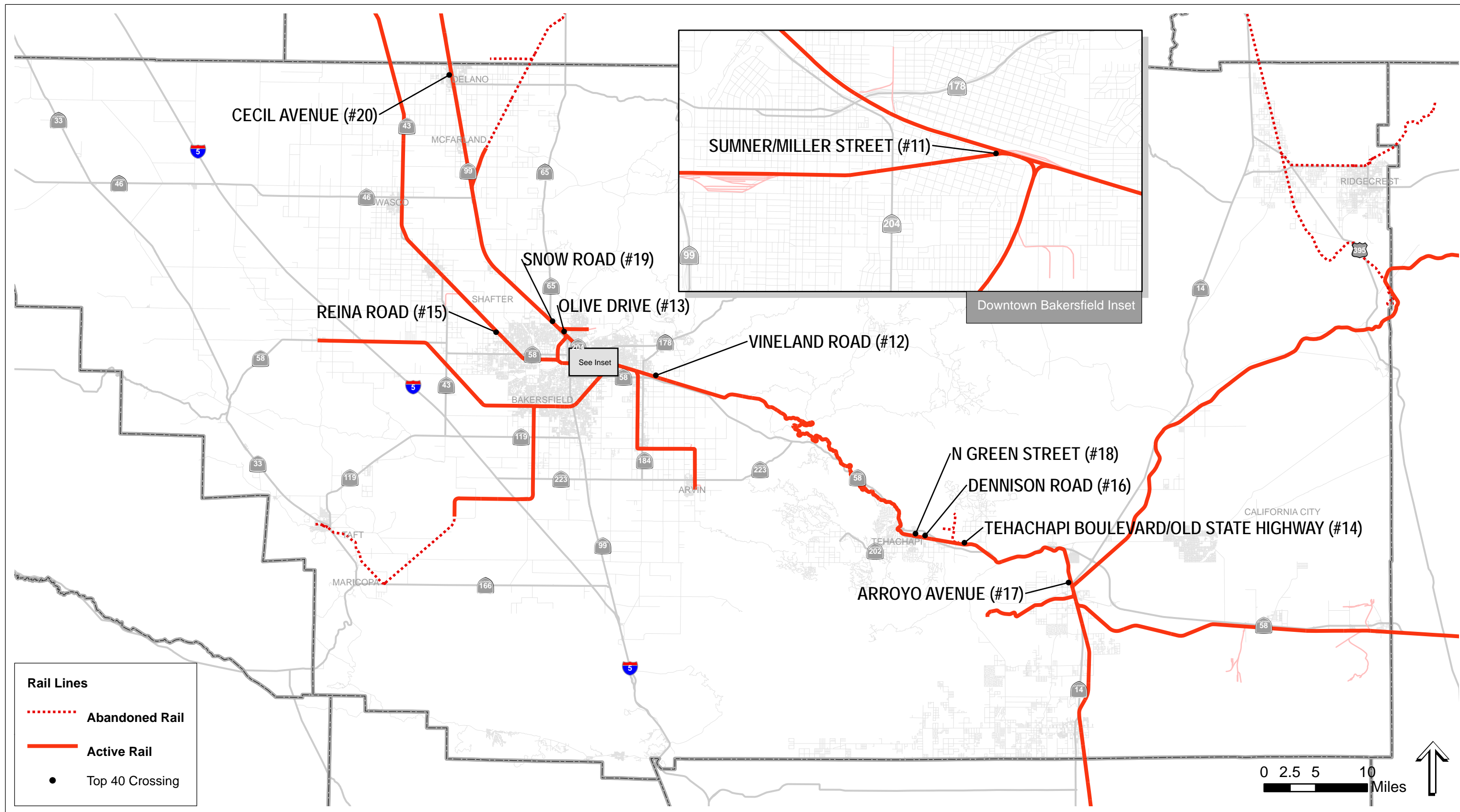
Among the 10 medium priority crossings are three CPUC and GBSGD 2010-2011 nominated crossings in Kern County: Olive Drive, Reina Road, and Snow Road. This group also contains three crossings (Dennison Road, Olive Drive and Reina Road) included in the RTP.

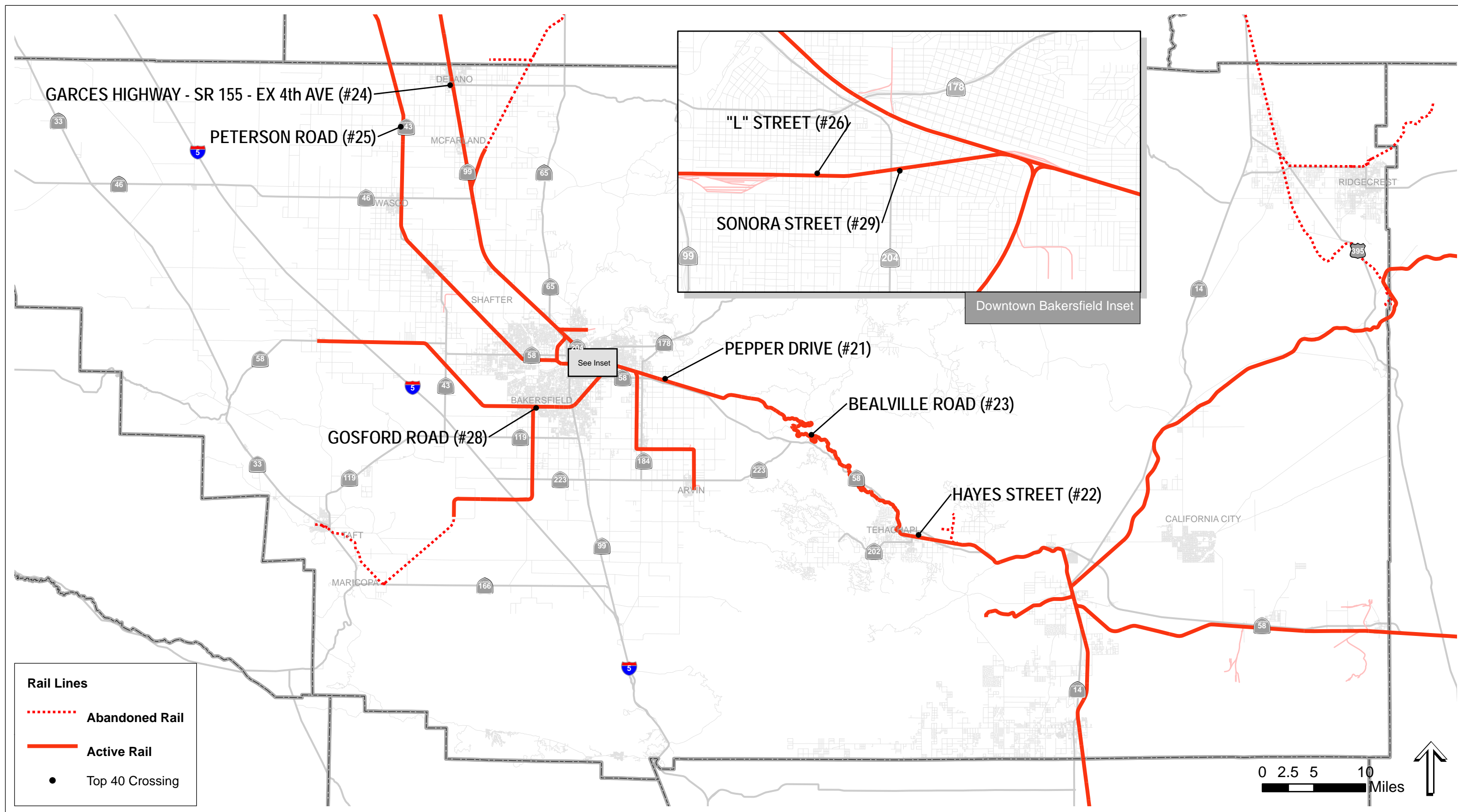
## GROUP C –LOW PRIORITY

Low priority crossings are those which demonstrate some need for separation but are not near term priorities. These crossings should be monitored as train and traffic increases in the area. The timeframe for separation of threes crossing is likely 20-25 years. The low priority crossings are listed in Table 14and shown in Figure 11.

**Table 14: Low Priority Crossings**

Overall Rank	Name	Jurisdiction	Railroad Owner
21	Pepper Drive	Kern County	UP
22	Hayes Street	City of Tehachapi	UP
23	Bealville Road	Kern County	UP
24	Garces Hwy (SR 155) (Ex 4th Ave)	City of Delano	UP
25	Peterson Road	Kern County	BNSF
26	L Street	City of Bakersfield	BNSF
27	Caliente Bodfish Road	Kern County	UP
28	Gosford Road	Kern County	SJVR
29	Sonora Street	City of Bakersfield	BNSF
30	N Street	City of Bakersfield	UP



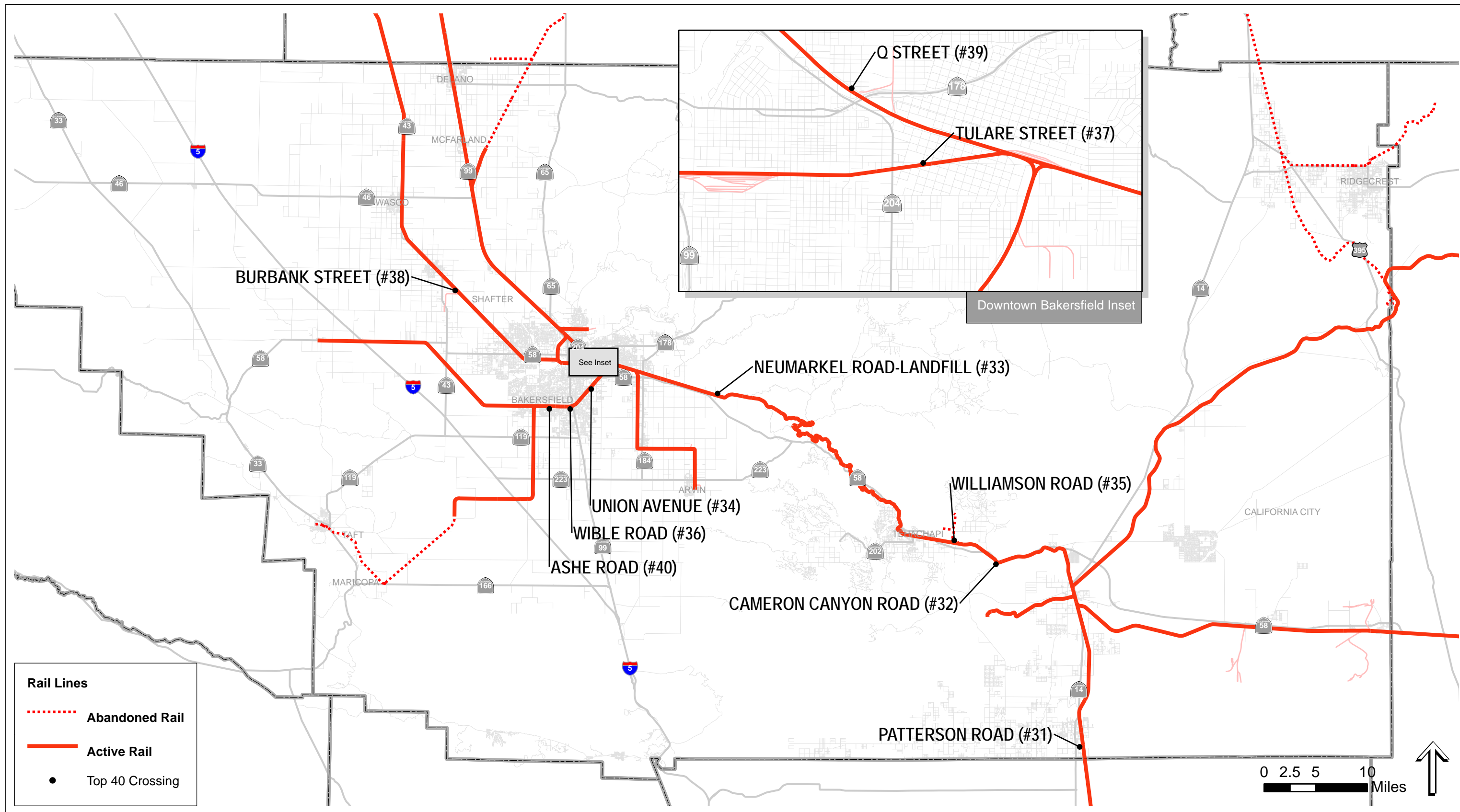


## GROUP D – OTHER

The lowest priority group takes on the “other” label because many of these crossings may not demonstrate conditions which warrant a full grade separation. Unless conditions change which increase vehicle or trains activity at these crossings, alternative treatments such as four-quadrant gates or medians should be evaluated to help improve safety. The “other” crossings are listed in Table 15 and shown in Figure 12.

**Table 15: Other Crossings**

Overall Rank	Name	Jurisdiction	Railroad Owner
31	Patterson Road	Kern County	UP
32	Cameron Canyon Road	Kern County	UP
33	Neumarkel Road – Landfill	Kern County	UP
34	Union Avenue	Kern County	SJVR
35	Williamson Road	Kern County	UP
36	Wible Road	City of Bakersfield	SJVR
37	Tulare Street	City of Bakersfield	BNSF
38	Burbank Street	Kern County	BNSF
39	Q Street	City of Bakersfield	UP
40	Ashe Road	City of Bakersfield	SJVR



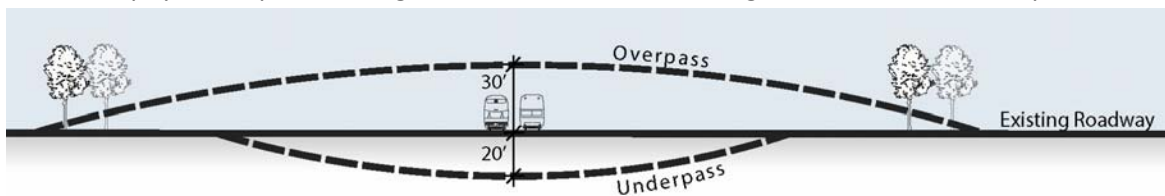
## GRADE SEPARATION CONCEPTS

Each of the 40 screened railroad crossings were field reviewed to determine how a grade separation might be used to improve safety and reduce delays. In several instances the crossings were interrelated to nearby crossings and a systems approach was employed to address the area needs for grade separations. The viability, desirability and best strategy for grade separations at each of the 40 crossings will benefit from public and stakeholder inputs, including inputs from the freight railroads and high speed rail authority. The following grade separation concepts are intended to begin discussion of the best strategies and to provide order of magnitude cost estimates for programming purposes.

Concepts for the 40 crossings are described within the context of the prioritization ratings:

- High Priority
- Medium Priority
- Low Priority
- Other

Conceptual drawings for the High and Medium priority crossing are included in Appendix B. Concepts for potential grade separations assumed either an overpass or underpass structure to create the physical separation. Figure 13 shows the basic configuration of these assumptions.



**Figure 13: Basic Grade Separation Concept**

In general, underpasses would require the road to be depressed about 18-20 feet for traffic clearance and structures. About 300 feet of transition ramping would be required to achieve the 18-foot grade change. Pedestrian and bicycles could be depressed only 15 feet and grades for pedestrians and cyclists could be flatter. ADA requirements generally limit sidewalk grades to five percent. Figure 14 shows an example of a grade crossing with different elevations for vehicles and bikes/pedestrians.



**Figure 14: Underpass with Bike and Pedestrian Separation**

The H Street underpass in Downtown Bakersfield has transitions of about 300 feet. For overpasses the roadway pavement would be about 30 feet (24 feet clearance plus six feet of structure minimum) above the rail tracks for train clearance and structures. About 600 feet of transition ramping would be required for these overpasses. The Oak Street overpass that is located near downtown Bakersfield has transitions of about 600 feet.

Railroads prefer overpasses to underpasses as they tend to be less disruptive to operations during their construction. Overpasses also tend to be more economical to construct. Key variables in grade separation costs relate to the right-of-way acquisition needs, replacement property access needs and for underpasses utility relocation and hazmat costs. Underpasses typically involve provision of temporary tracks to maintain rail operations during the construction process.

## GROUP A – HIGH PRIORITY

### Morning Drive (SR 184)

*High Priority*Estimated Cost: **\$ 20 M**

This crossing is located east of downtown along the UP main line and is adjacent to the Edison Highway. Breckenridge Road is located about 1,000 feet to the north of the crossing and Brundage Lane is located about 1,000 feet to the south of the Edison Highway. The GBSGD has developed a simple overcrossing concept for this crossing. The overcrossing would be about 1,600 feet in length. Local access would be provided by two new streets – a frontage road on the west side north of the tracks and a linkage road to Edison Highway on the west side south of the tracks. The Morning Drive grade separation is included in the Regional Transportation Plan list of financially unconstrained projects for \$69 million. The GBSGD estimates the cost of this improvement at \$20 million. The \$20 million cost estimate appears reasonable.

### Kratzmeyer Road

*High Priority*Estimated Cost: **\$ 17 M**

The Kratzmeyer Road crossing is located in a rural area. Kratzmeyer Road does not connect directly to I-5, but does connect via Olive Drive to SR-99. Olive Drive is rapidly developing towards this crossing and includes a new high school. The GBSGD envisions a simple overpass with landings located about 1,000 feet from the rail tracks. It appears that a new street connection is proposed for the southwest quadrant of the SR-43 intersection in the proposed concept. Refinement issues include the design speed for the overcrossing which impacts its length (and cost) and whether the overcrossing could be constructed in the current right of way either by construction closing of the crossing or provision of a temporary crossing. A grade separation is included in the Regional Transportation Plan for this crossing with an estimated budget of \$59 million. A more recent cost estimate developed by the GBSGD suggests a cost of \$17 million. It is a simple crossing, and \$17 million appears a valid estimate.

**Comanche Drive***High Priority*Estimated Cost: **\$ 25 M**

Comanche Drive crossing of the UPRR main line tracks is adjacent to the Edison Highway in a rural area. Comanche Drive is envisioned to become part of the region loop circulation system in the future. A simple 1,300 foot overpass could be constructed to connect over the rail tracks and Edison Highway. The two complicating issues for this grade separation projects relate to location decisions regarding high speed rail and to the proximity of the SR-58 interchange. The vision of Comanche Drive as a major regional highway raises issues about rebuild of the SR-58 interchange and closely spaced traffic signals. The suggested grade separation concept is an overpass of the railroad with Edison Highway being raised to a signalized intersection.

The Comanche crossing is on the RTP's list of grade separation projects for \$59 million. As part of the Bakersfield Loop this overcrossing will likely be a four-lane facility. A cost of \$25 million is estimated for this crossing.

**Rosedale Highway (SR 58)***High Priority*Estimated Cost: **\$ 60 M**

The Rosedale Highway crossing is not located along BNSF's main line tracks. Rosedale Highway (SR 58) however is a very busy arterial street. The GBSGD developed an undercrossing concept for this crossing which shifts the highway to the South and adds local access loop road to both the east and the west sides of the track. Issues for this crossing are the need for direct Rosedale Highway access for impacted properties versus "rear site access" and the design speed of the crossing. As Rosedale Highway is a major state roadway, a longer undercrossing with gentler slopes seems indicated (Mohawk to Case Street). Opportunities appear to exist for additional right-of-way on the south side, but these would only be needed for construction staging or in the event rear site access proves infeasible. The GBSGD estimates the cost for this project at \$23 million. This estimate seems low for a four lane higher speed undercrossing. Right-of-way and hazmat issues are largely unknown and could substantially increase costs. An estimate of \$60 million is proposed for this crossing.

**Lerdo Highway***High Priority*Estimated Cost: **\$ 25 M**

The Lerdo Highway crossing is located in the center of Shafter and is surrounding by development. An overpass is envisioned for this crossing with its landings located near the intersection of James Street and a point about 200 feet west of Elm Street. The James Street-Euclid Street connection would be improved to maintain local circulation. Sufficient right-of-way appears available to include a one-way westbound frontage road adjacent to the overpass between Elm and Mannel Avenue, if desired. This crossing is included in the RTP's list of grade separation projects for \$69 million. A four-lane overcrossing is estimated to cost \$25 million.

## Kimberlina Road

High Priority

Estimated Cost: \$ 17 M

The Kimberlina Road crossing of the BNSF main line is located in a rural area. Kimberlina Road connects to SR-99, but not directly with I-5. A simple overcrossing of the railroad appears possible with a local street constructed in the northeast (Wasco Road) and southwest quadrants to maintain local street connections to SR-43 which would also overpass SR-43. It might reduce the project costs if the irrigation district facilities could be relocated and SR-43 realigned adjacent to the track. This crossing is included in the Regional Transportation Plan for a grade separation at \$59 million. A two-lane overpass is estimated to cost \$17 million.

## Merced Avenue

High Priority

Estimated Cost: \$ 17 M

The Merced Avenue crossing is located in a rural area. Merced Avenue connects to SR-99 but not to I-5. A small residential subdivision exists in the southwest quadrant of the Merced SR-43 intersection. An overpass of the BNSF tracks is envisioned. To maintain access and provide for local circulation needs a new street would be constructed on the south and west of the subdivision. A simple two-lane overpass is estimated to cost \$17 million.

## East Truxton Avenue (includes Sonora, Tulare, Baker and Sumner/Miller)

High Priority

Estimated Cost: \$ 65 M

These five crossing are all located near each other. The Tulare and Baker Street crossings only have 20 feet of space between the tracks and Truxton Avenue. The GBSGD developed a trestle concept that would raise the double track rail main line above Baker and Truxton, and close the Sonora, Tulare and Gage Street crossings. Sumner would remain as an at-grade crossing. This concept retains important circulation connections at Baker and Beale Street intersections.

Railroads, however, tend not to like trestle solutions, and a costly temporary track connection would probably need to be constructed for maintenance of rail operations during construction of the trestle. Railroads would very much like to eliminate four at-grade crossings, and this concept should be explored with the railroads and community (noise and visual impacts).

Another strategy would be to realign Truxton above Sumner and connect it to the Beale Street overcrossing. The eastern end of Truxton would be connected to the southern portion of Beale Street and the current Beale and Tulare Street at-grade crossings would be closed. It would also be possible to connect the southern part of Baker Street to the northern portion of Beale Street via a Baker to Truxton underpass. Truxton Avenue's through traffic lanes would be "flared out" and an underpass portal with one lane in each direction would be nested between the through traffic lanes. Lastly, the Sonora at-grade crossing could be closed if a new traffic signal were installed on Union Avenue to accommodate left turns from westbound Truxton to southbound Union Avenue. Most of the traffic using the Sonora crossing is making this left turn to go southbound onto Union Avenue or to reach the large office complex located at Sonora and Union Avenue (new signal would accommodate both of these demands). Truxton overcrossing columns would complicate accommodation of all possible movements at the new signal.

The Beale Street crossing is on the Regional Transportation Plan's list of grade separation projects for \$69 million. Costs to construct the Truxton extension above Sumner Street and enhance the Beale Street overcrossing are estimated at \$40 million. Costs to construct the Truxton to Baker underpass are estimated at \$25 million. As such the total for the Sumner street viaduct and the trestle concept are about the same, but Gage Street could remain open. The Tulare Street crossing probably should be closed. Installation of a new traffic signal on Union Avenue would add about \$500,000 to the project costs.

### **Baker Street**

*High Priority*

*See East Truxton Avenue crossing description (high priority) which includes Baker Street, Sumner/Miller, Sonora and Tulare crossings)*

### **Rosamond Boulevard**

*High Priority*

Estimated Cost: **\$ 30 M**

The Rosamond Boulevard crossing is located about 150 feet to the east of the Sierra Highway intersection. Rosamond is a multilane arterial street that leads to the Edwards Air Force Base. A 1,200 foot overcrossing is suggested, beginning about 300 feet west of Sierra Highway (near Diamond Street) and terminating about 600 feet east of the railroad tracks (near Lincoln Street). 20<sup>th</sup> Street and Locust Street would be improved to maintain traffic interchanges between Rosamond Boulevard and Sierra Highway. This crossing is included in the Regional Transportation Plan's list of grade separation projects for \$69 million. A cost of \$30 million is estimated for this overcrossing.

## **GROUP B – MEDIUM PRIORITY**

### **Sumner / Miller Street**

*Medium Priority*

*See East Truxton Avenue crossing description (high priority) which includes Baker Street, Sumner/Miller, Sonora and Tulare crossings)*

### **Vineland Road (includes Pepper Drive)**

*Medium Priority*

Estimated Cost: **\$ 20 M**

These two crossings are located near each other (1.5 miles) along the Edison Highway. Vineland Road serves residential developments and has an overcrossing of SR-58 just to the south of Edison Highway. Pepper Drive primarily serves an agricultural business and while it is near Edison Road's SR-58 interchange it does not directly connect to it nor does it go very far to the north. It "Ts" into Edison Highway. Development of a grade separated crossing serving the Edison freeway connection is not possible. It is questionable how effective a grade separate crossing would be at Pepper Drive due to the nature of the adjacent businesses. In many ways the Pepper Drive crossing serves as almost a private driveway. For these reasons and the difficulty finding a good landing for a grade separation south of the Edison Highway at Pepper Drive, the investment at Vineland seems more promising. At Vineland Road an overcrossing is envisioned that would begin about 600 feet south of the Edison Highway and terminate about

600 feet north of the rail tracks. Local circulation could be improved by connecting Nathan Street to Brundage Lane. Costs are estimated at \$20 million.

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**Olive Drive***Medium Priority*Estimated Cost: **\$ 50 M**

The Olive Drive crossing of UP's main line tracks is located near its SR-99 interchange and in a developed urban area. The northbound ramps are about 900 feet from the crossing and the Roberts Lane intersection is about 100 feet from the crossing. An irrigation canal runs just to the north of Olive Drive. The GBSGD has developed an overcrossing concept for this crossing. The overcrossing would begin at the northbound ramp intersection and would terminate 1,000 feet east of the rail tracks. Local access streets would be provided north and south of Olive Drive east of Roberts Lane. Refinements might include realignment of Roberts Lane westward closer to the tracks to minimize the overcrossing length, consideration of an underpass to lessen property access impacts, and shifting the concept north onto the Caltrans site to avoid impacting the shopping complex. The Olive Drive crossing is on the RTP's list of rail grade separations for \$69 million. More recent cost estimates developed by the GBSGD indicate a cost of \$25 million. Right-of-way costs are a major unknown for this project and probably will push the total costs up to \$50 million.

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**Tehachapi Boulevard / Old State Highway***Medium Priority*Estimated Cost: **\$ 15 M**

This crossing is skewed and located near a cement plant. Speed limit is reduced to 30 mph for this tight "s" traffic movement. A 1,300 overcrossing is envisioned. A cost of \$15 million is estimated for a two lane overpass. A driveway access link would be provided as part of this concept.

---

**Reina Road (includes Renfro Road)***Medium Priority*Estimated Cost: **\$ 18 M**

The Reina crossing is located in a rural area adjacent to SR 43. Reina Road is located a half mile south of Kratzmeyer Road. Reina Road does not connect directly with either I-5 or SR-99. The GBSGD has developed a grade separation undercrossing concept for Renfro Road near Reina Road. It is understood that this Renfro crossing would replace the current Reina crossing. A lower cost separation concept for Renfro Road is for a 2,000 foot long overpass with new connecting streets developed on the south side of the tracks. Refinement issues include perhaps using a slower speed steeper grade for the overcrossing and having only one connecting street rather than the two that have been suggested. The Renfro crossing is on the RTP's list of grade separation projects for \$59 million. The GBSGD has estimated the cost to be \$18 million.

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**Dennison Road***Medium Priority*Estimated Cost: **\$ 25 M**

This crossing is one of three crossings along the UPRR main line tracks in Tehachapi. Dennison Road and Mill Street are the two major streets that connect to SR-58 freeway. Hayes and Green Streets are local street connectors in the downtown area.

An underpass at Dennison is suggested to avoid clear zone aviation requirements for the airport. The underpass would begin about 300 feet south of Tehachapi Boulevard and terminate at Goodrick Drive. The underpass is estimated to cost \$25 million. Local access would need to be improved with short new local street connections.

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**Arroyo Avenue***Medium Priority*Estimated Cost: **\$ 22 M**

This crossing is located on the north side of the City of Mojave, just to the north of Business 58's junction with SR-14 (near the Mojave Airport). It is the only crossing of the tracks for two miles northward and 0.7 miles southward. Arroyo Avenue functionally "Ts" into Business 58 about 100 feet east of the crossing at an un-signalized intersection. On the east side of the intersection a right-of-way connects to SR-14 through what appears to be a private business. The connection extends to SR-14 about 1,500 feet to the east. The proposed concept is to construct an overcrossing beginning about 600 feet west of the tracks and terminating about 600 feet east of Business 58 on an alignment just to the south of current development and connecting to SR-14 opposite from the driveway into Stater Bros Market. The current private driveway from Business 58 could be maintained. The private driveway onto SR-14 desirably should be realigned to tie into the extension of Arroyo Avenue. With access to SR-14 traffic interchanges to Business 58 could be via the current Business 58 signalized intersection. A two-lane overcrossing is estimated to cost \$22 million.

---

**N. Green Street***Medium Priority*Estimated Cost: **\$ 25 M**

This crossing is also one of three crossings along the UP main line tracks in Tehachapi. An underpass is proposed for Mill Street in lieu of N. Green Street. The underpass would begin near City Dump Drive and terminate at E Street. A two-lane underpass is estimated to cost \$25 million.

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**Snow Road***Medium Priority*Estimated Cost: **\$ 30 M**

This crossing is located in an industrial area along the UP main line tracks. The GBSGD has developed a grade separation concept for this crossing that includes a new SR-99 interchange. It is unclear if this new interchange has Caltrans's approval. To accommodate the new interchange SR-99 would be realigned to the east of its current alignment. The un-signalized Golden State Highway intersection is located very close to the Snow Road rail crossing. It would appear that the concept would work without the new interchange and realignment of SR-99. The overcrossing would have about 600 feet of length for the transition to grade on both sides of the UP tracks. The eastern terminus intersection of the overcrossing with Pegasus Drive would be very close to the current Unicorn Road intersection. While it might be possible for Unicorn Road to be realigned to intersect the Snow Road extension opposite from the northbound freeway ramp intersection, Caltrans generally frowns upon local street intersections opposite from freeway ramps.

A cost of \$75 million has been estimated for this project by the GBSGD. Most of this cost is associated with the new freeway interchange with \$25million to \$30 million probably for the grade separation itself. A two-lane overcrossing is estimated to cost \$25 million, and a wider four-lane overcrossing needed to complement the new interchange is estimated to cost \$30 million. These costs do not include realigning SR-99 or the new interchange.

## Cecil Avenue

Medium Priority

Estimated Cost: \$ 30 M

The railroad tracks are about 300 feet from the SR-99 northbound ramps and about 100 feet from High Street. An underpass requires about 300 feet of ramping transition. The options for a Cecil Avenue underpass are:

- Grade separate Cecil under the railroad tracks and under a realigned High Street. This would be a two-lane underpass beginning west of Glenwood Street and ending at Main Street. High Street would be realigned closer to the railroad tracks to shorten the undercrossing needs. One way frontage roads would be constructed at-grade, adjacent to the underpass, to maintain some access into local properties. A turn back loop could be provided for the one-way frontage road west of the railroad tracks. On the east side of the tracks, frontage road motorists would need to U-turn at the at-grade High Street intersection (reconfigured into a “T” intersection). If possible, Main Street would be realigned to have a single intersection with Cecil.
- Grade separate only the east-west through traffic movement and leave the local access traffic at-grade. A two-lane underpass is envisioned for this concept and about 30 feet of additional right-of-way would need to be acquired along the south side of Cecil Avenue. The UPRR would not favor this concept, nor would it compete well for state funding, but it would retain important property access and local street connections.

It is possible that a grade separation could be provided at a nearby location, but it is unlikely that this crossing would be heavily used. Traffic using the crossing is primarily oriented to the nearby SR-99 freeway ramps and also turns to/from High Street. A two-lane undercrossing just eliminating through traffic from the crossing is estimated to cost \$30 million.

## GROUP C – LOW PRIORITY

### Pepper Drive

Low Priority

*See Vineland Road (medium priority) which includes Pepper Drive*

### Hayes Street

Low Priority

Estimated Cost: \$ 20 M

This crossing is the third crossings along the UP main line tracks in Tehachapi. An overpass is proposed Snyder Avenue in lieu of Hayes. It would begin on H Street near Hayes and terminate on Snyder near E Street. Snyder between F Street and Tehachapi would remain open. A two-lane overpass is estimated to cost \$20 million.

**Bealville Road***Low Priority*Estimated Cost: **\$ 15 M**

This crossing is in a rural area and serves light traffic volumes. A 1,300 foot overcrossing is envisioned for this crossing. Minor improvements would need to be made to maintain property access and access to the service road. A cost of \$15 million is estimated.

**Garces Highway (SR 155)***Low Priority*Estimated Cost: **\$ 25 M**

The railroad tracks are located about 200 feet from High Street and Glenmont Streets and about 500 feet from Fremont and Main Streets. An underpass of the railroad could be constructed, but would close High Street and Glenmont Street. Sufficient right-of-way exists for a two-lane underpass. This crossing is listed in the Regional Transportation Plan's unconstrained list of grade separation improvement projects for \$39.5 million. A simple two-lane underpass likely could be constructed for \$25 million.

**Peterson Road***Low Priority*Estimated Cost: **\$ 15 M**

The Peterson Road crossing is located along the BNSF main line in a rural area adjacent to SR-43. Peterson Road does not connect to I-5, but does extend to a frontage road for SR-99. An agricultural business is located on the southeast quadrant of the SR-43 intersection. The railroad tracks are about 50 feet to the west of SR-43. Accident history led to this crossing being screened to the neediest 40 crossings, and reportedly the crossing protection has subsequently been upgraded addressing the safety problem. This crossing does not appear to merit further consideration for grade crossing investment. A simple overcrossing however, would be easy to construct in this relatively undeveloped area. A cost of \$15 million is estimated for this two-lane overpass.

**L Street (includes N Street)***Low Priority*Estimated Cost: **\$ 25 M**

Currently H Street, Chester Street and Q Street have underpasses of the BNSF yard downtown. High speed rail is planned as an elevated structure downtown roughly located above the BNSF tracks. While the major streets Truxton and California are located some distance from the tracks, important driveways and 14<sup>th</sup> Street property access is very near to the tracks. An underpass is the only option for these two crossings. In fact, the Rabobank Arena has a truck entry driveway immediately adjacent to the rail tracks. The parking garage south of the Kern County Superior Court also has its N Street driveway about 150 feet from the rail tracks.

It is recommended that only one of these two crossings (L or N Street) be grade-separated. These access issues suggest that L Street would be an easier street to grade separate even though it is narrower than L Street. A concept similar to the H Street underpass would be used. A cost of \$25 million is suggested.

Alternatively, transition ramps to the underpass could be constructed on 14<sup>th</sup> and 16<sup>th</sup> Streets with sharp turns onto N Street. A cost of \$30 million is proposed for this underpass concept.

### Caliente Bodfish Road

Low Priority

Estimated Cost: \$ 15 M

This crossing is on a horseshoe segment of the UP main line. Traffic seems very light on this crossing. A 1,300 foot overcrossing is envisioned connecting across the tracks. J Street would need to be extended to connect with the northern landing of the overcrossing. A cost of \$15 million is estimated.

### Gosford Road

Low Priority

Estimated Cost: \$ 40 M

Gosford Road transitions into Coffee Road to the north. Near the rail crossing, Gosford Road is at the hub of a retail development. Pacheco Road is located about 100 feet south of the crossing. An underpass is suggested to minimize property access impacts. A six-lane underpass would begin at the Walmart driveway and terminate at the Home Depot driveway. The Pacheco intersection would either be lost or relocated closer to the tracks on top of the underpass. Costs are estimated at \$40 million. For approximately \$100,000, the current median could be extended for safety and quiet zone purposes.

### Sonora Street

Low Priority

*See East Truxton Avenue crossing description (high priority) which includes Baker Street, Sumner/Miller, Sonora and Tulare crossings)*

### N Street

Low Priority

*See L Street crossing description (low priority) which includes N Street*

## GROUP D – OTHER

### Patterson Road

Other

Estimated Cost: \$ 15 M

The Patterson crossing is located south of Rosamond in an undeveloped part of the county. Patterson functions as a local access street for a few industrial properties and does not connect to SR-14. It goes about a half mile east and west of the rail tracks. This crossing does not appear to merit consideration for a grade separation. A two-lane overcrossing would cost about \$15 million.

### Cameron Canyon Road

Other

Estimated Cost: \$ 15 M

This crossing is in a rural area along a curved section of UP main line. The northern traffic approach to the crossing includes a sharp bend. Only about 400 feet of width is available between the railroad tracks and SR-58 freeway to land on the north side. A 1,200 foot

overcrossing could either be built on the existing alignment with a sharp bend on the north side of the tracks, or a diagonal crossing could be built on new right-of-way. As this is a low volume street, a sharp bend seems the lower cost approach. A cost of \$15 million is estimated for the overcrossing.

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**Neumarkel Road***Other*Estimated Cost: **\$ 15 M**

This crossing is adjacent to the Edison Highway (Bena Road) and serves a large landfill. Most of the traffic seems oriented to/from the west and includes many pickup trucks and vehicles with trailers. If this crossing merits investment in a grade separation it would be a very simple overpass connecting between the east and westbound Edison Highway to the west and the land fill to the east. Through traffic on Edison Highway would be routed to the right of the land fill ramp, and local access to the property to the south would be realigned to intersect Edison Highway at a nearby location. The overcrossing would be about 1,500 feet long for slow speed traffic. About 1,000 each side of the ramp, Edison Highway would need to be modified to accommodate the center median western oriented ramps. A U-turn jughandle would be provided a half mile west of Neumarkel Road for land fill traffic to/from the east. A cost of \$15 million is estimated.

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**Union Avenue***Other*Estimated Cost: **\$ 30 M**

The Union Avenue crossing is located along the SJVR Buttonwillow Subdivision near the Ming Avenue intersection. The tracks cross the intersection diagonally. The Kern County Fairgrounds are located in the northwest quadrant of the intersection. It appears possible to construct an overpass of the railroad for Union Avenue. In order to maintain all of the convenient circulation connections to/from Ming Avenue, however, Ming Avenue would also need to be raised above the tracks in an elevated intersection. Property immediately around the intersection would lose access. This could be mitigated somewhat by constructing a few new rear access streets. Some client spur tracks are located near the Union Avenue crossing that would complicate lowering the tracks. This concept is estimated to cost \$70 million. An option would be to only grade separate Union Avenue and retain Ming Avenue. This concept is estimated to cost \$30 million.

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**Williamson Road***Other*Estimated Cost: **\$ 15 M**

This crossing is located adjacent to Tehachapi Boulevard in a rural area. Williamson road serves a utility substation and a concrete plant. Traffic is very light and the property access makes it look questionable whether a grade separation at this location would be effective. If built, the overpass would cost about \$15 million.

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**Wible Road***Other*Estimated Cost: **\$ 25 M**

The Wible crossing is located along SJVR's Buttonwillow Subdivision in the Auto Row area. It is located immediately adjacent to the Pacheco Road intersection. A four-lane overcrossing of the tracks is envisioned starting about 600 feet south of Pacheco Road and terminating about 1,300

feet to the north at Barber Street. Traffic interchanging between Wible Road and Pacheco Road would need to use Motor Center Drive and Gasoline Alley Drive. The property owners and public might not see the safety benefits justifying the disconnected intersection. A two-lane overcrossing would cost about \$25 million to construct. For safety and quiet zone purposes, the current median could be extended and upgraded for about \$100,000.

### Tulare Street

Other

*See East Truxton Avenue crossing description (high priority) which includes Baker Street, Sumner/Miller, Sonora and Tulare crossings)*

### Burbank Avenue

Other

Estimated Cost: **\$ 17 M**

This crossing is located adjacent to the Shafter Cemetery in a rural area. Burbank Street does not connect directly with I-5 or SR-99. Traffic volumes appear light. An overcrossing landing about 700 feet east and west of the tracks is envisioned for this crossing. The access driveway to/from the cemetery would need to be relocated, and a new connection would need to be provided in the southwest quadrant of the SR 43 intersection for local circulation needs. A grade separation is included in the RTP for \$59 million. A two-lane overcrossing is estimated to cost \$17 million.

### Q Street

Other

Estimated Cost: **\$ 25 M**

The Q Street crossing is located along the UP main line tracks. The crossing is located about 300 feet from the Golden State Avenue, 150 feet from the Espee Avenue and 400 feet from the 28<sup>th</sup> Street intersections. An off ramp from SR 178 overpasses Q Street just to the south of the overcrossing, indicating that any grade separation would need to be an underpass. An underpass between Golden State Avenue and 28<sup>th</sup> Street is therefore the proposed concept. A grade separation is included in the Regional Transportation Plan's unconstrained list of projects for \$59 million. A simple two-lane underpass is estimated to cost \$25 million.

### Ashe Road

Other

Estimated Cost: **\$ 20 M**

Ashe Road crosses the SJVR's Buttonwillow Subdivision tracks about a half mile north of Harris Road and a half mile south of White Lane. District Boulevard is the nearest intersection 700 feet north of the crossing. A four-lane overcrossing of the tracks is envisioned beginning about 600 feet south near a new road (Woodman) and ending at District Boulevard. The overcrossing is estimated at \$20 million. For about \$100,000, the current median could be extended and upgraded for quiet zone and safety purposes.

## FUNDING SOURCES

Funding for roadway-rail grade separation projects is available from a number of sources. Table 16 list the most popular sources at the federal, state, and local levels.

**Table 16: Grade Separation Funding Sources**

Name	Source	Administered By <sup>1</sup>	Program Share / Local Share
SAFETEA-LU: Projects of National and Regional Significance (PNRS)	Federal	FHWA	80% / 20%
SAFETEA-LU: Congestion Mitigation and Air Quality Improvement (CMAQ)	Federal	FHWA	80% / 20%
SAFETEA-LU: Surface Transportation Program (STP)	Federal	FHWA	80% / 20%
Proposition 1B Bond Initiative	State	CTC	50% / 50%
CPUC Section 190 Grade Separation Fund	State	Caltrans	80% / 20%
Greater Bakersfield Separation of Grade District Fees	Local	GBSGD	100%/ 0%
Transportation Impact Fees	Local	Local Governments	varies

1. FHWA – Federal Highway Administration, CTC – California Transportation Commission, Caltrans – California Department of Transportation, GBSGD - Greater Bakersfield Separation of Grade District

### SAFETEA-LU: PROJECTS OF NATIONAL AND REGIONAL SIGNIFICANCE (PNRS)

PNRS are solicited by the Secretary of Transportation, and funding is awarded through a competitive process modeled on the Transit New Starts program. Projects are evaluated based on their ability to generate national economic benefits, reduce congestion, improve transportation safety, and maintain or protect the environment.

PNRS are typically large projects with large funding amounts and are earmarked annually under the federal transportation bill. This funding source is very uncertain, especially due to the unknowns surrounding the reauthorization of the federal transportation bill. The federal share is typically 80% of the total project cost.

### SAFETEA-LU: CONGESTION MITIGATION AND AIR QUALITY IMPROVEMENT (CMAQ)

CMAQ funds are provided for projects and programs in air quality nonattainment and maintenance areas for ozone, carbon monoxide and particulate matter which reduce transportation-related emissions. At-grade crossings where vehicles experience significant delay would be highest contenders for these funds. In addition, clearance improvements at crossings related to intermodal freight facility improvements could be used since freight facilities are eligible for these funds.

Similar to the other SAFETEA-LU funding sources, this source is very uncertain due to the unknowns surrounding the reauthorization of the federal transportation bill. The federal share is typically 80% of the total project cost.

### **SAFETEA-LU: SURFACE TRANSPORTATION PROGRAM (STP)**

STP is the federal program which provides flexible funding that may be used by state and local jurisdictions for any federal-aid highway, bridge, transit capital project and intracity and intercity bus terminal and facilities. Roadway-rail grade crossing improvements are eligible for these funds if the roadway is a federal-aid highway.

Similar to the other SAFETEA-LU funding sources, this source is very uncertain due to the unknowns surrounding the reauthorization of the federal transportation bill. The federal share is typically 80% of the total project cost.

### **CPUC SECTION 190 GRADE SEPARATION FUND**

Prop 1B, approved by the voters in 2006, created three new accounts worth \$3.25 billion in total which could be used to fund grade separation projects. The first account authorized \$2 billion to the Trade Corridors Improvement Fund (TCIF) which specifies eligibility for projects that separate rail lines from highway or local road traffic. The second account is the Highway-Railroad Crossing Safety Account (HRCSA) which allocated \$250 million for high-priority crossings on the CPUC statewide list. In Kern County, two crossings (7<sup>th</sup> Standard Rd/Santa Fe Way and Hageman Road/BNSF) received funding under this program during Part 1 of the 2008 adopted list. The final account includes another \$1 billion for goods movement projects that result in emission reductions. Grade separation projects may be eligible for this source as well.

### **PROPOSITION 1B BOND INITIATIVE**

The CPUC allocated \$15 million per year in state funds under Section 190 of the California Streets and Highways Code to fund new separations or improvements to existing crossings. The amount of funding for any one project is limited to \$5 million per year or one-third of the total fund (whichever is less), and the cumulative funding cannot exceed \$20 million. Funding is allocated based on the funding priority list generated by the CPUC. This list is updated every two years. In FY2010-2011, Kern County had the following eight crossing included: Morning Drive (#16), Olive Drive (#17), Lerdo Highway (#49), Kratzmeyer Road (#50), Snow Road (#66), East Truxton Avenue (#67), Rosedale Highway (#69), and Reina Road (#82).

The CPUC recommends that candidate project must be able to meet the following requirements, typically within two years of application:

- Design/final construction plan completed;
- Maintenance agreement established with the affected railroads;
- Environmental review completed;
- Authority to construct the project obtained from the CPUC; and
- Local funding share or remainder of the project cost must be procured.

The Caltrans share is up to 80%, but 5% or 10%<sup>9</sup> of the project cost must be paid by the railroad.

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<sup>9</sup> Actual percentage is based on whether project is federally funded.

## GREATER BAKERSFIELD SEPARATION OF GRADE DISTRICT FEES

The Greater Bakersfield Separation of Grade District receives approximately \$120,000 per year as its share of the 1% Special Districts' portion of local property taxes. The District uses these funds in its function of planning and initiating projects with local agencies and in pursuing funding from the State grade separation program and other various sources.

## TRANSPORTATION IMPACT FEES

Impacts from new development on the existing roadway infrastructure are paid through impact fees in the form of development extractions. Capital improvements such as grade separations which are required as mitigation to a transportation impact are eligible for these funds.

## SUMMARY

The total costs for each of the grade separation priority levels are shown in Table 17. Since some of the suggested separations include multiple crossings within one project, all crossings in these situations were assigned to the higher priority level. Thus, the higher priority levels tend to include a higher number of crossings in the cost estimates.

**Table 17: Cost Summary by Priority Level**

Priority Level	Estimated Cost (millions)	# of Crossings Included <sup>1</sup>
High	\$ 276	13
Medium	\$ 235	10
Low	\$155	8
Other	\$ 177	9

1. Some grade separation concepts suggest multiple crossings to be included as one project; thus more than 10 crossings may be included in each priority level. Lower priority crossings included with a higher priority crossing will be included in the higher level's cost estimate and not included in the lower level's cost estimate.

Implementation of grade separation improvements to the 40 high priority railroad crossings in Kern County will require a very substantial investment, well beyond current resources available to the County. Even targeting the 10 highest priority projects will challenge available funding resources. Thus, additional funding will need to be identified or traffic delays and safety risks will need to be tolerated. The Federal government will be addressing re-authorization of the transportation funding program in 2011. It is likely to be a six year funding program. The Re-authorization Bill will need to deal with many competing transportation interest. Increasing rail crossing safety funding tends not to a high priority.

Bakersfield could advocate for expanded federal funding for grade crossings. Budget resources at the State level are also stretched. Significant funding increases for rail grade separation projects therefore seem to fall mostly on local jurisdictions. The County might want to explore some forms of developer private sector funding as well as direct more local dollars to rail grade separations.

Kern COG should consider adding the high priority crossings to their RTP and local communities might want to consider the grade separation projects in their next general plan circulation element updates. Plans for high speed rail are progressing and the schedule for implementation and its alignment could also affect phasing of grade separation improvements.

## APPENDIX A: CROSSING SUMMARY SHEETS

*Presented alphabetically*

**Crossing Name:** Arroyo Avenue

**DOT Crossing ID:** 757244C

**CPUC Crossing ID:** 001B-379.40

**Jurisdiction**

**Unincorporated**

**RR Owner:**

**UP**

17

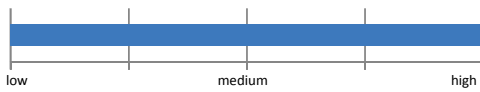
Prioritization Rating

### Crossing Information

**2010 Train Volume:** 38

(freight and passenger trains)

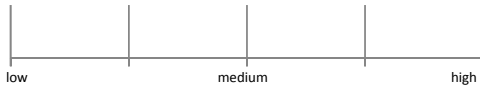
*Train Volume Score:* 20



**2010 Traffic Volume:** < 2,500

(estimated 2010 daily traffic)

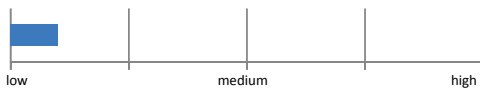
*Traffic Volume Score:* 0



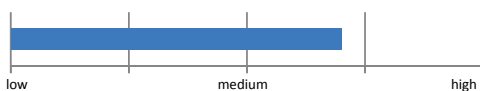
*Accident Score:* 0



*Crossing Delay Score:* 2



*Other Score:* 14



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** Ashe Road

**DOT Crossing ID:** 912096L

**CPUC Crossing ID:** 103BT-321.50

**Jurisdiction:** Bakersfield

**RR Owner:** SJVR

40

Prioritization Rating

### Crossing Information

**2010 Train Volume:** 6

(freight and passenger trains)

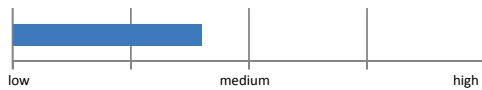
*Train Volume Score:* 2



**2010 Traffic Volume:** 12,477

(estimated 2010 daily traffic)

*Traffic Volume Score:* 8



*Accident Score:* 0



*Crossing Delay Score:* 4



*Other Score:* 6



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** Baker Street

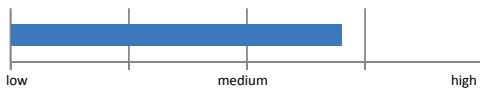
**DOT Crossing ID:** 028285V  
**CPUC Crossing ID:** 002-885.95  
**Jurisdiction:** Bakersfield  
**RR Owner:** BNSF

9

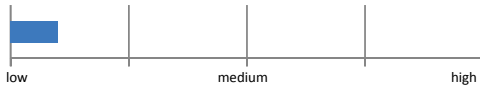
Prioritization Rating

### Crossing Information

**2010 Train Volume:** 26  
(freight and passenger trains)  
*Train Volume Score:* 14



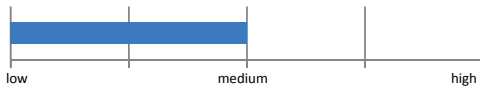
**2010 Traffic Volume:** 4,358  
(estimated 2010 daily traffic)  
*Traffic Volume Score:* 2



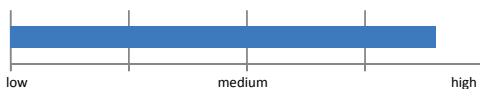
*Accident Score:* 0



*Crossing Delay Score:* 10



*Other Score:* 18



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** **Bealville Road**

**DOT Crossing ID:** **757430D**

**CPUC Crossing ID:** **001B-340-50**

**Jurisdiction**

**Unincorporated**

**RR Owner:**

**UP**

23

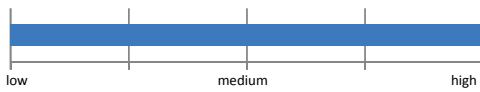
Prioritization Rating

### Crossing Information

**2010 Train Volume:** **38**

(freight and passenger trains)

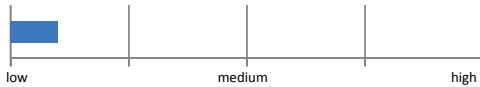
*Train Volume Score:* **20**



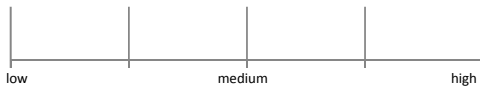
**2010 Traffic Volume:** **3,571**

(estimated 2010 daily traffic)

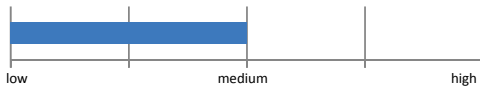
*Traffic Volume Score:* **2**



*Accident Score:* **0**



*Crossing Delay Score:* **10**



*Other Score:* **2**



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:**      **Burbank Street**

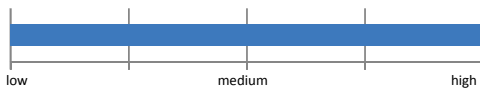
**DOT Crossing ID:**      **028383L**  
**CPUC Crossing ID:**      **002-902.30**  
**Jurisdiction:**      **Unincorporated**  
**RR Owner:**      **BNSF**

38

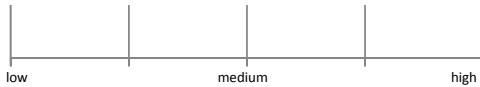
Prioritization Rating

Crossing Information

**2010 Train Volume:**      36  
(freight and passenger trains)  
*Train Volume Score:*      20



**2010 Traffic Volume:**      < 2,500  
(estimated 2010 daily traffic)  
*Traffic Volume Score:*      0



*Accident Score:*      0



*Crossing Delay Score:*      0



*Other Score:*      2



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** Caliente Bodfish Road

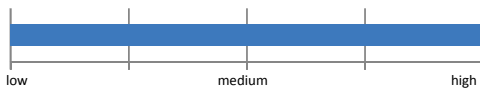
**DOT Crossing ID:** 757428C  
**CPUC Crossing ID:** 001B-335.50  
**Jurisdiction:** Unincorporated  
**RR Owner:** UP

27

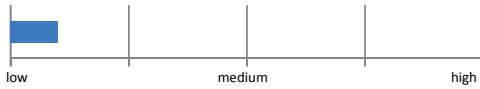
Prioritization Rating

### Crossing Information

**2010 Train Volume:** 38  
(freight and passenger trains)  
*Train Volume Score:* 20



**2010 Traffic Volume:** 3,598  
(estimated 2010 daily traffic)  
*Traffic Volume Score:* 2



*Accident Score:* 0



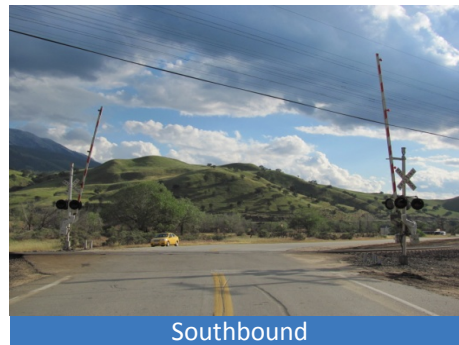
*Crossing Delay Score:* 6



*Other Score:* 2



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** Cameron Canyon Road

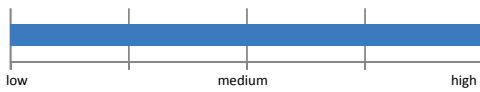
**DOT Crossing ID:** 757258K  
**CPUC Crossing ID:** 001B-369.20  
**Jurisdiction:** Unincorporated  
**RR Owner:** UP

32

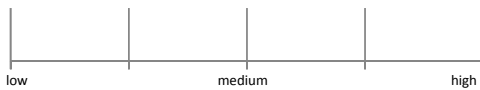
Prioritization Rating

### Crossing Information

**2010 Train Volume:** 38  
(freight and passenger trains)  
*Train Volume Score:* 20



**2010 Traffic Volume:** < 2,500  
(estimated 2010 daily traffic)  
*Traffic Volume Score:* 0



*Accident Score:* 2



*Crossing Delay Score:* 0



*Other Score:* 6



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** Cecil Avenue

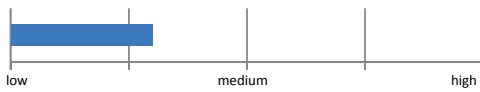
**DOT Crossing ID:** 757271Y  
**CPUC Crossing ID:** 001B-280.20  
**Jurisdiction:** Delano  
**RR Owner:** UP

20

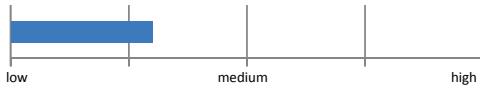
Prioritization Rating

### Crossing Information

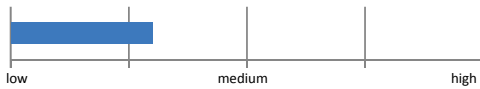
**2010 Train Volume:** 13  
(freight and passenger trains)  
*Train Volume Score:* 6



**2010 Traffic Volume:** 8,799  
(estimated 2010 daily traffic)  
*Traffic Volume Score:* 6



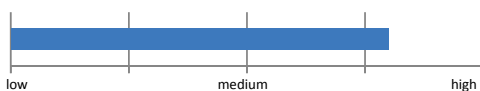
*Accident Score:* 6



*Crossing Delay Score:* 0



*Other Score:* 16



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** Comanche Drive

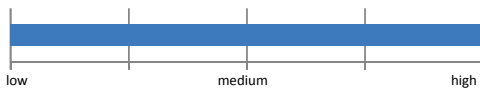
**DOT Crossing ID:** 757418W  
**CPUC Crossing ID:** 001B-321.70  
**Jurisdiction:** Unincorporated  
**RR Owner:** UP

3

Prioritization Rating

### Crossing Information

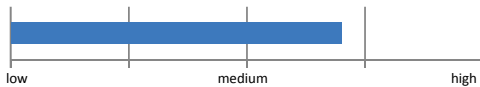
**2010 Train Volume:** 38  
(freight and passenger trains)  
*Train Volume Score:* 20



**2010 Traffic Volume:** < 2,500  
(estimated 2010 daily traffic)  
*Traffic Volume Score:* 0



*Accident Score:* 14



*Crossing Delay Score:* 2



*Other Score:* 14



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** **Dennison Road**

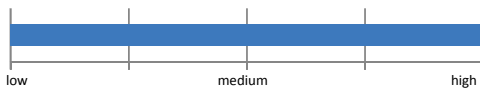
**DOT Crossing ID:** **757247X**  
**CPUC Crossing ID:** **001B-361.40**  
**Jurisdiction:** **Tehachapi**  
**RR Owner:** **UP**

16

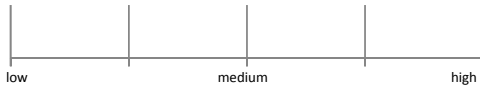
Prioritization Rating

### Crossing Information

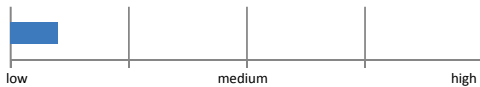
**2010 Train Volume:** **38**  
(freight and passenger trains)  
*Train Volume Score:* **20**



**2010 Traffic Volume:** **< 2,500**  
(estimated 2010 daily traffic)  
*Traffic Volume Score:* **0**



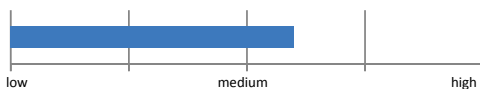
*Accident Score:* **2**



*Crossing Delay Score:* **2**



*Other Score:* **12**



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** East Truxtun Avenue

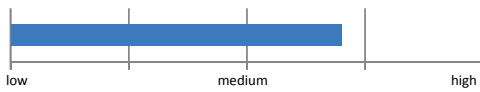
**DOT Crossing ID:** 028284N  
**CPUC Crossing ID:** 002-885.77  
**Jurisdiction:** Bakersfield  
**RR Owner:** BNSF

8

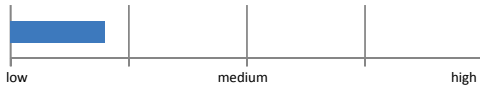
Prioritization Rating

**Crossing Information**

**2010 Train Volume:** 26  
 (freight and passenger trains)  
*Train Volume Score:* 14



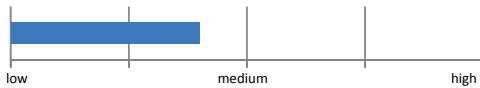
**2010 Traffic Volume:** 5,488  
 (estimated 2010 daily traffic)  
*Traffic Volume Score:* 4



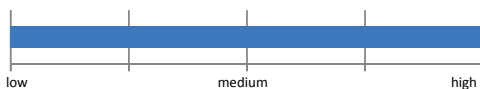
*Accident Score:* 0



*Crossing Delay Score:* 8



*Other Score:* 20



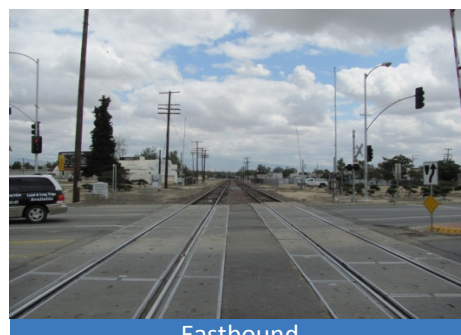
Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** Garces Hwy (SR 155) (Ex 4th Ave)

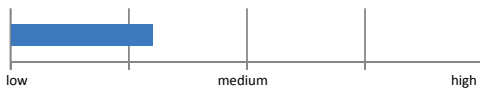
**DOT Crossing ID:** 757262A  
**CPUC Crossing ID:** 001B-281.20  
**Jurisdiction:** Delano  
**RR Owner:** UP

24

Prioritization Rating

### Crossing Information

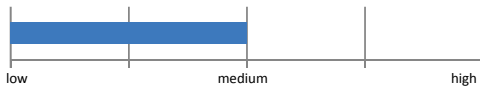
**2010 Train Volume:** 13  
(freight and passenger trains)  
*Train Volume Score:* 6



**2010 Traffic Volume:** 8,106  
(estimated 2010 daily traffic)  
*Traffic Volume Score:* 6



*Accident Score:* 10



*Crossing Delay Score:* 2



*Other Score:* 8



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** Gosford Road

**DOT Crossing ID:** 750966K

**CPUC Crossing ID:** 103BT-322.50

**Jurisdiction**

**Unincorporated**

**RR Owner:**

**SJVR**

28

Prioritization Rating

### Crossing Information

**2010 Train Volume:** 6

(freight and passenger trains)

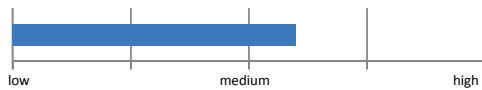
*Train Volume Score:* 2



**2010 Traffic Volume:** 24,186

(estimated 2010 daily traffic)

*Traffic Volume Score:* 12



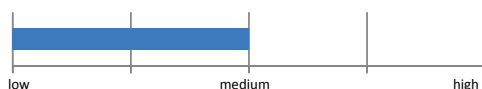
*Accident Score:* 2



*Crossing Delay Score:* 4



*Other Score:* 10



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** Hayes Street

**DOT Crossing ID:** 757246R

**CPUC Crossing ID:** 001B-360.90

**Jurisdiction:** Tehachapi

**RR Owner:** UP

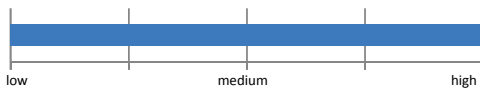
22

Prioritization Rating

### Crossing Information

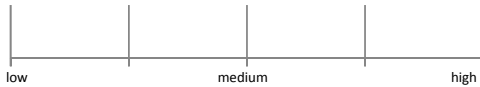
**2010 Train Volume:** 38  
(freight and passenger trains)

*Train Volume Score:* 20



**2010 Traffic Volume:** < 2,500  
(estimated 2010 daily traffic)

*Traffic Volume Score:* 0



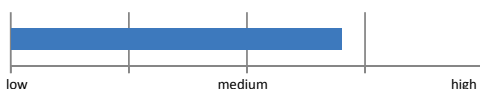
*Accident Score:* 0



*Crossing Delay Score:* 0



*Other Score:* 14



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** Kimberlina Road

**DOT Crossing ID:** 028397U

**CPUC Crossing ID:** 002-910.40

**Jurisdiction**

**Unincorporated**

**RR Owner:**

**BNSF**

6

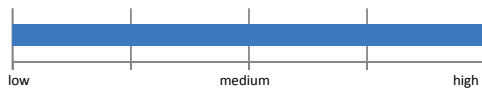
Prioritization Rating

### Crossing Information

**2010 Train Volume:** 36

(freight and passenger trains)

*Train Volume Score:* 20



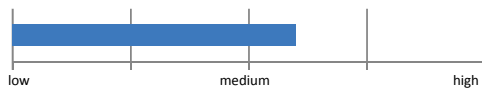
**2010 Traffic Volume:** 3,863

(estimated 2010 daily traffic)

*Traffic Volume Score:* 2



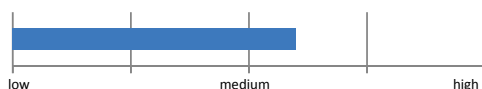
*Accident Score:* 12



*Crossing Delay Score:* 2



*Other Score:* 12



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** **Kratzmeyer Road**

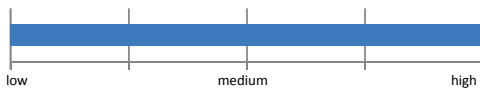
**DOT Crossing ID:** **028380R**  
**CPUC Crossing ID:** **002-897.30**  
**Jurisdiction:** **Bakersfield**  
**RR Owner:** **BNSF**

2

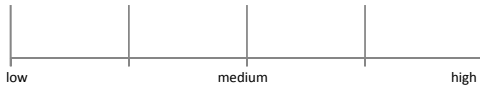
Prioritization Rating

### Crossing Information

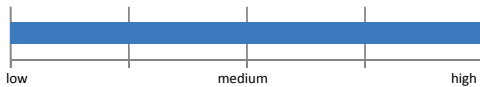
**2010 Train Volume:** **36**  
(freight and passenger trains)  
*Train Volume Score:* **20**



**2010 Traffic Volume:** **< 2,500**  
(estimated 2010 daily traffic)  
*Traffic Volume Score:* **0**



*Accident Score:* **20**



*Crossing Delay Score:* **0**



*Other Score:* **16**



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** L Street

**DOT Crossing ID:** 028354B

**CPUC Crossing ID:** 002-887.20

**Jurisdiction:** Bakersfield

**RR Owner:** BNSF

26

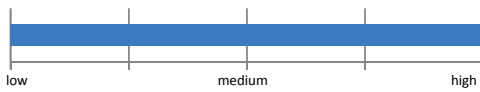
Prioritization Rating

### Crossing Information

**2010 Train Volume:** 38

(freight and passenger trains)

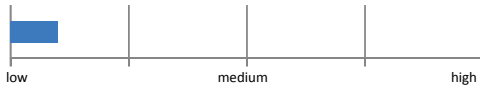
*Train Volume Score:* 20



**2010 Traffic Volume:** 3,097

(estimated 2010 daily traffic)

*Traffic Volume Score:* 2



*Accident Score:* 0



*Crossing Delay Score:* 2



*Other Score:* 8



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** Lerdo Highway

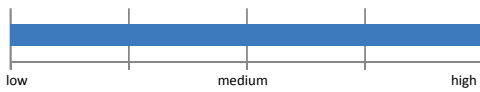
**DOT Crossing ID:** 028390W  
**CPUC Crossing ID:** 002-905.10  
**Jurisdiction:** Shafter  
**RR Owner:** BNSF

5

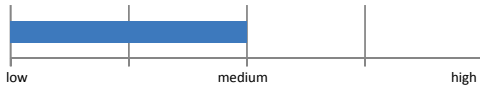
Prioritization Rating

### Crossing Information

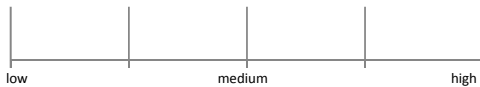
**2010 Train Volume:** 36  
(freight and passenger trains)  
*Train Volume Score:* 20



**2010 Traffic Volume:** 15,973  
(estimated 2010 daily traffic)  
*Traffic Volume Score:* 10



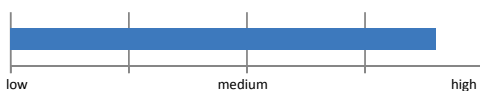
*Accident Score:* 0



*Crossing Delay Score:* 2



*Other Score:* 18



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** Merced Avenue

**DOT Crossing ID:** 028395F

**CPUC Crossing ID:** 002-908.00

**Jurisdiction**

**Unincorporated**

**RR Owner:**

**BNSF**

7

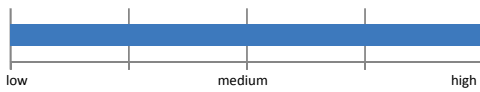
Prioritization Rating

### Crossing Information

**2010 Train Volume:** 36

(freight and passenger trains)

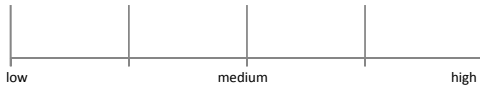
*Train Volume Score:* 20



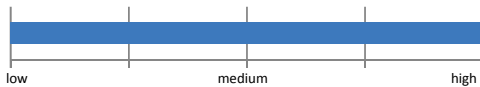
**2010 Traffic Volume:** < 2,500

(estimated 2010 daily traffic)

*Traffic Volume Score:* 0



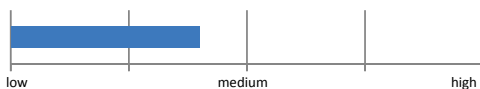
*Accident Score:* 20



*Crossing Delay Score:* 0



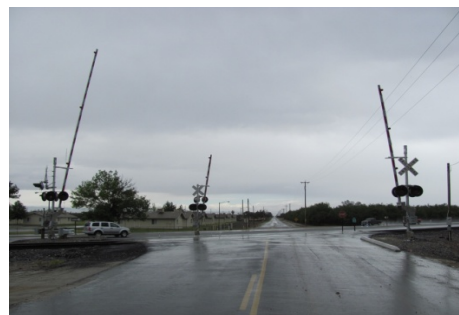
*Other Score:* 8



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** Morning Drive (SR 184)

**DOT Crossing ID:** 757413M

**CPUC Crossing ID:** 001B-317.50

**Jurisdiction**

**Unincorporated**

**RR Owner:**

**UP**

1

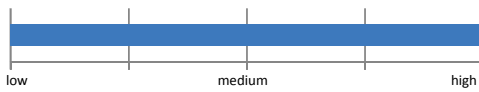
Prioritization Rating

### Crossing Information

**2010 Train Volume:** 38

(freight and passenger trains)

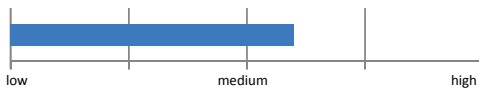
*Train Volume Score:* 20



**2010 Traffic Volume:** 21,743

(estimated 2010 daily traffic)

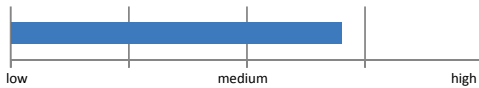
*Traffic Volume Score:* 12



*Accident Score:* 8



*Crossing Delay Score:* 14



*Other Score:* 16



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** N Street

**DOT Crossing ID:** 028351F

**CPUC Crossing ID:** 002-887.10

**Jurisdiction**

**Bakersfield**

**RR Owner:**

**UP**

30

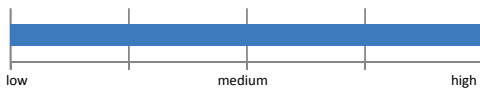
Prioritization Rating

### Crossing Information

**2010 Train Volume:** 38

(freight and passenger trains)

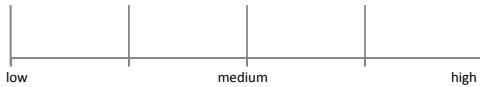
*Train Volume Score:* 20



**2010 Traffic Volume:** < 2,500

(estimated 2010 daily traffic)

*Traffic Volume Score:* 0



*Accident Score:* 0



*Crossing Delay Score:* 2



*Other Score:* 8



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** N. Green Street

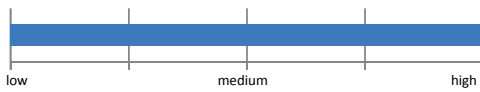
**DOT Crossing ID:** 757436U  
**CPUC Crossing ID:** 001B-360.50  
**Jurisdiction:** Tehachapi  
**RR Owner:** UP

18

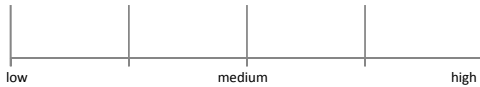
Prioritization Rating

### Crossing Information

**2010 Train Volume:** 38  
(freight and passenger trains)  
*Train Volume Score:* 20



**2010 Traffic Volume:** < 2,500  
(estimated 2010 daily traffic)  
*Traffic Volume Score:* 0



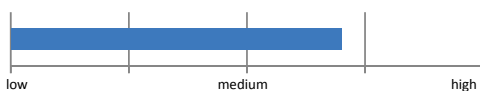
*Accident Score:* 0



*Crossing Delay Score:* 2



*Other Score:* 14



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** Neumarkel Road – Landfill

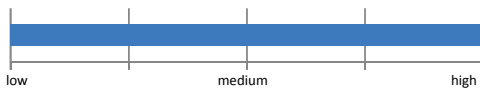
**DOT Crossing ID:** 757421E  
**CPUC Crossing ID:** 001B-324.80  
**Jurisdiction:** Unincorporated  
**RR Owner:** UP

33

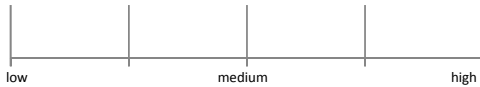
Prioritization Rating

Crossing Information

**2010 Train Volume:** 38  
 (freight and passenger trains)  
*Train Volume Score:* 20



**2010 Traffic Volume:** < 2,500  
 (estimated 2010 daily traffic)  
*Traffic Volume Score:* 0



*Accident Score:* 0



*Crossing Delay Score:* 0



*Other Score:* 8



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** Olive Drive

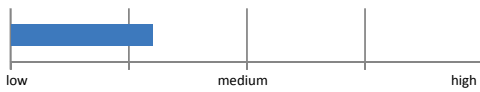
**DOT Crossing ID:** 756945M  
**CPUC Crossing ID:** 001B-308.90  
**Jurisdiction:** Unincorporated  
**RR Owner:** UP

13

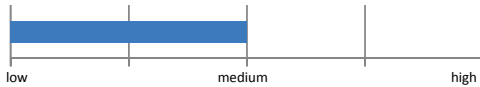
Prioritization Rating

### Crossing Information

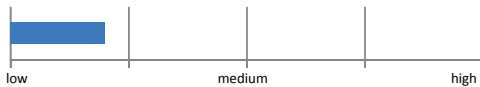
**2010 Train Volume:** 13  
(freight and passenger trains)  
*Train Volume Score:* 6



**2010 Traffic Volume:** 16,475  
(estimated 2010 daily traffic)  
*Traffic Volume Score:* 10



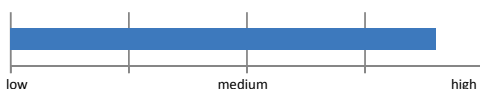
*Accident Score:* 4



*Crossing Delay Score:* 0



*Other Score:* 18



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** **Patterson Road**

**DOT Crossing ID:** **750636E**

**CPUC Crossing ID:** **001B-396.00**

**Jurisdiction**

**Unincorporated**

**RR Owner:**

**UP**

31

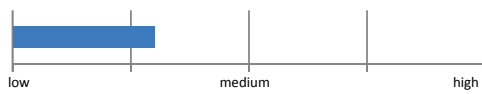
Prioritization Rating

### Crossing Information

**2010 Train Volume:** **12**

(freight and passenger trains)

*Train Volume Score:* **6**



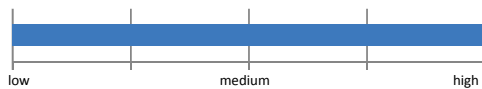
**2010 Traffic Volume:** **< 2,500**

(estimated 2010 daily traffic)

*Traffic Volume Score:* **0**



*Accident Score:* **20**



*Crossing Delay Score:* **0**



*Other Score:* **2**



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** **Pepper Drive**

**DOT Crossing ID:** **757416H**

**CPUC Crossing ID:** **001B-319.90**

**Jurisdiction**

**Unincorporated**

**RR Owner:**

**UP**

21

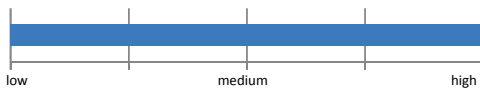
Prioritization Rating

### Crossing Information

**2010 Train Volume:** **38**

(freight and passenger trains)

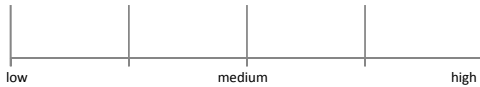
*Train Volume Score:* **20**



**2010 Traffic Volume:** **< 2,500**

(estimated 2010 daily traffic)

*Traffic Volume Score:* **0**



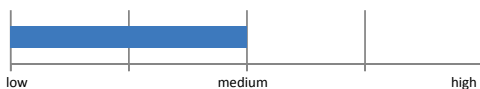
*Accident Score:* **2**



*Crossing Delay Score:* **2**



*Other Score:* **10**



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** Peterson Road

**DOT Crossing ID:** 028310B

**CPUC Crossing ID:** 002-920.50

**Jurisdiction**

**Unincorporated**

**RR Owner:**

**BNSF**

25

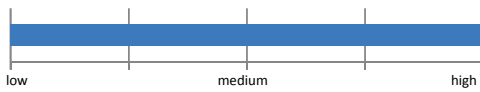
Prioritization Rating

### Crossing Information

**2010 Train Volume:** 36

(freight and passenger trains)

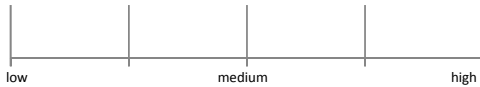
*Train Volume Score:* 20



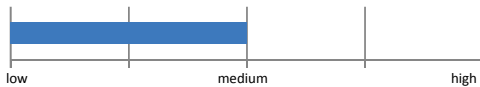
**2010 Traffic Volume:** < 2,500

(estimated 2010 daily traffic)

*Traffic Volume Score:* 0



*Accident Score:* 10



*Crossing Delay Score:* 0



*Other Score:* 2



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** Q Street

**DOT Crossing ID:** 757241G

**CPUC Crossing ID:** 001B-311.80

**Jurisdiction**

**Bakersfield**

**RR Owner:**

**UP**

39

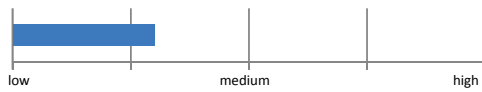
Prioritization Rating

### Crossing Information

**2010 Train Volume:** 13

(freight and passenger trains)

*Train Volume Score:* 6



**2010 Traffic Volume:** 5,888

(estimated 2010 daily traffic)

*Traffic Volume Score:* 4



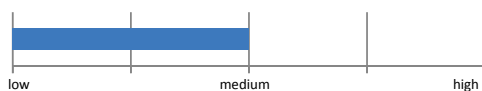
*Accident Score:* 0



*Crossing Delay Score:* 0



*Other Score:* 10



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** Reina Road

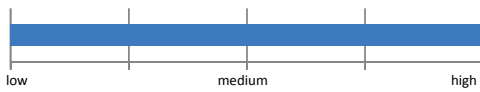
**DOT Crossing ID:** 028379W  
**CPUC Crossing ID:** 002-896.60  
**Jurisdiction:** Unincorporated  
**RR Owner:** BNSF

15

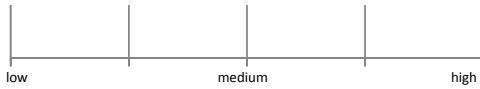
Prioritization Rating

### Crossing Information

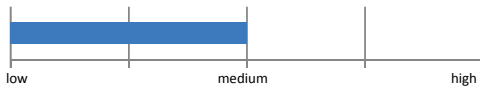
**2010 Train Volume:** 36  
(freight and passenger trains)  
*Train Volume Score:* 20



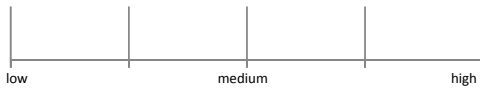
**2010 Traffic Volume:** < 2,500  
(estimated 2010 daily traffic)  
*Traffic Volume Score:* 0



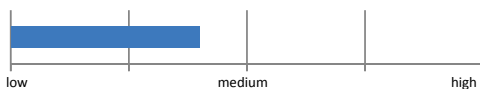
*Accident Score:* 10



*Crossing Delay Score:* 0



*Other Score:* 8



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** Rosamond Boulevard

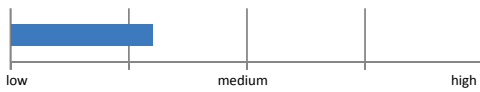
**DOT Crossing ID:** 750635X  
**CPUC Crossing ID:** 001B-393.90  
**Jurisdiction:** Unincorporated  
**RR Owner:** UP

10

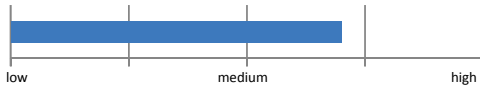
Prioritization Rating

### Crossing Information

**2010 Train Volume:** 12  
(freight and passenger trains)  
*Train Volume Score:* 6



**2010 Traffic Volume:** 28,802  
(estimated 2010 daily traffic)  
*Traffic Volume Score:* 14



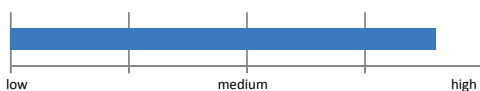
*Accident Score:* 4



*Crossing Delay Score:* 0



*Other Score:* 18



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:**      **Rosedale Highway (SR 58)**

**DOT Crossing ID:**      **029473N**  
**CPUC Crossing ID:**      **103Q-113.20**  
**Jurisdiction:**      **Unincorporated**  
**RR Owner:**      **SJVR**

**4**

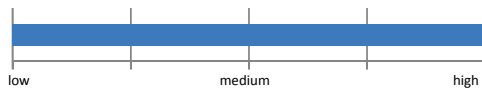
Prioritization Rating

**Crossing Information**

**2010 Train Volume:**      **8**  
(freight and passenger trains)  
*Train Volume Score:*      **4**



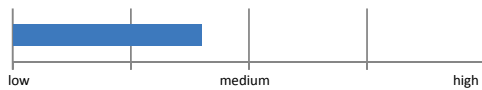
**2010 Traffic Volume:**      **46,414**  
(estimated 2010 daily traffic)  
*Traffic Volume Score:*      **20**



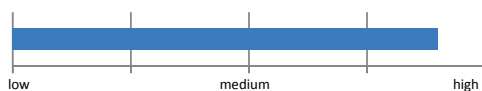
*Accident Score:*      **0**



*Crossing Delay Score:*      **8**



*Other Score:*      **18**



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:**      **Snow Road**

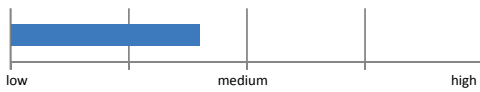
**DOT Crossing ID:**      **756948H**  
**CPUC Crossing ID:**      **001B-307.40**  
**Jurisdiction:**      **Unincorporated**  
**RR Owner:**      **UP**

**19**

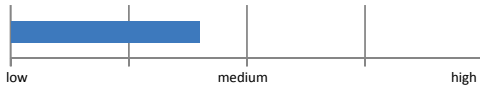
Prioritization Rating

**Crossing Information**

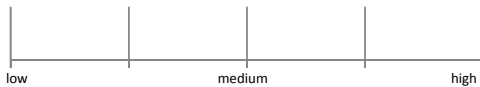
**2010 Train Volume:**      **15**  
(freight and passenger trains)  
*Train Volume Score:*      **8**



**2010 Traffic Volume:**      **10,542**  
(estimated 2010 daily traffic)  
*Traffic Volume Score:*      **8**



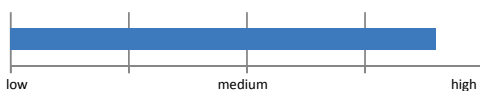
*Accident Score:*      **0**



*Crossing Delay Score:*      **2**



*Other Score:*      **18**



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** Sonora Street

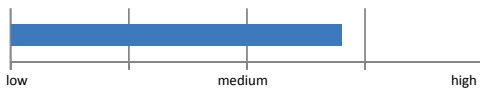
**DOT Crossing ID:** 028289X  
**CPUC Crossing ID:** 002-886.40  
**Jurisdiction:** Bakersfield  
**RR Owner:** BNSF

29

Prioritization Rating

**Crossing Information**

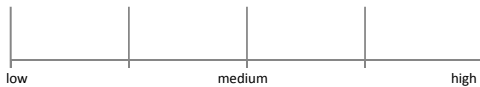
**2010 Train Volume:** 26  
 (freight and passenger trains)  
*Train Volume Score:* 14



**2010 Traffic Volume:** < 2,500  
 (estimated 2010 daily traffic)  
*Traffic Volume Score:* 0



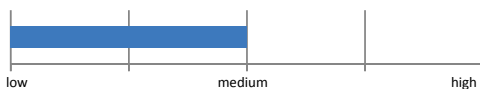
*Accident Score:* 0



*Crossing Delay Score:* 6



*Other Score:* 10



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** Sumner / Miller Street

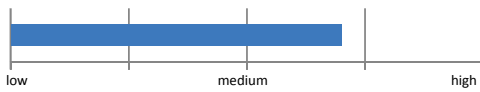
**DOT Crossing ID:** 028280L  
**CPUC Crossing ID:** 002-885.40  
**Jurisdiction:** Bakersfield  
**RR Owner:** BNSF

11

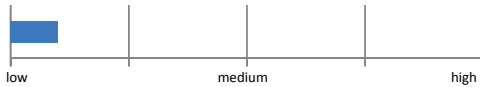
Prioritization Rating

### Crossing Information

**2010 Train Volume:** 26  
(freight and passenger trains)  
*Train Volume Score:* 14



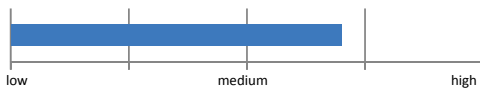
**2010 Traffic Volume:** 3,608  
(estimated 2010 daily traffic)  
*Traffic Volume Score:* 2



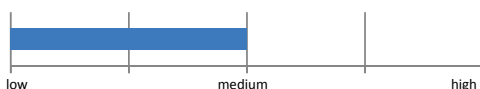
*Accident Score:* 0



*Crossing Delay Score:* 14



*Other Score:* 10



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** Tehachapi Blvd/Old State Hwy

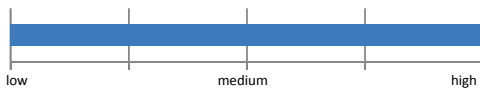
**DOT Crossing ID:** 757255P  
**CPUC Crossing ID:** 001B-365.20  
**Jurisdiction:** Unincorporated  
**RR Owner:** UP

14

Prioritization Rating

### Crossing Information

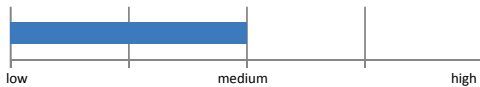
**2010 Train Volume:** 38  
(freight and passenger trains)  
*Train Volume Score:* 20



**2010 Traffic Volume:** < 2,500  
(estimated 2010 daily traffic)  
*Traffic Volume Score:* 0



*Accident Score:* 10



*Crossing Delay Score:* 0



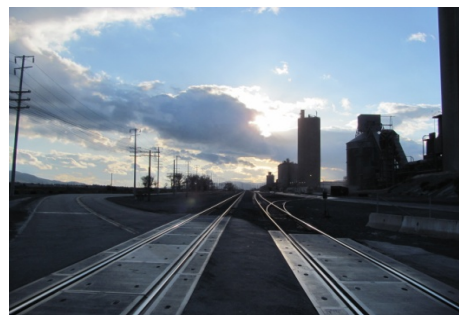
*Other Score:* 8



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** **Tulare Street**

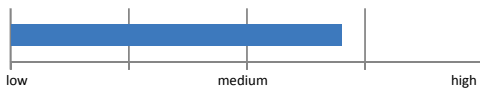
**DOT Crossing ID:** **028288R**  
**CPUC Crossing ID:** **002-886.20**  
**Jurisdiction:** **Bakersfield**  
**RR Owner:** **BNSF**

**37**

Prioritization Rating

**Crossing Information**

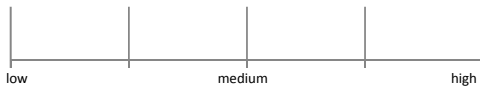
**2010 Train Volume:** **26**  
(freight and passenger trains)  
*Train Volume Score:* **14**



**2010 Traffic Volume:** **< 2,500**  
(estimated 2010 daily traffic)  
*Traffic Volume Score:* **0**



*Accident Score:* **0**



*Crossing Delay Score:* **4**



*Other Score:* **4**



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** Union Avenue

**DOT Crossing ID:** 750993G

**CPUC Crossing ID:** 103BT-316.70

**Jurisdiction**

**Unincorporated**

**RR Owner:**

**SJVR**

34

Prioritization Rating

### Crossing Information

**2010 Train Volume:** 6

(freight and passenger trains)

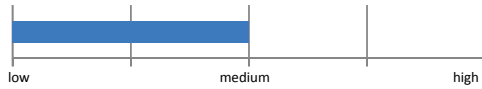
*Train Volume Score:* 2



**2010 Traffic Volume:** 16,561

(estimated 2010 daily traffic)

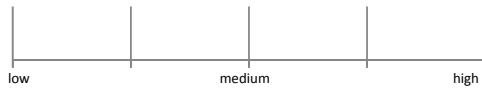
*Traffic Volume Score:* 10



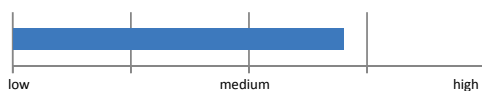
*Accident Score:* 0



*Crossing Delay Score:* 0



*Other Score:* 14



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** Vineland Road

**DOT Crossing ID:** 757414U

**CPUC Crossing ID:** 001B-318.50

**Jurisdiction**

**Unincorporated**

**RR Owner:**

**UP**

12

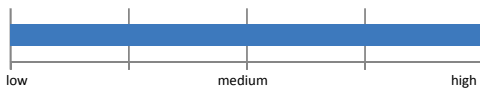
Prioritization Rating

### Crossing Information

**2010 Train Volume:** 38

(freight and passenger trains)

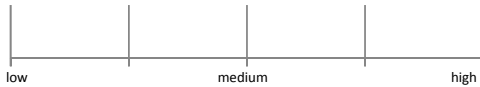
*Train Volume Score:* 20



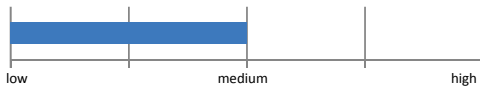
**2010 Traffic Volume:** < 2,500

(estimated 2010 daily traffic)

*Traffic Volume Score:* 0



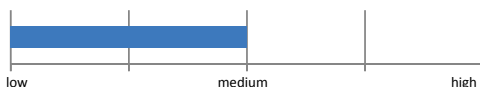
*Accident Score:* 10



*Crossing Delay Score:* 0



*Other Score:* 10



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** Wible Road

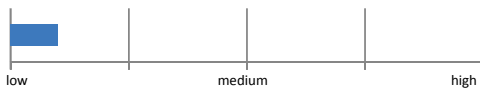
**DOT Crossing ID:** 750962H  
**CPUC Crossing ID:** 103BT-319.50  
**Jurisdiction:** Bakersfield  
**RR Owner:** SJVR

36

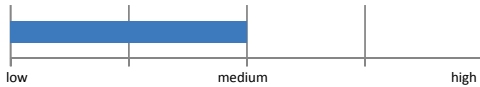
Prioritization Rating

### Crossing Information

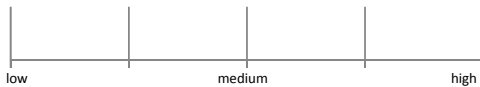
**2010 Train Volume:** 6  
(freight and passenger trains)  
*Train Volume Score:* 2



**2010 Traffic Volume:** 19,024  
(estimated 2010 daily traffic)  
*Traffic Volume Score:* 10



*Accident Score:* 0



*Crossing Delay Score:* 4



*Other Score:* 6



Northbound



Southbound



Westbound



Eastbound

**Crossing Name:** Williamson Road

**DOT Crossing ID:** 757253B

**CPUC Crossing ID:** 001B-364.40

**Jurisdiction**

**Unincorporated**

**RR Owner:**

**UP**

35

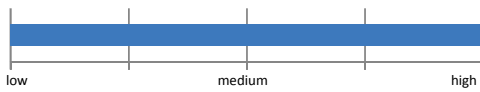
Prioritization Rating

### Crossing Information

**2010 Train Volume:** 38

(freight and passenger trains)

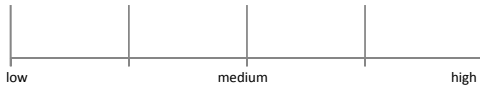
*Train Volume Score:* 20



**2010 Traffic Volume:** < 2,500

(estimated 2010 daily traffic)

*Traffic Volume Score:* 0



*Accident Score:* 2



*Crossing Delay Score:* 0



*Other Score:* 2



Northbound



Southbound



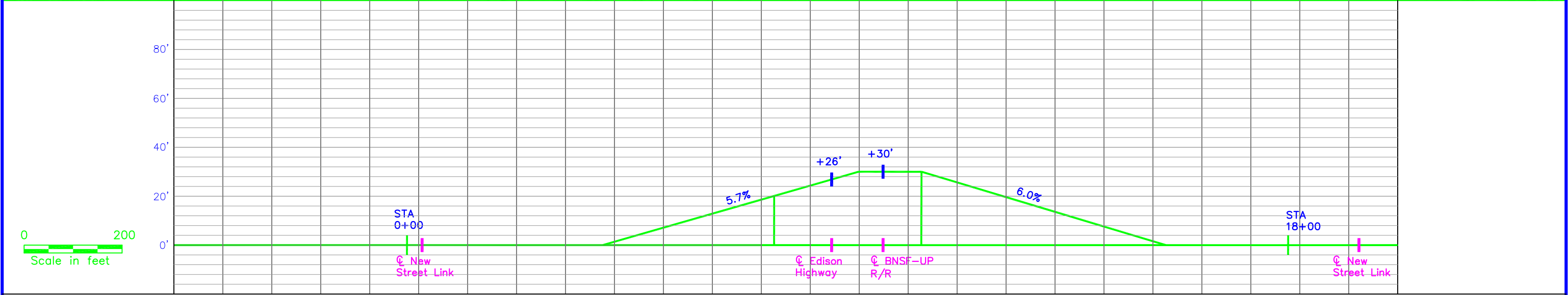
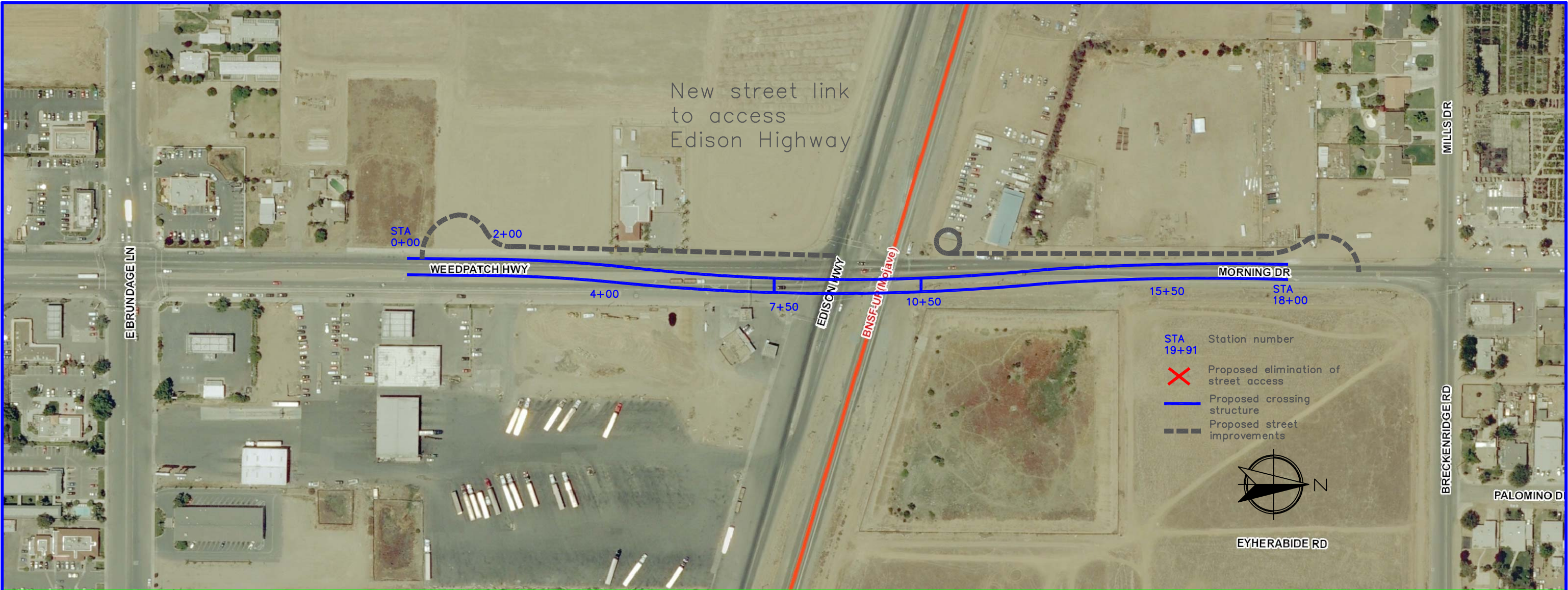
Westbound

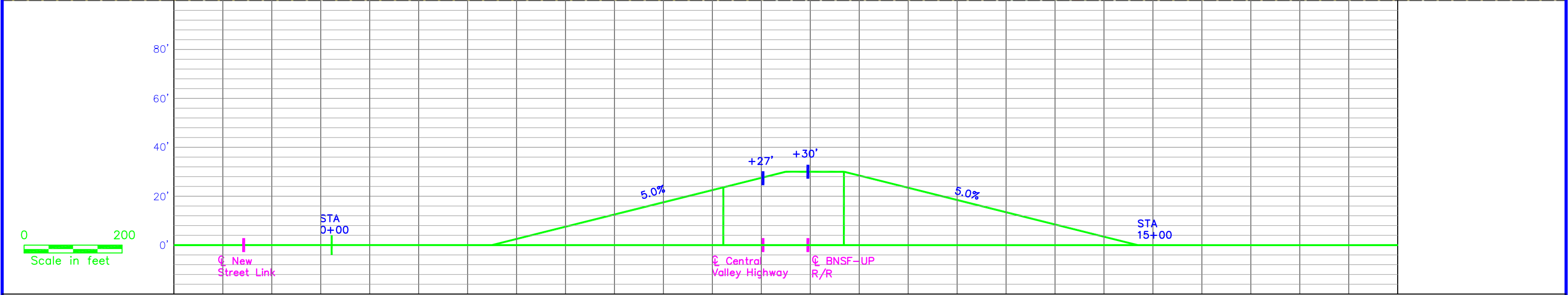
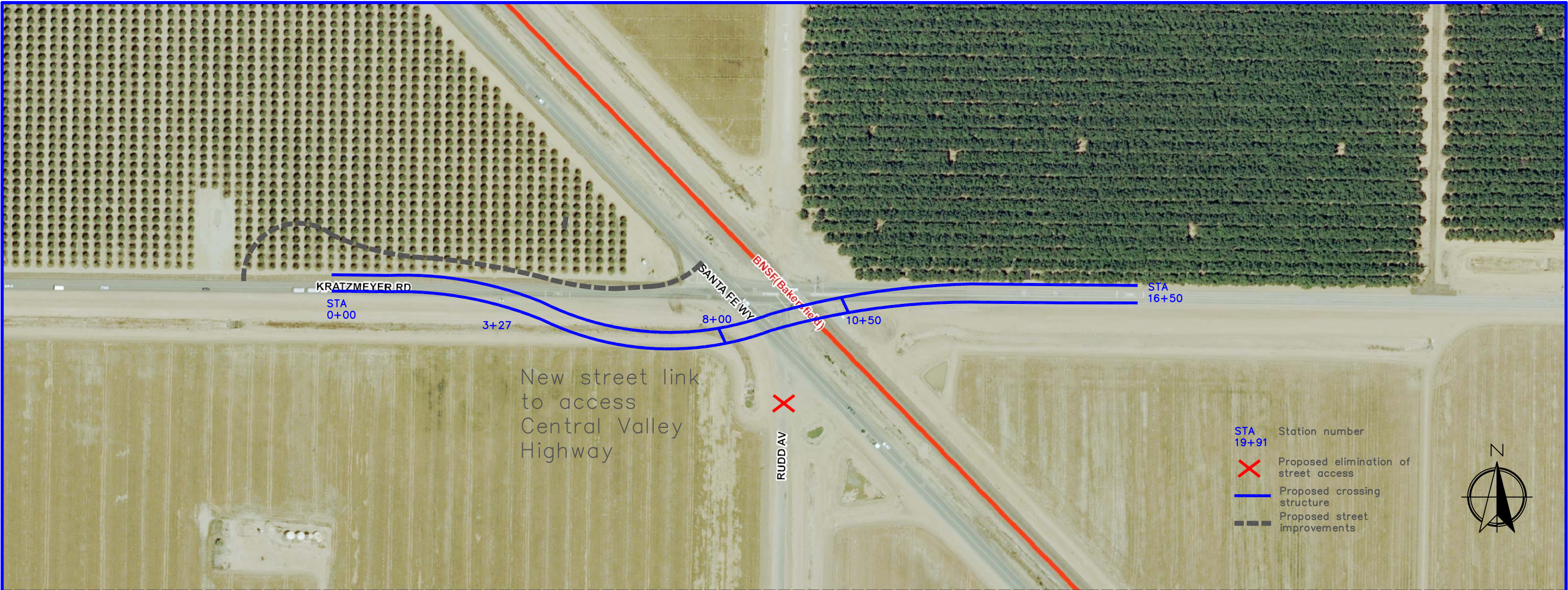


Eastbound

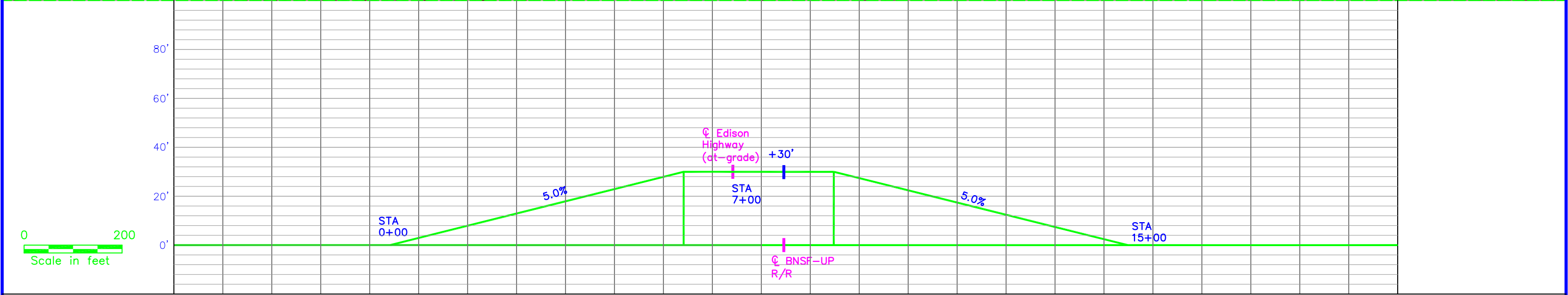
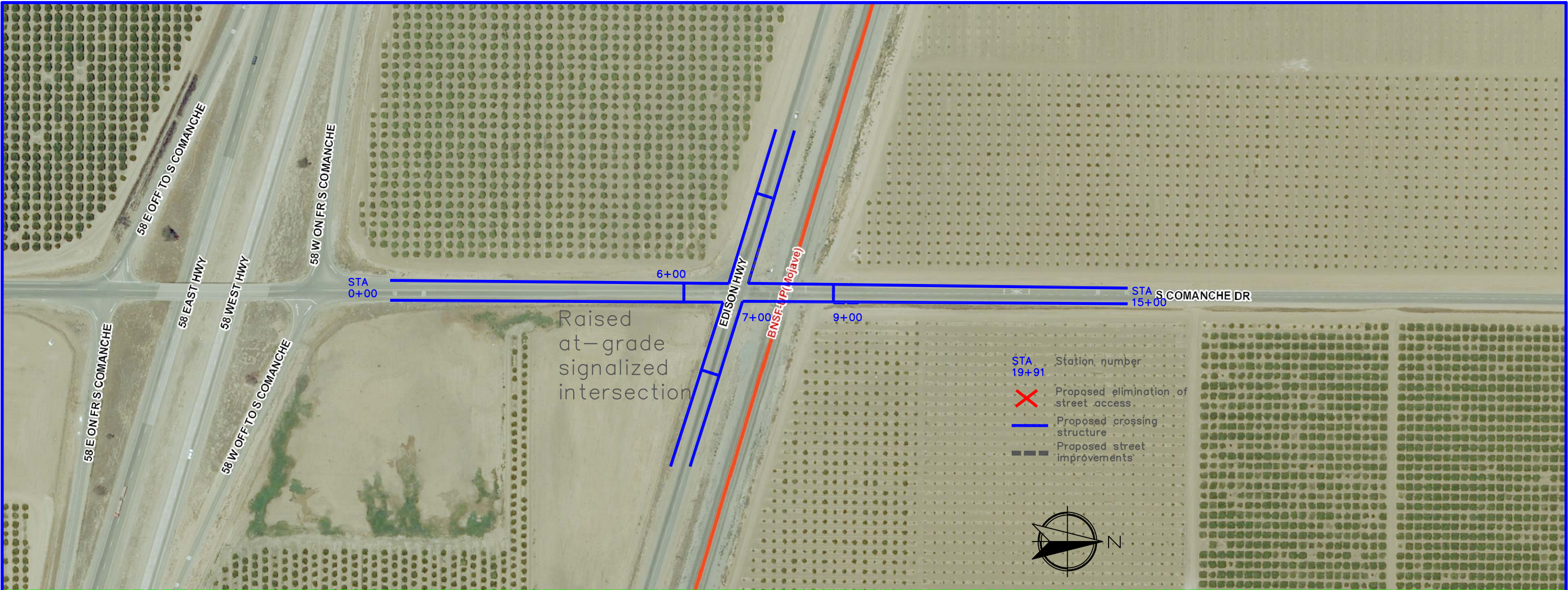
## APPENDIX B: CONCEPTUAL DESIGNS (HIGH AND MEDIUM PRIORITY CROSSINGS)

*Presented by priority*

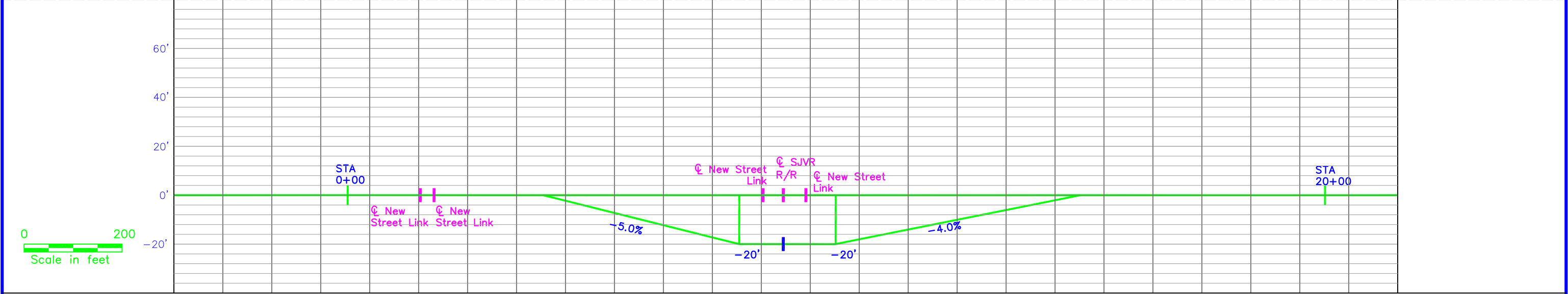
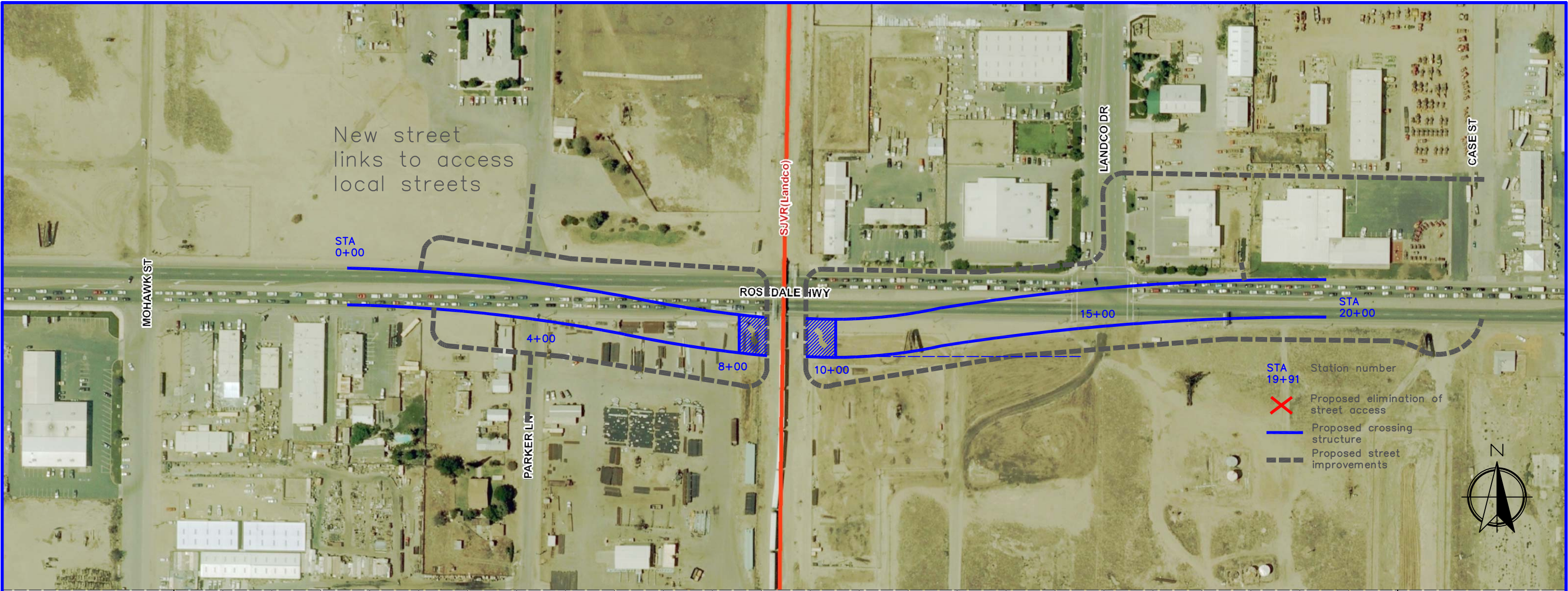


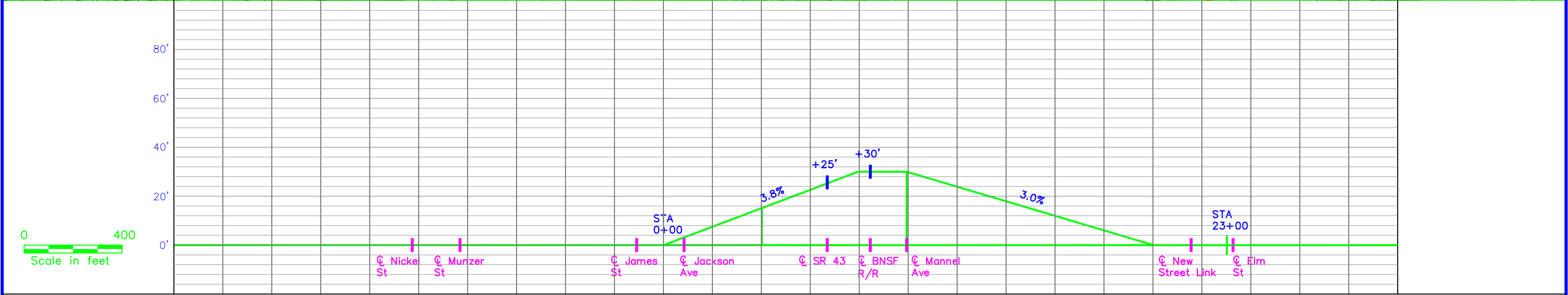
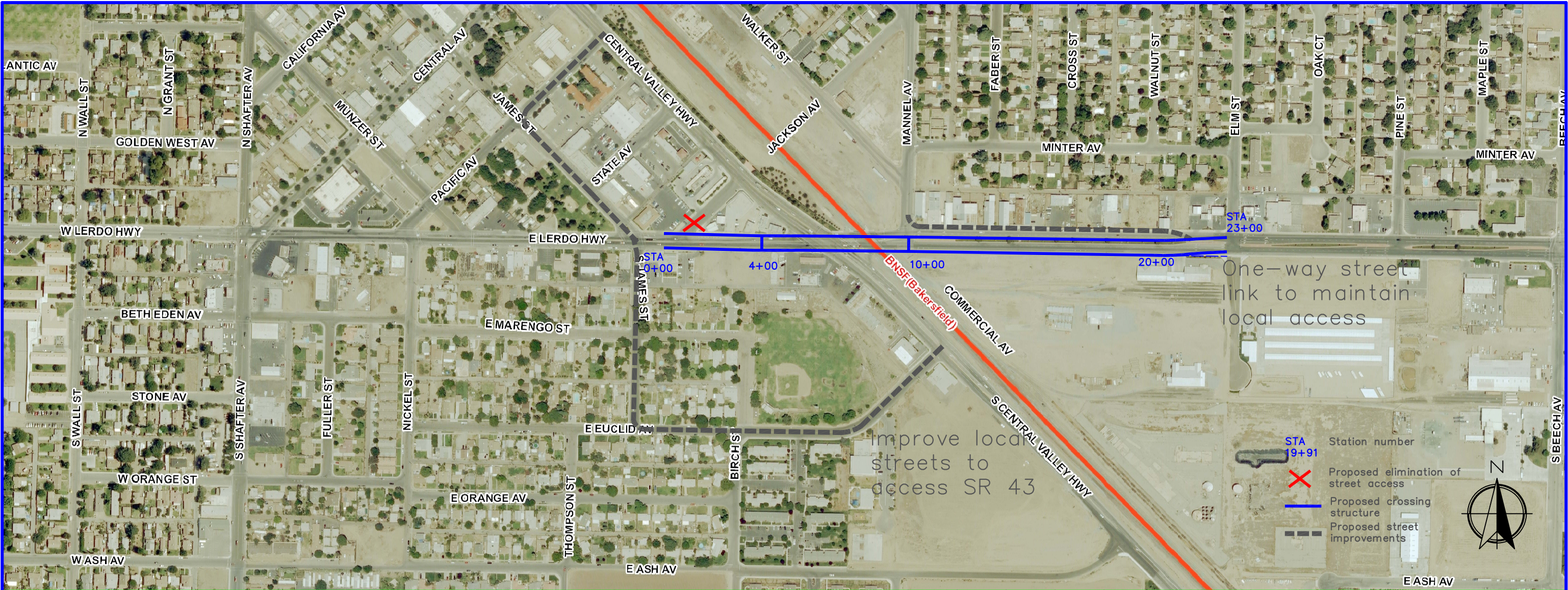


<b>PRELIMINARY CONCEPT – FOR DISCUSSION PURPOSES ONLY</b>		Designed By: <b>PCM</b> Drawn By: <b>TCH</b> Checked By:  Approved By:	<b>Kratzmeyer Road and BNSF</b>  Kern County Grade Separation Study	Scale: 1" = 200' horizontal, 40' vertical
				CADD Filename: Grade Separations.dwg Submission Date:  Drawing No.: 2 Sheet No.: 2 of 40



PRELIMINARY CONCEPT – FOR DISCUSSION PURPOSES ONLY	<b>WilburSmith</b> ASSOCIATES	Designed By: PCM Drawn By: TCH Checked By: Approved By:	<b>Comanche Drive and BNSF–UP</b>  Kern County Grade Separation Study	Scale: 1" = 200' horizontal, 40' vertical
				CADD Filename: Grade_Separations.dwg Submission Date:  Drawing No.: 3 Sheet No.: 3 of 40
Approved By: _____				





PRELIMINARY CONCEPT –  
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PURPOSES ONLY

**WilburSmith**  
ASSOCIATES

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Designed By:

PCM

Drawn By:

TCH

Checked By:

Approved By:

**Lerdo Highway  
and BNSF**

Kern County  
Grade Separation Study

Scale:

1" = 400' horizontal, 40' vertical

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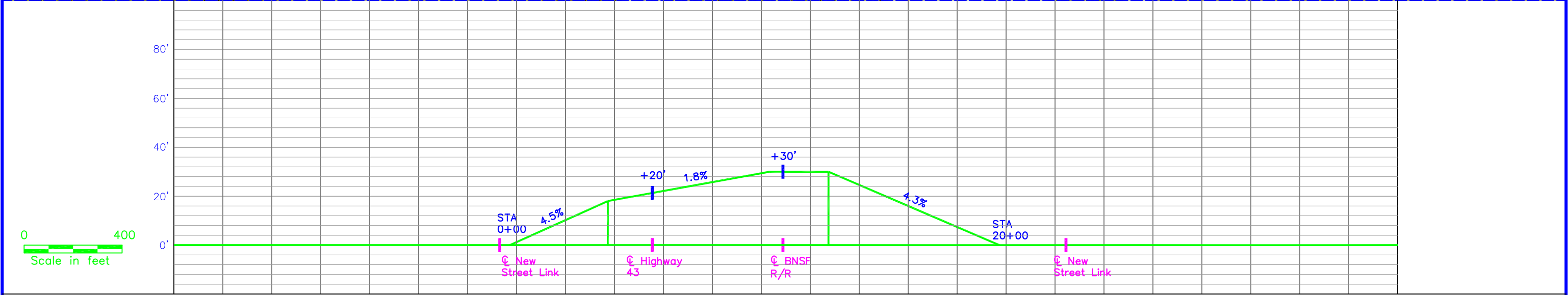
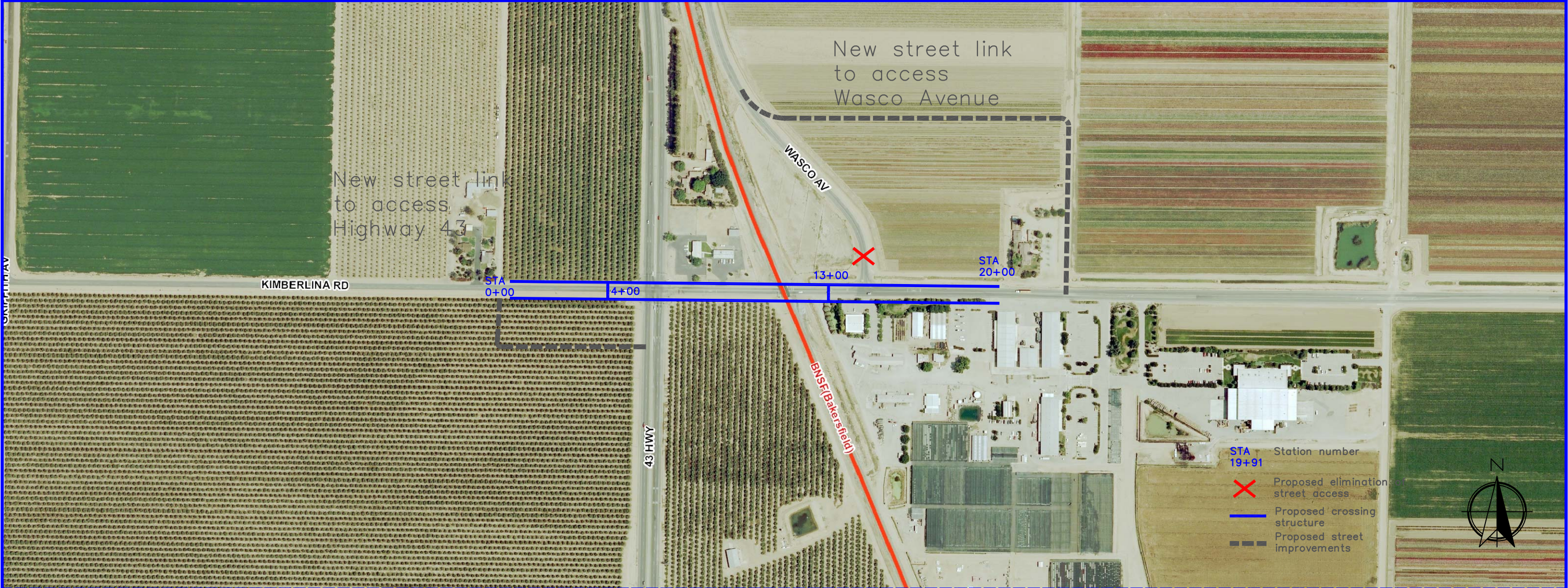
Submission Date

Drawing No.:

5

Sheet No.:

5 of 40



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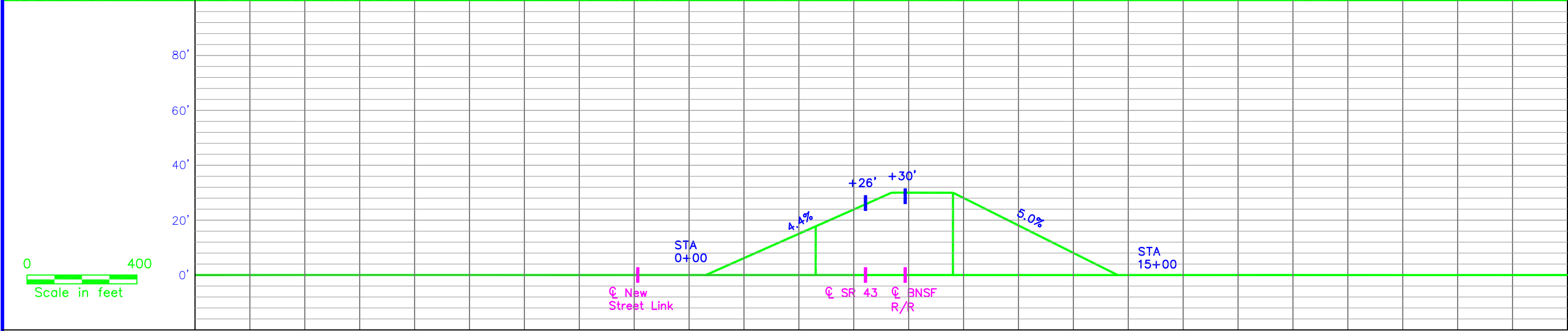
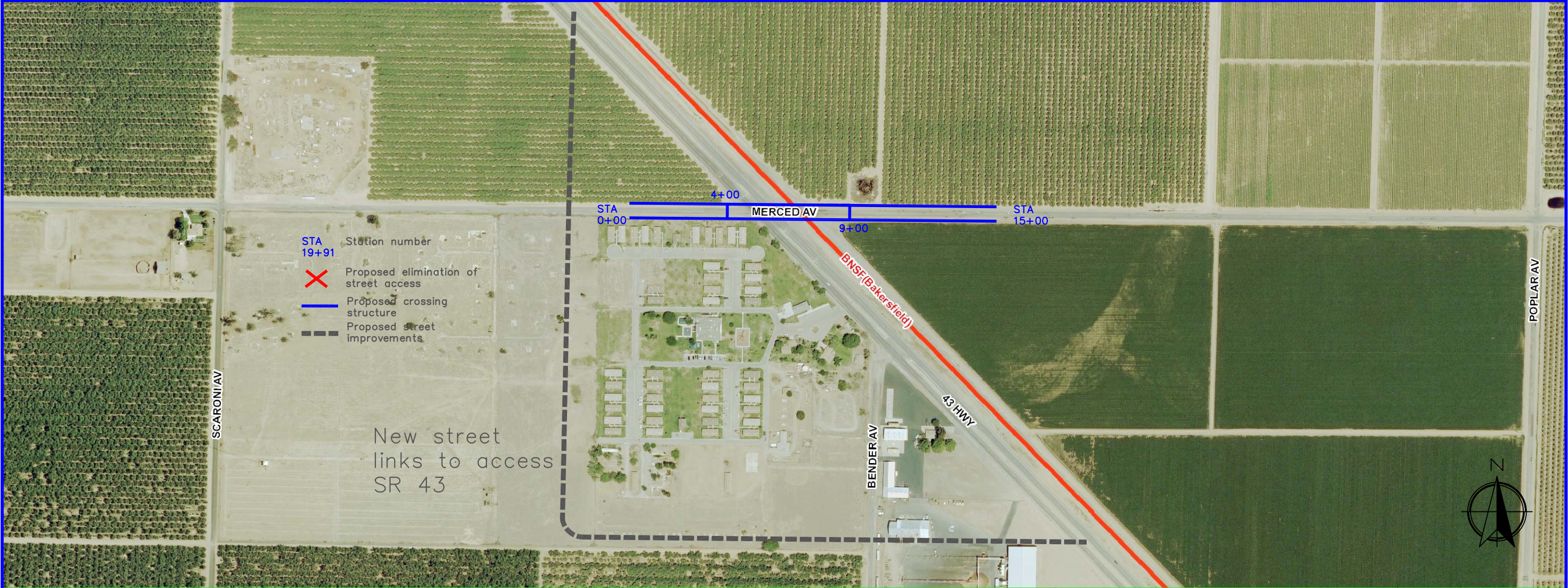
Approved By:

Kimberlina Road  
and BNSF

Kern County  
Grade Separation Study

Scale:  
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Grade Separations.dwg  
Submittal Date

Drawing No.: 6  
Sheet No.: 6 of 40



PRELIMINARY CONCEPT –  
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ASSOCIATES

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Designed By:

PCM

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TCH

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Approved By:

**Merced Avenue  
and BNSF**

Kern County  
Grade Separation Study

Scale:

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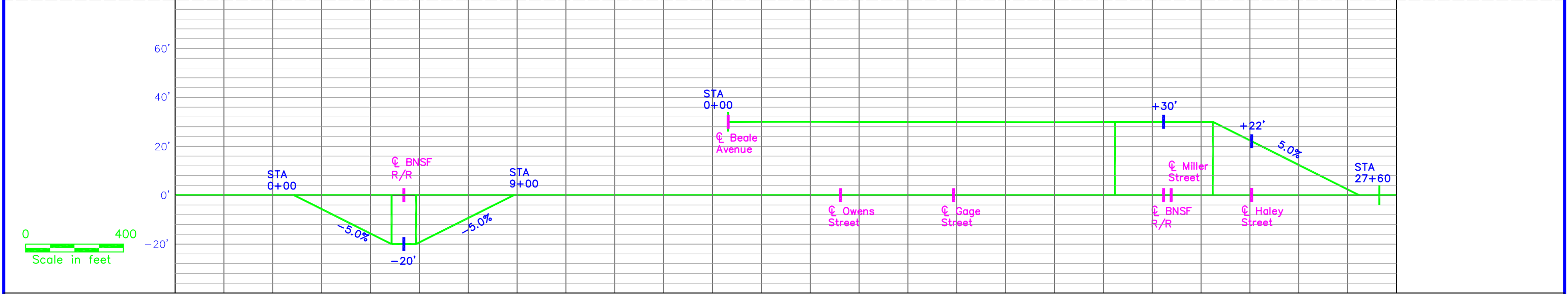
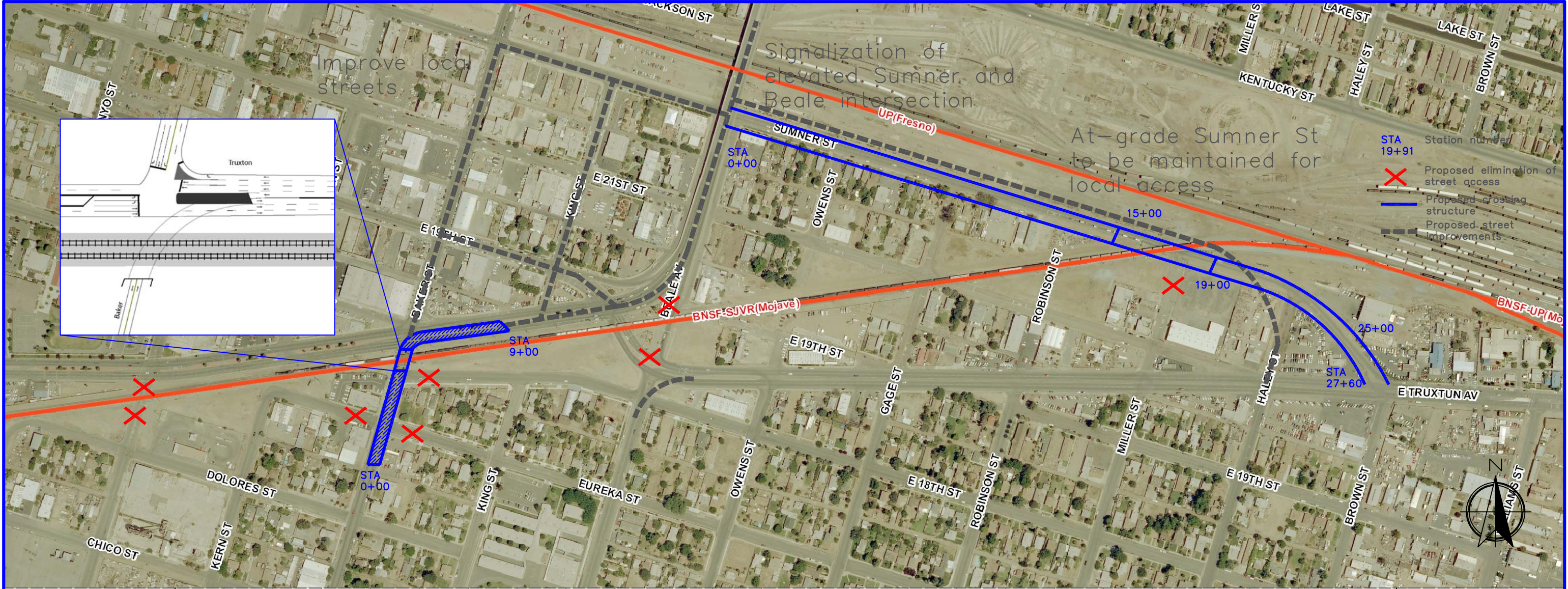
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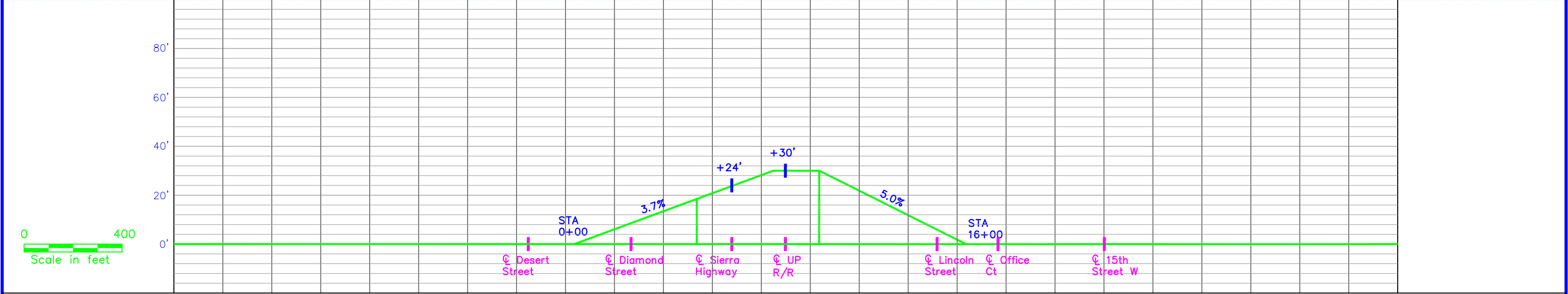
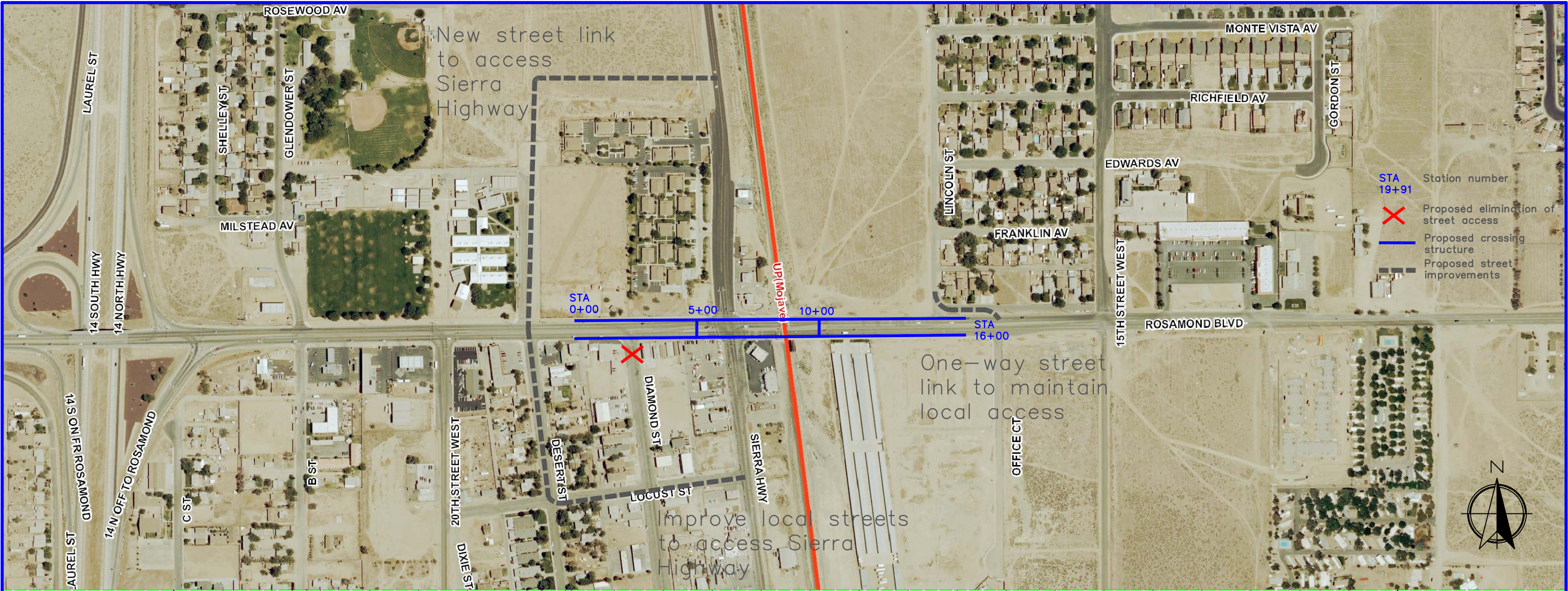
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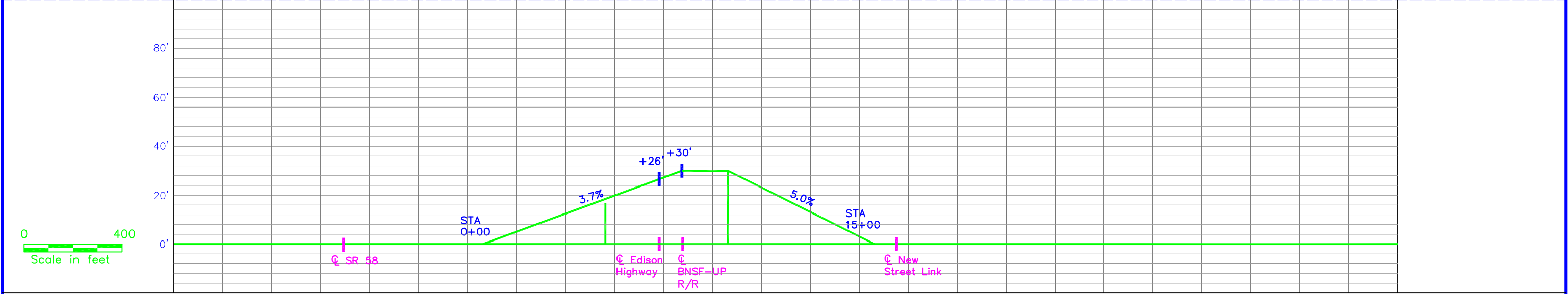
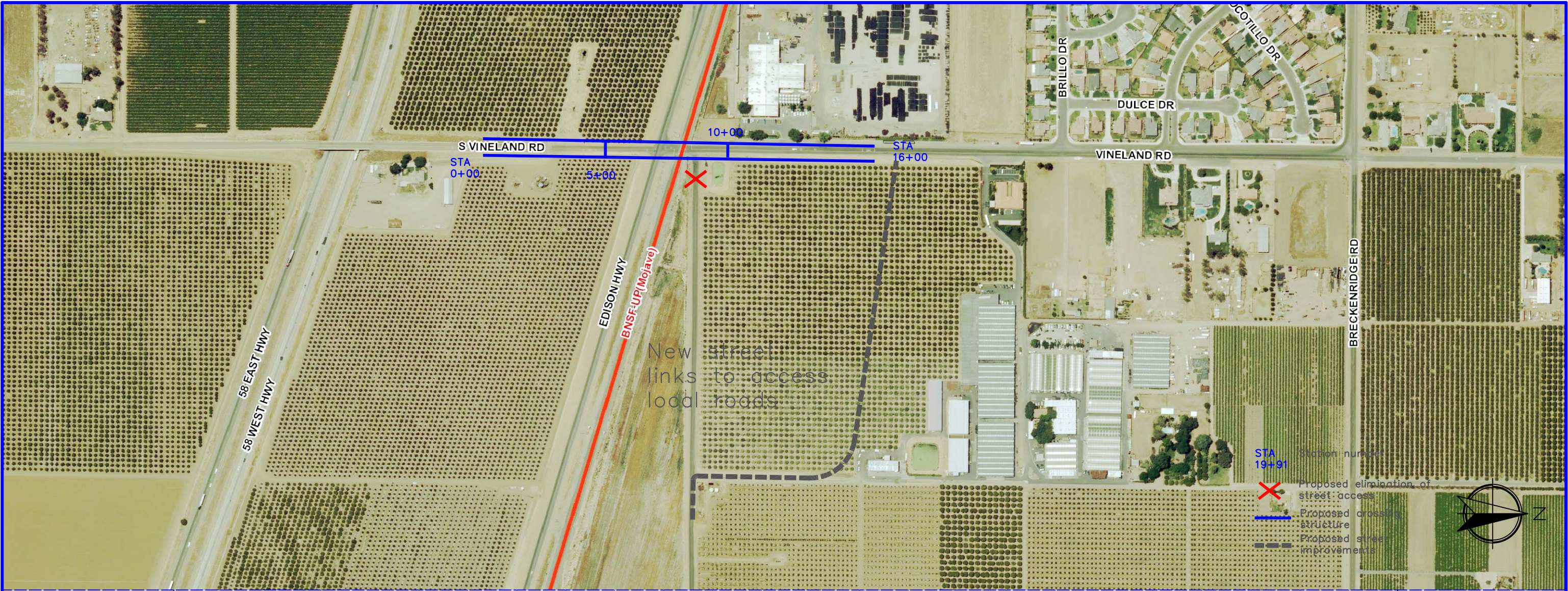
Sheet No.:

7 of 40





<b>PRELIMINARY CONCEPT – FOR DISCUSSION PURPOSES ONLY</b>	<b>WilburSmith</b> ASSOCIATES	Approved By: _____	Designed By: PCM	<b>Rosamond Boulevard and UPRR</b>	Scale: 1" = 400' horizontal, 40' vertical
			Drawn By: TCH		CADD Filename: Grade Separations.dwg
			Checked By:		Submission Date:
			Approved By:		Drawing No.: 9
				Kern County Grade Separation Study	Sheet No.: 9 of 40



PRELIMINARY CONCEPT –  
FOR DISCUSSION  
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Designed By:

PCM

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TCH

Checked By:

Approved By:

**Vineland Road  
and BNSF-UP**

Kern County  
Grade Separation Study

Scale:

1" = 400' horizontal, 40' vertical

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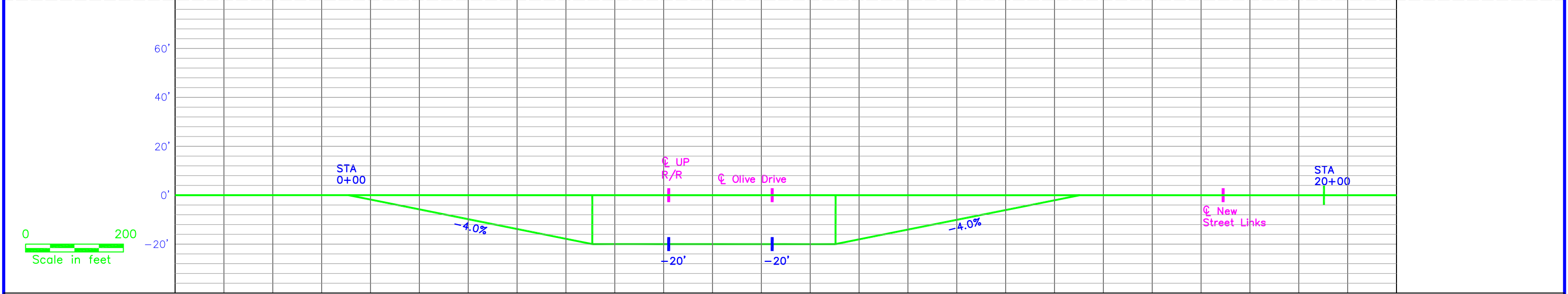
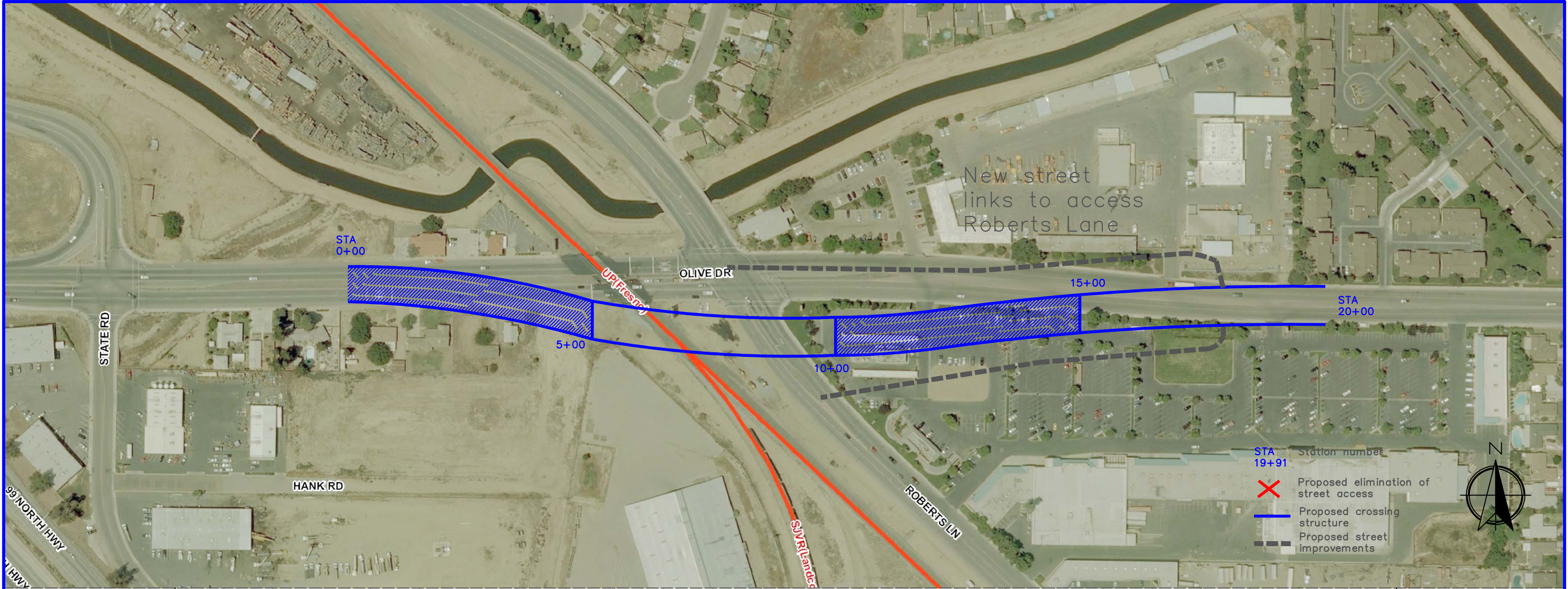
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10

Sheet No.:

10 of 40



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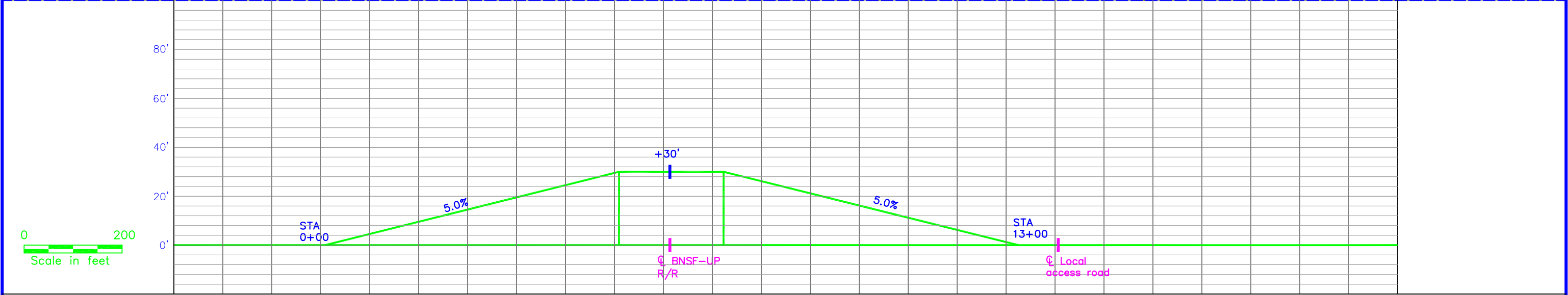
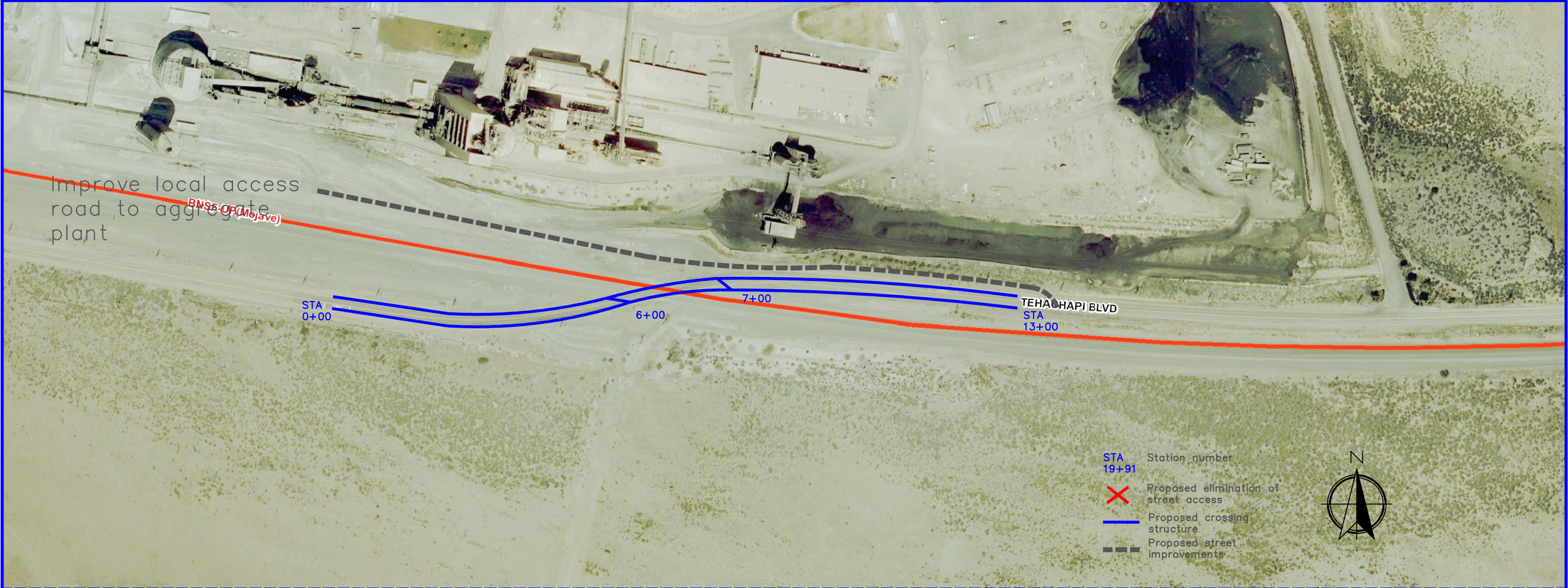
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PCM  
Drawn By:  
TCH  
Checked By:  
Approved By:

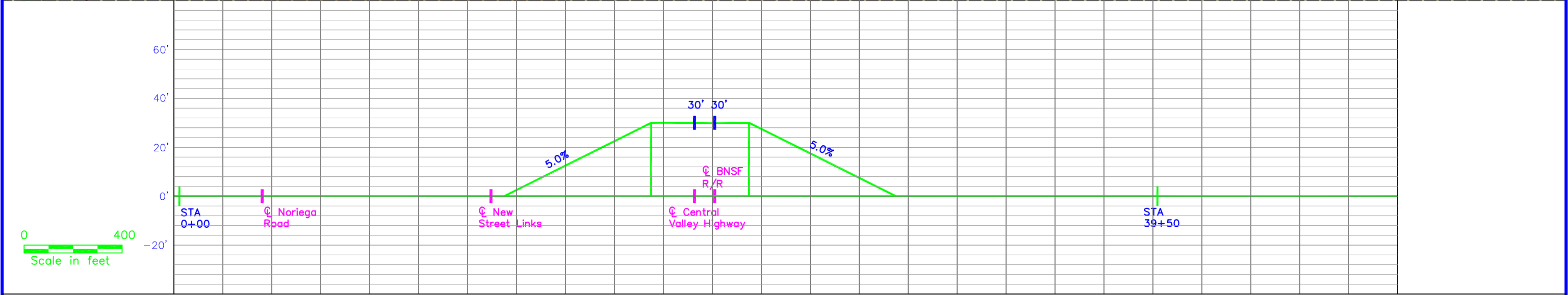
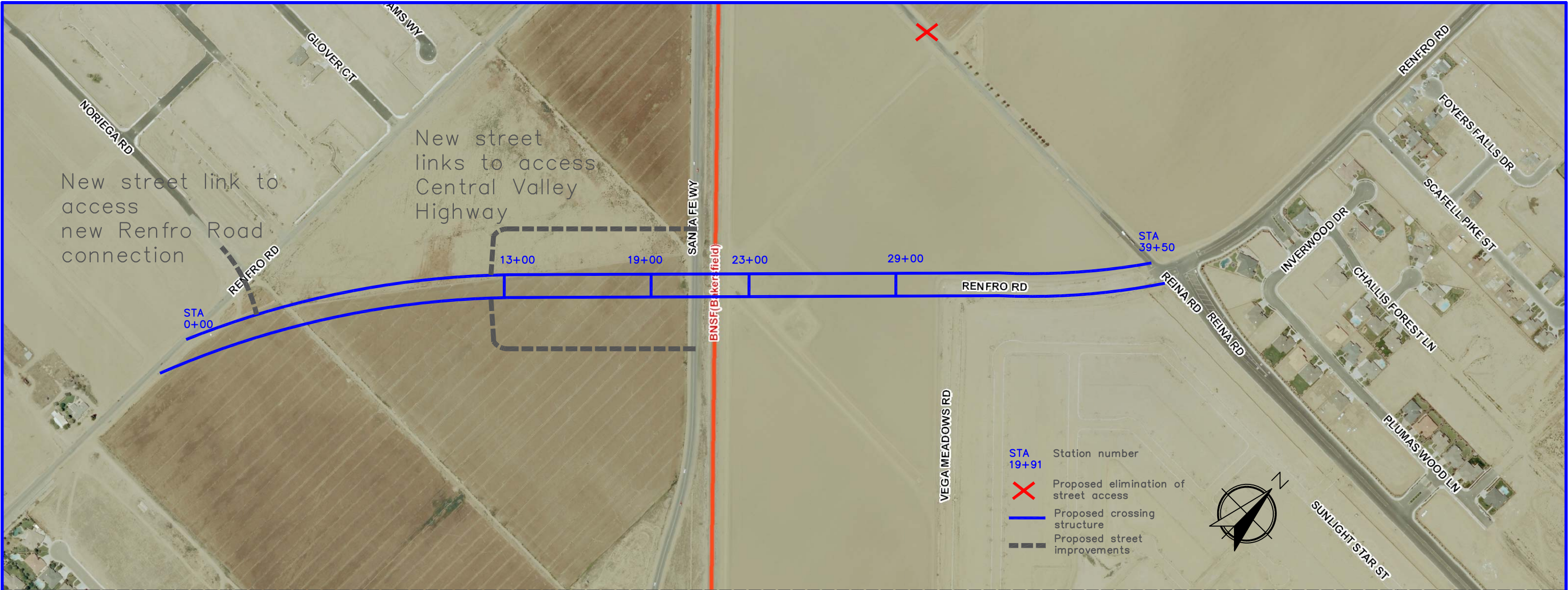
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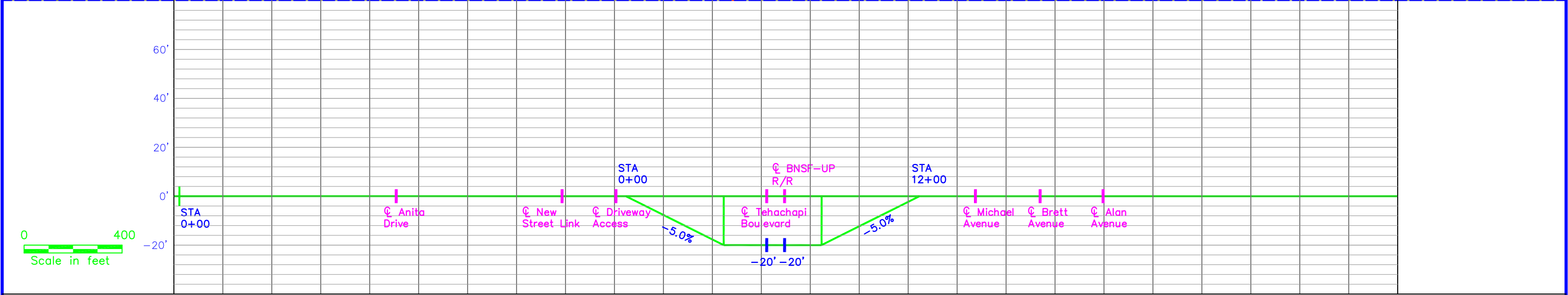
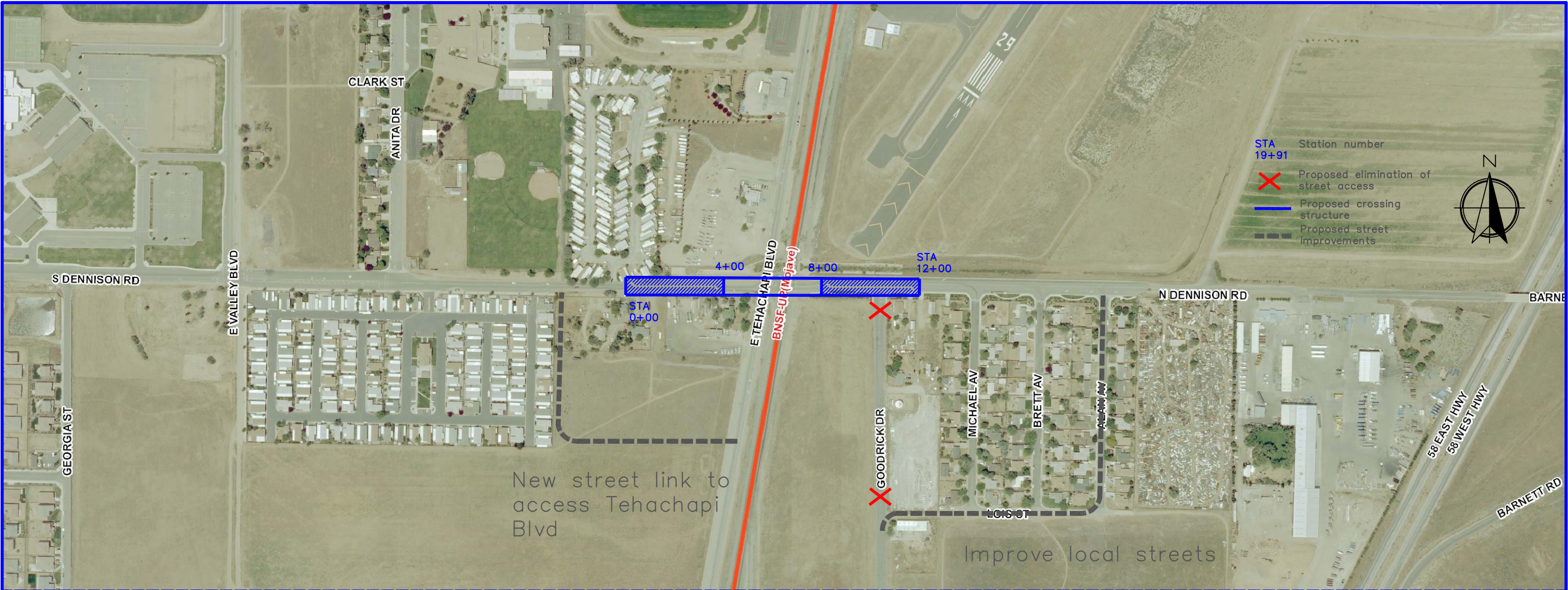
Kern County  
Grade Separation Study

Scale:  
1" = 200' horizontal, 40' vertical  
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Submittal Date  
Drawing No.:  
11  
Sheet No.:  
11 of 40



PRELIMINARY CONCEPT – FOR DISCUSSION PURPOSES ONLY		Designed By: PCM Drawn By: TCH Checked By: Approved By:	Tehachapi Boulevard and BNSF-UP  Kern County Grade Separation Study	Scale: 1" = 200' horizontal, 40' vertical
				CADD Filename: Grade Separations.dwg Submission Date: Drawing No.: 12 Sheet No.: 12 of 40





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TCH

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Approved By:

**Dennison Road  
and BNSF-UP**

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Grade Separation Study

Scale:

1" = 400' horizontal, 40' vertical

CADD Filename:

Grade Separations.dwg

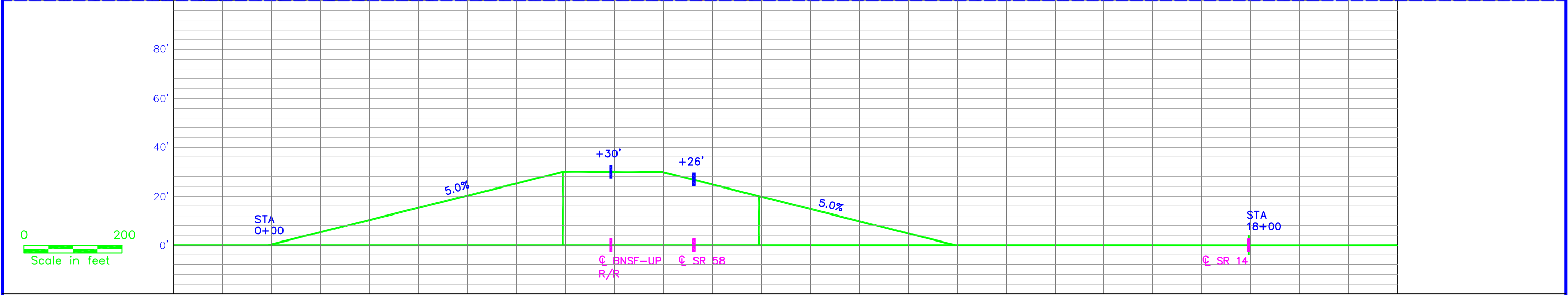
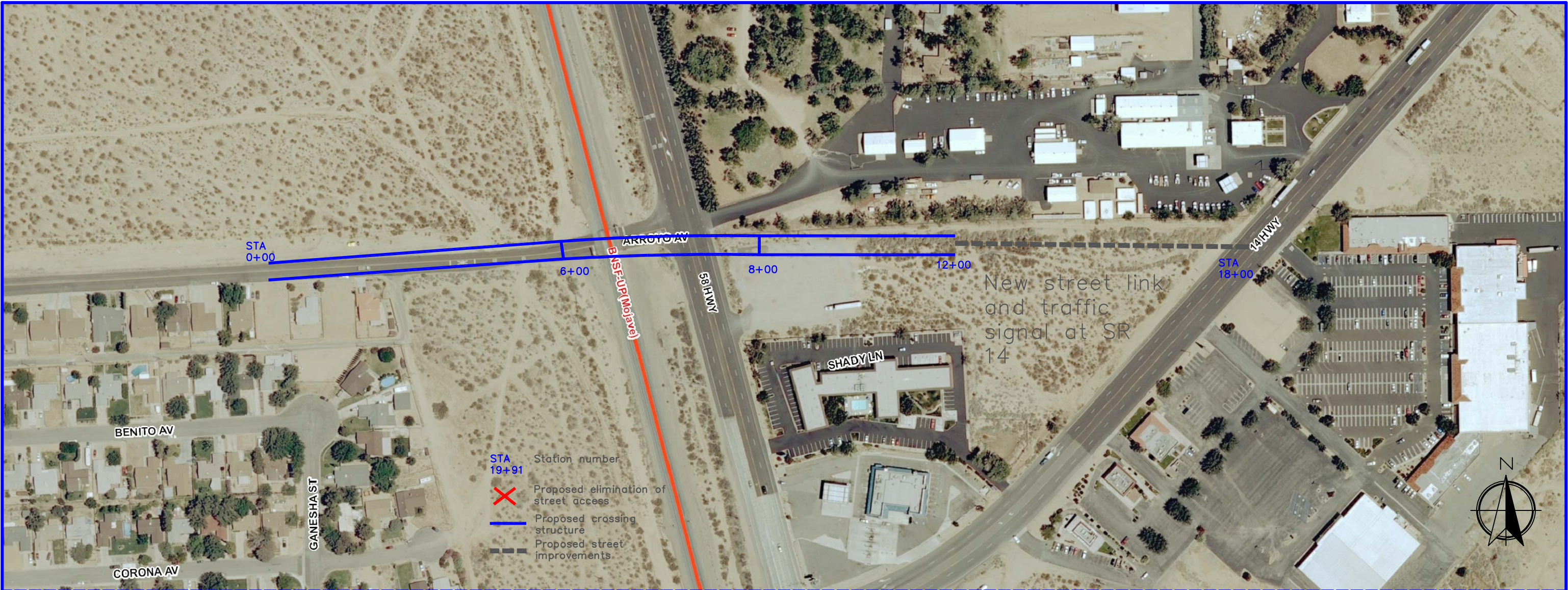
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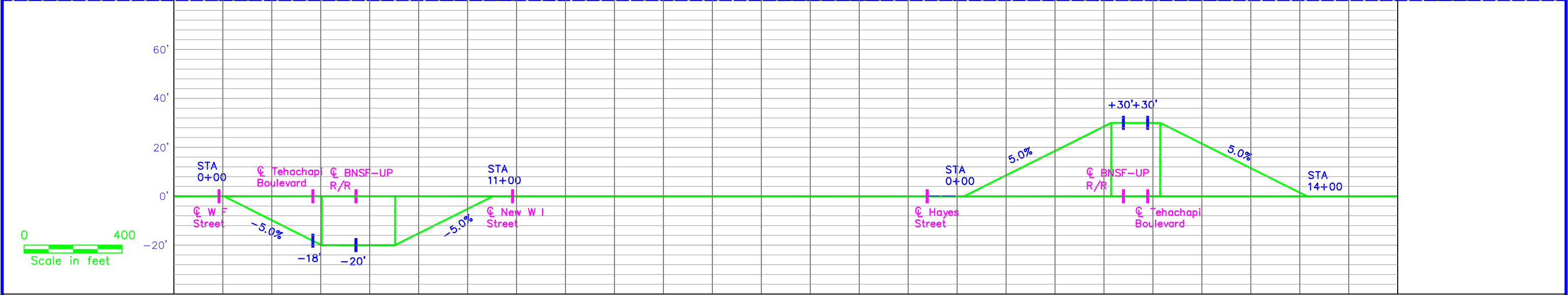
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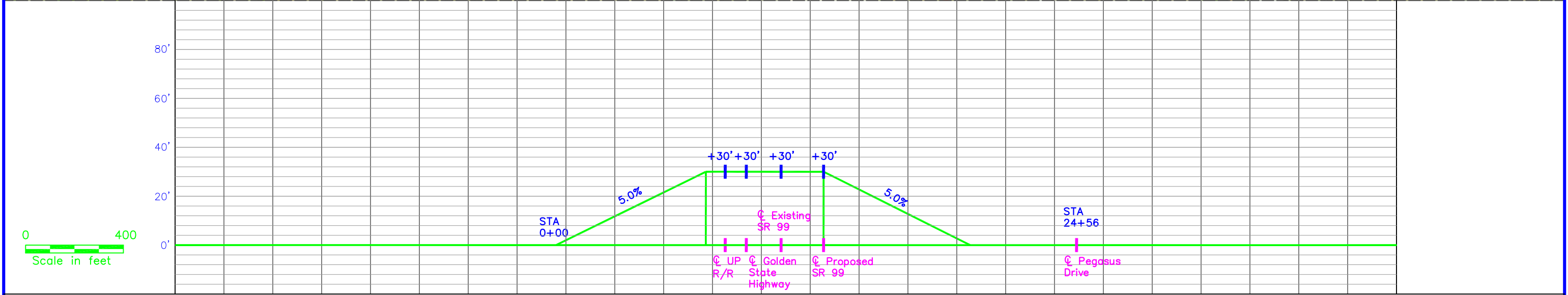
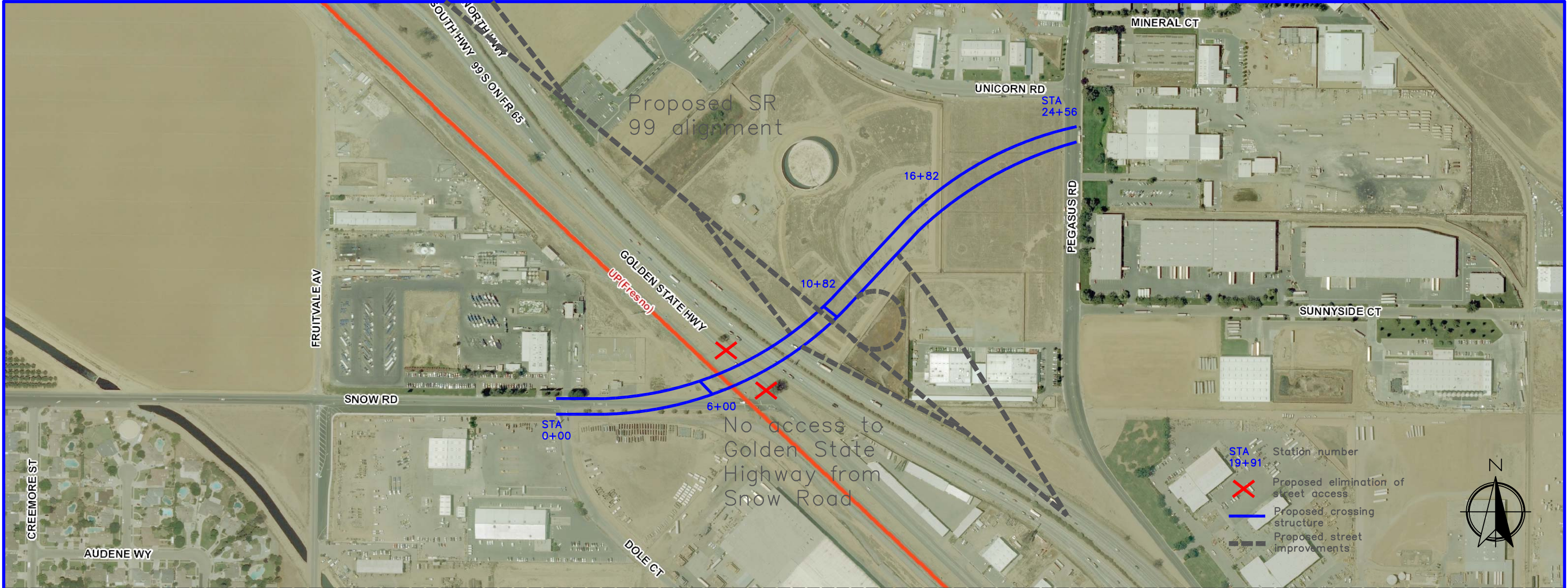
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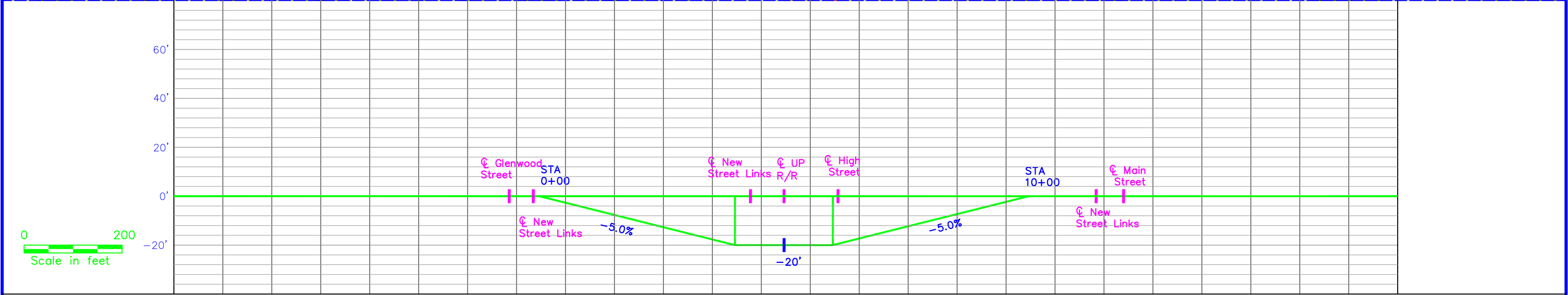
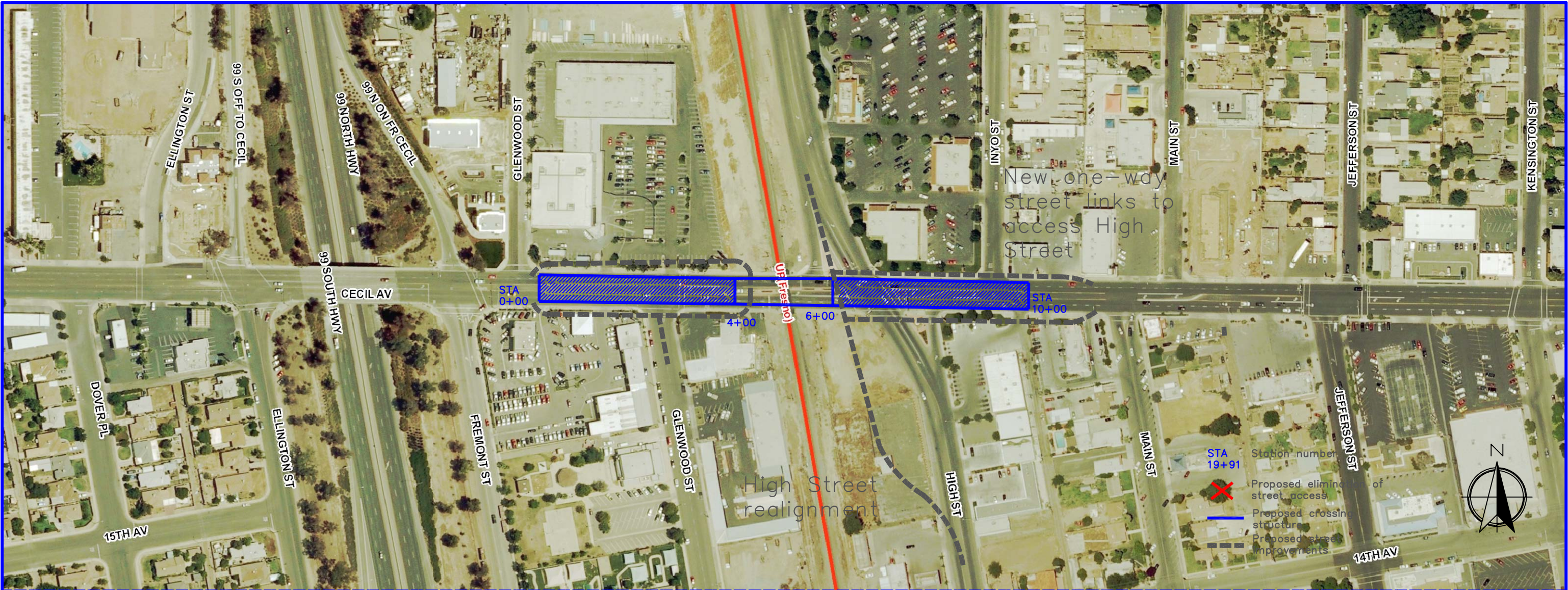
14 of 40



PRELIMINARY CONCEPT — FOR DISCUSSION PURPOSES ONLY	<b>WilburSmith</b> ASSOCIATES	Approved By: _____	Designed By: PCM	Arroyo Avenue and BNSF-UP	Scale: 1" = 200' horizontal, 40' vertical
			Drawn By: TCH		CADD Filename: Grade Separations.dwg
			Checked By:		Submittal Date
			Approved By:	Kern County Grade Separation Study	Drawing No.: 15
					Sheet No.: 15 of 40







PRELIMINARY CONCEPT –  
FOR DISCUSSION  
PURPOSES ONLY

**WilburSmith**  
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TCH

Checked By:

Approved By:

Cecil Avenue  
and UPRR

Kern County  
Grade Separation Study

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Drawing No.:

18

Sheet No.:

18 of 40