# PROJECT STUDY REPORT

**FOR**

# AIRPORT ROAD WIDENING

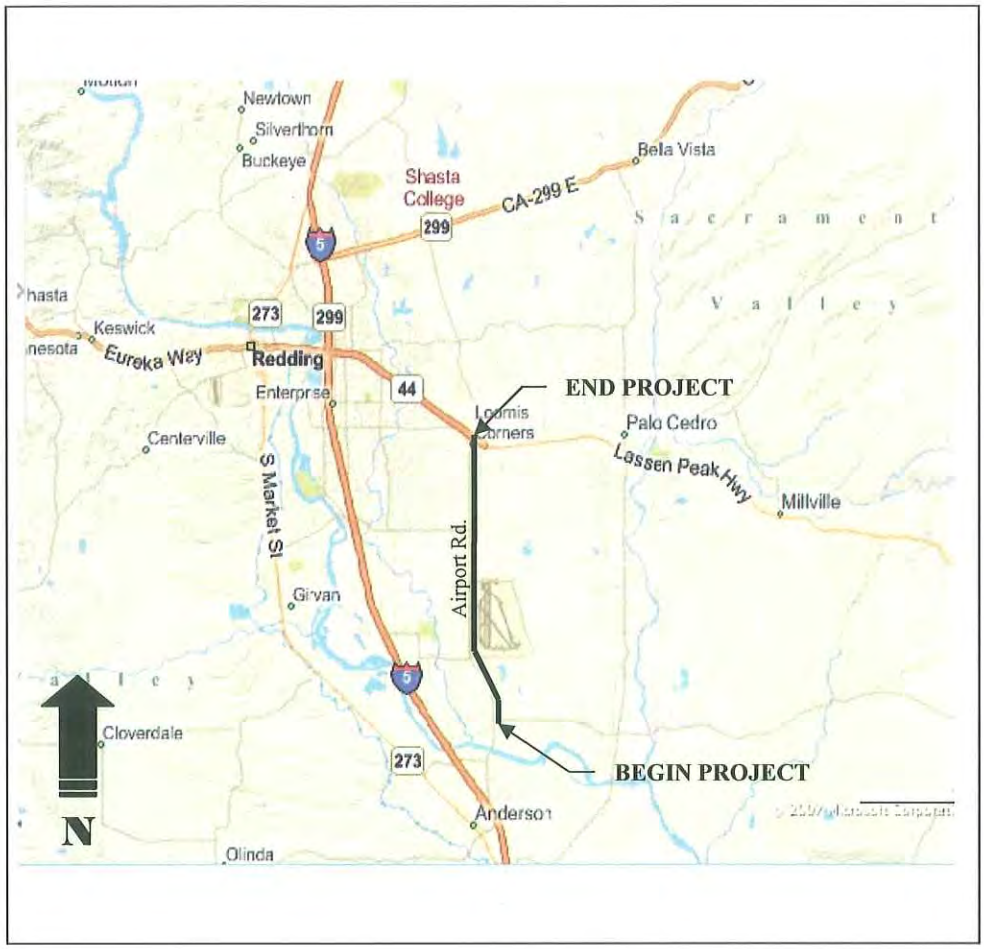
**IN THE CITY OF REDDING**
**BETWEEN CHURN CREEK ROAD/**
**DERSCH ROAD AND OLD 44 DRIVE**

**PREPARED FOR:**
**THE CITY OF REDDING**

**April 16, 2008**

**PREPARED BY:**
**Parsons Brinckerhoff**

# PROJECT STUDY REPORT




## Airport Road from Highway 44 to Dersch Road

APPROVAL RECOMMENDED: _____
*PROJECT MANAGER*

APPROVED: _____ 4/24/08
*CITY ENGINEER* *DATE*

This Project Study Report has been prepared under the direction of the following Registered Engineer. The registered Civil Engineer attests to the technical information contained therein and has judged the qualifications of any technical specialists providing engineering data upon which recommendations, conclusions, and decisions are based.

Cynthia K. Holt 04-16-08

Cynthia K. Holt, P.E.
REGISTERED CIVIL ENGINEER

DATE

REGISTERED PROFESSIONAL ENGINEER
CYNTHIA K.
HOLT
No. C51329
Exp. 06-30-08
CIVIL
STATE OF CALIFORNIA

# Table of Contents

1. INTRODUCTION ..... 1
2. BACKGROUND ..... 1
3. PURPOSE AND NEED STATEMENT ..... 3
4. DEFICIENCIES ..... 3
5. CORRIDOR AND SYSTEM COORDINATION ..... 7
6. ALTERNATIVES ..... 7
7. COMMUNITY INVOLVEMENT ..... 9
8. ENVIRONMENTAL DETERMINATION/DOCUMENTATION ..... 9
9. FUNDING ..... 11
10. SCHEDULE ..... 12
11. FHWA COORDINATION ..... 12

# Attachments

I. PROJECT STUDY REPORT PLANS

II. PRELIMINARY PROJECT COST ESTIMATE SUMMARY

III. TRAFFIC REPORT

IV. PRELIMINARY ENVIRONMENTAL ASSESSMENT REPORT (PEAR)

V. INITIAL SITE ASSESSMENT (ISA)

VI. PRELIMINARY GEOTECHNICAL ASSESSMENT

VII. PRELIMINARY DRAINAGE REPORT

VIII. RIGHT OF WAY DATA SHEETS

IX. ADVANCE PLANNING STUDY

## 1. INTRODUCTION

The City of Redding is proposing to widen approximately six miles of Airport Road from a mostly two lane roadway to a four- to six-lane expressway with frontage roads between Dersch Road and State Route (SR) 44, as identified in the City's 2000-2020 General Plan. This planned widening will require the right of way to expand to roughly 110-150 feet depending on the number of lanes. This project is proposed to meet the future traffic demands of the planned and anticipated future development along the corridor.

See the cost estimate for specific work items included in this project.

| | |
|---|---|
| **Project Limits** | Airport Road from Churn Creek Road/Dersch Road to Old 44 Drive |
| **Project Length** | 6.0 miles |
| **Number of Alternatives:** | 2 |
| **Alternative Recommended for Programming:** | 1 |
| **Programmed or Proposed Capital Construction Costs** | $96 M |
| **Programmed or Proposal Capital Right of Way Costs:** | $32 M |
| **Funding Source:** | TIF, STIP, Redevelopment Increment |
| **Type of Facility (conventional, expressway, freeway):** | Expressway |
| **Number of Structures:** | 1 |
| **Anticipated Environmental Determination/Document** | NEPA/EIS |

A project report will serve as approval of the "selected" alternative.

If federal funding becomes available, the California Department of Transportation (Caltrans) would be the National Environmental Policy Act (NEPA) lead agency under the *NEPA Delegation Pilot Program*, authorized under SAFETEA LU.

## 2. BACKGROUND

Airport Road is identified as a four-lane expressway under the Transportation Element of the City of Redding's 2000-2020 General Plan and as a four-lane arterial in the 2004 Shasta County Regional Transportation Plan. As development has occurred along the corridor, the City has systematically constructed improvements to accommodate the future widening, such as setting back traffic signals to the ultimate build-out location. Development has been and is anticipated to continue to occur throughout the corridor. Due to current and anticipated growth, the City is proposing a conceptual plan line that

will be utilized for future planning and development to help manage access, define future right of way requirements and improve overall safety along the Airport Road corridor.

**EXISTING FACILITY**

Airport Road parallels Interstate 5 and provides access to the Redding Municipal Airport and the City of Anderson. Situated at the eastern edge of the City, Airport Road runs south approximately 6.2 miles, until it reaches the North Street Bridge over the Sacramento River. At the north end of the project limits, Airport Road intersects SR44 in a spread diamond interchange.

Airport Road is currently a two- to three-lane arterial that consists of one northbound and one southbound lane, with some turn pockets and right and left turn channelization at critical intersections. Operating speeds range from 35 to 55 miles per hour. Airport Road carries 9,000 to 11,000 vehicles per day, and is a designated commercial/industrial access route.

There are existing traffic signals at the intersections of Airport Road and the SR44 Ramps, Shasta View, Rancho Road, Knighton Road and Churn Creek Road/Dersch Road. New signals are proposed as part of future development at the Preserve Boulevard intersection with Airport Road and at the Fig Tree Lane intersection. All of the other intersections along Airport Road are two-way stop controlled, with Airport Road serving as the through leg of the intersection. The topography in the area is generally flat, except at the south end where Airport Road drops in elevation as it crosses the Sacramento River. South of the river, Airport Road continues as North Street into the City of Anderson. Shasta County will start construction on a new North Street bridge in Fall 2007, which includes widening Airport Road to four lanes between the Sacramento River Bridge and Churn Creek Road/Dersch Road.

Airport Road traverses both City and County right of way. Access is currently uncontrolled with numerous residential driveways and commercial/business access points. West of the Redding Municipal Airport there is an existing frontage road that parallels Airport Road for a short distance, providing access to several industrial, commercial and business sites. Along the project corridor, land is primarily zoned for commercial and industrial development, although the corridor includes some large residential subdivisions with planned “open space”. Active projects in the area include Shastina Ranch, Clover Creek Estates and Stillwater Business Park. Right of Way will need to be acquired or “dedicated” through the entire length of the proposed Airport Road Widening Project.

Existing drainage consists of sheet flow collected in road side ditches and in gutters where intermittent improvements have been constructed. Utilities exist along the entire corridor and include both wet and dry facilities. Overhead power, cable and telephone are hung on joint poles along much of the project along with existing underground sewer, water, gas, fiber optics cable and 12kV electrical lines.

## 3. PURPOSE AND NEED STATEMENT

### NEED

It is proposed to widen Airport Road between SR 44 and the Sacramento River to accommodate an acceptable level of service for the projected year 2030 traffic volumes. This project is needed to accommodate the forecasted traffic demand, while managing access to improve the overall mobility and safety along the corridor. Currently, the 2030 projected volumes of traffic are between 18,000 to 27,000 ADT which would result in a Level of Service (LOS) F along the corridor where no improvements are made. The acceptable LOS is defined in the City's General Plan as LOS C for most arterial streets and their intersections.

### PURPOSE

The Proposed Project purposes include the following:

- To relieve congestion from anticipated future traffic,
- To manage access/egress throughout the corridor, and
- To improve safety along the corridor.

## 4. DEFICIENCIES

### LEVEL OF SERVICE

Roadway segment operations were evaluated using the Average Daily Traffic (ADT) volume thresholds summarized in the City of Redding General Plan EIR (City of Redding, 2000). Table 1 presents the relationship between daily traffic volumes and LOS ratings.

**TABLE 1– MAXIMUM DAILY TRAFFIC VOLUMES PER TRAFFIC LANE**

| Roadway Category | A | B | C | D | E |
|---|---|---|---|---|---|
| Freeway – Level Terrain | 6,110 | 9,770 | 14,340 | 17,590 | 19,200 |
| Freeway – Rolling Terrain | 5,060 | 8,090 | 11,880 | 14,560 | 15,900 |
| Expressway – High Access Control | 6,300 | 7,350 | 8,400 | 9,450 | 10,500 |
| Express Way – Moderate Access Control | 5,820 | 6,790 | 7,760 | 8,730 | 9,700 |
| Urban Arterial – Moderate Access Control | 5,280 | 6,160 | 7,040 | 7,920 | 8,800 |
| Urban Arterial – Low Access Control | 4,740 | 5,530 | 6,320 | 7,110 | 7,900 |
| Urban Arterial – CBD one-way street | (1) | (1) | (1) | (1) | (1) |
| Urban Collector – No Access Control | (2) | (2) | (2) | (2) | (2) |
| Rural Roadway | 1,500 | 2,950 | 4,800 | 7,750 | 12,500 |

(1) One-way street LOS in Downtown Redding is determined from the analysis of selected signalized intersections

(2) Collector road LOS is evaluated under the intersection evaluation

Source: *City of Redding General Plan EIR* (Table 4-3, 2000) and the *Highway Capacity Manual* (TRB, 1994)

Currently, Airport Road operates at a Level of Service (LOS) A and B between SR 44

and Churn Creek Road/Dersch Road. As the eastern portion of Redding continues to grow and develop, the existing two-lane roadway will not be sufficient to handle the additional traffic volume projected for this facility. By 2010, if no improvements are made to the facility, Airport Road will be operating at a LOS C or below and by 2030 at an unacceptable LOS E or F from 7:00 a.m. until 7:00 p.m. With the proposed project, all segments of Airport Road will operate at LOS A or B at year 2030, as shown in Table 2. Without the proposed project, by 2030 eight of the eleven intersections within the project boundary will be operating at LOS F during the peak hour. With the Proposed Project, all intersections will be operating at a minimum of LOS C (see Table 3).

**TABLE 2 – ROADWAY LEVEL OF SERVICE FOR 2030 CONDITIONS**

| Roadway Segment | 2030 No Project | | | 2030 With Project | | |
|---|---|---|---|---|---|---|
| | Lanes | ADT[1] | LOS[2] | Lanes | ADT[1] | LOS[2] |
| SR 44 to Rancho Road | 2 | **25,800** | **F** | 4 | 25,800 | B |
| Rancho Road to Shasta View Drive | 2 | **19,830** | **F** | 4 | 19,830 | A |
| Shasta View Drive to Knighton Road | 2 | **19,120*** | **F** | 4 | 19,120* | A |
| Knighton Road to Meadow View Drive | 2 | **20,680*** | **F** | 4 | 20,680* | A |
| Meadow View Drive to Fig Tree Lane | 2 | **17,780** | **F** | 4 | 17,780 | A |
| Fig Tree Lane to Churn Creek Road-Dersch Road | 2 | **23,500*** | **F** | 4 | 23,500* | B |
| South of Churn Creek Road-Dersch Road[3] | 4 | 26,600 | B | 4 | 26,600 | B |

Notes:
Bold text indicates unacceptable LOS (level of service).
* indicates the ADT was estimated based on peak hour turning movement volumes.
1 ADT = Average Daily Traffic Volumes
2 LOS = Level of Service
3This roadway segment is assumed as part of the Shasta County Bridge project.
Source: Fehr and Peers, 2007

**TABLE 3 – INTERSECTION OPERATIONS FOR YEAR 2030 CONDITIONS**

| Intersection | Peak Hour | 2030 No Project | | | 2030 With Project | | |
|---|---|---|---|---|---|---|---|
| | | Control | Delay[1] | LOS | Delay[1] | Delay | LOS |
| 1. Airport Road (Old Oregon Trail Road)/ SR 44 Westbound Ramps | AM<br>PM | Signal | 25<br>27 | C<br>C | Signal | 9<br>16 | A<br>B |
| 2. Airport Road (Old Oregon Trail Road)/ SR 44 Eastbound Ramps | AM<br>PM | Signal | **>80**<br>**>80** | **F**<br>**F** | Signal | 16<br>17 | B<br>B |
| 3. Airport Road/Hartnell Avenue | AM<br>PM | Side-Street Stop | **>50**<br>**>50** | **F**<br>**F** | Side-Street Stop | 22<br>19 | C<br>C |
| 4. Airport Road/Old Oregon Trail | AM<br>PM | - | - | - | Signal | 12<br>14 | B<br>B |
| 5. Airport Road/Preserve (realigned Argyle Road) | AM<br>PM | Side-Street Stop | **>50**<br>**>50** | **F**<br>**F** | Signal | 22<br>30 | C<br>C |
| 6. Airport Road/Rancho Road | AM<br>PM | Signal | **>50**<br>**>50** | **F**<br>**F** | Signal | 32<br>34 | C<br>C |
| 7. Airport Road/Shasta View Drive | AM<br>PM | Signal | 23<br>**>80** | C<br>**F** | Signal | 20<br>29 | C<br>C |
| 8. Airport Road/Knighton Road | AM<br>PM | Signal | 14<br>31 | B<br>C | Signal | 17<br>25 | B<br>C |
| 9. Airport Road/Meadow View Drive | AM<br>PM | Side-Street Stop | **38**<br>**>50** | **E**<br>**F** | Signal | 19<br>23 | B<br>C |
| 10. Airport Road/Fig Tree Lane | AM<br>PM | Side-Street Stop | 25<br>**>50** | C<br>**F** | Signal | 15<br>21 | B<br>C |
| 11. Airport Road/Churn Creek Road-Dersch Road | AM<br>PM | Signal | **>80**<br>**>80** | **F**<br>**F** | Signal | 25<br>27 | C<br>C |
| ***Network Performance (Vehicle Hour of Delay)*** | ***AM***<br>***PM*** | ***1,630***<br>***1,950*** | | | ***210***<br>***230*** | | |

Notes:
Bold text indicates unacceptable LOS (level of service).
1. The table lists the LOS and average control delay (measured in seconds per vehicle) for each intersection. For side-street–stop-controlled intersections, the LOS and control delay for the worst movement is shown.
Source: Fehr & Peers, 2007

## ACCESS

Currently Airport Road has little to no access control, with many direct access driveways onto Airport Road. By providing frontage roads and connector roads, the access will be limited to major intersections where feasible, thus improving the overall mobility and safety along the corridor.

## SAFETY

Airport Road parallels Interstate 5 in the eastern portion of the City of Redding and provides access to multiple commercial and residential properties, as well as access to the Redding Municipal Airport and the City of Anderson. The City of Redding and Caltrans provided accident data from November 1, 2003, through October 30, 2006, for Airport

Road from SR 44 to Churn Creek Road/Dersch Road. Table 4 summarizes the data for roadway segments, while Table 5 summarizes the accident history by collision severity.

Airport Road between SR 44 and Argyle Road experienced 21 accidents over the three year period. Approximately 60% of these accidents were broadside collisions, with one fatality and 20% sideswipe collisions. The recently installed traffic signal at the SR 44 eastbound ramps intersection should reduce the number of broadside accidents at this location.

The segment of Airport Road between Knighton Road and Churn Creek Road/Dersch Road experienced 23 accidents over the same three year period, with one fatality. Overall, the Project corridor experienced 69 accidents over the three year period, with over 40% of the accidents categorized as broadsides. Reducing the number of direct-access driveway encroachments onto Airport Road and incorporating frontage roads into the corridor would improve mobility and safety. In addition, signalizing the key intersections should reduce the number of broadside accidents.

**TABLE 4 – AIRPORT ROAD ACCIDENT HISTORY BY ACCIDENTS TYPE**
**NOVEMBER 1, 2003 TO OCTOBER 30, 2006**

| Location | Accident Type | | | | | | Total |
|---|---|---|---|---|---|---|---|
| | Hit Object | Head-On | Rear-End | Broadside | Sideswipe | Other[1] | |
| Old Highway 44 to Argyle Road | 0 | 1 | 2 | 13[2] | 4 | 1 | 21 |
| Argyle Road to Rancho Road | 3 | 0 | 4 | 3 | 0 | 0 | 10 |
| Rancho Road to Knighton Road | 2 | 1 | 4 | 3 | 3 | 2 | 15 |
| Knighton Road to Churn Creek Road-Dersch Road | 3 | 4[2] | 4 | 9 | 0 | 3 | 23 |

Notes:
[1] This category includes the following TASAS accident types: Overturn, auto/pedestrian, and other.
[2] Includes one fatality.
Source: City of Redding, Caltrans (SWITRS), and Fehr & Peers, 2007

| TABLE 5 - COLLISON DATA SUMMARY (NOVEMBER 1, 2003 TO OCTOBER 30, 2006) | | | |
|---|---|---|---|
| | Number of Accidents | | |
| Location | Injury | Fatal | Total |
| Old Highway 44 to Argyle Road | 14[1] | 1[1] | 21 |
| Argyle Road to Rancho Road | 5 | 0 | 10 |
| Rancho Road to Knighton Road | 9 | 0 | 15 |
| Knighton Road to Churn Creek Road-Dersch Road | 12[1] | 1[1] | 23 |

Notes:
[1] Accident resulted in both a fatality and injury.
Source: City of Redding, Caltrans, and Fehr & Peers, 2007

## 5. CORRIDOR AND SYSTEM COORDINATION

The purpose and need of the proposed project is consistent with the overall purpose of the 2004 Shasta County Regional Transportation Plan which is summarized as "to reduce traffic delays, congestion, improve safety and improve the overall mobility for the traveling public on both the state highway and local roads in Shasta County."

The proposed project is consistent with the City of Redding's 2000-2020 General Plan which identifies Airport Road as a four-lane expressway, and the 2004 Shasta County Regional Transportation Plan which identifies it as a four lane arterial. In addition, Shasta County is in the final design stages of replacing the Airport Road Bridge (Br. No. 06C-0008) over the Sacramento River, which also includes the widening of Airport Road to four lanes with a center-turn lane from Riverside Avenue to Churn Creek Road/Dersch Road.

The proposed project also incorporates proposed improvements for several local development projects including Clover Creek Estates, Shastina Ranch and the Stillwater Business Park.

Coordination with Caltrans will be required for the replacement of the Airport Road Overcrossing over SR 44 (Br. No. 06-0182). (See Attachment IX).

## 6. ALTERNATIVES

Two "build" alternatives and a "no-build" alternative were evaluated for this project.

**No Build**: With the no-build alternative, an unacceptable level of service would occur for the majority of the project length as Airport Road could not accommodate the forecasted traffic volumes. As stated previously in this report, without the proposed project, by 2030 eight of the eleven intersections within the project boundary will be operating at LOS F during the peak hour. Since no improvements would be constructed with the no-build alternative, it is likely that the number of accidents in the corridor

would increase as traffic volumes increase. Access, mobility and safety would not be improved with this alternative.

**Alterative One:** This alternative proposes to widen Airport Road to a four-lane expressway based on the current City standard drawing 112.50 for a standard 110' right of way expressway thoroughfare. Additional lanes and signalization are proposed at key intersections. This alternative includes curb & gutter, sidewalks, an 18' landscaped median and storm drain for the length of the project. For programming purposes, the sidewalk is shown directly behind the curb and gutter; however the exact location will be determined in later project phases. This alternative also includes frontage roads and connector roads where feasible, which will reduce the number of access points along Airport Road and improve safety along the corridor.

On the north end of the project, the SR 44 Airport Road Overcrossing is proposed to be replaced to improve the stopping sight distance along Airport Road. The existing bridge was designed based on a 35 mph speed limit. The proposed bridge is designed based on a 55 mph design speed for the stopping sight distance. A lower design speed may be approved by Caltrans, which would reduce the overall cost and therefore should be studied in more detail during a future phase of the project.

Currently, the Meadow View Drive intersection has a higher than normal accident and fatality rate. Alternative One proposes to improve the horizontal curve radius at Meadow View Drive and reduce the rate of superelevation through the intersection, along with signalizing the intersection. Two options are shown for the alignment in this area. Option B will have less of an impact on the existing utilities and wetlands, and does not impact the Airport Clear Space. Therefore Option B is the preferred alignment.

As development occurs along the corridor, frontage roads and intersection improvements will be based on the approved "plan line" and will be included with the development. Future access will be restricted to the frontage roads.

With this alternative, utility relocations will be required including approximately two to five large City of Redding power poles. This relocation cost is anticipated to be $200,000.

The total escalated right of way cost for this alternative is estimated to be approximately $32 million.

It is anticipated Alternative One could be constructed in phases, as development occurs along the corridor and as traffic volumes warrant improvements. Depending on the proposed development, the actual frontage road locations may vary from those shown (see Attachment I) and would be constructed in conjunction with planned development, along with intersection improvements as warranted by the development.

The segment of roadway from SR 44 to Rancho Road is projected to be at a LOS E by 2010 and therefore this segment is recommended to be constructed as Phase 1. The

County portion from Rancho Road to Shasta View Drive could be constructed in several phases, with the initial phase including widening Airport Road to four lanes with a raised median to provide moderate access control by limiting the left turn movements to Rancho Road, Charlene Drive and Shasta View Drive intersections as shown on layout sheets 9a and 10a. This would result in a LOS D based on projected 2030 traffic volumes. Frontage roads and access roads could be constructed in a later phase and access limited as feasible and warranted by traffic volumes.

The segment of roadway from Fig Tree Lane to Churn Creek Road/Dersch Road is projected to be at a LOS E with no project by 2010. Therefore, it is recommended this segment be widened to four lanes with a dual left turn lane as Phase 1. The connector roads could be added at a later date to provide improved mobility as the traffic volumes further increase.

**Alternative Two**: Alternative Two proposes to widen Airport Road to a six-lane expressway. Based on the 2030 projected traffic volumes for Airport Road, the additional lanes are not warranted except for turn lanes at key intersections. Since widening of key intersections is included in Alternative One, no additional benefit would be derived with this alternative. Therefore, Alternative Two was not evaluated further.

## 7. COMMUNITY INVOLVEMENT

A public workshop was held on Monday, October 22, 2007 at the City of Redding offices. After the public workshop, the City received several written comments from some of the attendees. Some of the existing landowners were concerned about the location and need for the proposed frontage roads, which will be driven by future development in the area. In addition, several comments were made with regards to the addition of bike lanes along the corridor. The typical section for Airport Road shows a 10’ outside shoulder, which would accommodate an on-street bike lane.

Overall, the attendees were in support of the project and the proposed improvements. Additional coordination with property owners is recommended as the project proceeds through the environmental clearance and design phases.

## 8. ENVIRONMENTAL DETERMINATION/DOCUMENTATION

A Preliminary Environmental Analysis Report (PEAR) was prepared by Jones & Stokes (see Attachment IV). The findings of the PEAR document are summarized as follows:

### Anticipated Environmental Approval

Anticipated California Environmental Quality Act (CEQA) environmental documentation will be an Environmental Impact Report (EIR) and the anticipated environmental document to comply with National Environmental Policy Act (NEPA) is an Environmental Impact Statement (EIS). It is estimated that approximately 24-30 months would be required to conduct the technical studies, prepare and circulate the joint environmental document for public review, and obtain environmental approvals. If an

Environmental Assessment (EA) and Finding Of No Significant Impact (FONSI) could be prepared instead of an EIS for NEPA compliance, the schedule could be shortened to approximately 18-24 months.

The City of Redding is the (CEQA) lead agency. If federal funding becomes available, Caltrans would be the designated NEPA lead agency under *the NEPA Delegation Pilot Program*. The City's role is to oversee the CEQA and NEPA process, decision-making and the development, review and approval of the environmental documentation being produced for this project. More detailed studies or changes in project characteristics may change these conclusions.

The key environmental issues associated with the proposed project include impacts to biological resources (wetlands and special-status species), property displacement and other community impacts, noise, and cumulative effects. It is anticipated that the proposed project would require preparation of the following technical studies: visual assessment; community impact assessment; relocation impact study; noise study; air quality study; water quality study; Section 106 cultural resource studies (including an historic property survey report and archaeological survey report); initial site assessment; biological studies (natural environment study, including biological assessment and wetland delineation); and authorizations and approvals under the Clean Water Act, California Fish and Game Code, and state and federal Endangered Species Acts.

**Special Considerations**

The sources of funding, as well as federal and state lead agency involvement, are key issues that will need to be addressed early in the environmental review process as they could affect project delivery and scheduling.

**Anticipated Project Mitigation**

The following is a list of potential environmental mitigation requirements for the proposed project.

- Visual Effects-A visual assessment will be required and should include potential project effects and affected existing landscaped areas. The final cost of the project should include landscaping, soundwalls, and street lighting.

- Water Quality and Erosion-Standard erosion control measures and BMPs to mitigate erosion and water quality during construction are expected.

- Air Quality-Standard dust control measures and compliance with the City of Redding's Air Pollutant Emission thresholds will be required.

- Noise-Required locations of soundwalls will need to be studied further.

- Hazardous Waste/Materials-There are several parcels along the corridor which are potentially contaminated based on a database records search. These parcels are listed in the Phase I Initial Site Assessment (ISA) which was conducted by

- Biological Resources-Mitigation for temporary and permanent impacts to sensitive biological resources include, but are not limited to, onsite restoration of aquatic resources including waters of the United States, offsite mitigation credits for vernal pool habitat and waters of the United States, and endangered species mitigation. For this project it was assumed that three acres of wetland/vernal pool habitat, including endangered species, would be impacted and one elderberry shrub would be removed. In addition, mitigation would be required for any oak trees removed within the County limits.

**Anticipated Permits**
The following is a list of potential regulatory agency and permit requirements.

- U.S. Army Corps of Engineers (USACE)—Clean Water Act Section 404 nationwide permit(s) 14 (linear transportation projects) or an individual permit (creek crossings and effects on wetlands).

- Central Valley Regional Water Quality Control Board (CVRWQB)—Clean Water Act Section 401 water quality certification and National Pollution Discharge Elimination System (NPDES) Construction Activity Stormwater Permit.

- U.S. Fish and Wildlife Service (USFWS)—biological opinion for adverse effects on federally listed species.

- California Department of Fish and Game (CDFG)—Streambed Alteration Agreement (1602 Agreement) and California Endangered Species Act (CESA).

- Compliance with Section 106 of the National Historic Preservation Act (NHPA).

## 9. FUNDING

Currently, $12 million in Traffic Impact fees is programmed for the proposed project. It is anticipated that future STIP funds, redevelopment funds, and specific project mitigation from upcoming development projects will be used for the proposed project.

### CAPITAL COST

**Capital Cost Estimate for the Alternative Identified for Programming**

| ITEM | COST $2007 |
|---|---|
| Capital | $96,000,000 |
| Environmental Planning | $3,000,000 |
| Design | $9,000,000 |
| Construction Administration | $9,000,000 |
| Right of Way (Escalated) | $32,000,000 |

## 10. SCHEDULE

| HQ Milestones | Anticipated Timeframe (Months) |
|---|---|
| Environmental Compliance | 24-36 |
| Design Complete | 24 |
| Right of Way Acquisition | 18-24 |
| Construction | 24 |

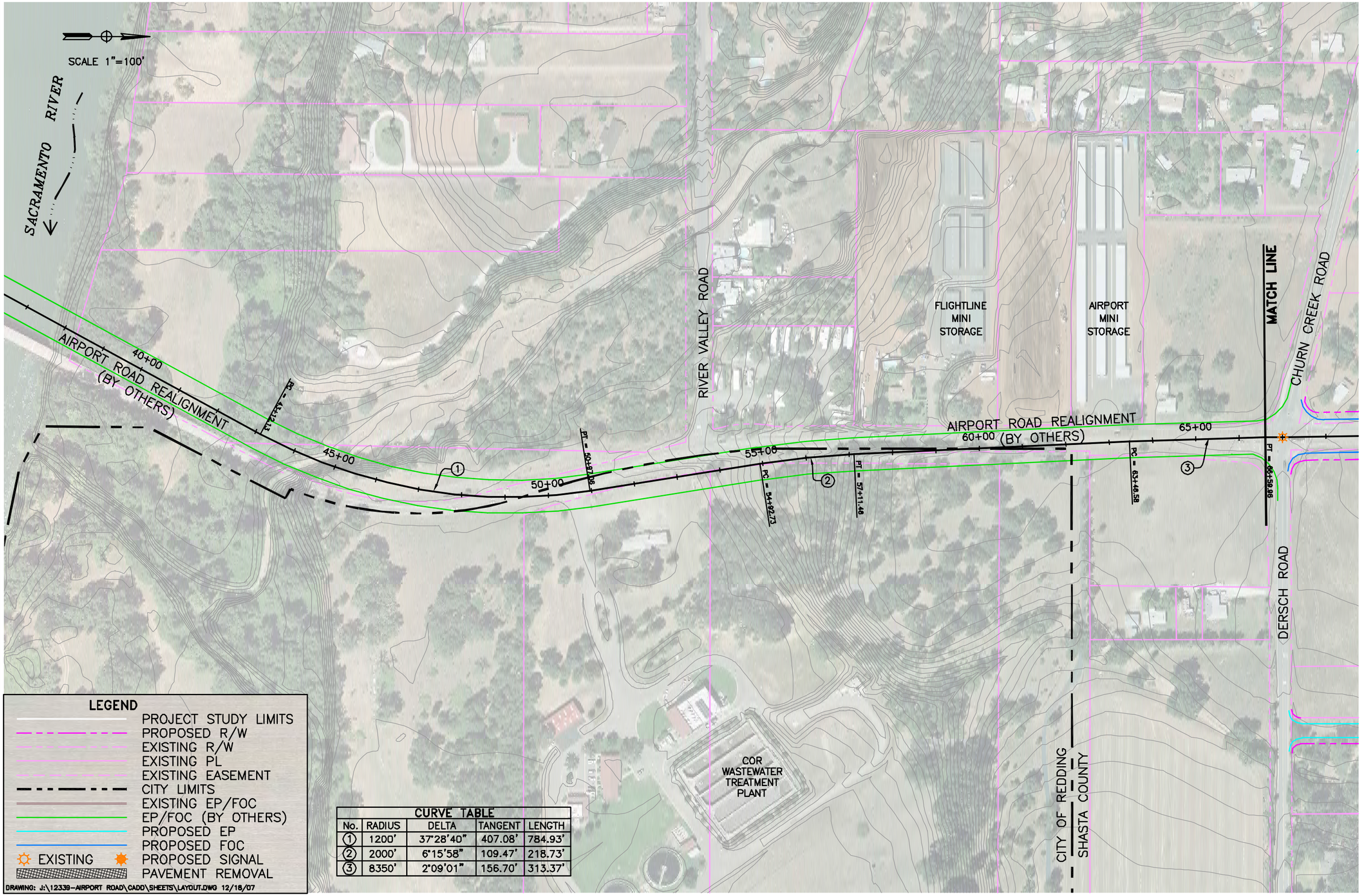
## 11. FHWA COORDINATION

No federal-aid funding is identified for this project at this time.

# ATTACHMENT I

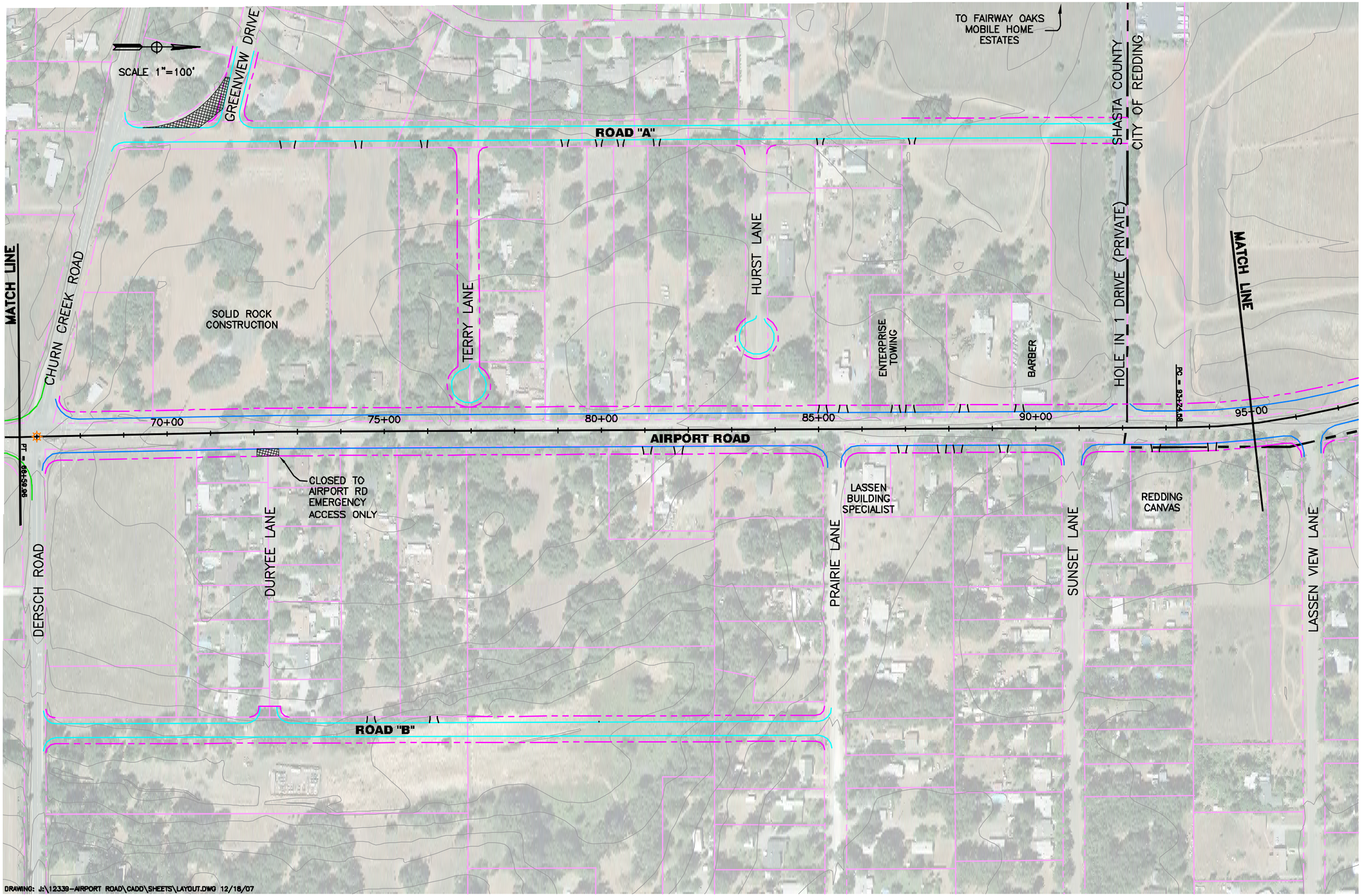
# PROJECT STUDY REPORT PLANS

# AIRPORT ROAD WIDENING - PSR
## LAYOUT

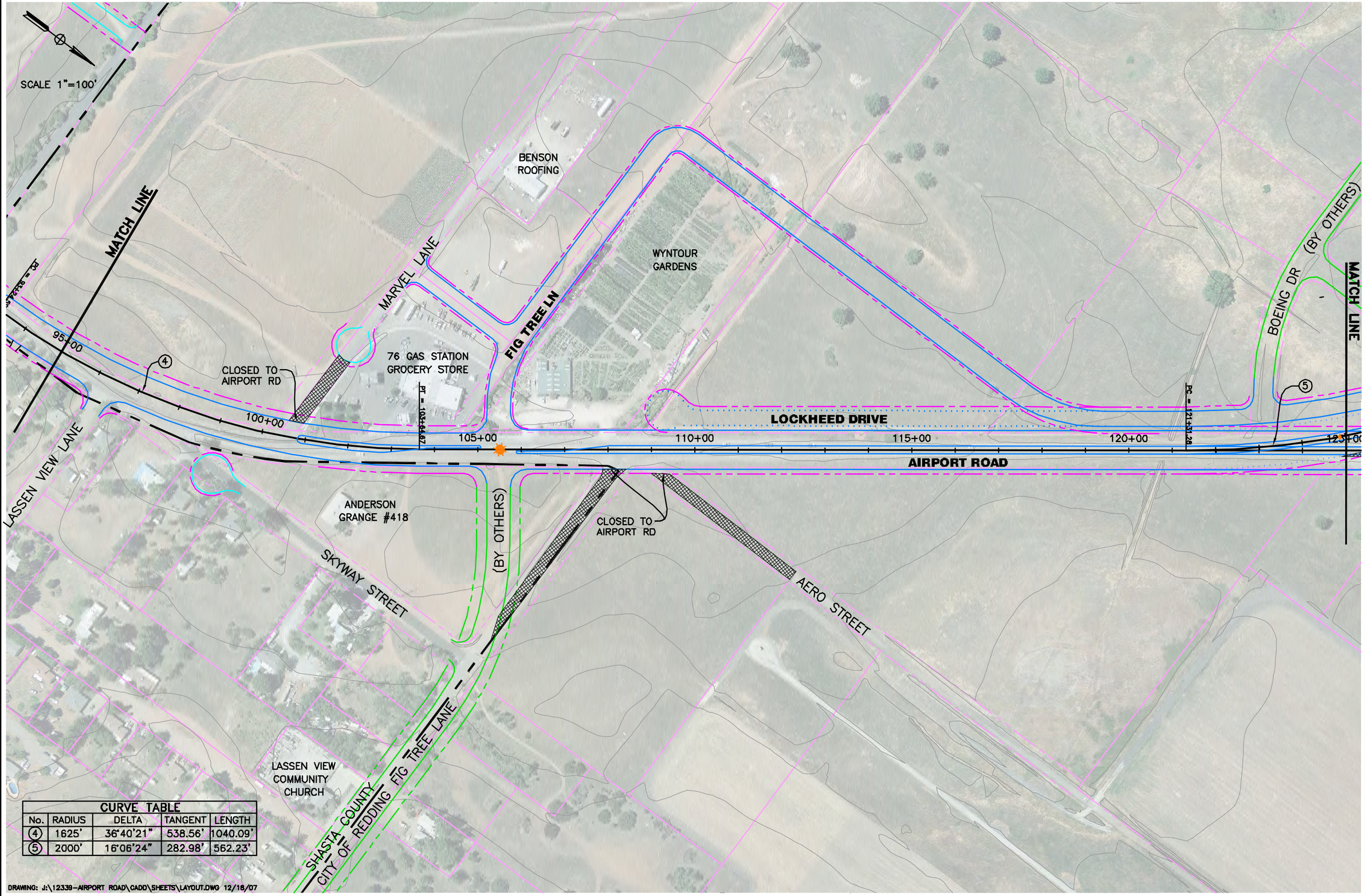



**CURVE TABLE**

| No. | RADIUS | DELTA | TANGENT | LENGTH |
|---|---|---|---|---|
| 1 | 1200' | 37°28'40" | 407.08' | 784.93' |
| 2 | 2000' | 6°15'58" | 109.47' | 218.73' |
| 3 | 8350' | 2°09'01" | 156.70' | 313.37' |




# AIRPORT ROAD WIDENING - PSR
## LAYOUT

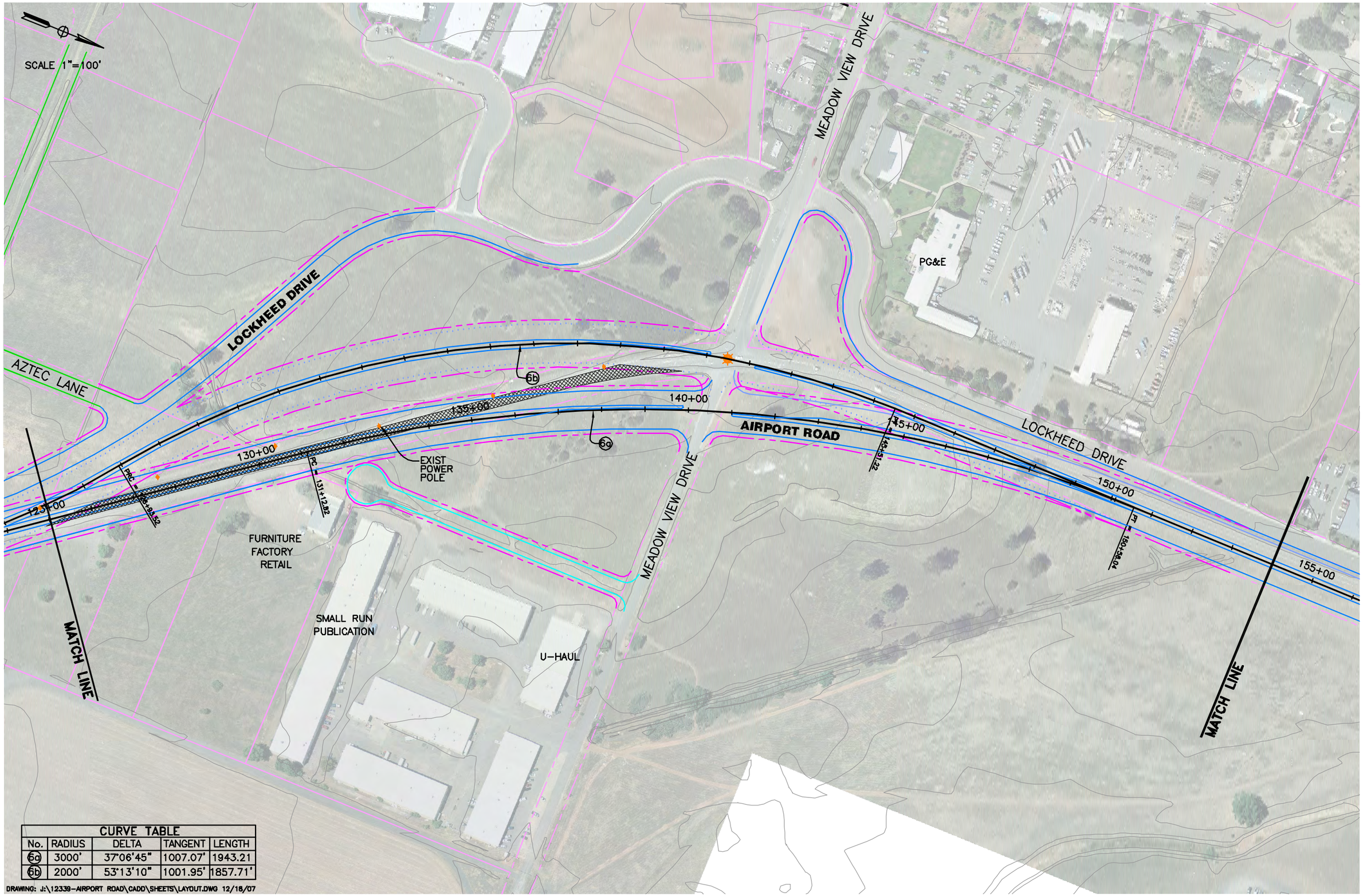



CURVE TABLE

| No. | RADIUS | DELTA | TANGENT | LENGTH |
|---|---|---|---|---|
| 4 | 1625' | 36°40'21" | 538.56' | 1040.09' |
| 5 | 2000' | 16°06'24" | 282.98' | 562.23' |

DRAWING: J:\12339-AIRPORT ROAD\CADD\SHEETS\LAYOUT.DWG 12/18/07

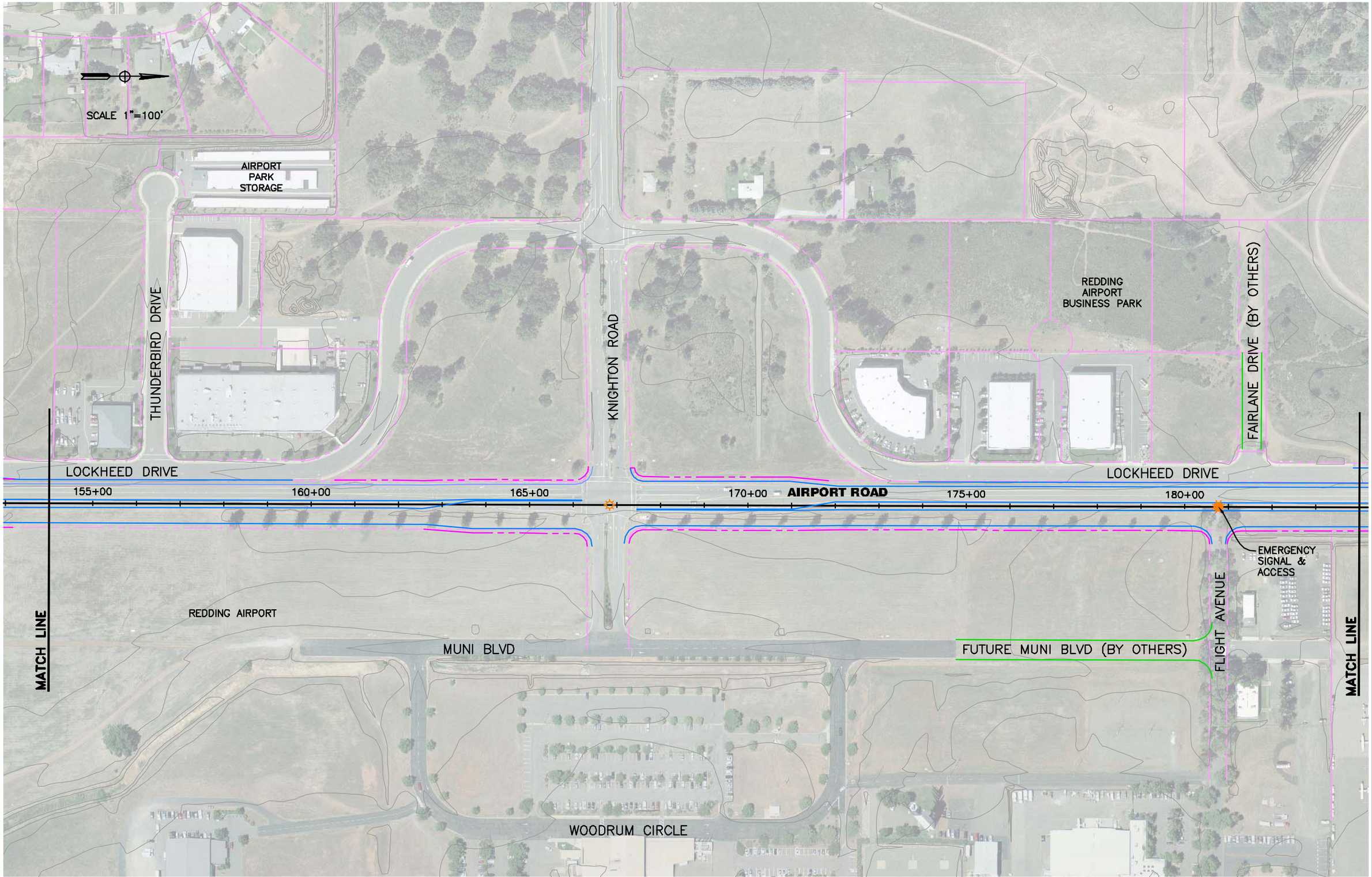
# AIRPORT ROAD WIDENING - PSR
## LAYOUT




| CURVE TABLE | | | | |
|---|---|---|---|---|
| No. | RADIUS | DELTA | TANGENT | LENGTH |
| 6a | 3000' | 37°06'45" | 1007.07' | 1943.21 |
| 6b | 2000' | 53°13'10" | 1001.95' | 1857.71' |

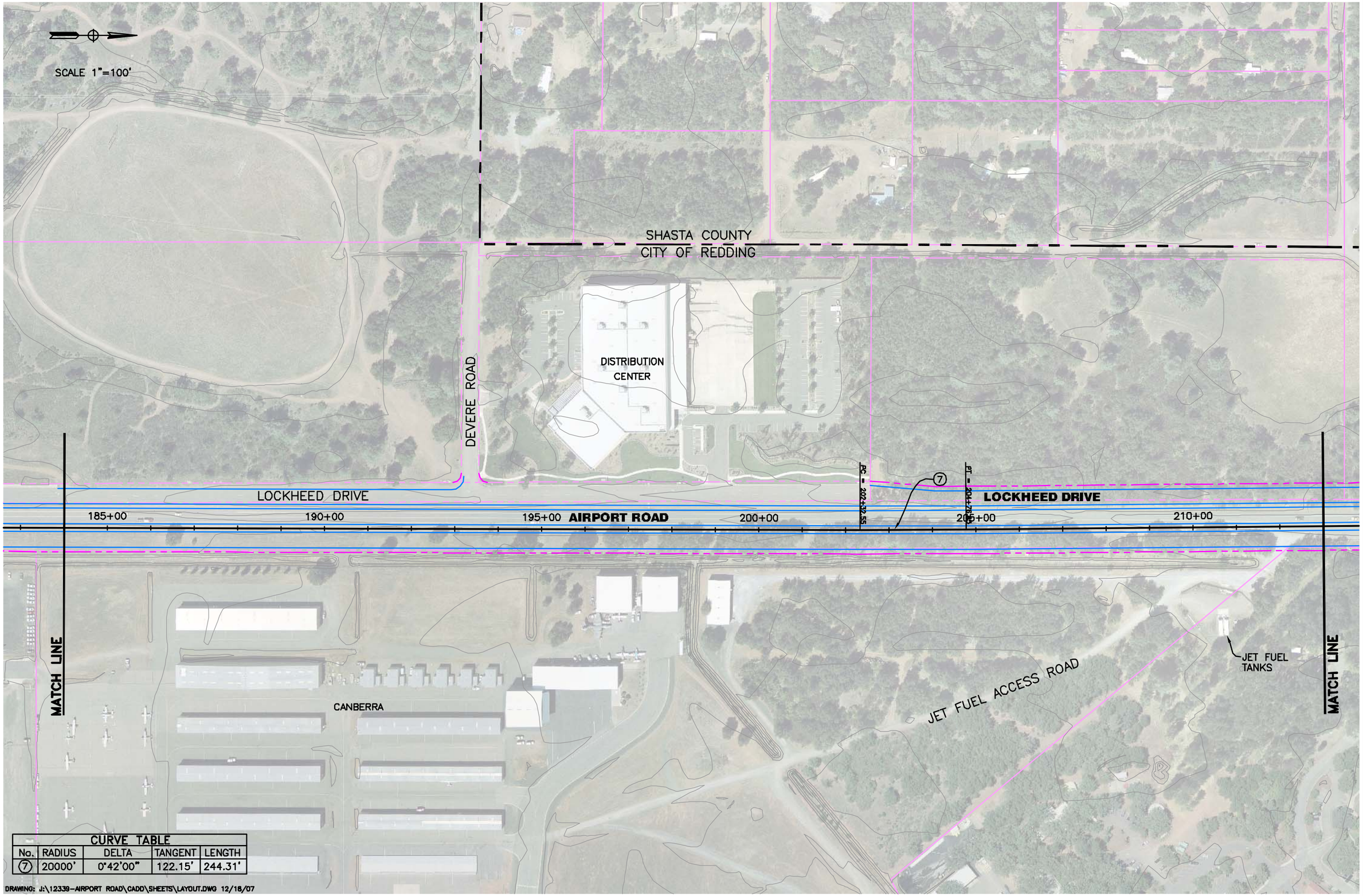
DRAWING: J:\12339-AIRPORT ROAD\CADD\SHEETS\LAYOUT.DWG 12/18/07

# AIRPORT ROAD WIDENING - PSR
## LAYOUT




DRAWING: J:\12339-AIRPORT ROAD\CADD\SHEETS\LAYOUT.DWG 12/18/07

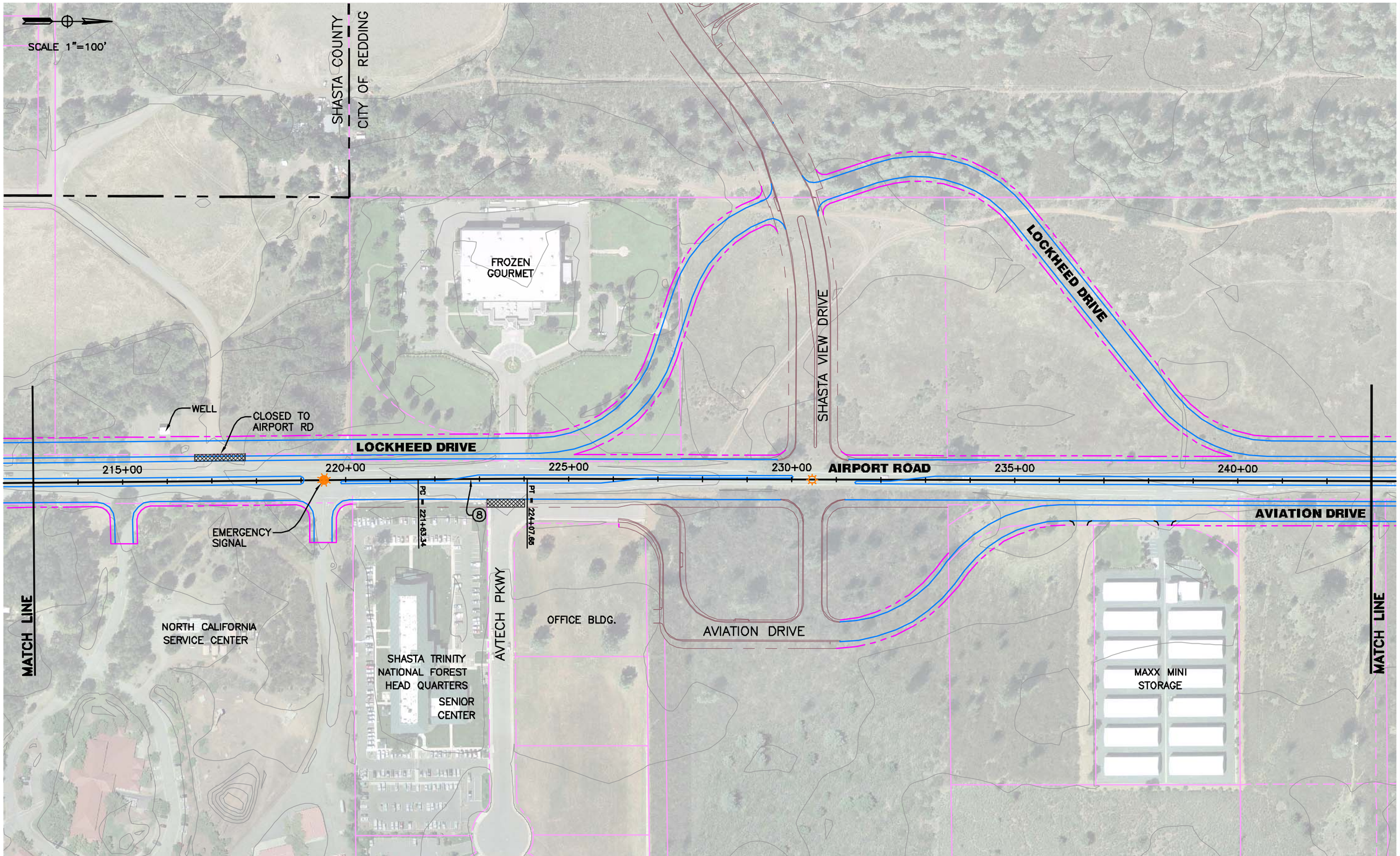
# AIRPORT ROAD WIDENING - PSR
## LAYOUT




| CURVE TABLE | | | | |
|---|---|---|---|---|
| No. | RADIUS | DELTA | TANGENT | LENGTH |
| 7 | 20000' | 0°42'00" | 122.15' | 244.31' |

DRAWING: J:\12339-AIRPORT ROAD\CADD\SHEETS\LAYOUT.DWG 12/18/07

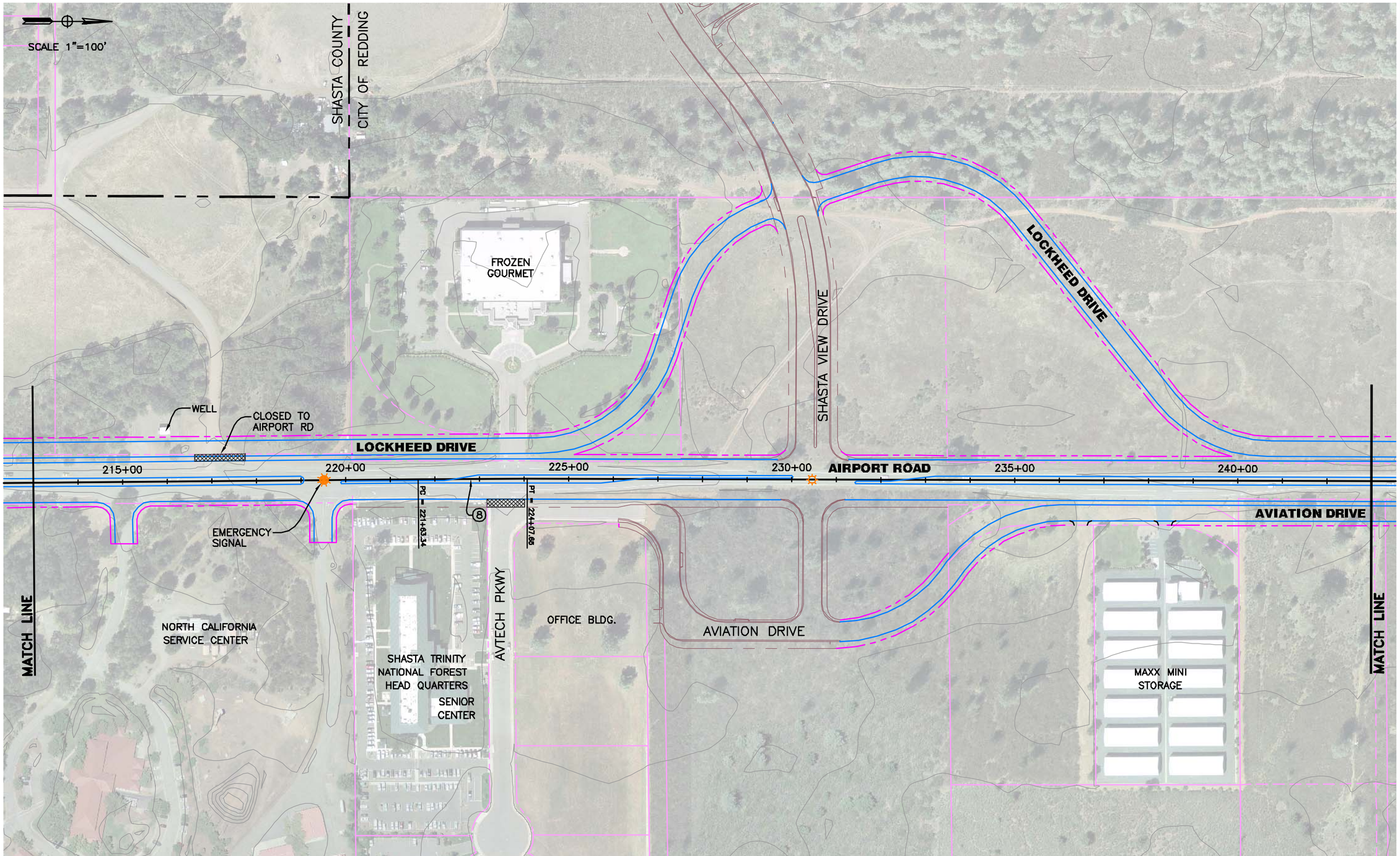
# AIRPORT ROAD WIDENING - PSR
## LAYOUT




| CURVE TABLE | | | | |
|---|---|---|---|---|
| No. | RADIUS | DELTA | TANGENT | LENGTH |
| 8 | 20000' | 0°42'00" | 122.15' | 244.31' |

DRAWING: J:\12339-AIRPORT ROAD\CADD\SHEETS\LAYOUT.DWG 12/18/07

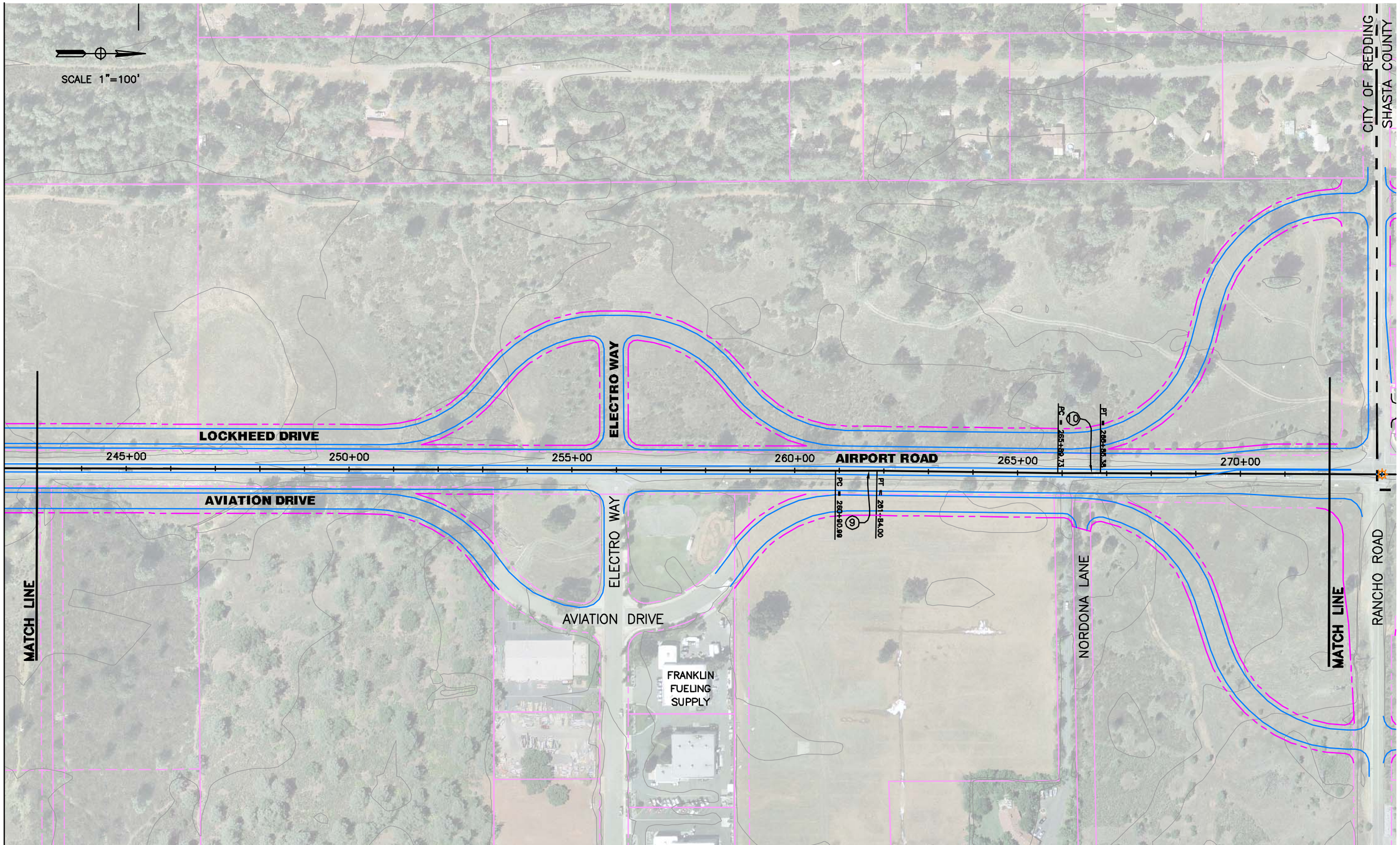
# AIRPORT ROAD WIDENING - PSR
## LAYOUT




| CURVE TABLE | | | | |
|---|---|---|---|---|
| No. | RADIUS | DELTA | TANGENT | LENGTH |
| 8 | 20000' | 0°42'00" | 122.15' | 244.31' |

DRAWING: J:\12339-AIRPORT ROAD\CADD\SHEETS\LAYOUT.DWG 12/18/07

# AIRPORT ROAD WIDENING - PSR
## LAYOUT



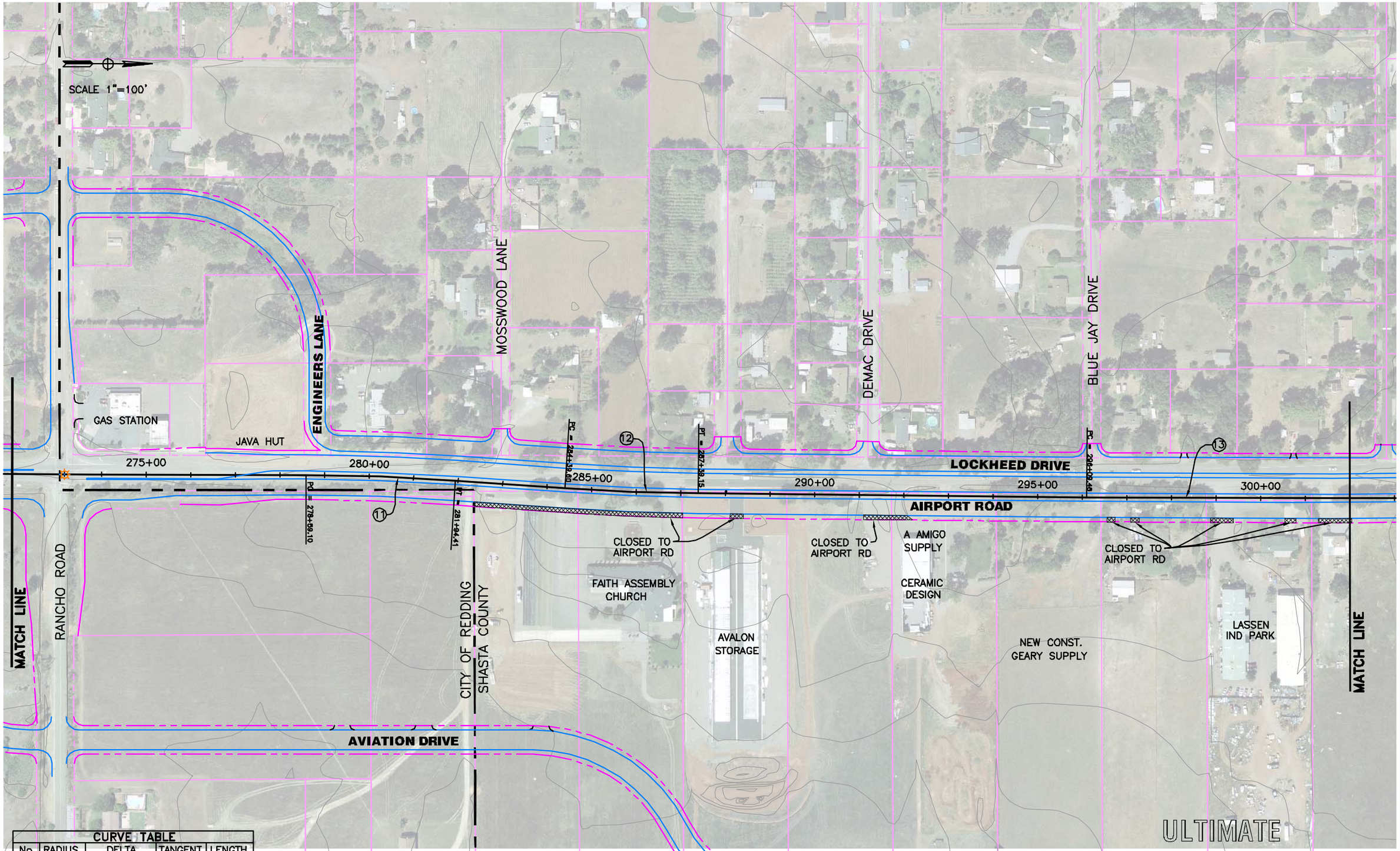

| CURVE TABLE | | | | |
|---|---|---|---|---|
| No. | RADIUS | DELTA | TANGENT | LENGTH |
| 9 | 10000' | 0°31'59" | 46.51 | 93.02' |
| 10 | 10000' | 0°32'53" | 47.83' | 95.65' |

DRAWING: J:\12339-AIRPORT ROAD\CADD\SHEETS\LAYOUT.DWG 12/18/07

# AIRPORT ROAD WIDENING - PSR
## LAYOUT

8/12

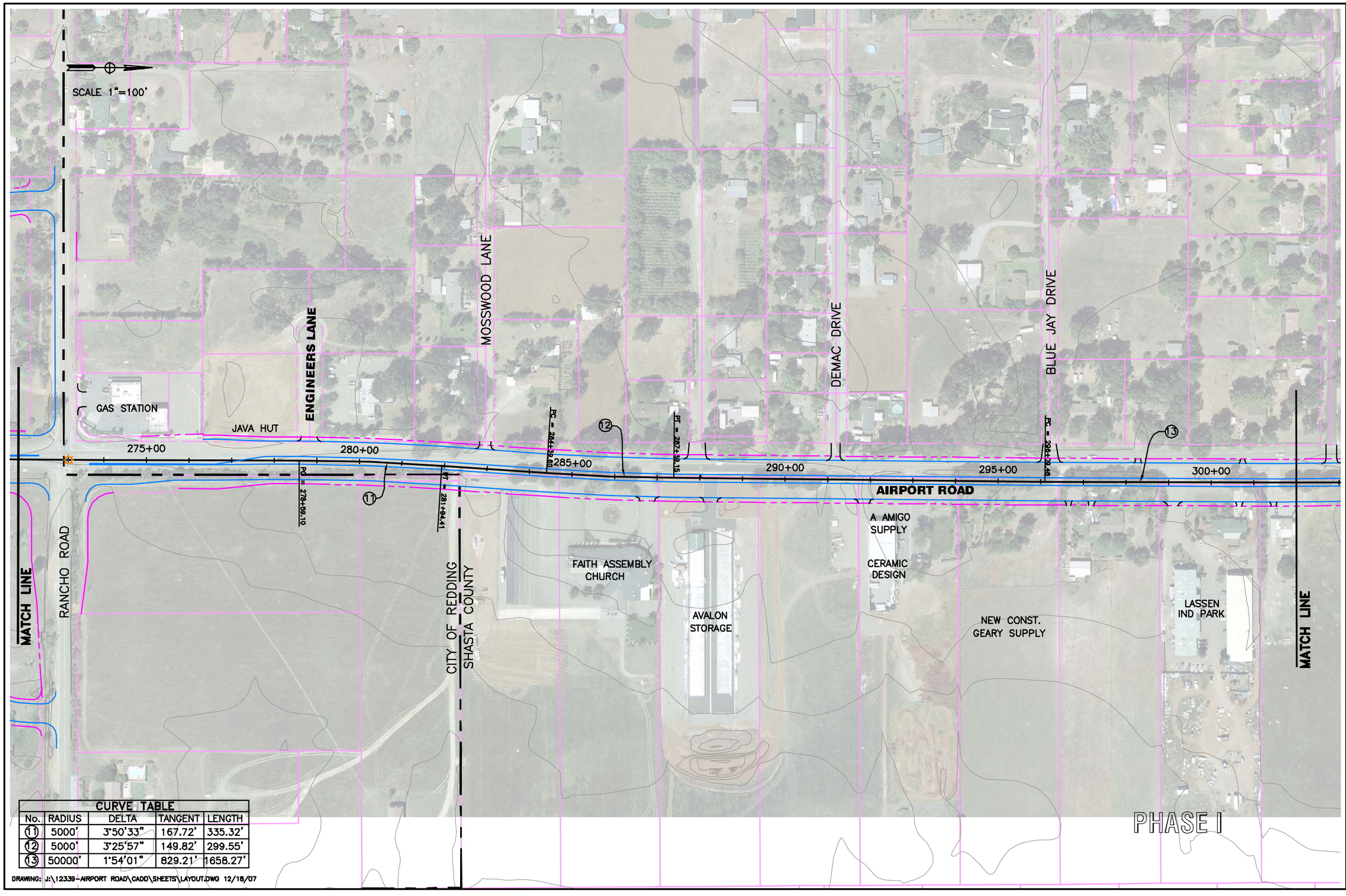
# AIRPORT ROAD WIDENING - PSR
## LAYOUT




CURVE TABLE

| No. | RADIUS | DELTA | TANGENT | LENGTH |
|---|---|---|---|---|
| 11 | 5000' | 3°50'33" | 167.72' | 335.32' |
| 12 | 5000' | 3°25'57" | 149.82' | 299.55' |
| 13 | 50000' | 1°54'01" | 829.21' | 1658.27' |

DRAWING: J:\12339-AIRPORT ROAD\CADD\SHEETS\LAYOUT.DWG 12/18/07




CURVE TABLE

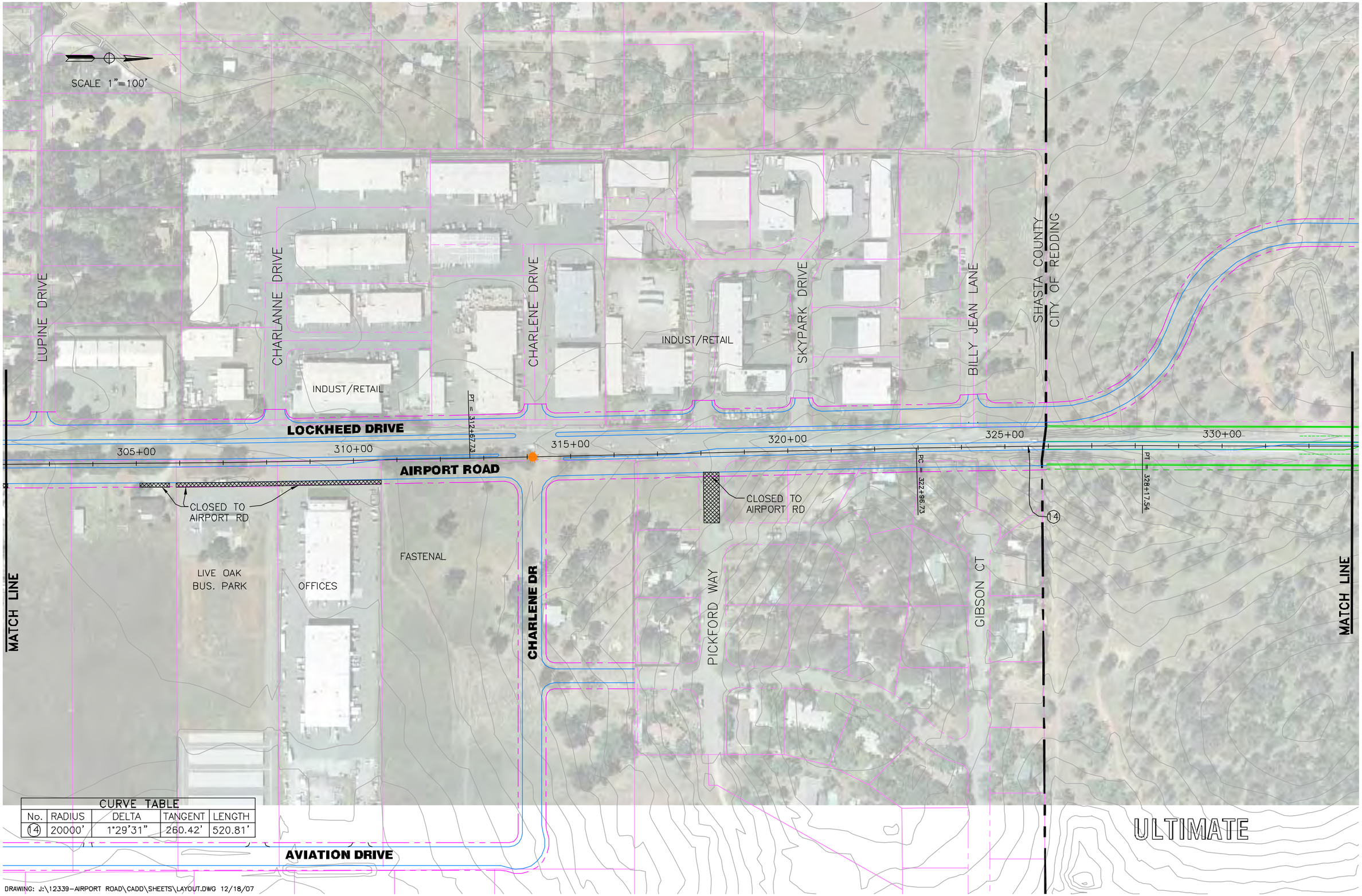
| No. | RADIUS | DELTA | TANGENT | LENGTH |
|---|---|---|---|---|
| 11 | 5000' | 3°50'33" | 167.72' | 335.32' |
| 12 | 5000' | 3°25'57" | 149.82' | 299.55' |
| 13 | 50000' | 1°54'01" | 829.21' | 1658.27' |

DRAWING: J:\12339-AIRPORT ROAD\CADD\SHEETS\LAYOUT.DWG 12/18/07

# AIRPORT ROAD WIDENING - PSR
## LAYOUT

9A/12

# AIRPORT ROAD WIDENING - PSR
## LAYOUT

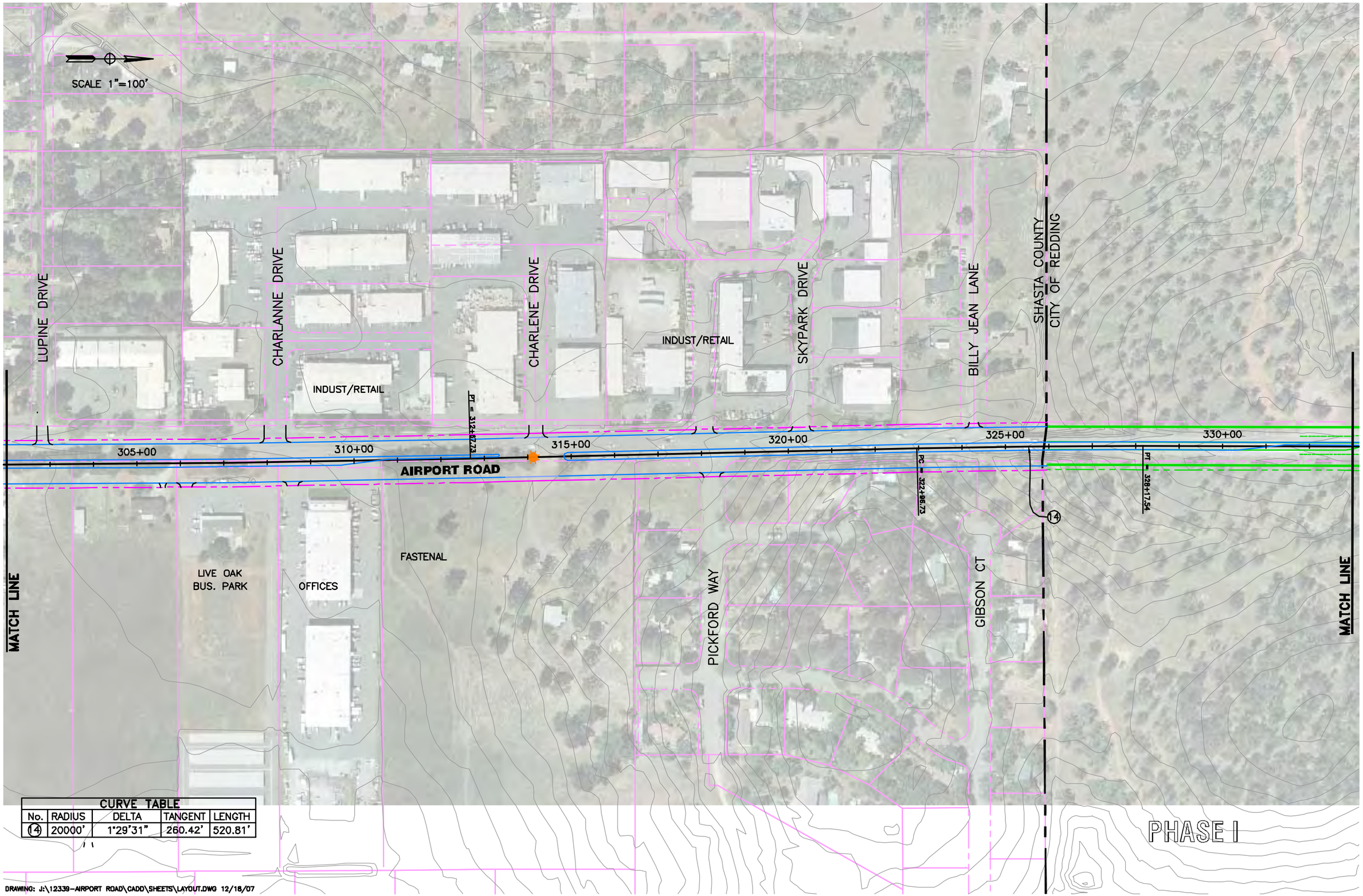



CURVE TABLE

| No. | RADIUS | DELTA | TANGENT | LENGTH |
|---|---|---|---|---|
| 14 | 20000' | 1°29'31" | 260.42' | 520.81' |

DRAWING: J:\12339-AIRPORT ROAD\CADD\SHEETS\LAYOUT.DWG 12/18/07

10/12



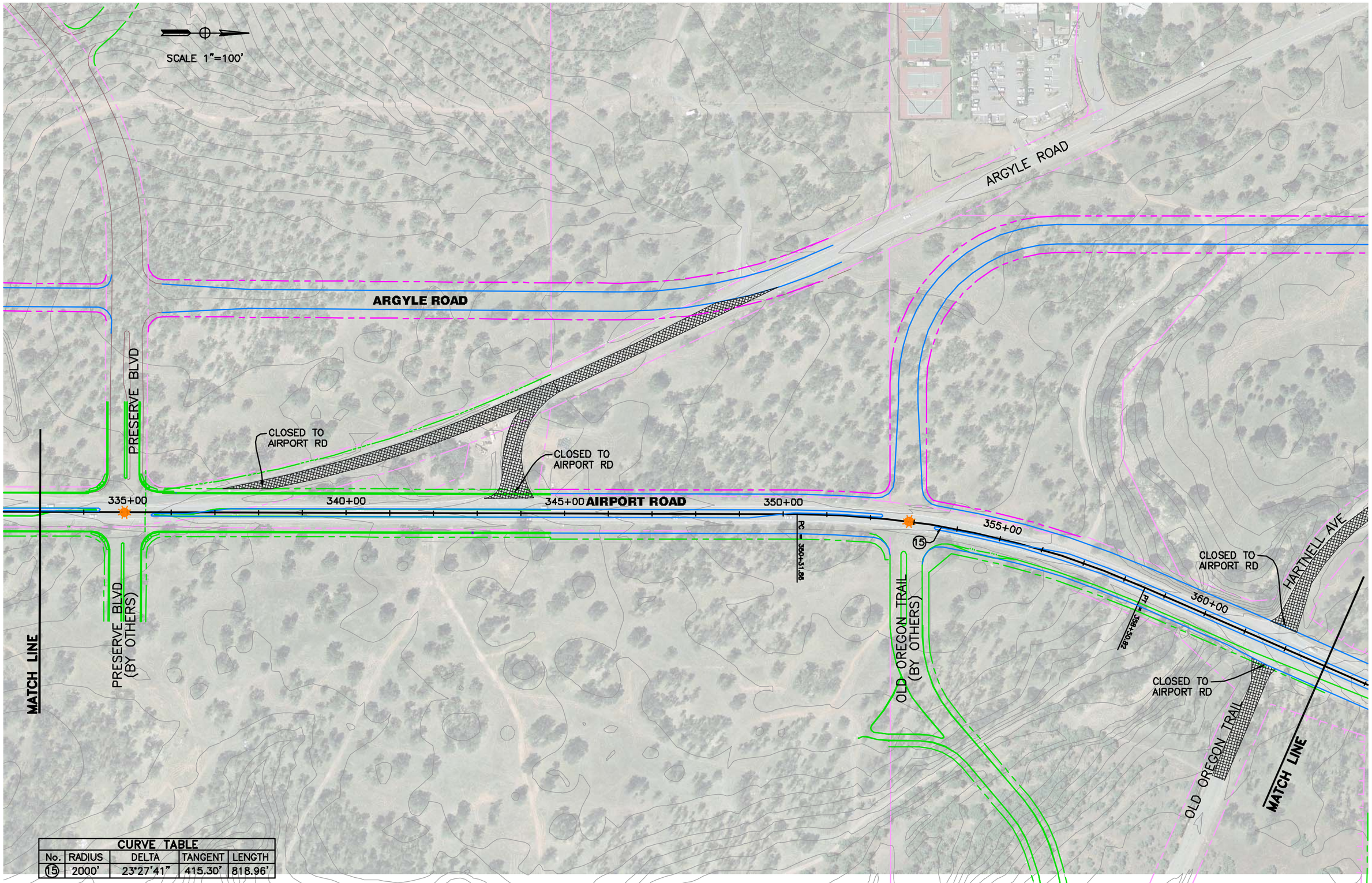

CURVE TABLE

| No. | RADIUS | DELTA | TANGENT | LENGTH |
|---|---|---|---|---|
| 14 | 20000' | 1°29'31" | 260.42' | 520.81' |

DRAWING: J:\12339-AIRPORT ROAD\CADD\SHEETS\LAYOUT.DWG 12/18/07

# AIRPORT ROAD WIDENING - PSR
## LAYOUT

10A/12

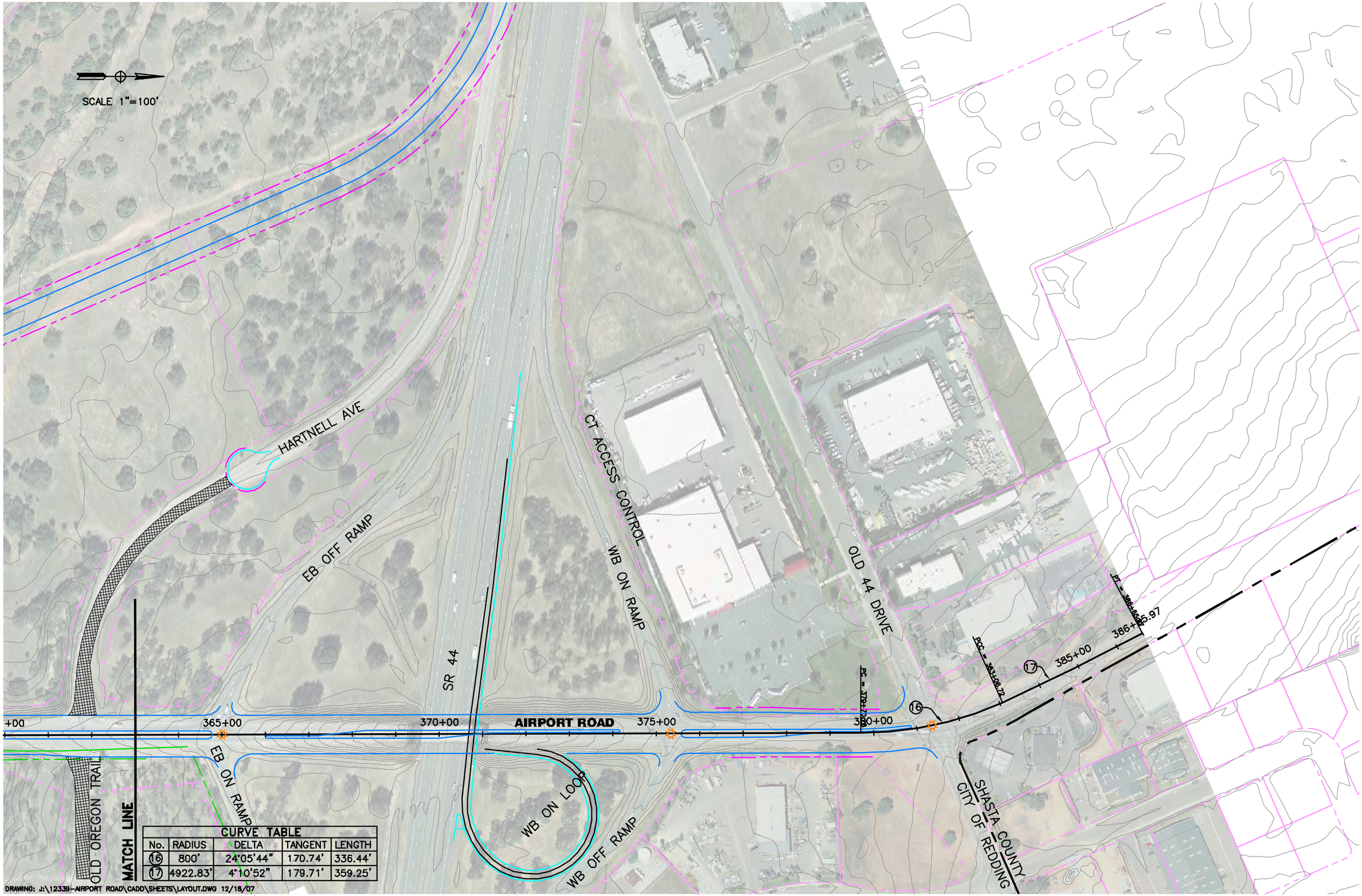



| CURVE TABLE | | | | |
|---|---|---|---|---|
| No. | RADIUS | DELTA | TANGENT | LENGTH |
| 15 | 2000' | 23°27'41" | 415.30' | 818.96' |

DRAWING: J:\12339-AIRPORT ROAD\CADD\SHEETS\LAYOUT.DWG 12/18/07

# AIRPORT ROAD WIDENING - PSR
## LAYOUT

11/12



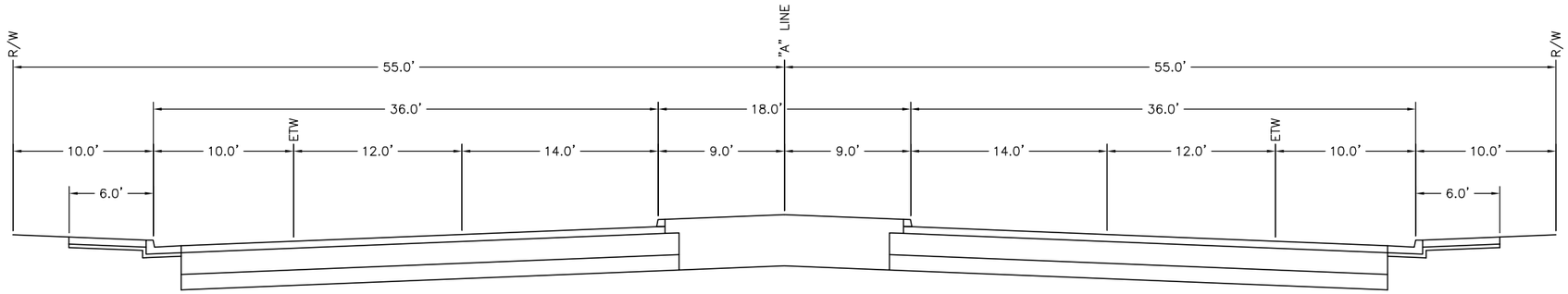

CURVE TABLE

| No. | RADIUS | DELTA | TANGENT | LENGTH |
|---|---|---|---|---|
| 16 | 800' | 24°05'44" | 170.74' | 336.44' |
| 17 | 4922.83' | 4°10'52" | 179.71' | 359.25' |

DRAWING: J:\12339-AIRPORT ROAD\CADD\SHEETS\LAYOUT.DWG 12/18/07

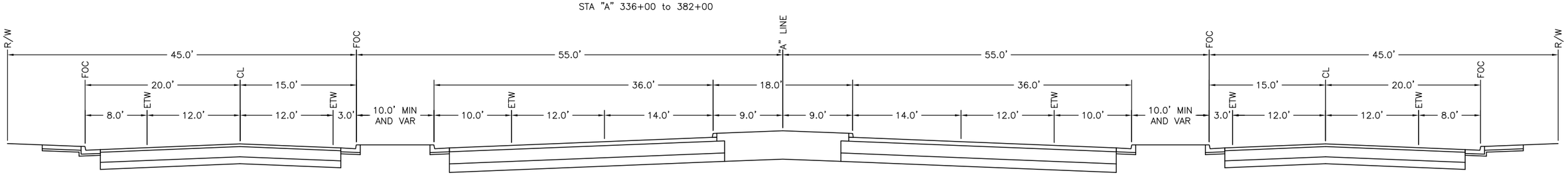
# AIRPORT ROAD WIDENING - PSR
## LAYOUT

12/12




## AIRPORT ROAD

STA "A" 336+00 to 382+00




## LOCKHEED DRIVE

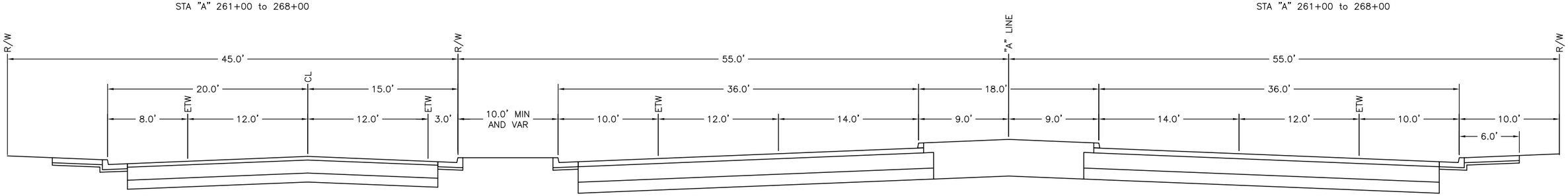
STA "A" 241+00 to 252+50
STA "A" 261+00 to 268+00

## AIRPORT ROAD

STA "A" 224+50 to 274+00

## AVIATION DRIVE

STA "A" 236+50 to 252+50
STA "A" 261+00 to 268+00

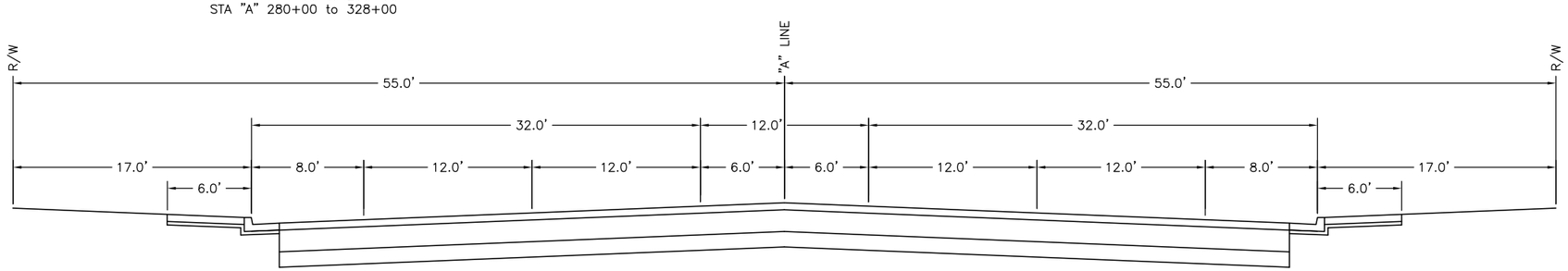



## LOCKHEED DRIVE

STA "A" 105+50 to 129+00
STA "A" 144+50 to 161+50
STA "A" 174+00 to 209+50
STA "A" 280+00 to 328+00

## AIRPORT ROAD

STA "A" 100+80 to 224+50
STA "A" 274+00 to 336+00

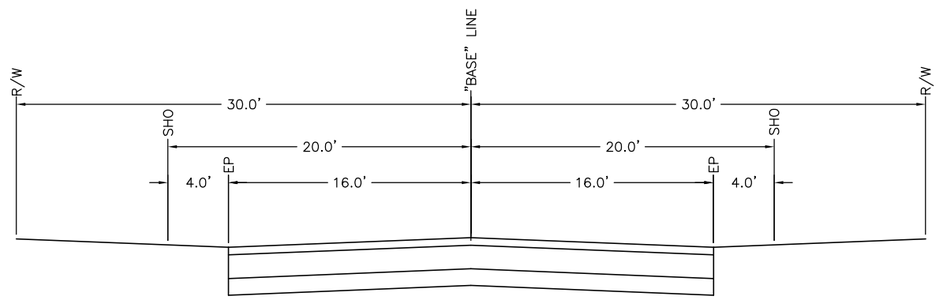



## AIRPORT ROAD W/TWLTL (TWO WAY LEFT TURN LANE)

STA "A" 66+00 to 100+80

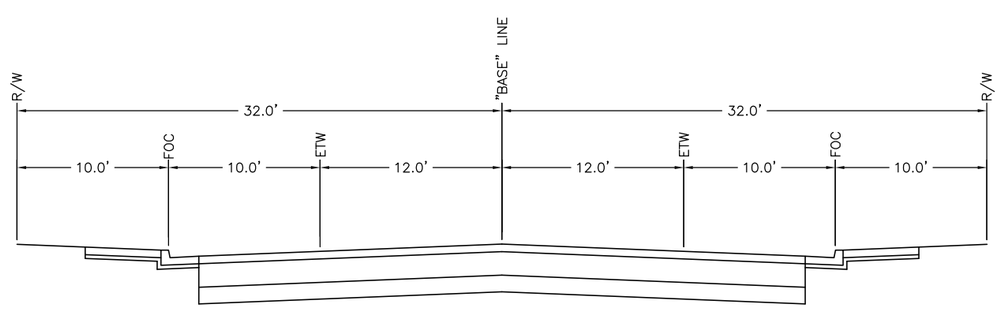
DRAWING: J:\12339-AIRPORT ROAD\CADD\SHEETS\TYPICAL-SEC.DWG 12/18/07

# AIRPORT ROAD WIDENING - PSR
## TYPICAL SECTIONS




**60' R/W**
(COLLECTOR, INDUSTRIAL)
(SHASTA COUNTY)

| LINE | NAME | STATION RANGE |
|---|---|---|
| RA | ROAD "A" | STA "A" 67+00 to 92+00 |
| RB | ROAD "B" | STA "A" 67+00 to 85+30 |

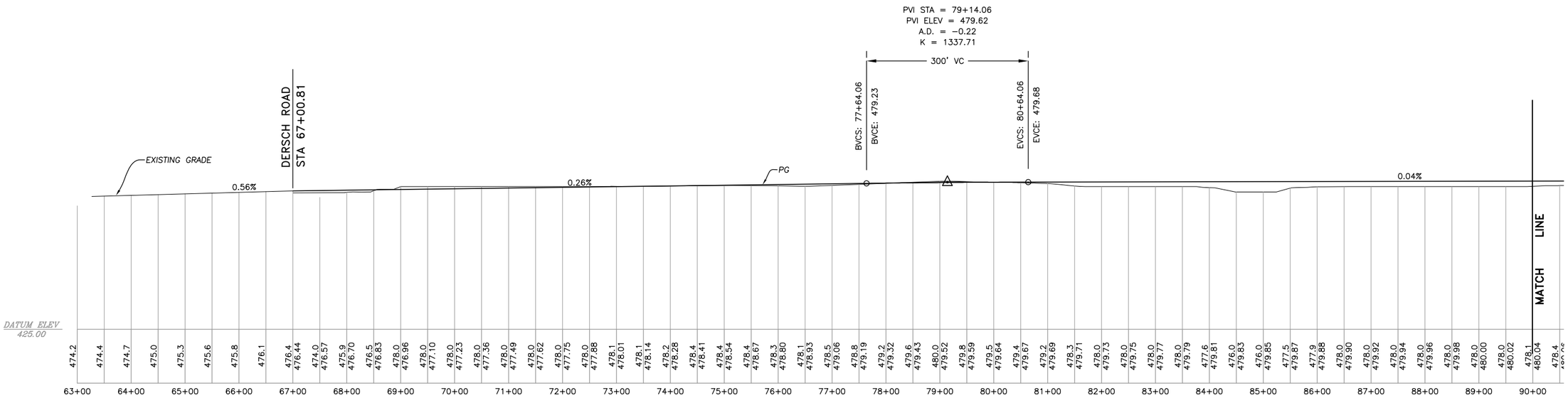


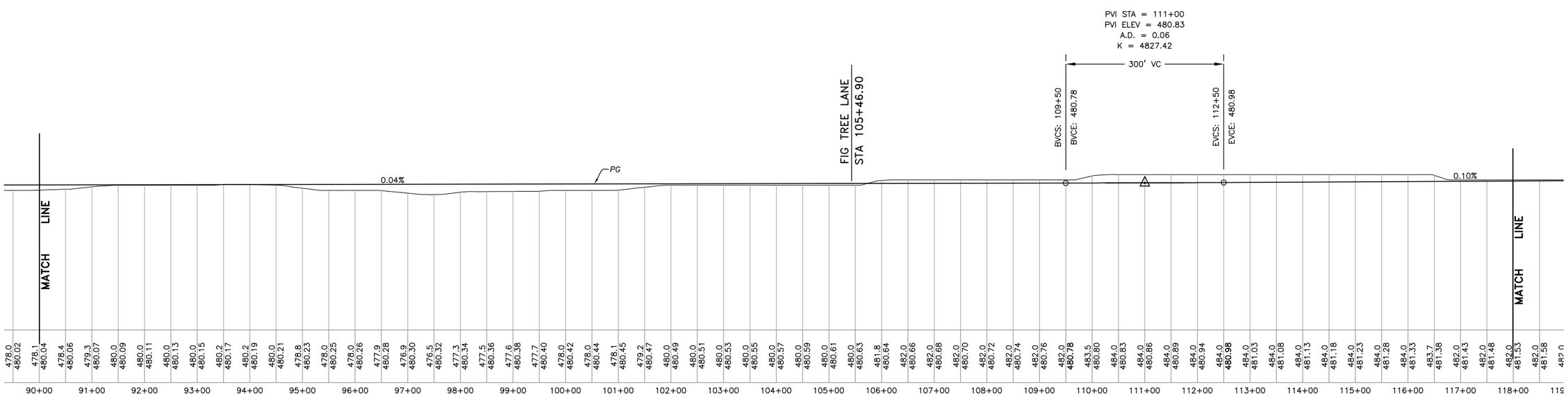

**64' R/W**
(LOCAL, INDUSTRIAL)
(CITY OF REDDING)

| LINE | NAME | STATION RANGE |
|---|---|---|
| LO | LOCKHEED DR | STA "A" 129+00 to 336+00 |
| AV | AVIATION DR | STA "A" 232+00 to 319+00 |
| EL | ELECTRO WAY | STA "A" 256+90 |
| CH | CHARLENE | STA "A" 315+00 |

# AIRPORT ROAD WIDENING - PSR
## TYPICAL SECTIONS

DRAWING: J:\12339-AIRPORT ROAD\CADD\SHEETS\TYPICAL-SEC.DWG 12/18/07

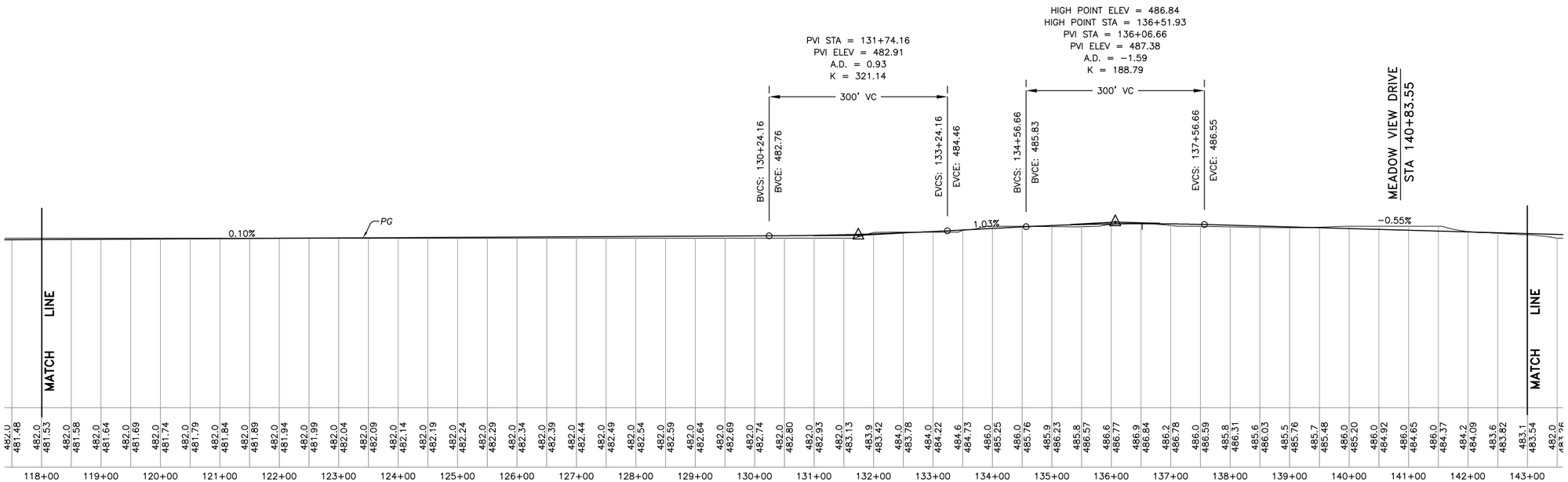


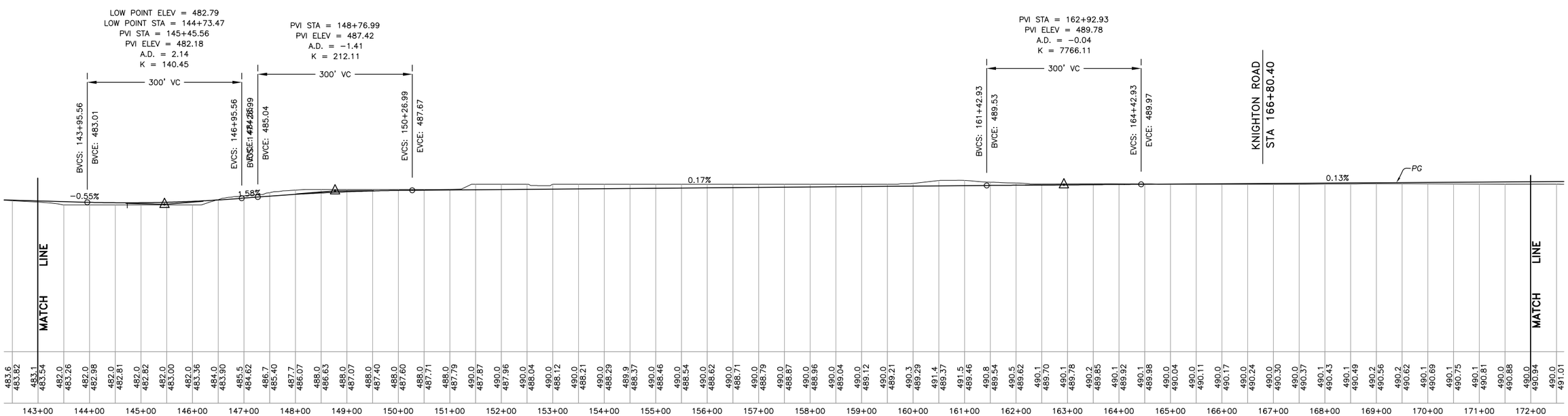




# AIRPORT ROAD PROFILE

DRAWING: J:\12339-AIRPORT ROAD\CADD\SHEETS\PROFILE.DWG 12/18/2007

# AIRPORT ROAD WIDENING - PSR
## PROFILE - AIRPORT ROAD

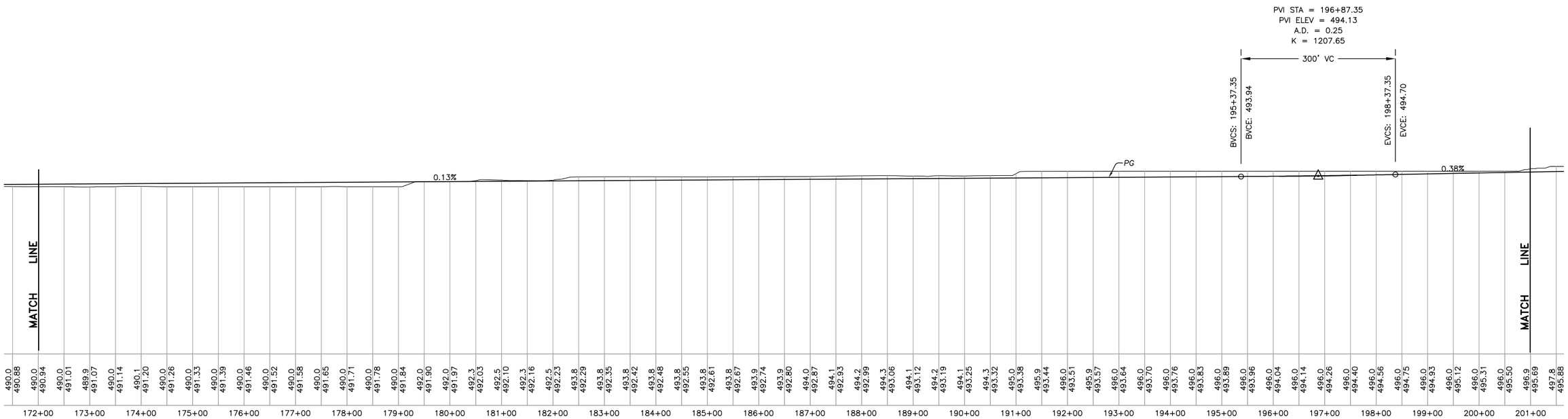


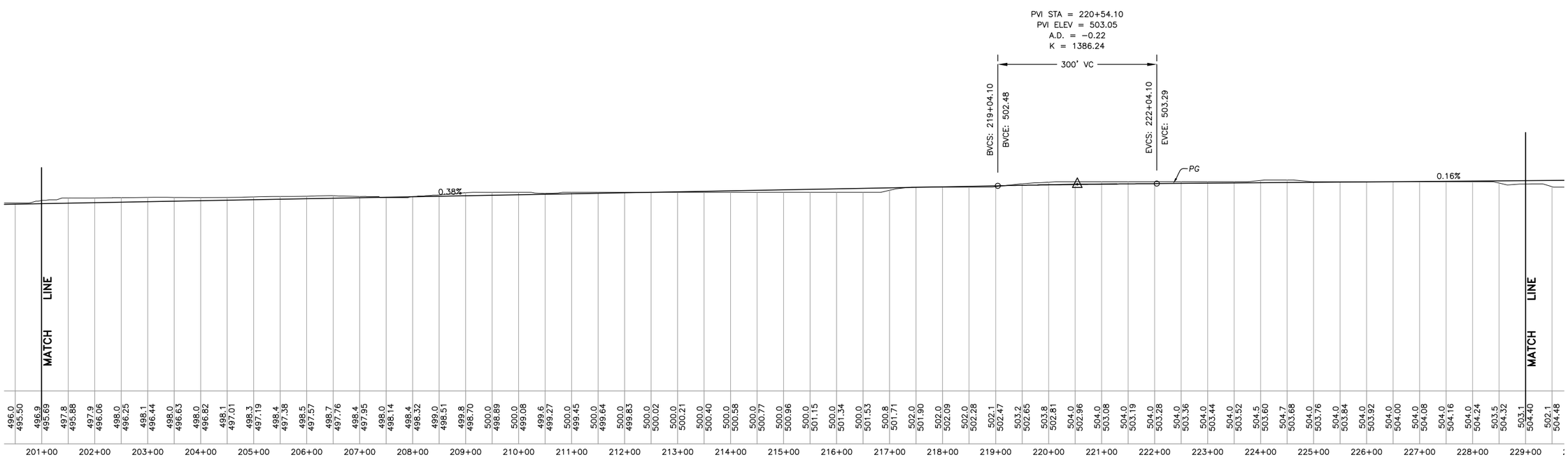




# AIRPORT ROAD PROFILE

DRAWING: J:\12339-AIRPORT ROAD\CADD\SHEETS\PROFILE.DWG 12/18/2007

**AIRPORT ROAD WIDENING - PSR**
**PROFILE - AIRPORT ROAD**

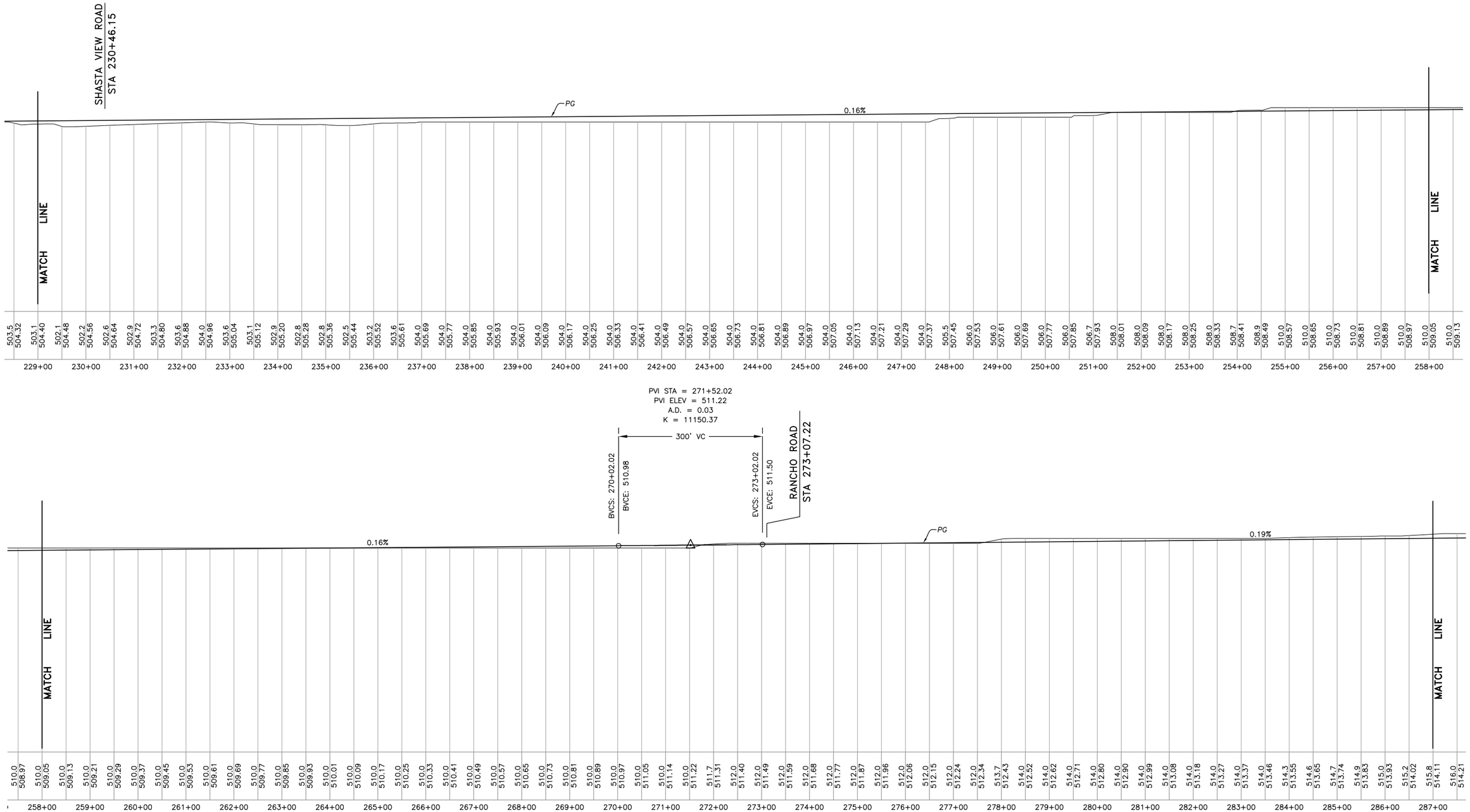



# AIRPORT ROAD PROFILE

DRAWING: J:\12339-AIRPORT ROAD\CADD\SHEETS\PROFILE.DWG 12/18/2007

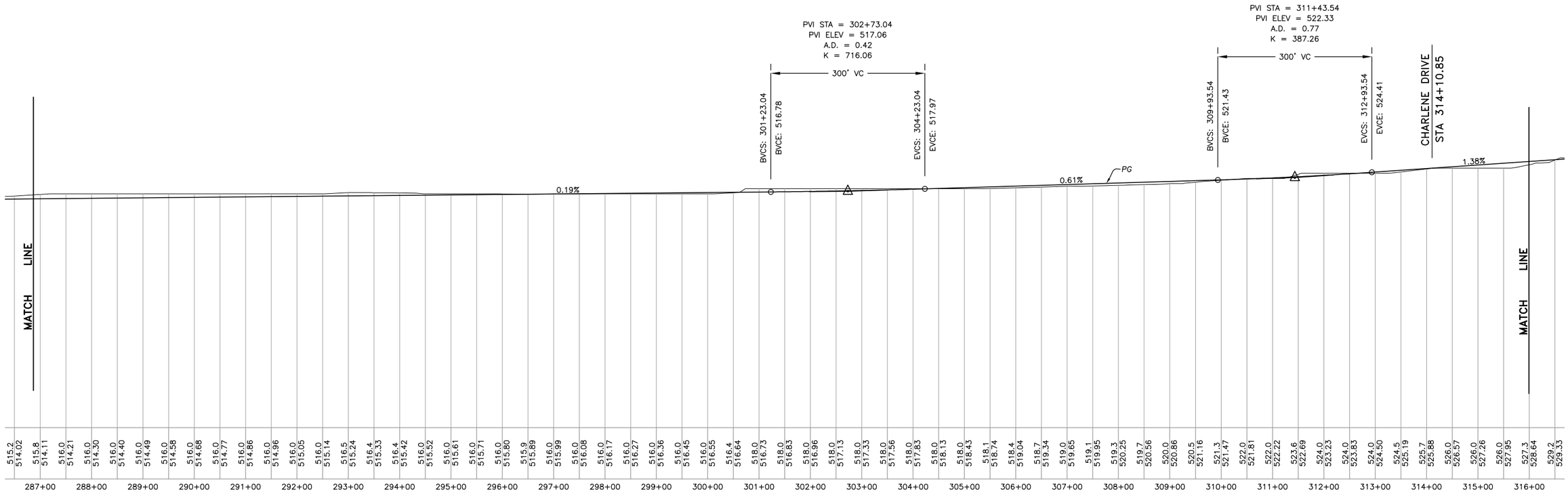
**AIRPORT ROAD WIDENING - PSR**
**PROFILE - AIRPORT ROAD**

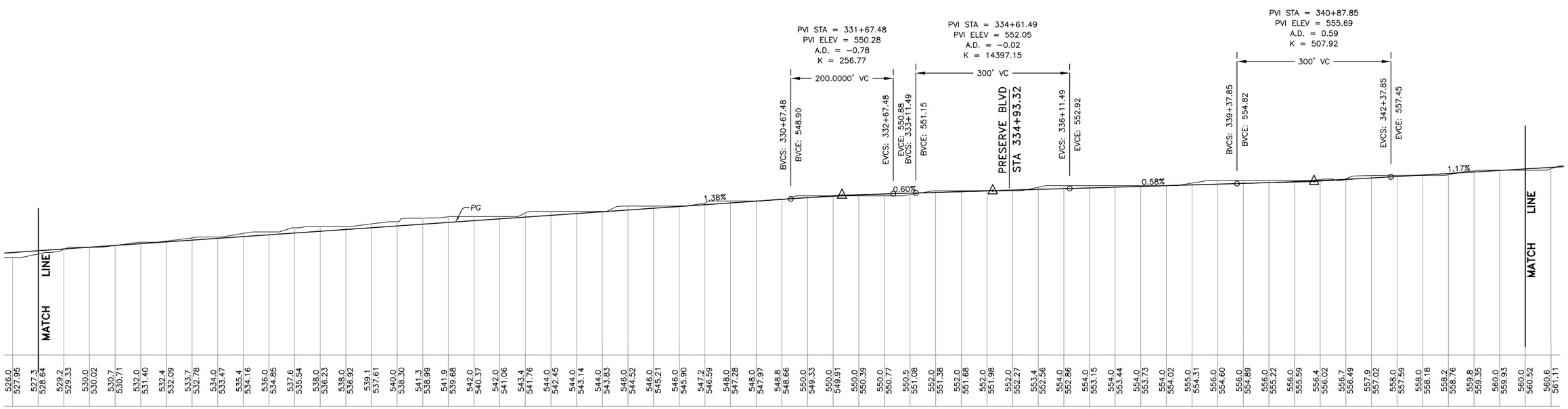



# AIRPORT ROAD PROFILE

DRAWING: J:\12339-AIRPORT ROAD\CADD\SHEETS\PROFILE.DWG 12/18/2007

# AIRPORT ROAD WIDENING - PSR
## PROFILE - AIRPORT ROAD

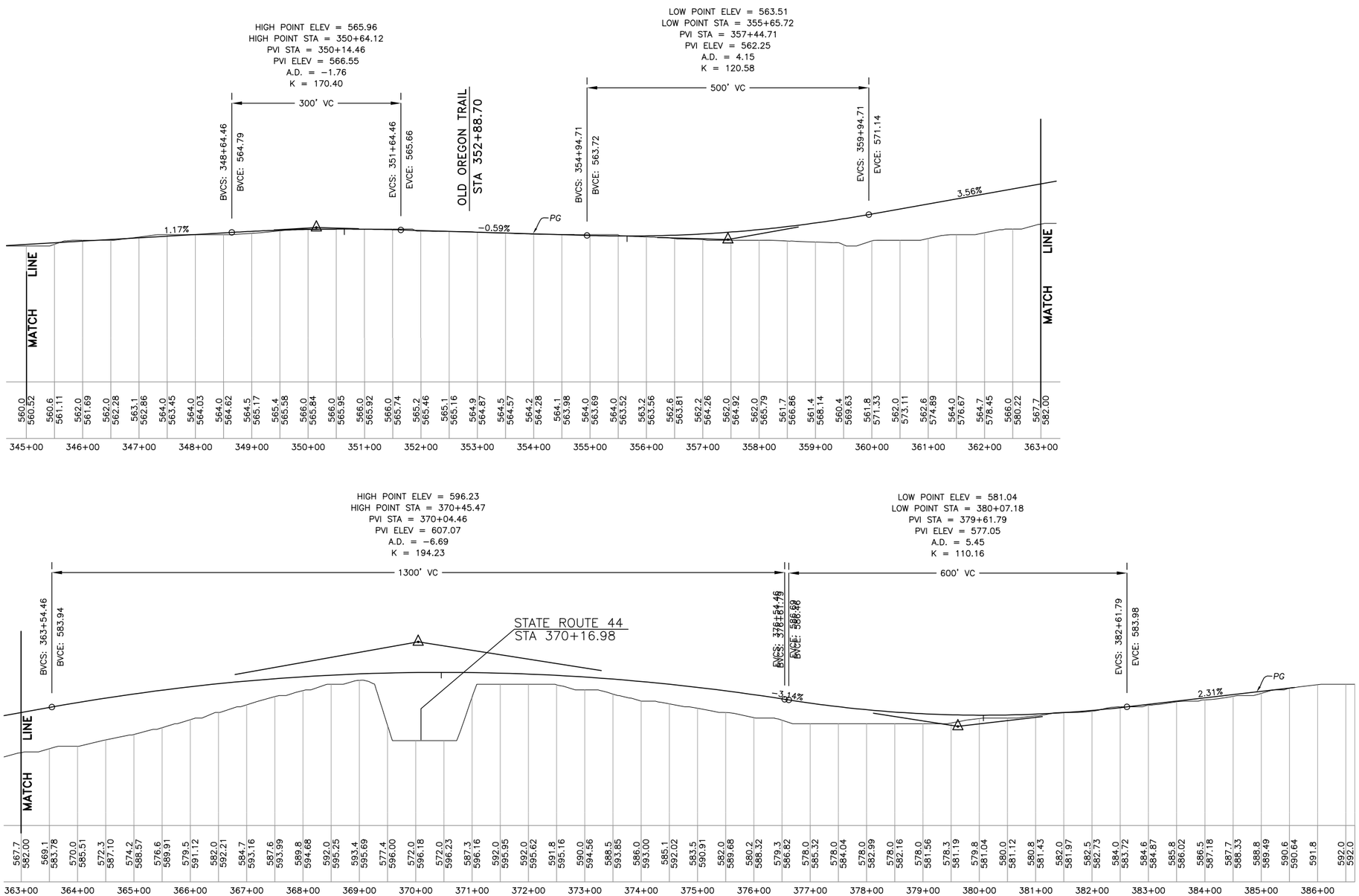



# AIRPORT ROAD PROFILE

DRAWING: J:\12339-AIRPORT ROAD\CADD\SHEETS\PROFILE.DWG 12/18/2007

# AIRPORT ROAD WIDENING - PSR
## PROFILE - AIRPORT ROAD




# AIRPORT ROAD PROFILE

DRAWING: J:\12339-AIRPORT ROAD\CADD\SHEETS\PROFILE.DWG 12/18/2007

# AIRPORT ROAD WIDENING - PSR
## PROFILE - AIRPORT ROAD

# ATTACHMENT II

# PRELIMINARY PROJECT COST ESTIMATE SUMMARY

# AIRPORT ROAD WIDENING PROJECT
# CITY OF REDDING
# PRELIMINARY PROJECT COST ESTIMATE SUMMARY

| | |
|---|---|
| PROJECT # | 12339 |
| PROJECT NAME | Airport Road Widening |
| PROJECT SPONSOR | City of Redding |

**PROJECT DESCRIPTION:**

**LIMITS:** Airport Road Widening from Churn Creek Road/Dersch Road to Old 44 Drive

**PROPOSED IMPROVEMENTS:** Roadway widening from two to four lanes, including bridge replacement, curb, gutter, sidewalk, median, traffic signals, landscaping, storm drain facilities, frontage roads and connector roads.

**ALTERNATIVE:** Alternative One

## SUMMARY OF PROJECT COST ESTIMATE (2007$)

| | |
|---|---|
| **TOTAL ROADWAY ITEMS** | **$87,863,000** |
| **TOTAL STRUCTURE ITEMS** | **$8,058,000** |
| **SUBTOTAL CONSTRUCTION COSTS** | **$95,921,000** |
| **TOTAL RIGHT OF WAY ITEMS (Escalated to 2010)** | **$32,149,000** |
| **TOTAL PROJECT CAPITAL OUTLAY COSTS** | **$128,070,000** |

PROJECT MANAGER Teri Zink, P.E.

PROJECT ENGINEER Cynthia Holt, P.E. DATE 12/2007

# PRELIMINARY PROJECT COST ESTIMATE SUMMARY

PROJECT # 12339
PROJECT: Airport Road Widening

## I. ROADWAY ITEMS

### SECTION 1: EARTHWORK

| | QUANTITY | UNIT | UNIT PRICE | ITEM COST |
|---|---|---|---|---|
| ROADWAY EXCAVATION | 420,000 | CY | $14 | $5,880,000 |
| IMPORTED BORROW | | | | |
| EMBANKMENT | 80,000 | CY | $18 | $1,440,000 |
| CLEARING & GRUBBING | 1 | LS | $500,000 | $500,000 |
| DEVELOP WATER SUPPLY | | | | |
| REMOVE AC | 18,000 | SY | $21 | $378,180 |
| **SUBTOTAL EARTHWORK** | | | | **$8,198,180** |

### SECTION 2: PAVEMENT STRUCTURAL SECTION

| | | | | | | |
|---|---|---|---|---|---|---|
| AC, RUBBER OVERLAY | Depth | | | | | |
| AC, TYPE A | 6" Depth | 152,000 | TON | $90 | $13,680,000 |
| PCC PAVEMENT | Depth | | | | |
| AGGREGATE BASE | 24" Depth | 300,000 | CY | $40 | $12,000,000 |
| AGGREGATE SUBBASE | Depth | | | | |
| PAVEMENT REINFORCING FABRIC | | | | | |
| COLD PLANE AC PAVEMENT | | | | | |
| PCC CURB AND GUTTER | | 134,000 | LF | $25 | $3,350,000 |
| PCC CURB | | 54,000 | LF | $15 | $810,000 |
| PCC SIDEWALK | | 134,000 | LF | $30 | $4,020,000 |
| **SUBTOTAL PAVEMENT STRUCTURAL SECTION** | | | | | **$33,860,000** |

### SECTION 3: DRAINAGE

| | | | | |
|---|---|---|---|---|
| LARGE DRAINAGE FACILITIES | | | | |
| STORM DRAINS | 1 | LS | $1,000,000 | $1,000,000 |
| CONSTRUCTION SITE | | | | |
| BMP'S | 1 | LS | $500,000 | $500,000 |
| **SUBTOTAL DRAINAGE** | | | | **$1,500,000** |

# PRELIMINARY PROJECT COST ESTIMATE SUMMARY

PROJECT # 12339
PROJECT: Airport Road Widening

## I. ROADWAY ITEMS cont.

| | QUANTITY | UNIT | UNIT PRICE | ITEM COST |
|---|---|---|---|---|
| SECTION 4: SPECIALTY ITEMS | | | | |
| RETAINING WALL | 3400 | SF | $90 | $306,000 |
| NOISE BARRIERS | 1 | LS | $1,250,000 | $1,250,000 |
| BARRIERS & GUARDRAILS | 1 | LS | $100,000 | $100,000 |
| LANDSCAPING & IRRIGATION | 1 | LS | $1,500,000 | $1,500,000 |
| REPLACEMENT PLANTING | | | | |
| EROSION CONTROL | 1 | LS | $500,000 | $500,000 |
| SLOPE PROTECTION | | | | |
| WATER POLLUTION CONTROL | 1 | LS | $300,000 | $300,000 |
| HAZ WASTE MITIGATION | | | | |
| ENVIROMENTAL MITIGATION | 1 | LS | $1,222,500 | $1,222,500 |
| | | | **SUBTOTAL SPECIALTY ITEMS** | **$5,178,500** |
| SECTION 5: TRAFFIC ITEMS | | | | |
| LIGHTING | 1 | LS | $1,450,000 | $1,450,000 |
| SIGNING & STRIPING | 1 | LS | $400,000 | $400,000 |
| TRAFFIC SIGNALS - MODIFICATION | 7 | EA | $150,000 | $1,050,000 |
| TRAFFIC SIGNALS - NEW | 7 | EA | $350,000 | $2,450,000 |
| TRAFFIC CONTROL SYSTEM & STAGING | 1 | LS | $1,000,000 | $1,000,000 |
| | | | **SUBTOTAL TRAFFIC ITEMS** | **$6,350,000** |
| | | | **TOTAL SECTIONS 1 thru 5** | **$55,086,680** |

# PRELIMINARY PROJECT COST ESTIMATE SUMMARY

PROJECT # 12339
PROJECT: Airport Road Widening

## I. ROADWAY ITEMS cont.

SECTION COST

SECTION 6: MINOR ITEMS
(use 5 to 10%)

| | | | | |
|---|---|---|---|---|
| $55,086,680 | x | 10% = | $5,508,668 | |
| (subtotal section 1 Thru 5) | | | | |
| | | **TOTAL MINOR ITEMS** | | **$5,508,668** |

SECTION 7: ROADWAY MOBILIZATION
(use 5 to 10%)

| | | | | |
|---|---|---|---|---|
| $60,595,348 | x | 10% = | $6,059,535 | |
| (subtotal section 1 Thru 6) | | | | |
| | | **TOTAL ROADWAY MOBILIZATION** | | **$6,059,535** |

SECTION 8: ROADWAY ADDITIONS

| | | | | |
|---|---|---|---|---|
| SUPPLEMENTAL WORK (use 5 to 10%) | $60,595,348 | x | 10% = | $6,059,535 |
| | (subtotal section 1 Thru 6) | | | |
| CONTINGENCIES (chap 20) | $60,595,348 | x | 25% = | $15,148,837 |
| | (subtotal section 1 Thru 6) | | | |
| | | | **TOTAL ROADWAY ADDITIONS** | **$21,208,372** |

**TOTAL ROADWAY ITEMS** **$87,863,000**

ESTIMATE PREPARED BY Kathryn Wickam, P.E. DATE 11/2007

ESTIMATE CHECKED BY Cynthia Holt, P.E. DATE 12/2007

# PRELIMINARY PROJECT COST ESTIMATE SUMMARY

PROJECT # 12339
PROJECT: Airport Road Widening

## II. STRUCTURES ITEMS

| | STRUCTURE (1) | | STRUCTURE | STRUCTURE (3) |
|---|---|---|---|---|
| BRIDGE NAME | SR44 OC | | | |
| STRUCTURE TYPE | CIP PCB Girder | | | |
| WIDTH (out to out) | 102 | FT | | |
| LENGTH | 200 | FT | | |
| TOTAL AREA | 20400 | SF | | |
| FOOTING TYPE | | | | |
| COST per SF* | $395 | | | |
| (incl. 10% mob + 20% contingency) | | | | |
| *Price includes demo of exist structure | | | | |
| **TOTAL COST FOR STRUCTURE** | $8,058,000 | | | |

**SUBTOTAL STRUCTURES ITEMS** **$8,058,000**

RAILROAD RELATED COSTS

**SUBTOTAL RAILROAD ITEMS** **$0**

**TOTAL STRUCTURES ITEMS** **$8,058,000**
(strutures + railroad items)

ESTIMATE PREPARED BY Kathryn Wickam, P.E. DATE 11/2007

ESTIMATE CHECKED BY Cynthia Holt, P.E. DATE 12/2007

# PRELIMINARY PROJECT COST ESTIMATE SUMMARY

PROJECT # 12339
PROJECT: Airport Road Widening

## III. RIGHT OF WAY ITEMS

| | | CURRENT VALUE (2007$) | ESCALATED |
|---|---|---|---|
| A. | ACQUISTION, DAMAGE & GOODWILL | $26,897,000 | $28,917,000 |
| B. | UTILITY RELOCATION | $500,000 | $564,000 |
| C. | RELOCATION ASSISTANCE | $1,296,000 | $1,394,000 |
| D. | CLEARANCE/DEMOLITION | $378,000 | $427,000 |
| E. | TITLE & ESCROW FEES | $142,000 | $142,000 |
| F. | SB 1210 COSTS | $705,000 | $705,000 |

**TOTAL RIGHT OF WAY ITEMS** **$32,149,000**
(ESCALATED VALUE)
Anticipated Date of Right of Way Certification **6/2010**
(Date to which Values are Escalated)

F. CONSTRUCTION CONTRACT WORK

Description of work:

**CONSTRUCTION CONTRACT WORK** **$0**
(To be included in RDWY or STRUC items, not ROW)

COMMENTS:

ESTIMATE PREPARED BY Kathryn Wickam, P.E. DATE 11/2007

ESTIMATE CHECKED BY Cynthia Holt, P.E. DATE 12/2007

# ATTACHMENT III

# TRAFFIC REPORT

FEHR & PEERS
TRANSPORTATION CONSULTANTS

FINAL

# AIRPORT ROAD WIDENING PROJECT

***Updated May 25, 2007***

***Prepared for:***
***City of Redding***

***RS06-2347***

## TABLE OF CONTENTS

**Executive Summary** ..... **i**
Background ..... i
Analysis Methodology and Traffic Volume Forecasts ..... i
Results and recommendations ..... i

**1. Introduction** ..... **1**
Background ..... 1
Outline ..... 1

**2. Traffic Analysis Methodologies** ..... **3**
Traffic Volume forecasts ..... 3
Analysis Methodology and Key Assumptions ..... 3

**3. Existing Conditions Analysis** ..... **6**
Study Area ..... 6
Intersection Operations ..... 8
Roadway Operations ..... 8
Accident Data Analysis ..... 8

**4. Project Description** ..... **12**
No Project Alternative ..... 12
Proposed Project ..... 12
Analysis Scenarios ..... 12

**5. 2010 Conditions Analysis** ..... **14**
Intersection Operations ..... 14
Roadway Operations ..... 18

**6. 2030 Conditions Analysis** ..... **19**
Intersection Operations ..... 19
Queuing Analysis ..... 23

## APPENDICES

Appendix A: Level of Service Calculations

## LIST OF FIGURES

Figure 1 - Study Area ..... 2
Figure 2 – Existing Volumes and Lane Configurations ..... 7
Figure 3 – Future Roadway Improvement ..... 13
Figure 4 – 2010 No Project Volumes and Lane Configurations ..... 15
Figure 5 – 2010 With Project Volumes and Lane Configurations ..... 16
Figure 6 – 2030 No Project Volumes and Lane Configurations ..... 20
Figure 7 – 2030 With Project Volumes and Lane Configurations ..... 21

## LIST OF TABLES

Table 1 – Intersection Level of Service Thresholds ..... 4

Table 2 – Maximum Daily Traffic Volumes Per Traffic Lane ..... 5

Table 3 - Existing Intersection Levels of Service ..... 9

TAble 4 – Existing Roadway Levels of Service Along Airport Road ..... 10

Table 5 - Airport Road Accident History by Accidents Type ..... 10

Table 6 - Airport Road Accident History by Collision Severity ..... 11

Table 7 - Intersection Operations for Year 2010 Conditions ..... 17

Table 8 – Roadway Level of Service for 2010 Conditions ..... 18

Table 9 - Intersection Operations for Year 2030 Conditions ..... 22

Table 10 – Roadway Level of Service for 2010 Conditions ..... 23

Table 11 – Storage Lengths – 2030 Conditions ..... 24

# EXECUTIVE SUMMARY

## BACKGROUND

This report summarizes the traffic operations results for proposed improvements to the Airport Road corridor, from Old 44 (north of the State Route (SR) 44 interchange) to Churn Creek Road-Dersch Road, in Redding, California. The purpose of the project is to provide additional capacity for approved and planned development in the area. The widening of Airport Road is consistent with the City's General Plan, which identifies this segment as a four- to six-lane expressway.

The study intersections were evaluated during the morning (AM) and evening (PM) peak hours. The operations results were reviewed to identify the most appropriate intersection controls and lane configurations. Overall roadway segment capacity was also assessed by reviewing daily traffic volumes on the roadway links.

## ANALYSIS METHODOLOGY AND TRAFFIC VOLUME FORECASTS

All intersection operations analyses were conducted using procedures and methodologies consistent with the *Highway Capacity Manual 2000* (HCM 2000), Transportation Research Board, 2000, using Synchro/SimTraffic. The analysis software accounts for delay and queues resulting from insufficient queuing capacity and vehicle arrivals/departures from upstream and downstream intersections. For roadway segments, expected daily traffic volumes were compared to roadway segment capacities summarized in the City of Redding's General Plan.

The travel demand forecasts were developed using the Shasta County Travel Demand Forecasting (TDF) model to estimate growth along Airport Road. Forecasts were developed for Year 2010 (Construction Year) and Year 2030 (Design Year) analysis horizons. Before developing preliminary traffic volume forecasts, the Shasta County TDF model was modified to reflect existing and planned land use and roadway network modifications in the study area.

The following scenarios were analyzed.

1. Existing Conditions
2. Construction Year (2010) No Project Conditions
3. Construction Year (2010) With Project Conditions
4. Design Year (2030) No Project Conditions
5. Design Year (2030) With Project Conditions

## RESULTS AND RECOMMENDATIONS

The results indicate that the proposed project as a four-lane–limited-access facility will provide sufficient capacity to accommodate projected traffic. Without the proposed project, congestion would increase and degrade the operations of Airport Road to unacceptable levels.

# 1. INTRODUCTION

## BACKGROUND

This report summarizes the results of the traffic operations assessment of future improvements to the Airport Road corridor from Old 44 to Churn Creek Road-Dersch Road in Redding, California. Figure 1 displays the study area.

### *Project Description*

The proposed project would widen and improve Airport Road from two- to four-lanes, beginning at Old 44 and extending south past Churn Creek Road-Dersch Road. The City of Redding General Plan identifies this facility as a four- to six-lane expressway. Since the facility is proposed to be an expressway, the following assumptions are incorporated into the project.

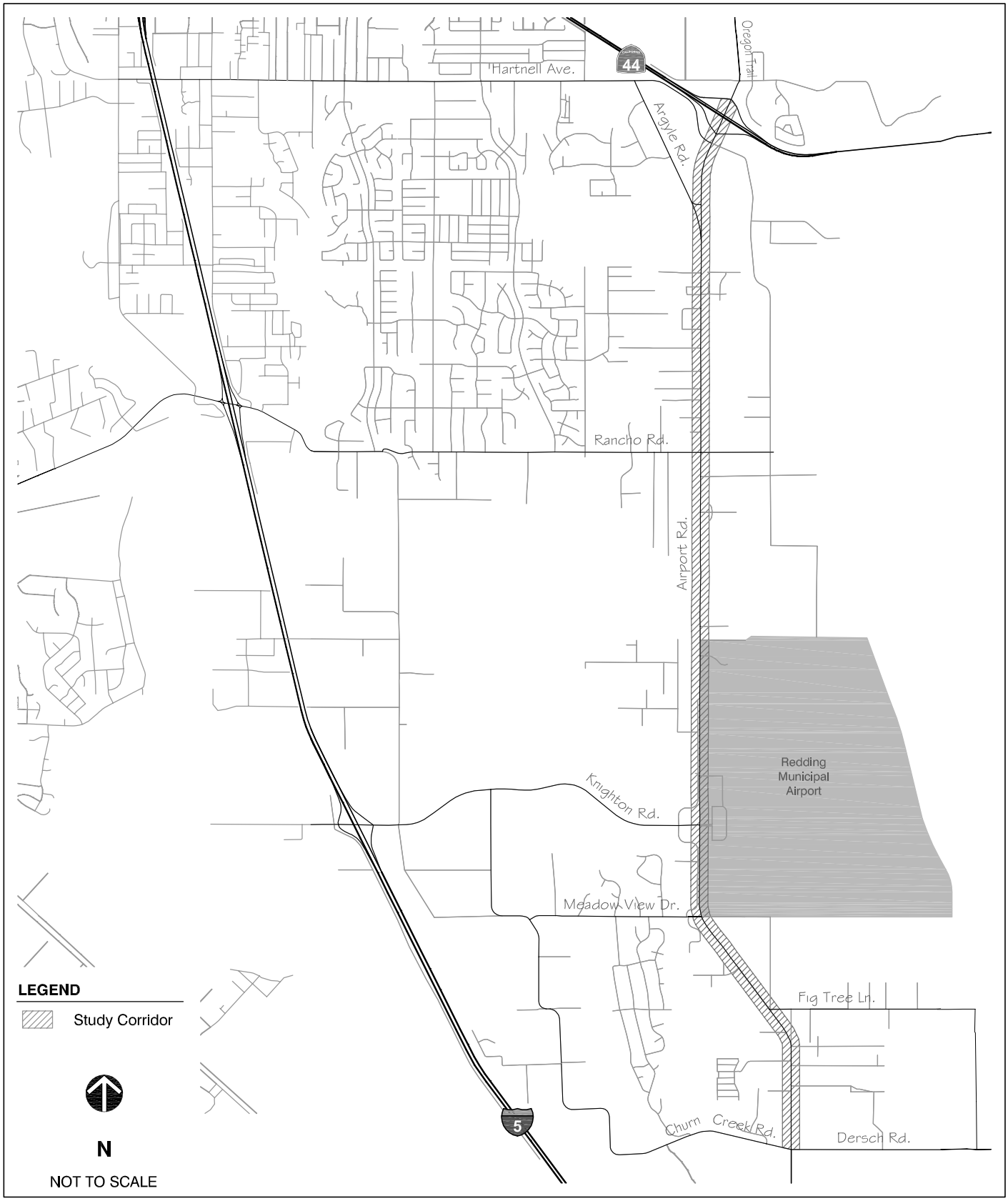
- Traffic signals will be provided at all the study intersections except at the Hartnell Avenue/Airport Road intersection, where right-turn only access is provided.
- Frontage roads will be provided to access adjacent development.
- Airport Road will be a limited access facility.
- The proposed project will complete construction by Year 2010. Assuming a 20-year design life, the project should provide acceptable operations through Year 2030.

## OUTLINE

The remainder of this report is divided into the following five chapters.

- Chapter 2 – Traffic Analysis Methodology
- Chapter 3 – Existing Conditions Analysis
- Chapter 4 – Project Description
- Chapter 5 – 2010 Conditions Analysis
- Chapter 6 – 2030 Conditions Analysis

Following this introduction, Chapter 2 describes the analysis methodology and assumptions used in the travel demand forecasts and the traffic operations analysis. Chapter 3 summarizes the existing conditions analysis. The fourth chapter describes the project and outlines the scenarios analyzed under future conditions. The next two chapters (5 and 6) present the traffic analysis results of the project scenarios under Year 2010 and Year 2030 conditions.




FEHR & PEERS
TRANSPORTATION CONSULTANTS

Apr 03, 2007 MJC
N:\2006Projects\2347_Airport_Road_Widening\Graphics\draft\fig01_study_area.dwg

**STUDY AREA**

**FIGURE 1**

# 2. TRAFFIC ANALYSIS METHODOLOGIES

## TRAFFIC VOLUME FORECASTS

The recently updated Shasta County Travel Demand Forecasting (TDF) model (2006 model update) was used to develop Year 2010 and Year 2030 traffic forecasts. Before developing traffic volume forecasts, the Shasta County TDF model was modified to more accurately reflect planned land use and roadway network improvements in the study area. Modifications made to the traffic model are highlighted below:

- Updated the land use data to include the proposed Vineyards at Anderson and North Fork Ranch projects.
- Removed the Anderson Hills Parkway overcrossing of I-5 (this improvement is not fully funded).
- Modified the external station weight south of the county line to account for the Tehama Del Webb and Tehama Morgan Ranch developments.

Airport Road was modified, in the model, to be a high-speed–six-lane roadway (55 mph or higher) to maximize traffic volumes on this roadway.

## ANALYSIS METHODOLOGY AND KEY ASSUMPTIONS

The following outlines the analysis methodologies and key assumptions for the study intersections' operations analysis.

### *Analysis Methodology*

All operations analyses were conducted using procedures and methodologies consistent with the *Highway Capacity Manual 2000* (HCM 2000), Transportation Research Board, 2000, using the Synchro/SimTraffic software.

### *Key Assumptions*

- A future peak hour factor (PHF) of 0.95 was used for study intersections. A PHF of 0.87 was used for Existing Conditions, based on existing traffic count data.
- A truck percentage of four percent was assumed for Airport Road during the AM and PM peak hours, based on existing count data.
- A free flow speed of 55 mile per hour (mph) was used for Airport Road and 20 to 35 mph was used for side street approaches.
- The ideal intersection saturation flow rate was assumed to be 1,900 passenger cars per lane.

The analysis methodology described above was used to assess traffic operations for the study intersections. The analysis results include a descriptive term known as level of service (LOS). LOS is a measure of traffic operating conditions, which varies from LOS A (the lowest delay) to LOS F (the highest delay). LOS E represents "at-capacity" operations. For this analysis, LOS C is the target operating level.

Table 1 describes the LOS thresholds for intersections. The intersection LOS thresholds differ between signalized and stop-controlled intersections. The LOS is determined by the average control delay on an intersection-wide basis for signalized intersections and on the movement with the highest delay for side-street–stop-controlled intersections. Appendix A contains all technical calculations used to determine LOS.

**TABLE 1 – INTERSECTION LEVEL OF SERVICE THRESHOLDS**

| Level of Service | Description | Average Control Delay[1] | |
|---|---|---|---|
| | | Signal | Stop Control |
| A | Operations with very low delay occurring with favorable progression and/or short cycle length. | ≤ 10 | ≤ 10 |
| B | Operations with low delay occurring with good progression and/or short cycle lengths. | > 10 to 20 | > 10 to 15 |
| C | Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear. | > 20 to 35 | > 15 to 25 |
| D | Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop and individual cycle failures are noticeable. | > 35 to 55 | > 25 to 35 |
| E | Operations with high delay values indicating poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay. | > 55 to 80 | > 35 to 50 |
| F | Operation with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths. | > 80 | > 50 |

Note:
[1] Measured in seconds per vehicle
Source: *Highway Capacity Manual* (Transportation Research Board, 2000)

Roadway segment operations were evaluated using the Average Daily Traffic (ADT) volume thresholds summarized in the City of Redding General Plan EIR (City of Redding, 2000). Table 2 presents the relationship between daily traffic volumes and LOS ratings.

**TABLE 2 – MAXIMUM DAILY TRAFFIC VOLUMES PER TRAFFIC LANE**

| Roadway Category | A | B | C | D | E |
|---|---|---|---|---|---|
| Freeway – Level Terrain | 6,110 | 9,770 | 14,340 | 17,590 | 19,200 |
| Freeway – Rolling Terrain | 5,060 | 8,090 | 11,880 | 14,560 | 15,900 |
| Expressway – High Access Control | 6,300 | 7,350 | 8,400 | 9,450 | 10,500 |
| Express Way – Moderate Access Control | 5,820 | 6,790 | 7,760 | 8,730 | 9,700 |
| Urban Arterial – Moderate Access Control | 5,280 | 6,160 | 7,040 | 7,920 | 8,800 |
| Urban Arterial – Low Access Control | 4,740 | 5,530 | 6,320 | 7,110 | 7,900 |
| Urban Arterial – CBD one-way street | (1) | (1) | (1) | (1) | (1) |
| Urban Collector – No Access Control | (2) | (2) | (2) | (2) | (2) |
| Rural Roadway | 1,500 | 2,950 | 4,800 | 7,750 | 12,500 |

(1) One-way street LOS in Downtown Redding is determined from the analysis of selected signalized intersections

(2) Collector road LOS is evaluated under the intersection evaluation

Source: *City of Redding General Plan EIR* (Table 4-3, 2000) and the *Highway Capacity Manual* (TRB, 1994)

# 3. EXISTING CONDITIONS ANALYSIS

## STUDY AREA

The proposed project consists of widening Airport Road from Old 44 to Churn Creek Road-Dersch Road. The study area, shown in Figure 1, includes the following study intersections and roadway segments.

Intersections

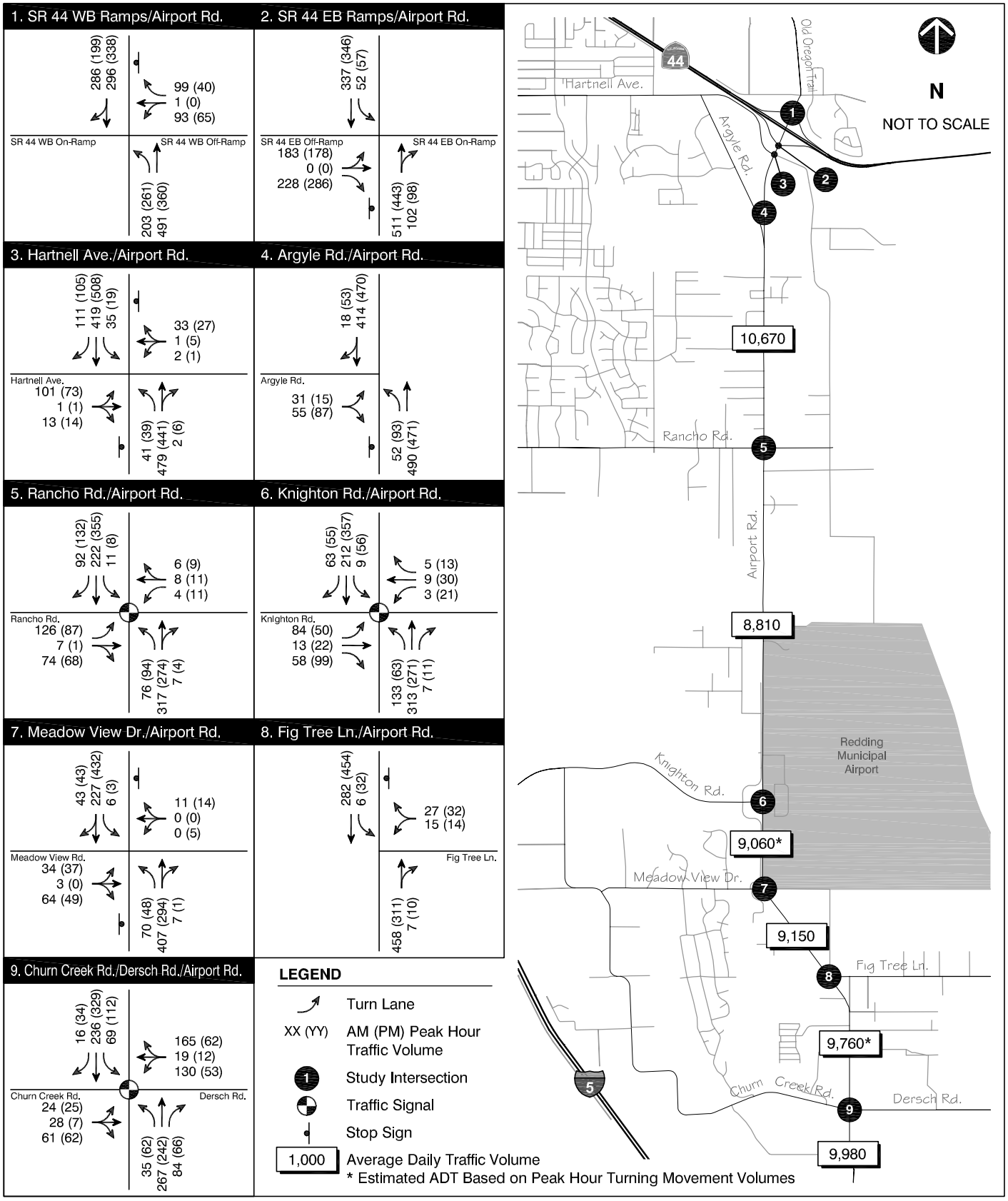
1. SR 44 Westbound Ramps/Airport Road (Old Oregon Trail Road)
2. SR 44 Eastbound Ramps/Airport Road (Old Oregon Trail Road)
3. Hartnell Avenue/Airport Road
4. Argyle Road/Airport Road
5. Rancho Road/Airport Road
6. Knighton Road/Airport Road
7. Meadow View Drive/Airport Road
8. Fig Tree Lane/Airport Road
9. Churn Creek Road-Dersch Road/Airport Road

Roadway Segments

1. Argyle Road to Rancho Road
2. Rancho Road to Knighton Road
3. Knighton Road to Meadowview Drive
4. Meadow View Drive to Fig Tree Lane
5. Fig Tree Lane to Churn Creek Road-Dersch Road
6. South of Churn Creek Road-Dersch Road

Airport Road begins at Old SR 44 and continues south to North Street. Through the study area, Airport Road is a rural two-lane roadway paralleling I-5 to the east.

Traffic counts were conducted during the morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak period at all study intersections in early December, 2006. Daily roadway segment volumes were collected for three consecutive days (Tuesday through Thursday) in early December, 2006. Figure 2 details the existing intersection peak hour counts, daily roadway segment volume counts, intersection geometrics, and intersection traffic control devices at the study locations.




FEHR & PEERS
TRANSPORTATION CONSULTANTS

May 25, 2007 MJC
N:\2006Projects\2347_Airport_Road_Widening\Graphics\draft\fig02_phtv_ex_con.dwg

**PEAK HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS - EXISTING CONDITIONS**

**FIGURE 2**

## INTERSECTION OPERATIONS

Table 3 summarizes the results of the LOS analysis at the study intersections. The results indicate that the following study intersections operate at an unacceptable LOS D[1] during the AM or PM peak hours:

- Airport Road (Old Oregon Trail Road)/SR 44 Westbound Ramps (AM and PM peak hours)
- Airport Road (Old Oregon Trail Road)/SR 44 Eastbound Ramps (AM peak hour)

During the preparation of this study, a traffic signal was constructed at the Airport Road/SR44 Eastbound Ramps intersection. This intersection now operates as a signalized intersection with a separate northbound right-turn lane. For this study, the Airport Road/SR 44 Eastbound Ramps intersection was assumed to remain unsignalized under Existing Conditions analysis to reflect actual traffic operations when the traffic count data was collected.

## ROADWAY OPERATIONS

Table 4 summarizes the results of the LOS assessment for the study roadway segments. The results indicate that all segments have sufficient capacity to serve existing traffic demands.

## ACCIDENT DATA ANALYSIS

The City of Redding and Caltrans[2] provided accident data from November 1, 2003, through October 30, 2006, for Airport Road, from Old Highway 44 to Churn Creek Road-Dersch Road. Table 5 summarizes the data for roadway segments, while Table 6 summarizes the accident history by collision severity.

Airport Road between Old Highway 44 and Argyle Road experienced 21 accidents over the three-year period. Approximately 60 percent of these accidents were broadside collisions, with one fatality, and 20 percent were sideswipe collisions. The area between Churn Creek Road-Dersch Road to Knighton Road experienced 23 accidents over the past three years, with one fatality.

Although Airport Road, from Old Highway 44 to Argyle Road, experienced 13 broadside collisions, the recently installed traffic signal at the SR 44 eastbound ramps intersection should reduce the number of broadside accidents on this roadway segment.

Airport Road, from Knighton Road to Churn Creek-Dersch Road, experienced nine broadside collisions. The proposed project, which includes access consolidation and signalization of major access points, should reduce the number of broadside accidents on this segment.

Table 6 summarizes the accident history by collision severity on Airport Road. As shown in Table 6, most accidents between Old Highway 44 to Argyle Road and Knighton Road to Churn Creek Road-Dersch Road were injury accidents, and each location experienced one fatality accident over the last three years.

---

[1] For this study, LOS C is considered the minimum acceptable operating level.
[2] Caltrans data is based on Statewide Integrated Traffic records System (SWITRS).

| TABLE 3 – EXISTING INTERSECTION LEVELS OF SERVICE | | | | |
|---|---|---|---|---|
| **Intersection** | **Control** | **Peak Hour** | **Control Delay[1] (Seconds)** | **Level of Service** |
| 1. Airport Road (Old Oregon Trail Road)/ SR 44 Westbound Ramps | Side-Street Stop | AM<br>PM | 33<br>26 | D<br>D |
| 2. Airport Road (Old Oregon Trail Road) /SR 44 Eastbound Ramps [2] | Side-Street Stop | AM<br>PM | 29<br>24 | D<br>C |
| 3. Airport Road/Hartnell Avenue | Side-Street Stop | AM<br>PM | 21<br>16 | C<br>C |
| 4. Airport Road/Argyle Road (South) | Side-Street Stop | AM<br>PM | 11<br>12 | B<br>B |
| 5. Airport Road/Rancho Road | Signal | AM<br>PM | 15<br>16 | B<br>B |
| 6. Airport Road/Knighton Road | Signal | AM<br>PM | 8<br>9 | A<br>A |
| 7. Airport Road/Meadow View Drive | Side-Street Stop | AM<br>PM | 15<br>12 | B<br>B |
| 8. Airport Road/Fig Tree Lane Airport | Side-Street Stop | AM<br>PM | 11<br>10 | B<br>A |
| 9. Airport Road/Churn Creek Road-Dersch Road | Signal | AM<br>PM | 18<br>16 | C<br>C |

Notes:

1. The table lists the LOS (level of service) and average control delay (measured in seconds per vehicle) for each intersection. For side-street–stop-controlled intersections, the LOS and control delay for the worst movement/approach is shown.
2. During the preparation of this study, a traffic signal at the Airport Road (Old Oregon Trail)/SR 44 Eastbound Ramps intersection was constructed, which is now an operating signalized intersection with a separate northbound right-turn lane.

Source: Fehr & Peers 2007

**TABLE 4 – EXISTING ROADWAY SEGMENT LEVELS OF SERVICE**

| Roadway Segment | Lanes | ADT[1] Per Lane | LOS[2] |
|---|---|---|---|
| Argyle Road to Rancho Road | 2 | 5,340 | B |
| Rancho Road to Knighton Road | 2 | 4,410 | A |
| Knighton Road to Meadow View Drive | 2 | 4,530* | A |
| Meadow View Drive to Fig Tree Lane | 2 | 4,580 | A |
| Fig Tree Lane to Churn Creek Road-Dersch Road | 2 | 4,880* | B |
| South of Churn Creek Road-Dersch Road | 2 | 4,990 | B |

Notes:

* Indicates that the ADT was estimated based on using ADT counts on segments north or south of the segment and the peak hour turning movement counts.

[1] ADT = Average Daily Traffic Volumes

[2] LOS = Level of Service

Source: Fehr and Peers, 2007

**TABLE 5 – AIRPORT ROAD ACCIDENT HISTORY BY ACCIDENTS TYPE NOVEMBER 1, 2003 TO OCTOBER 30, 2006**

| Location | Accident Type | | | | | | Total |
|---|---|---|---|---|---|---|---|
| | Hit Object | Head-On | Rear-End | Broadside | Sideswipe | Other[1] | |
| Old Highway 44 to Argyle Road | 0 | 1 | 2 | 13[2] | 4 | 1 | 21 |
| Argyle Road to Rancho Road | 3 | 0 | 4 | 3 | 0 | 0 | 10 |
| Rancho Road to Knighton Road | 2 | 1 | 4 | 3 | 3 | 2 | 15 |
| Knighton Road to Churn Creek Road-Dersch Road | 3 | 4[2] | 4 | 9 | 0 | 3 | 23 |

Notes:

[1] This category includes the following TASAS accident types: Overturn, auto/pedestrian, and other.

[2] Includes one fatality.

Source: City of Redding, Caltrans (SWITRS), and Fehr & Peers, 2007

**TABLE 6 – AIRPORT ROAD ACCIDENT HISTORY BY COLLISION SEVERITY NOVEMBER 1, 2003 TO OCTOBER 30, 2006**

| Location | Number of Accidents | | |
|---|---|---|---|
| | Injury | Fatal | Total |
| Old Highway 44 to Argyle Road | 14[1] | 1[1] | 21 |
| Argyle Road to Rancho Road | 5 | 0 | 10 |
| Rancho Road to Knighton Road | 9 | 0 | 15 |
| Knighton Road to Churn Creek Road-Dersch Road | 12[1] | 1[1] | 23 |

Notes:
[1] Accident resulted in both a fatality and injury.
Source: City of Redding, Caltrans, and Fehr & Peers, 2007

# 4. PROJECT DESCRIPTION

## NO PROJECT ALTERNATIVE

For the No Project alternative, no improvements would be implemented through the corridor except at the SR 44 interchange, where traffic signals will be installed with or without the proposed Airport Road widening. These improvements are assumed during the Construction Year (2010) and Design Year (2030) No Project analysis scenarios.

## PROPOSED PROJECT

The proposed project would widen Airport Road from two- to four-lanes, beginning north of the SR 44/Airport Road interchange and extending south past Churn Creek Road-Dersch Road. The widening project would include providing a frontage road from Hartnell Avenue to Fig Tree Lane on the west side of Airport Road and from Old Oregon Trail to north of Redding Municipal Airport on the east. Major cross streets would provide access to the frontage roads. Airport Road would be access-controlled between major intersections.

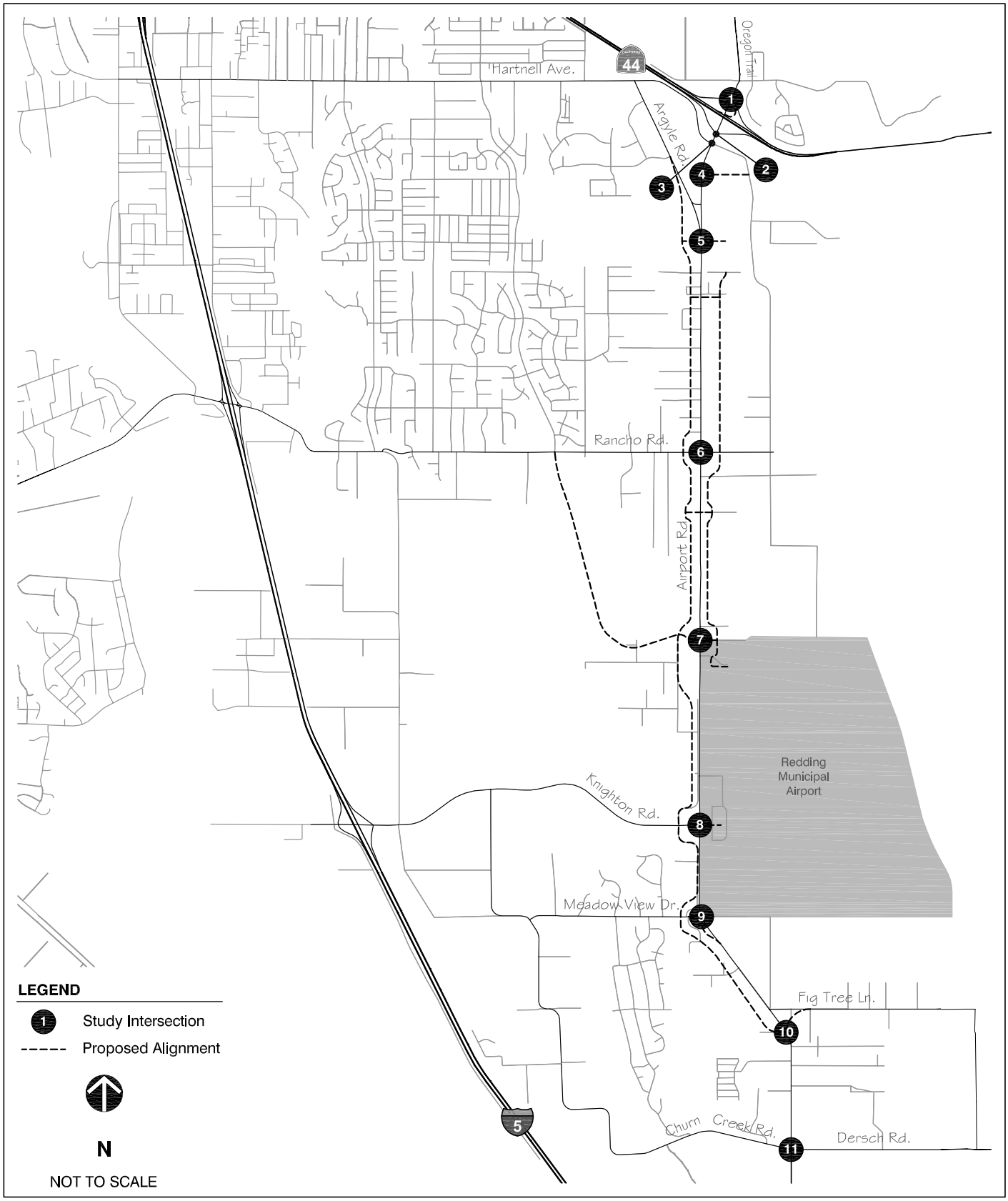
The proposed widening also includes a northbound to westbound loop on-ramp (Type L-4) at the SR 44 interchange.

Figure 3 displays the planned improvements along the study corridor.

## ANALYSIS SCENARIOS

The following scenarios were analyzed for the traffic report.

1. Construction Year (2010) No Project Conditions
   - Year 2010 volume projections with existing lane configurations through the study corridor
2. Construction Year (2010) With Project Conditions
   - Year 2010 volume projections with the identified improvements through the corridor
3. Design Year (2030) No Project Conditions
   - Year 2030 projections with existing lane configurations
5. Design Year (2030) With Project Conditions
   - Year 2030 volume projections with the identified improvements through the corridor




FEHR & PEERS
TRANSPORTATION CONSULTANTS

Apr 03, 2007 MJC
N:\2006Projects\2347_Airport_Road_Widening\Graphics\draft\fig03_future_imps.dwg

**FUTURE ROADWAY IMPROVEMENTS**

**FIGURE 3**

# 5. 2010 CONDITIONS ANALYSIS

Year 2010 (Construction Year) Conditions were evaluated for the No Project and With Project Conditions. This chapter summarizes the results of our analyses.

Figure 4 and Figure 5 present the Year 2010 No Project and Year 2010 With Project volume projections and lane configuration, respectively.

## INTERSECTION OPERATIONS

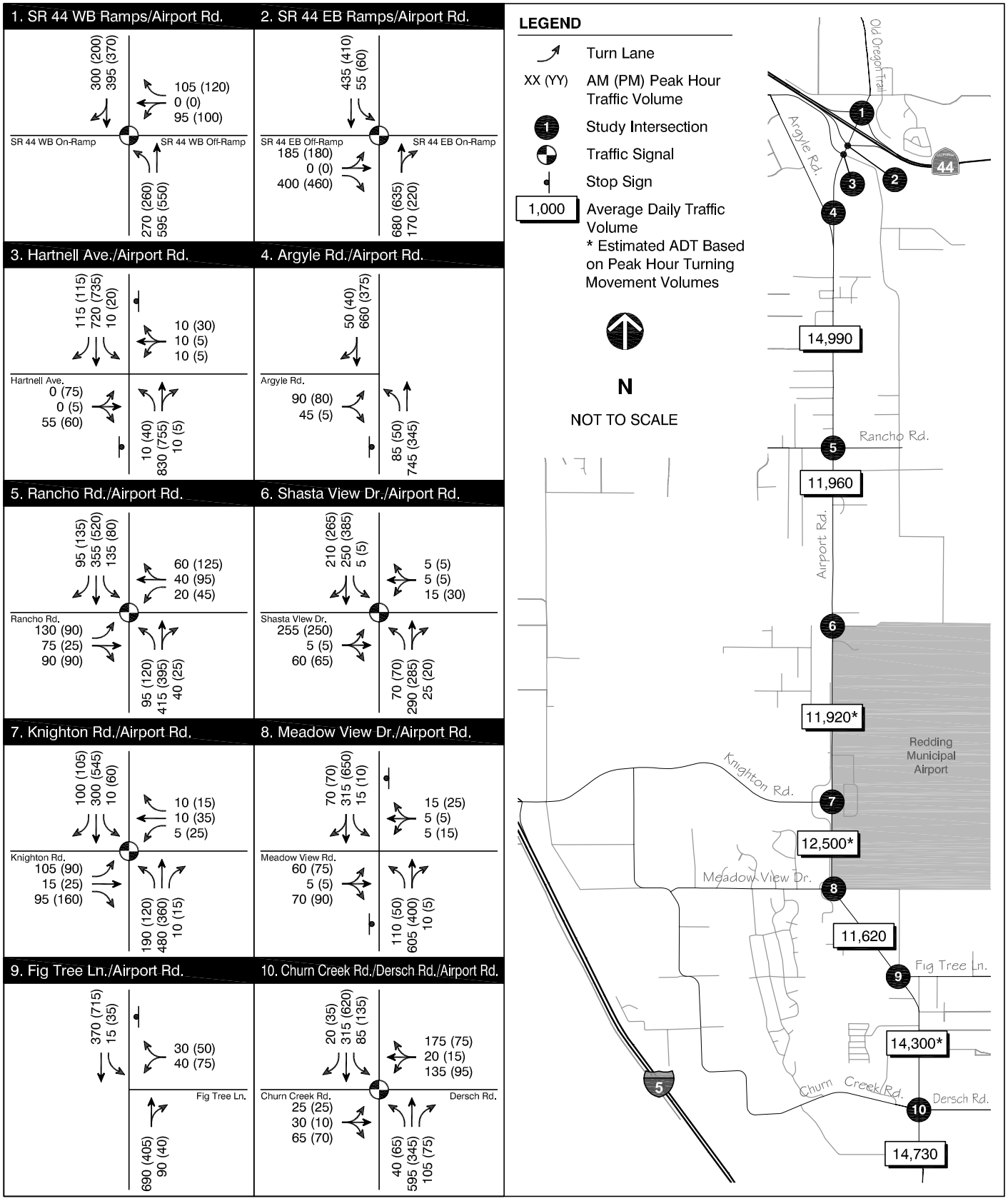
Table 7 shows the level of service and delay for the study intersections under Year 2010 No Project and Year 2010 With Project Conditions.

### *No Project Conditions*

Under the No Project Condition, the following intersections would operate at an unacceptable LOS D, E, or F during one or more of the peak hours:

- Airport Road/Hartnell Avenue – LOS F (AM and PM peak hours)
- Airport Road/Argyle Road – LOS E (AM peak hour)
- Airport Road/Meadow View Drive – LOS D (PM peak hour)
- Airport Road/Churn Creek Road – Dersch Road – LOS E and D (AM and PM peak hours)

The corridor will experience over 80 vehicle hours of delay during the AM and PM peak hours.

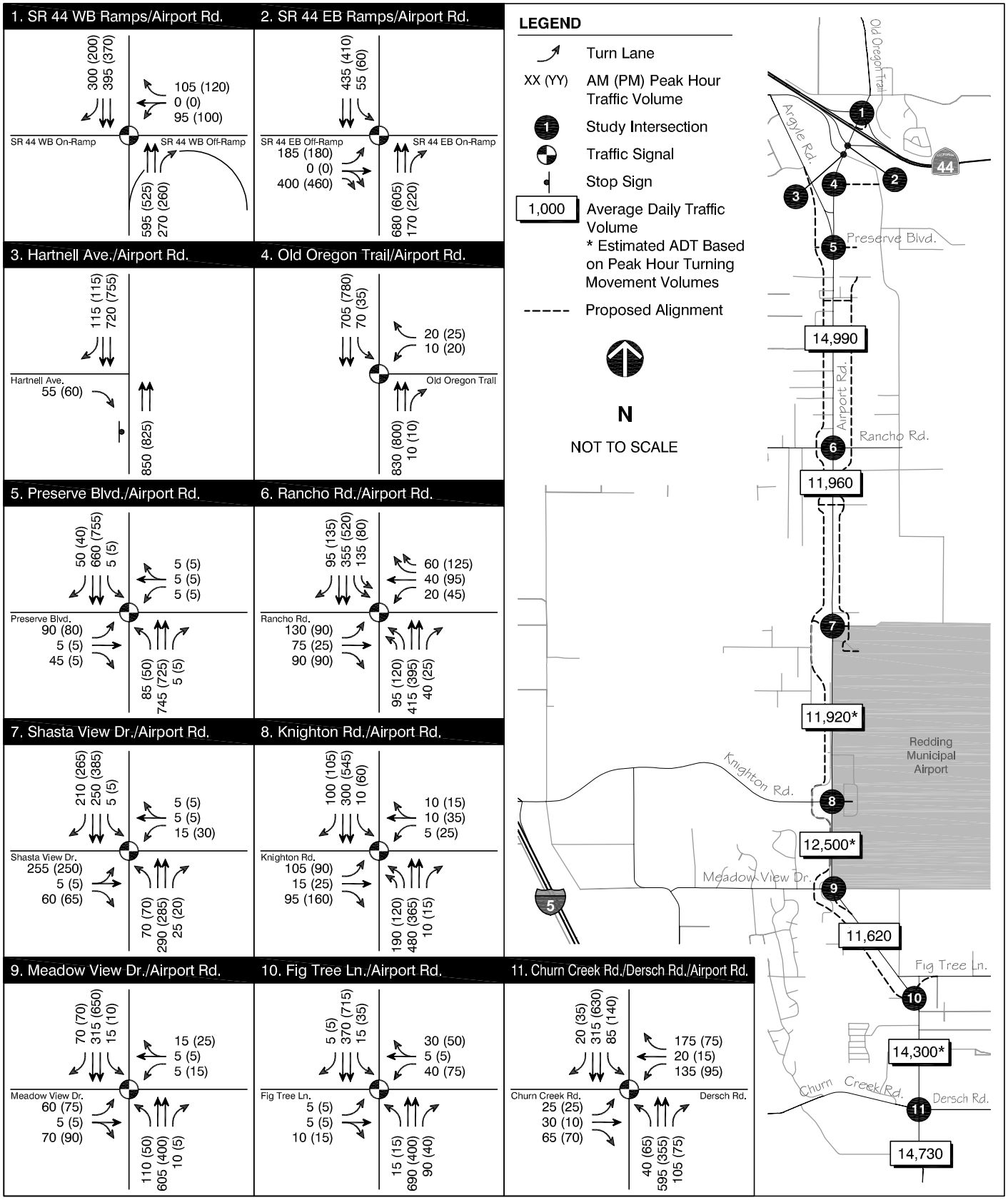



FEHR & PEERS
TRANSPORTATION CONSULTANTS

May 25, 2007 MJC
N:\2006Projects\2347_Airport_Road_Widening\Graphics\draft\fig04_phtv_2010_np_con.dwg

**PEAK HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS - 2010 NO PROJECT CONDITIONS**

**FIGURE 4**




FEHR & PEERS
TRANSPORTATION CONSULTANTS

May 25, 2007 MJC
N:\2006Projects\2347_Airport_Road_Widening\Graphics\draft\fig05_phtv_2010_wp_con.dwg

**PEAK HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS - 2010 WITH PROJECT CONDITIONS**

**FIGURE 5**

**TABLE 7 – INTERSECTION OPERATIONS FOR YEAR 2010 CONDITIONS**

| Intersection | Peak Hour | 2010 No Project | | | 2010 With Project | | |
|---|---|---|---|---|---|---|---|
| | | Control | Delay[1] | LOS | Delay[1] | Delay | LOS |
| 1. Airport Road (Old Oregon Trail Road)/ SR 44 Westbound Ramps | AM<br>PM | Signal | 27<br>22 | C<br>C | Signal | 9<br>6 | A<br>A |
| 2. Airport Road (Old Oregon Trail Road)/ SR 44 Eastbound Ramps | AM<br>PM | Signal | 23<br>28 | C<br>C | Signal | 11<br>12 | B<br>B |
| 3. Airport Road/Hartnell Avenue | AM<br>PM | Side-Street Stop | **>50**<br>**>50** | **F**<br>**F** | Side-Street Stop | 10<br>6 | B<br>A |
| 4. Airport Road/Old Oregon Trail | AM<br>PM | - | - | - | Signal | 5<br>4 | A<br>A |
| 5. Airport Road/Preserved (realigned Argyle Road) | AM<br>PM | Side-Street Stop | **43**<br>10 | **E**<br>A | Signal | 14<br>9 | B<br>A |
| 6. Airport Road/Rancho Road | AM<br>PM | Signal | 23<br>25 | C<br>C | Signal | 25<br>17 | C<br>B |
| 7. Airport Road/Shasta View Drive | AM<br>PM | Signal | 13<br>19 | B<br>B | Signal | 17<br>16 | B<br>B |
| 8. Airport Road/Knighton Road | AM<br>PM | Signal | 13<br>18 | B<br>B | Signal | 16<br>15 | B<br>B |
| 9. Airport Road/Meadow View Drive | AM<br>PM | Side-Street Stop | 17<br>**26** | C<br>**D** | Signal | 13<br>10 | B<br>A |
| 10. Airport Road/Fig Tree Lane | AM<br>PM | Side-Street Stop | 15<br>18 | C<br>C | Signal | 5<br>9 | A<br>A |
| 11. Airport Road/Churn Creek Road-Dersch Road | AM<br>PM | Signal | **69**<br>**36** | **E**<br>**D** | Signal | 18<br>16 | B<br>B |
| ***Network Performance (vehicle Hours of Delay)*** | ***AM***<br>***PM*** | ***115***<br>***135*** | | | ***60***<br>***70*** | | |

Notes:

**Bold** text indicates unacceptable LOS (level of service).

1. The table lists the LOS and average control delay (measured in seconds per vehicle) for each intersection. For side-street–stop-controlled intersections, the LOS and control delay for the worst movement is shown.

Source: Fehr & Peers, 2007

### *With Project Conditions*

Under the With Project Condition, all study intersections would operate at an acceptable LOS C or better during both peak hours. Vehicle hours of delay would be reduced by approximately 50 percent during the PM peak hour.

## ROADWAY OPERATIONS

Table 8 displays the level of service for the study roadway segments under Year 2010 No Project and Year 2010 With Project Conditions.

**TABLE 8 – ROADWAY LEVEL OF SERVICE FOR 2010 CONDITIONS**

| Roadway Segment | 2010 No Project | | | 2010 With Project | | |
|---|---|---|---|---|---|---|
| | Lanes | ADT[1] Per Lane | LOS[2] | Lanes | ADT[1] Per Lane | LOS[2] |
| Argyle Road to Rancho Road | 2 | **7,480** | **E** | 4 | 3,750 | A |
| Rancho Road to Shasta View Drive | 2 | 5,980 | C | 4 | 2,990 | A |
| Shasta View Drive to Knighton Road | 2 | NA | NA | 4 | 2,980* | A |
| Knighton Road to Meadow View Drive | 2 | 6,250* | C | 4 | 3,130* | A |
| Meadow View Drive to Fig Tree Lane | 2 | 5,810 | C | 4 | 2,910 | A |
| Fig Tree Lane to Churn Creek Road-Dersch Road | 2 | **7,150*** | **E** | 4 | 3,580* | A |
| South of Churn Creek Road-Dersch Road | 2 | **7,370** | **E** | 4 | 3,690 | A |

Notes:
**Bold** text indicates unacceptable LOS (level of service).
* indicates the ADT were estimated based on peak hour turning movement volumes.
[1] ADT = Average Daily Traffic Volumes
[2] LOS = Level of Service
Source: Fehr and Peers, 2007

The roadway segment analysis reflects the need to widen the corridor two four-lanes by Year 2010. Specifically, the following segments are projected to operate at an unacceptable level without the project:

- Argyle Road to Rancho Road
- Fig Tree Lane to Churn Creek Road-Dersch Road
- South of Churn Creek Road-Dersch Road

With the proposed improvements, the entire roadway will operate at an acceptable level.

# 6. 2030 CONDITIONS ANALYSIS

Year 2030 (Design Year) Conditions were evaluated for the No Project and With Project scenarios. This chapter summarizes the results of our analyses. Figure 6 and Figure 7 present the Year 2030 No Project and Year 2030 With Project volume projections and lane configurations, respectively.

## INTERSECTION OPERATIONS

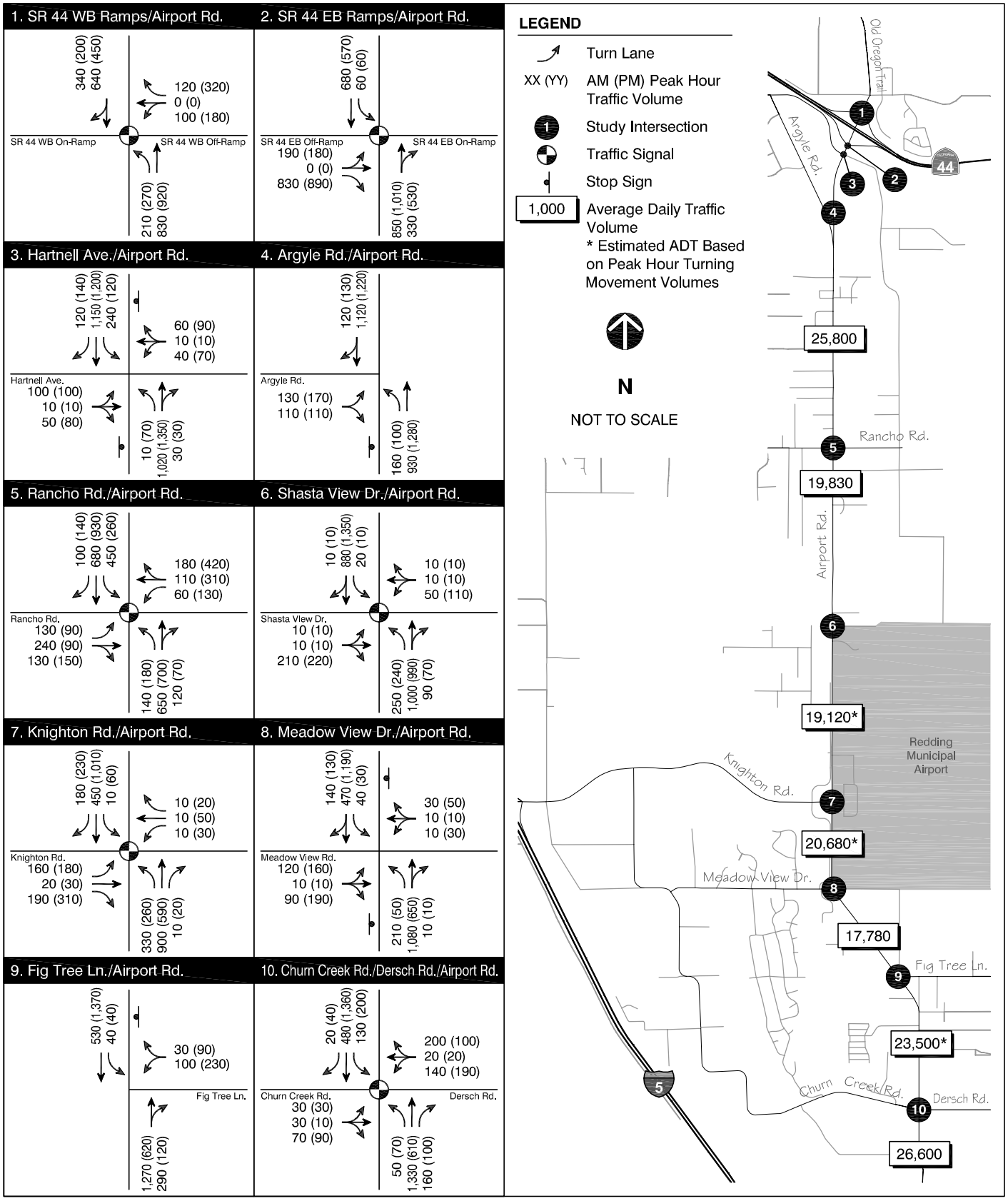
Table 9 shows the level of service and delay for the study intersections.

### *No Project Conditions*

Under the No Project Condition scenario, the following intersections would operate at an unacceptable LOS during one or more of the peak hours:

- SR 44 Eastbound Ramps/Airport Road – LOS F (AM and PM peak hours)
- Hartnell Avenue/Airport Road – LOS F (AM and PM peak hours)
- Argyle Road/Airport Road – LOS F (AM and PM peak hours)
- Rancho Road/Airport Road – LOS F (AM and PM peak hours)
- Shasta View Drive/Airport Road – LOS F ( PM peak hour)
- Meadow View Drive/Airport Road – LOS E (AM Peak Hour) and LOS F (PM peak hour)
- Fig Tree Lane/Airport Road –LOS F (PM peak hour)
- Churn Creek Road-Dersch Road/Airport Road – LOS F (AM and PM peak hours)

The corridor experienced over 1,630 and 1,950 vehicle hours of delay during the AM and PM peak hours, respectively. These delays reflect significant congestion through the corridor without any of the identified improvements.

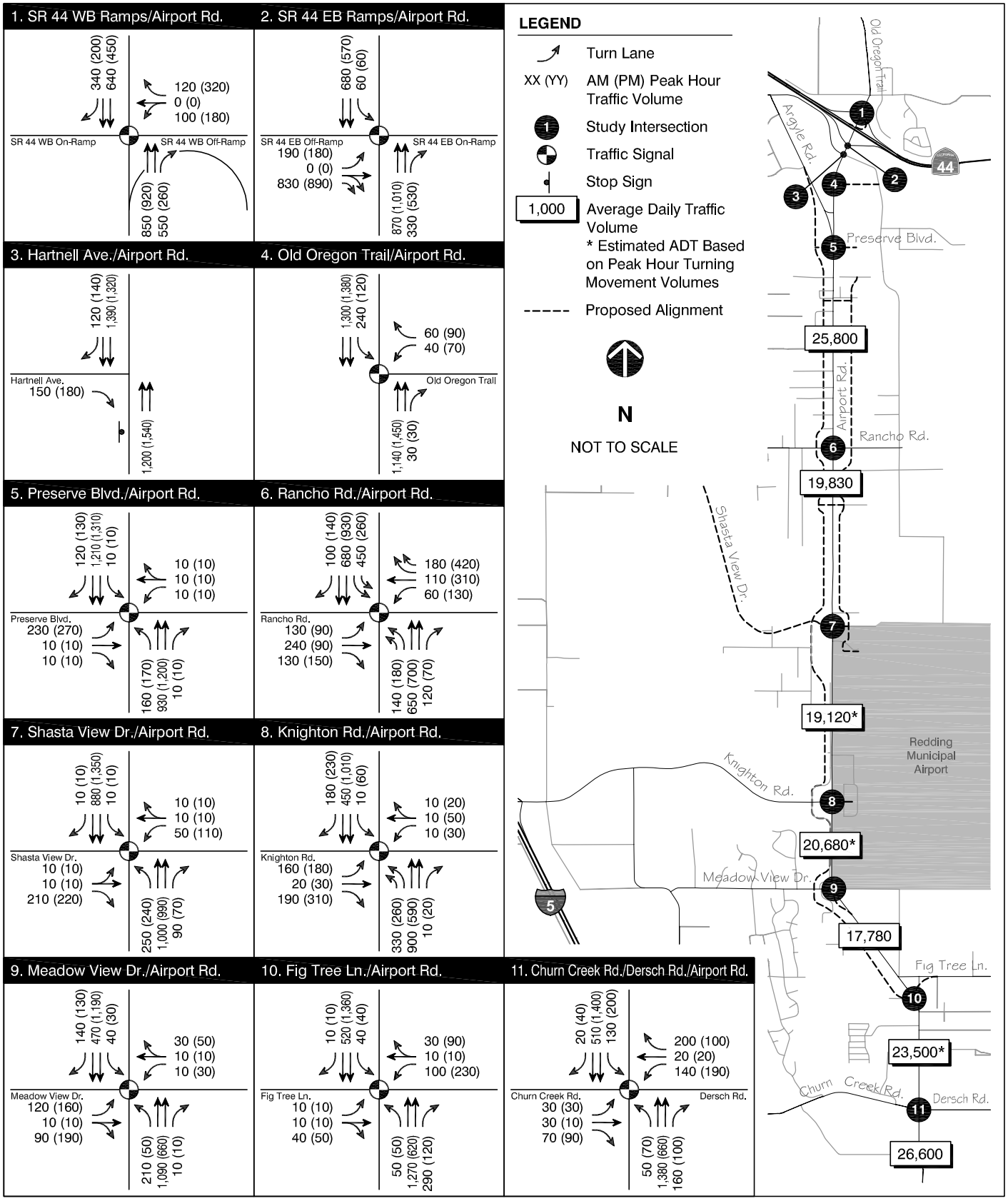



FEHR & PEERS
TRANSPORTATION CONSULTANTS

May 25, 2007 MJC
N:\2006Projects\2347_Airport_Road_Widening\Graphics\draft\fig06_phtv_2030_np_con.dwg

**PEAK HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS - 2030 NO PROJECT CONDITIONS**

**FIGURE 6**




FEHR & PEERS
TRANSPORTATION CONSULTANTS

May 25, 2007 MJC
N:\2006Projects\2347_Airport_Road_Widening\Graphics\draft\fig07_phtv_2030_wp_con.dwg

**PEAK HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS - 2030 WITH PROJECT CONDITIONS**

**FIGURE 7**

| TABLE 9 – INTERSECTION OPERATIONS FOR YEAR 2030 CONDITIONS | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Intersection** | **Peak Hour** | **2030 No Project** | | | **2030 With Project** | | |
| | | **Control** | **Delay[1]** | **LOS** | **Delay[1]** | **Delay** | **LOS** |
| 1. Airport Road (Old Oregon Trail Road)/ SR 44 Westbound Ramps | AM<br>PM | Signal | 25<br>27 | C<br>C | Signal | 9<br>16 | A<br>B |
| 2. Airport Road (Old Oregon Trail Road)/ SR 44 Eastbound Ramps | AM<br>PM | Signal | **>80**<br>**>80** | **F**<br>**F** | Signal | 16<br>17 | B<br>B |
| 3. Airport Road/Hartnell Avenue | AM<br>PM | Side-Street Stop | **>50**<br>**>50** | **F**<br>**F** | Side-Street Stop | 22<br>19 | C<br>C |
| 4. Airport Road/Old Oregon Trail | AM<br>PM | - | - | - | Signal | 12<br>14 | B<br>B |
| 5. Airport Road/Preserved (realigned Argyle Road) | AM<br>PM | Side-Street Stop | **>50**<br>**>50** | **F**<br>**F** | Signal | 22<br>30 | C<br>C |
| 6. Airport Road/Rancho Road | AM<br>PM | Signal | **>50**<br>**>50** | **F**<br>**F** | Signal | 32<br>34 | C<br>C |
| 7. Airport Road/Shasta View Drive | AM<br>PM | Signal | 23<br>**>80** | C<br>**F** | Signal | 20<br>29 | C<br>C |
| 8. Airport Road/Knighton Road | AM<br>PM | Signal | 14<br>31 | B<br>C | Signal | 17<br>25 | B<br>C |
| 9. Airport Road/Meadow View Drive | AM<br>PM | Side-Street Stop | **38**<br>**>50** | **E**<br>**F** | Signal | 19<br>23 | B<br>C |
| 10. Airport Road/Fig Tree Lane | AM<br>PM | Side-Street Stop | 25<br>**>50** | C<br>**F** | Signal | 15<br>21 | B<br>C |
| 11. Airport Road/Churn Creek Road-Dersch Road | AM<br>PM | Signal | **>80**<br>**>80** | **F**<br>**F** | Signal | 25<br>27 | C<br>C |
| ***Network Performance (Vehicle Hour of Delay)*** | ***AM***<br>***PM*** | ***1,630***<br>***1,950*** | | | ***210***<br>***230*** | | |

Notes:

**Bold** text indicates unacceptable LOS (level of service).

1. The table lists the LOS and average control delay (measured in seconds per vehicle) for each intersection. For side-street–stop-controlled intersections, the LOS and control delay for the worst movement is shown.

Source: Fehr & Peers, 2007

### *With Project Conditions*

With the improvements, all of the study intersections would operate at an acceptable level. The corridor would experience less than 230 vehicle hours of delay for AM and PM peak hours.

## ROADWAY OPERATIONS

Table 10 displays the level of service for the study roadway segments under Year 2030 No Project and Year 2030 With Project Conditions. To be consistent with the City of Redding General Plan, Airport Road is considered a four-lane expressway with moderate access control.

**TABLE 10 – ROADWAY LEVEL OF SERVICE FOR 2010 CONDITIONS**

| Roadway Segment | 2030 No Project | | | 2030 With Project | | |
|---|---|---|---|---|---|---|
| | Lanes | ADT[1] Per Lane | LOS[2] | Lanes | ADT[1] Per Lane | LOS[2] |
| Argyle Road to Rancho Road | 2 | **12,900** | **F** | 4 | 6,450 | B |
| Rancho Road to Shasta View Drive | 2 | **9,920** | **F** | 4 | 4,960 | A |
| Shasta View Drive to Knighton Road | 2 | NA | NA | 4 | 4,780* | A |
| Knighton Road to Meadow View Drive | 2 | **10,340*** | **F** | 4 | 5,170* | A |
| Meadow View Drive to Fig Tree Lane | 2 | **8,890** | **F** | 4 | 4,450 | A |
| Fig Tree Lane to Churn Creek Road-Dersch Road | 2 | **11,750*** | **F** | 4 | 5,880* | B |
| South of Churn Creek Road-Dersch Road | 2 | **13,300** | **F** | 4 | 6,650 | B |

Notes:
**Bold** text indicates unacceptable LOS (level of service).
* indicates the ADT were estimated based on peak hour turning movement volumes.
[1] ADT = Average Daily Traffic Volumes
[2] LOS = Level of Service
Source: Fehr and Peers, 2007

The roadway segment analysis identifies that, without the identified improvement, all segments within the study corridor will operate at an unacceptable level. With the proposed project, all will operate at an acceptable level.

## QUEUING ANALYSIS

The simulation was reviewed for Year 2030 Conditions to ensure that turn lane lengths are sufficient such that queues do not spill out of the pocket and conflict with through traffic on Airport Road. Please note that the identified queues represent the maximum simulated queue length, which is greater than the 95$^{th}$ percentile queue that is typically used for the design of turn pocket storage lengths. It should also be noted that these pocket lengths do not include the deceleration length, just the recommended length for queue storage. Table 11 summarizes the recommended pocket lengths based on the maximum queues experienced within the simulation.

**TABLE 11 – STORAGE LENGTHS – 2030 CONDITIONS**

| Intersection | Northbound | | Southbound | | Eastbound | | Westbound | |
|---|---|---|---|---|---|---|---|---|
| | Left (ft.) | Right (ft.) | Left (ft.) | Right (ft.) | Left (ft.) | Right (ft.) | Left (ft.) | Right (ft.) |
| 1. Airport Road/SR 44 Westbound Ramps | - | - | - | 200 | - | - | - | 375 |
| 2. Airport Road/SR 44 Eastbound Ramps | - | 300 | 125 | - | 200 | 450 | - | - |
| 3. Airport Road/Hartnell Avenue | - | - | - | - | - | - | - | - |
| 4. Airport Road/Old Oregon Trail | - | 75 | 200 | - | - | - | 125 | - |
| 5. Airport Road/Preserve Boulevard | 300 | 75 | 75 | 150 | 325 | 75 | 75 | 75 |
| 6. Airport Road/Rancho Road | **250** | 75 | **300** | 210 | 225 | 175 | 275 | **300** |
| 7. Airport Road/Shasta View Drive | 325 | 100 | 75 | 75 | 75 | 275 | 175 | 125 |
| 8. Airport Road/Knighton Road | **250** | 75 | 350 | 350 | 275 | 175 | 125 | 75 |
| 9. Airport Road/Meadow View Drive | 275 | 75 | 100 | 150 | 225 | - | 75 | - |
| 10. Airport Road/Fig Tree Lane | 125 | 100 | 100 | 100 | 75 | - | 275 | - |
| 11. Airport Road/Churn Creek Road | 225 | 250 | 300 | 250 | 75 | 100 | 250 | 175 |

Notes:

**Bold** and shading indicates the queue lengths for dual left-turn lanes.

Source: Fehr & Peers, 2007

# APPENDIX A:
# LEVEL OF SERVICE CALCULATIONS

# EXISTING CONDITIONS

## 1: SR 44 WB & Old Oregon Trail Rd. Performance by movement

| Movement | WBL | WBR | NBL | NBT | SBT | SBR | All |
|---|---|---|---|---|---|---|---|
| Total Delay (hr) | 0.8 | 0.4 | 0.6 | 0.3 | 0.4 | 0.2 | 2.7 |
| Delay / Veh (s) | 32.8 | 14.6 | 10.7 | 2.1 | 4.8 | 2.6 | 6.6 |
| Vehicles Entered | 89 | 95 | 207 | 509 | 287 | 284 | 1471 |
| Vehicles Exited | 89 | 95 | 208 | 509 | 287 | 284 | 1472 |
| Hourly Exit Rate | 89 | 95 | 208 | 509 | 287 | 284 | 1472 |
| Denied Entry Before | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Denied Entry After | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## 2: SR 44 EB & Old Oregon Trail Rd. Performance by movement

| Movement | EBL | EBR | NBT | NBR | SBL | SBT | All |
|---|---|---|---|---|---|---|---|
| Total Delay (hr) | 1.5 | 0.7 | 0.3 | 0.0 | 0.1 | 0.2 | 2.7 |
| Delay / Veh (s) | 28.9 | 10.4 | 1.9 | 0.7 | 6.4 | 1.9 | 6.8 |
| Vehicles Entered | 183 | 231 | 534 | 99 | 46 | 332 | 1425 |
| Vehicles Exited | 182 | 232 | 534 | 99 | 46 | 332 | 1425 |
| Hourly Exit Rate | 182 | 232 | 534 | 99 | 46 | 332 | 1425 |
| Denied Entry Before | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Denied Entry After | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## 3: Hartnell Ave. & Old Oregon Trail Rd. Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay (hr) | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.3 | 0.0 | 0.0 | 0.1 | 0.0 |
| Delay / Veh (s) | 17.5 | 20.9 | 9.9 | 10.3 | 8.3 | 6.3 | 4.8 | 2.4 | 1.9 | 4.4 | 0.6 | 0.5 |
| Vehicles Entered | 103 | 1 | 12 | 1 | 1 | 36 | 40 | 494 | 2 | 34 | 420 | 111 |
| Vehicles Exited | 104 | 1 | 12 | 1 | 1 | 36 | 40 | 495 | 2 | 34 | 421 | 110 |
| Hourly Exit Rate | 104 | 1 | 12 | 1 | 1 | 36 | 40 | 495 | 2 | 34 | 421 | 110 |
| Denied Entry Before | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Denied Entry After | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## 3: Hartnell Ave. & Old Oregon Trail Rd. Performance by movement

| Movement | All |
|---|---|
| Total Delay (hr) | 1.1 |
| Delay / Veh (s) | 3.2 |
| Vehicles Entered | 1255 |
| Vehicles Exited | 1257 |
| Hourly Exit Rate | 1257 |
| Denied Entry Before | 0 |
| Denied Entry After | 0 |

## 4: Argyle Rd. (North) & Old Oregon Trail Rd. Performance by movement

| Movement | EBL | EBR | NBL | NBT | SBT | SBR | All |
|---|---|---|---|---|---|---|---|
| Total Delay (hr) | 0.1 | 0.1 | 0.1 | 0.2 | 0.1 | 0.0 | 0.6 |
| Delay / Veh (s) | 10.6 | 5.3 | 4.6 | 1.6 | 1.2 | 0.6 | 2.0 |
| Vehicles Entered | 29 | 55 | 51 | 504 | 415 | 16 | 1070 |
| Vehicles Exited | 29 | 55 | 51 | 505 | 416 | 16 | 1072 |
| Hourly Exit Rate | 29 | 55 | 51 | 505 | 416 | 16 | 1072 |
| Denied Entry Before | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Denied Entry After | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## 5: Bend Performance by approach

| Approach | NB | SB | All |
|---|---|---|---|
| Total Delay (hr) | 0.8 | 0.1 | 0.9 |
| Delay / Veh (s) | 6.5 | 0.7 | 3.6 |
| Vehicles Entered | 460 | 470 | 930 |
| Vehicles Exited | 462 | 470 | 932 |
| Hourly Exit Rate | 462 | 470 | 932 |
| Denied Entry Before | 0 | 0 | 0 |
| Denied Entry After | 0 | 0 | 0 |

## 6: Rancho Rd. & Old Oregon Trail Rd. Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay (hr) | 0.8 | 0.1 | 0.1 | 0.0 | 0.1 | 0.0 | 0.7 | 1.5 | 0.0 | 0.1 | 1.0 | 0.2 |
| Delay / Veh (s) | 23.5 | 30.1 | 5.4 | 28.3 | 28.2 | 4.4 | 34.6 | 16.6 | 15.3 | 34.5 | 9.6 | 6.6 |
| Vehicles Entered | 126 | 8 | 73 | 4 | 9 | 5 | 72 | 331 | 9 | 11 | 370 | 90 |
| Vehicles Exited | 125 | 8 | 74 | 4 | 9 | 5 | 72 | 336 | 8 | 11 | 372 | 90 |
| Hourly Exit Rate | 125 | 8 | 74 | 4 | 9 | 5 | 72 | 336 | 8 | 11 | 372 | 90 |
| Denied Entry Before | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Denied Entry After | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## 6: Rancho Rd. & Old Oregon Trail Rd. Performance by movement

| Movement | All |
|---|---|
| Total Delay (hr) | 4.6 |
| Delay / Veh (s) | 15.0 |
| Vehicles Entered | 1108 |
| Vehicles Exited | 1114 |
| Hourly Exit Rate | 1114 |
| Denied Entry Before | 0 |
| Denied Entry After | 0 |

## 7: Knighton Rd. & Old Oregon Trail Rd. Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay (hr) | 0.5 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.6 | 0.4 | 0.0 | 0.1 | 0.4 | 0.0 |
| Delay / Veh (s) | 19.4 | 15.9 | 3.2 | 24.0 | 14.5 | 6.4 | 17.7 | 4.3 | 1.6 | 23.1 | 6.9 | 2.4 |
| Vehicles Entered | 86 | 13 | 58 | 2 | 9 | 5 | 130 | 318 | 6 | 9 | 230 | 69 |
| Vehicles Exited | 85 | 12 | 58 | 2 | 9 | 5 | 131 | 319 | 6 | 9 | 230 | 69 |
| Hourly Exit Rate | 85 | 12 | 58 | 2 | 9 | 5 | 131 | 319 | 6 | 9 | 230 | 69 |
| Denied Entry Before | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Denied Entry After | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## 7: Knighton Rd. & Old Oregon Trail Rd. Performance by movement

| Movement | All |
|---|---|
| Total Delay (hr) | 2.2 |
| Delay / Veh (s) | 8.4 |
| Vehicles Entered | 935 |
| Vehicles Exited | 935 |
| Hourly Exit Rate | 935 |
| Denied Entry Before | 0 |
| Denied Entry After | 0 |

## 8: Meadow View Dr. & Old Oregon Trail Rd. Performance by movement

| Movement | EBL | EBT | EBR | WBR | NBL | NBT | NBR | SBL | SBT | SBR | All |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay (hr) | 0.1 | 0.0 | 0.1 | 0.0 | 0.1 | 0.4 | 0.0 | 0.0 | 0.2 | 0.0 | 0.9 |
| Delay / Veh (s) | 10.3 | 14.9 | 5.2 | 3.4 | 6.2 | 3.7 | 3.2 | 5.3 | 2.5 | 1.5 | 3.9 |
| Vehicles Entered | 32 | 2 | 67 | 9 | 72 | 417 | 8 | 6 | 226 | 45 | 884 |
| Vehicles Exited | 33 | 2 | 68 | 9 | 71 | 414 | 8 | 6 | 228 | 45 | 884 |
| Hourly Exit Rate | 33 | 2 | 68 | 9 | 71 | 414 | 8 | 6 | 228 | 45 | 884 |
| Denied Entry Before | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Denied Entry After | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## 9: Fig Tree Lane & Old Oregon Trail Rd. Performance by movement

| Movement | WBL | WBR | NBT | NBR | SBL | SBT | All |
|---|---|---|---|---|---|---|---|
| Total Delay (hr) | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.2 | 0.5 |
| Delay / Veh (s) | 10.8 | 4.8 | 1.3 | 0.7 | 7.8 | 2.5 | 2.1 |
| Vehicles Entered | 14 | 28 | 472 | 10 | 6 | 289 | 819 |
| Vehicles Exited | 14 | 28 | 471 | 10 | 6 | 290 | 819 |
| Hourly Exit Rate | 14 | 28 | 471 | 10 | 6 | 290 | 819 |
| Denied Entry Before | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Denied Entry After | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## 10: Churn Creek Rd. & Old Oregon Trail Rd. Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay (hr) | 0.1 | 0.1 | 0.1 | 0.9 | 0.1 | 0.7 | 0.4 | 1.4 | 0.3 | 0.6 | 1.0 | 0.0 |
| Delay / Veh (s) | 18.3 | 15.1 | 5.1 | 24.7 | 25.1 | 14.6 | 40.1 | 18.9 | 11.4 | 32.9 | 15.6 | 6.8 |
| Vehicles Entered | 22 | 28 | 64 | 128 | 21 | 175 | 33 | 272 | 83 | 67 | 239 | 18 |
| Vehicles Exited | 22 | 29 | 64 | 129 | 21 | 176 | 34 | 273 | 83 | 67 | 239 | 18 |
| Hourly Exit Rate | 22 | 29 | 64 | 129 | 21 | 176 | 34 | 273 | 83 | 67 | 239 | 18 |
| Denied Entry Before | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Denied Entry After | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## 10: Churn Creek Rd. & Old Oregon Trail Rd. Performance by movement

| Movement | All |
|---|---|
| Total Delay (hr) | 5.8 |
| Delay / Veh (s) | 18.1 |
| Vehicles Entered | 1150 |
| Vehicles Exited | 1155 |
| Hourly Exit Rate | 1155 |
| Denied Entry Before | 0 |
| Denied Entry After | 0 |

## 11: External Performance by approach

| Approach | NW | All |
|---|---|---|
| Total Delay (hr) | 0.1 | 0.1 |
| Delay / Veh (s) | 0.8 | 0.8 |
| Vehicles Entered | 492 | 492 |
| Vehicles Exited | 493 | 493 |
| Hourly Exit Rate | 493 | 493 |
| Denied Entry Before | 0 | 0 |
| Denied Entry After | 0 | 0 |

## 12: External Performance by approach

| Approach | NB | All |
|---|---|---|
| Total Delay (hr) | 0.0 | 0.0 |
| Delay / Veh (s) | 0.3 | 0.3 |
| Vehicles Entered | 68 | 68 |
| Vehicles Exited | 68 | 68 |
| Hourly Exit Rate | 68 | 68 |
| Denied Entry Before | 0 | 0 |
| Denied Entry After | 0 | 0 |

## 1: SR 44 WB & Old Oregon Trail Rd. Performance by movement

| Movement | WBL | WBR | NBL | NBT | SBT | SBR | All |
|---|---|---|---|---|---|---|---|
| Total Delay (hr) | 0.5 | 0.1 | 0.7 | 0.2 | 0.4 | 0.1 | 2.0 |
| Delay / Veh (s) | 26.1 | 9.1 | 9.9 | 2.0 | 3.9 | 2.1 | 5.6 |
| Vehicles Entered | 63 | 42 | 260 | 368 | 345 | 197 | 1275 |
| Vehicles Exited | 63 | 42 | 261 | 369 | 345 | 197 | 1277 |
| Hourly Exit Rate | 63 | 42 | 261 | 369 | 345 | 197 | 1277 |
| Denied Entry Before | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Denied Entry After | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## 2: SR 44 EB & Old Oregon Trail Rd. Performance by movement

| Movement | EBL | EBR | NBT | NBR | SBL | SBT | All |
|---|---|---|---|---|---|---|---|
| Total Delay (hr) | 1.2 | 0.9 | 0.2 | 0.0 | 0.1 | 0.2 | 2.6 |
| Delay / Veh (s) | 23.9 | 11.6 | 1.8 | 0.6 | 5.6 | 2.0 | 6.6 |
| Vehicles Entered | 175 | 281 | 455 | 98 | 58 | 343 | 1410 |
| Vehicles Exited | 174 | 282 | 455 | 98 | 58 | 342 | 1409 |
| Hourly Exit Rate | 174 | 282 | 455 | 98 | 58 | 342 | 1409 |
| Denied Entry Before | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Denied Entry After | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## 3: Hartnell Ave. & Old Oregon Trail Rd. Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay (hr) | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.3 | 0.0 | 0.0 | 0.1 | 0.0 |
| Delay / Veh (s) | 16.4 | 10.4 | 6.7 | 4.2 | 14.0 | 6.1 | 4.9 | 2.1 | 1.1 | 3.9 | 0.6 | 0.5 |
| Vehicles Entered | 71 | 1 | 14 | 1 | 4 | 28 | 38 | 453 | 8 | 19 | 500 | 107 |
| Vehicles Exited | 71 | 1 | 14 | 1 | 4 | 28 | 38 | 453 | 8 | 19 | 500 | 107 |
| Hourly Exit Rate | 71 | 1 | 14 | 1 | 4 | 28 | 38 | 453 | 8 | 19 | 500 | 107 |
| Denied Entry Before | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Denied Entry After | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## 3: Hartnell Ave. & Old Oregon Trail Rd. Performance by movement

| Movement | All |
|---|---|
| Total Delay (hr) | 0.9 |
| Delay / Veh (s) | 2.5 |
| Vehicles Entered | 1244 |
| Vehicles Exited | 1244 |
| Hourly Exit Rate | 1244 |
| Denied Entry Before | 0 |
| Denied Entry After | 0 |

## 4: Argyle Rd. (North) & Old Oregon Trail Rd. Performance by movement

| Movement | EBL | EBR | NBL | NBT | SBT | SBR | All |
|---|---|---|---|---|---|---|---|
| Total Delay (hr) | 0.0 | 0.1 | 0.2 | 0.3 | 0.2 | 0.0 | 0.8 |
| Delay / Veh (s) | 12.1 | 5.1 | 6.6 | 2.0 | 1.7 | 1.1 | 2.6 |
| Vehicles Entered | 13 | 90 | 95 | 484 | 459 | 50 | 1191 |
| Vehicles Exited | 13 | 91 | 96 | 485 | 459 | 51 | 1195 |
| Hourly Exit Rate | 13 | 91 | 96 | 485 | 459 | 51 | 1195 |
| Denied Entry Before | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Denied Entry After | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## 5: Bend Performance by approach

| Approach | NB | SB | All |
|---|---|---|---|
| Total Delay (hr) | 0.6 | 0.1 | 0.7 |
| Delay / Veh (s) | 5.9 | 0.8 | 2.9 |
| Vehicles Entered | 380 | 550 | 930 |
| Vehicles Exited | 383 | 549 | 932 |
| Hourly Exit Rate | 383 | 549 | 932 |
| Denied Entry Before | 0 | 0 | 0 |
| Denied Entry After | 0 | 0 | 0 |

## 6: Rancho Rd. & Old Oregon Trail Rd. Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay (hr) | 0.6 | 0.0 | 0.1 | 0.1 | 0.1 | 0.0 | 0.9 | 1.1 | 0.0 | 0.1 | 1.6 | 0.3 |
| Delay / Veh (s) | 25.4 | 36.5 | 4.7 | 30.8 | 34.3 | 4.6 | 34.6 | 14.0 | 8.6 | 36.0 | 13.6 | 8.4 |
| Vehicles Entered | 88 | 1 | 68 | 10 | 9 | 11 | 94 | 282 | 4 | 7 | 408 | 134 |
| Vehicles Exited | 88 | 1 | 68 | 10 | 9 | 11 | 92 | 282 | 4 | 7 | 412 | 134 |
| Hourly Exit Rate | 88 | 1 | 68 | 10 | 9 | 11 | 92 | 282 | 4 | 7 | 412 | 134 |
| Denied Entry Before | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Denied Entry After | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## 6: Rancho Rd. & Old Oregon Trail Rd. Performance by movement

| Movement | All |
|---|---|
| Total Delay (hr) | 4.8 |
| Delay / Veh (s) | 15.6 |
| Vehicles Entered | 1116 |
| Vehicles Exited | 1118 |
| Hourly Exit Rate | 1118 |
| Denied Entry Before | 0 |
| Denied Entry After | 0 |

## 7: Knighton Rd. & Old Oregon Trail Rd. Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay (hr) | 0.3 | 0.1 | 0.1 | 0.1 | 0.1 | 0.0 | 0.3 | 0.4 | 0.0 | 0.4 | 0.7 | 0.0 |
| Delay / Veh (s) | 19.4 | 17.5 | 3.5 | 21.1 | 15.3 | 6.7 | 19.7 | 5.7 | 1.7 | 22.2 | 7.1 | 2.1 |
| Vehicles Entered | 49 | 22 | 103 | 20 | 32 | 11 | 61 | 280 | 12 | 58 | 347 | 55 |
| Vehicles Exited | 49 | 22 | 103 | 20 | 32 | 11 | 61 | 280 | 12 | 57 | 347 | 55 |
| Hourly Exit Rate | 49 | 22 | 103 | 20 | 32 | 11 | 61 | 280 | 12 | 57 | 347 | 55 |
| Denied Entry Before | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Denied Entry After | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## 7: Knighton Rd. & Old Oregon Trail Rd. Performance by movement

| Movement | All |
|---|---|
| Total Delay (hr) | 2.6 |
| Delay / Veh (s) | 8.9 |
| Vehicles Entered | 1050 |
| Vehicles Exited | 1049 |
| Hourly Exit Rate | 1049 |
| Denied Entry Before | 0 |
| Denied Entry After | 0 |

## 8: Meadow View Dr. & Old Oregon Trail Rd. Performance by movement

| Movement | EBL | EBR | WBL | WBR | NBL | NBT | NBR | SBL | SBT | SBR | All |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay (hr) | 0.1 | 0.1 | 0.0 | 0.0 | 0.1 | 0.2 | 0.0 | 0.0 | 0.3 | 0.0 | 0.9 |
| Delay / Veh (s) | 12.0 | 6.6 | 9.3 | 3.2 | 7.0 | 2.8 | 4.1 | 4.3 | 2.7 | 1.8 | 3.5 |
| Vehicles Entered | 35 | 48 | 4 | 14 | 45 | 302 | 2 | 2 | 430 | 42 | 924 |
| Vehicles Exited | 34 | 48 | 4 | 14 | 45 | 304 | 2 | 2 | 429 | 42 | 924 |
| Hourly Exit Rate | 34 | 48 | 4 | 14 | 45 | 304 | 2 | 2 | 429 | 42 | 924 |
| Denied Entry Before | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Denied Entry After | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## 9: Fig Tree Lane & Old Oregon Trail Rd. Performance by movement

| Movement | WBL | WBR | NBT | NBR | SBL | SBT | All |
|---|---|---|---|---|---|---|---|
| Total Delay (hr) | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | 0.4 | 0.7 |
| Delay / Veh (s) | 9.5 | 3.7 | 1.1 | 0.6 | 6.9 | 3.4 | 2.7 |
| Vehicles Entered | 14 | 31 | 326 | 11 | 33 | 445 | 860 |
| Vehicles Exited | 14 | 31 | 326 | 11 | 34 | 446 | 862 |
| Hourly Exit Rate | 14 | 31 | 326 | 11 | 34 | 446 | 862 |
| Denied Entry Before | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Denied Entry After | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## 10: Churn Creek Rd. & Old Oregon Trail Rd. Performance by movement

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay (hr) | 0.1 | 0.0 | 0.1 | 0.3 | 0.1 | 0.1 | 0.6 | 0.9 | 0.2 | 0.9 | 1.2 | 0.1 |
| Delay / Veh (s) | 20.6 | 22.0 | 5.3 | 21.7 | 18.9 | 7.6 | 32.5 | 13.7 | 9.5 | 29.0 | 13.3 | 7.4 |
| Vehicles Entered | 25 | 6 | 65 | 49 | 13 | 63 | 64 | 249 | 71 | 110 | 327 | 33 |
| Vehicles Exited | 25 | 6 | 64 | 49 | 13 | 63 | 63 | 249 | 70 | 110 | 326 | 33 |
| Hourly Exit Rate | 25 | 6 | 64 | 49 | 13 | 63 | 63 | 249 | 70 | 110 | 326 | 33 |
| Denied Entry Before | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Denied Entry After | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## 10: Churn Creek Rd. & Old Oregon Trail Rd. Performance by movement

| Movement | All |
|---|---|
| Total Delay (hr) | 4.6 |
| Delay / Veh (s) | 15.6 |
| Vehicles Entered | 1075 |
| Vehicles Exited | 1071 |
| Hourly Exit Rate | 1071 |
| Denied Entry Before | 0 |
| Denied Entry After | 0 |

## 11: External Performance by approach

| Approach | NW | All |
|---|---|---|
| Total Delay (hr) | 0.1 | 0.1 |
| Delay / Veh (s) | 0.8 | 0.8 |
| Vehicles Entered | 456 | 456 |
| Vehicles Exited | 456 | 456 |
| Hourly Exit Rate | 456 | 456 |
| Denied Entry Before | 0 | 0 |
| Denied Entry After | 0 | 0 |

## 12: External Performance by approach

| Approach | NB | All |
|---|---|---|
| Total Delay (hr) | 0.0 | 0.0 |
| Delay / Veh (s) | 0.3 | 0.3 |
| Vehicles Entered | 147 | 147 |
| Vehicles Exited | 147 | 147 |
| Hourly Exit Rate | 147 | 147 |
| Denied Entry Before | 0 | 0 |
| Denied Entry After | 0 | 0 |

# 2010 NO PROJECT CONDITIONS

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** Airport Road Widening Project **HCM:** 2000
**Scenario:** 2010 No Project **PHF:** 0.95
**TOD:** AM **Analysis Period:** Hourly **# of Runs:** 10

**Intersection:** 1: SR 44 WB & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 284 | 266 | 94 | 14 | 64.1 | E | -- |
| | T | 626 | 592 | 95 | 22 | 33.9 | C | -- |
| | **Subtotal** | **911** | **858** | **94** | -- | **43.3** | **D** | -- |
| SB | T | 416 | 407 | 98 | 15 | 11.4 | B | -- |
| | R | 316 | 300 | 95 | 11 | 5.7 | A | -- |
| | **Subtotal** | **732** | **706** | **96** | -- | **9.0** | **A** | -- |
| WB | L | 100 | 100 | 100 | 8 | 31.8 | C | -- |
| | R | 111 | 104 | 94 | 14 | 15.3 | B | -- |
| | **Subtotal** | **211** | **204** | **97** | -- | **23.4** | **C** | -- |
| | **Total** | **1853** | **1768** | **95** | -- | **27.3** | **C** | -- |

**Intersection:** 2: SR 44 EB & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | T | 716 | 676 | 94 | 19 | 30.8 | C | -- |
| | R | 179 | 171 | 96 | 13 | 24.0 | C | -- |
| | **Subtotal** | **895** | **847** | **95** | -- | **29.4** | **C** | -- |
| SB | L | 58 | 52 | 90 | 9 | 47.8 | D | -- |
| | T | 458 | 448 | 98 | 11 | 10.0 | B | -- |
| | **Subtotal** | **516** | **499** | 97 | -- | **13.9** | **B** | -- |
| EB | L | 195 | 188 | 96 | 11 | 31.5 | C | -- |
| | R | 421 | 410 | 97 | 15 | 16.5 | B | -- |
| | **Subtotal** | **616** | **597** | **97** | -- | **21.2** | **C** | -- |
| | **Total** | **2026** | **1943** | **96** | -- | **22.9** | **C** | -- |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** Airport Road Widening Project **HCM:** 2000
**Scenario:** 2010 No Project **PHF:** 0.95
**TOD:** AM **Analysis Period:** Hourly **# of Runs:** 10

**Intersection:** 3: Hartnell Ave. & Airport Road **Type:** Un-Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 11 | 10 | 91 | 2 | 47.6 | E | -- |
| | T | 874 | 827 | 95 | 15 | 43.1 | E | -- |
| | R | 11 | 11 | 100 | 2 | 34.5 | D | -- |
| | **Subtotal** | **895** | **847** | **95** | -- | **43.0** | **E** | -- |
| SB | L | 11 | 9 | 82 | 3 | 28.9 | D | -- |
| | T | 758 | 743 | 98 | 27 | 12.2 | B | -- |
| | R | 121 | 116 | 96 | 15 | 0.9 | A | -- |
| | **Subtotal** | **889** | **868** | **98** | -- | **10.8** | **B** | -- |
| EB | R | 58 | 56 | 97 | 6 | 7.5 | A | -- |
| | **Subtotal** | **58** | **56** | **97** | -- | **7.5** | **A** | -- |
| WB | L | 11 | 9 | 82 | 3 | 80.2 | F | -- |
| | T | 11 | 9 | 82 | 3 | 123.6 | F | -- |
| | R | 11 | 10 | 91 | 2 | 135.0 | F | -- |
| | **Subtotal** | 32 | 27 | **84** | -- | **113.8** | **F** | -- |
| | **Total** | **1874** | **1798** | **96** | -- | **27.5** | **D** | -- |

**Intersection:** 5: Preserve Blvd (to Argyle Rd) & Airport Road **Type:** Un-Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 89 | 86 | 97 | 11 | 10.2 | B | -- |
| | T | 784 | 754 | 96 | 25 | 7.1 | A | -- |
| | **Subtotal** | **874** | **839** | **96** | -- | **7.4** | **A** | -- |
| SB | T | 695 | 753 | 108 | 19 | 2.2 | A | -- |
| | R | 53 | 54 | 102 | 10 | 0.7 | A | -- |
| | **Subtotal** | **747** | **808** | **108** | -- | **2.1** | **A** | -- |
| EB | L | 95 | 87 | 92 | 8 | 43.4 | E | -- |
| | R | 47 | 47 | 98 | 9 | 28.1 | D | -- |
| | **Subtotal** | **142** | **134** | **94** | -- | **38.1** | **E** | -- |
| | **Total** | **1763** | **1781** | **101** | -- | **7.3** | **A** | -- |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** Airport Road Widening Project **HCM:** 2000
**Scenario:** 2010 No Project **PHF:** 0.95
**TOD:** AM **Analysis Period:** Hourly **# of Runs:** 10

**Intersection:** 6: Rancho Rd. & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 100 | 86 | 86 | 12 | 42.2 | D | -- |
| | T | 437 | 430 | 98 | 15 | 24.1 | C | -- |
| | R | 42 | 39 | 93 | 7 | 16.2 | B | -- |
| | **Subtotal** | **579** | **556** | **96** | -- | **26.3** | **C** | -- |
| SB | L | 142 | 136 | 96 | 17 | 37.3 | D | -- |
| | T | 374 | 487 | 130 | 15 | 14.7 | B | -- |
| | R | 100 | 98 | 98 | 12 | 7.4 | A | -- |
| | **Subtotal** | **616** | **722** | **117** | -- | **17.9** | **B** | -- |
| EB | L | 137 | 131 | 96 | 11 | 34.2 | C | -- |
| | T | 79 | 74 | 94 | 7 | 29.3 | C | -- |
| | R | 95 | 91 | 96 | 8 | 12.5 | B | -- |
| | **Subtotal** | **311** | **296** | **95** | -- | **26.3** | **C** | -- |
| WB | L | 21 | 18 | 86 | 4 | 42.0 | D | -- |
| | T | 42 | 36 | 86 | 5 | 33.6 | C | -- |
| | R | 63 | 59 | 94 | 8 | 11.3 | B | -- |
| | **Subtotal** | **126** | **114** | **90** | -- | **23.4** | **C** | -- |
| | **Total** | **1632** | **1687** | **103** | -- | **22.5** | **C** | -- |

**Intersection:** 7: Shasta View & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 74 | 68 | 92 | 7 | 26.6 | C | -- |
| | T | 305 | 500 | 164 | 21 | 8.7 | A | -- |
| | R | 26 | 23 | 88 | 4 | 5.4 | A | -- |
| | **Subtotal** | **405** | **591** | **146** | -- | **10.7** | **B** | -- |
| SB | L | 5 | 5 | 100 | 2 | 30.6 | C | -- |
| | T | 263 | 265 | 101 | 9 | 18.9 | B | -- |
| | R | 221 | 212 | 96 | 13 | 9.6 | A | -- |
| | **Subtotal** | **489** | **482** | **99** | -- | **14.9** | **B** | -- |
| EB | L | 268 | 255 | 95 | 12 | 15.8 | B | -- |
| | T | 5 | 5 | 100 | 3 | 16.0 | B | -- |
| | R | 63 | 60 | 95 | 6 | 7.1 | A | -- |
| | **Subtotal** | **337** | **321** | **95** | -- | **14.2** | **B** | -- |
| WB | L | 16 | 16 | 100 | 3 | 27.3 | C | -- |
| | T | 5 | 5 | 100 | 2 | 24.1 | C | -- |
| | R | 5 | 5 | 100 | 1 | 6.0 | A | -- |
| | **Subtotal** | **26** | **25** | **96** | -- | **22.8** | **C** | -- |
| | **Total** | **1258** | 1419 | 113 | -- | **13.1** | **B** | -- |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** Airport Road Widening Project **HCM:** 2000
**Scenario:** 2010 No Project **PHF:** 0.95
**TOD:** AM **Analysis Period:** Hourly **# of Runs:** 10

**Intersection:** 8: Knighton Rd. & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 200 | 189 | 95 | 9 | 23.0 | C | -- |
| | T | 505 | 480 | 95 | 19 | 8.0 | A | -- |
| | R | 11 | 10 | 91 | 3 | 3.6 | A | -- |
| | **Subtotal** | **716** | **679** | **95** | **--** | **12.1** | **B** | **--** |
| SB | L | 11 | 10 | 91 | 3 | 31.7 | C | -- |
| | T | 316 | 300 | 95 | 16 | 16.4 | B | -- |
| | R | 105 | 106 | 101 | 9 | 7.2 | A | -- |
| | **Subtotal** | **432** | **416** | **96** | **--** | **14.4** | **B** | **--** |
| EB | L | 111 | 102 | 92 | 14 | 23.2 | C | -- |
| | T | 16 | 15 | 94 | 4 | 19.5 | B | -- |
| | R | 100 | 96 | 96 | 7 | 5.3 | A | -- |
| | **Subtotal** | **226** | **213** | **94** | **--** | **14.9** | **B** | **--** |
| WB | L | 5 | 4 | 80 | 2 | 22.9 | C | -- |
| | T | 11 | 10 | 91 | 3 | 24.4 | C | -- |
| | R | 11 | 9 | 82 | 3 | 5.7 | A | -- |
| | **Subtotal** | **26** | **23** | **88** | **--** | **16.6** | **B** | **--** |
| | **Total** | **1400** | **1330** | **95** | **--** | **13.4** | **B** | **--** |

**Intersection:** 9: Meadow View Dr. & Airport Road **Type:** Un-Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 116 | 106 | 91 | 11 | 5.8 | A | -- |
| | T | 637 | 606 | 95 | 21 | 5.4 | A | -- |
| | R | 11 | 11 | 100 | 3 | 3.1 | A | -- |
| | **Subtotal** | **763** | **723** | **95** | **--** | **5.4** | **A** | **--** |
| SB | L | 16 | 15 | 94 | 4 | 7.0 | A | -- |
| | T | 332 | 319 | 96 | 20 | 5.9 | A | -- |
| | R | 74 | 72 | 97 | 9 | 3.4 | A | -- |
| | **Subtotal** | **421** | **406** | **96** | **--** | **5.5** | **A** | **--** |
| EB | L | 63 | 56 | 89 | 10 | 16.0 | C | -- |
| | T | 5 | 5 | 100 | 2 | 17.0 | C | -- |
| | R | 74 | 75 | 101 | 8 | 8.1 | A | -- |
| | **Subtotal** | **142** | **136** | **96** | **--** | **11.7** | **B** | **--** |
| WB | L | 5 | 5 | 100 | 2 | 13.0 | B | -- |
| | T | 5 | 5 | 100 | 3 | 13.3 | B | -- |
| | R | 16 | 17 | 106 | 6 | 6.9 | A | -- |
| | **Subtotal** | **26** | **27** | **104** | **--** | **9.3** | **A** | **--** |
| | **Total** | **1353** | **1291** | **95** | **--** | **6.2** | **A** | **--** |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** Airport Road Widening Project **HCM:** 2000
**Scenario:** 2010 No Project **PHF:** 0.95
**TOD:** AM **Analysis Period:** Hourly **# of Runs:** 10

**Intersection:** 10: Fig Tree Lane & Airport Road **Type:** Un-Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | T | 726 | 705 | 97 | 24 | 2.6 | A | -- |
| | R | 95 | 87 | 92 | 8 | 0.5 | A | -- |
| | **Subtotal** | **821** | **792** | **96** | -- | **2.4** | **A** | -- |
| SB | L | 16 | 15 | 94 | 3 | 8.0 | A | -- |
| | T | 389 | 383 | 98 | 26 | 2.6 | A | -- |
| | **Subtotal** | **405** | **397** | **98** | -- | **2.8** | **A** | -- |
| WB | L | 42 | 38 | 90 | 5 | 15.2 | C | -- |
| | R | 32 | 31 | 97 | 5 | 7.5 | A | -- |
| | **Subtotal** | **74** | **69** | **93** | -- | **11.8** | **B** | -- |
| | **Total** | **1300** | **1258** | **97** | -- | **3.0** | **A** | -- |

**Intersection:** 11: Churn Creek Rd. & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 42 | 39 | 93 | 5 | 108.6 | F | -- |
| | T | 626 | 588 | 94 | 22 | 89.6 | F | -- |
| | R | 111 | 107 | 96 | 10 | 55.7 | E | -- |
| | **Subtotal** | **779** | **734** | **94** | -- | **85.6** | **F** | -- |
| SB | L | 89 | 87 | 98 | 7 | 79.2 | E | -- |
| | T | 332 | 317 | 95 | 21 | 26.2 | C | -- |
| | R | 21 | 20 | 95 | 4 | 5.0 | A | -- |
| | **Subtotal** | **442** | **424** | **96** | -- | **36.0** | **D** | -- |
| EB | L | 26 | 24 | 92 | 6 | 45.8 | D | -- |
| | T | 32 | 27 | 84 | 6 | 57.9 | E | -- |
| | R | 68 | 65 | 96 | 9 | 24.8 | C | -- |
| | **Subtotal** | **126** | **116** | **92** | -- | **36.9** | **D** | -- |
| WB | L | 142 | 137 | 96 | 11 | 86.4 | F | -- |
| | T | 21 | 21 | 100 | 6 | 103.9 | F | -- |
| | R | 184 | 182 | 99 | 10 | 78.9 | E | -- |
| | **Subtotal** | **347** | **340** | **98** | -- | **83.5** | **F** | -- |
| | **Total** | **1695** | **1613** | **95** | -- | **68.6** | **E** | -- |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** Airport Road Widening Project **HCM:** 2000
**Scenario:** 2010 No Project **PHF:** 0.95
**TOD:** PM **Analysis Period:** Hourly **# of Runs:** 10

**Intersection:** 1: SR 44 WB & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 279 | 248 | 89 | 11 | 41.5 | D | -- |
| | T | 578 | 537 | 93 | 13 | 15.6 | B | -- |
| | **Subtotal** | 857 | **785** | **92** | -- | **23.8** | **C** | -- |
| SB | T | 389 | 378 | 97 | 16 | 20.7 | C | -- |
| | R | 209 | 200 | 96 | 16 | 14.0 | B | -- |
| | **Subtotal** | **599** | **578** | **96** | -- | **18.4** | **B** | -- |
| WB | L | 103 | 98 | 95 | 9 | 30.9 | C | -- |
| | R | 126 | 122 | 97 | 13 | 14.0 | B | -- |
| | **Subtotal** | **229** | **220** | **96** | -- | **21.5** | **C** | -- |
| | **Total** | **1685** | **1584** | **94** | -- | **21.5** | **C** | -- |

**Intersection:** 2: SR 44 EB & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | T | 668 | 613 | 92 | 16 | 45.0 | D | -- |
| | R | 233 | 208 | 89 | 6 | 37.4 | D | -- |
| | **Subtotal** | **901** | **820** | **91** | -- | **43.1** | **D** | -- |
| SB | L | 63 | 59 | 94 | 8 | 50.9 | D | -- |
| | T | 432 | 413 | 96 | 13 | 8.5 | A | -- |
| | **Subtotal** | **495** | **472** | **95** | -- | **13.8** | **B** | -- |
| EB | L | 188 | 176 | 94 | 12 | 26.9 | C | -- |
| | R | 483 | 459 | 95 | 33 | 17.5 | B | -- |
| | **Subtotal** | **672** | **635** | **94** | -- | **20.1** | **C** | -- |
| | **Total** | **2067** | **1927** | **93** | -- | **28.3** | **C** | -- |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** Airport Road Widening Project **HCM:** 2000
**Scenario:** 2010 No Project **PHF:** 0.95
**TOD:** PM **Analysis Period:** Hourly **# of Runs:** 10

**Intersection:** 3: Hartnell Ave. & Airport Road **Type:** Un-Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 42 | 38 | 90 | 4 | 22.0 | C | -- |
| | T | 795 | 750 | 94 | 18 | 22.4 | C | -- |
| | R | 5 | 5 | 100 | 2 | 10.9 | B | -- |
| | **Subtotal** | **842** | 793 | **94** | -- | **22.3** | **C** | -- |
| SB | L | 21 | 23 | 110 | 5 | 17.6 | C | -- |
| | T | 774 | 739 | 95 | 28 | 10.3 | B | -- |
| | R | 121 | 118 | 98 | 9 | 0.8 | A | -- |
| | **Subtotal** | **916** | **880** | **96** | -- | **9.2** | **A** | -- |
| EB | L | 79 | 42 | 53 | 7 | 1475.8 | F | -- |
| | T | 5 | 3 | 60 | 1 | 1537.9 | F | -- |
| | R | 63 | 34 | 54 | 11 | 1389.2 | F | -- |
| | **Subtotal** | 147 | **79** | **54** | -- | **1440.2** | **F** | -- |
| WB | L | 1 | 1 | 100 | 1 | 63.0 | F | -- |
| | T | 5 | 4 | 80 | 2 | 83.0 | F | -- |
| | R | 28 | 26 | 93 | 5 | 104.9 | F | -- |
| | **Subtotal** | **35** | **32** | 91 | -- | **100.4** | **F** | -- |
| | **Total** | **1940** | **1784** | 92 | -- | **79.9** | **F** | -- |

**Intersection:** 5: Preserve Blvd (to Argyle Rd) & Airport Road **Type:** Un-Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 53 | 47 | 89 | 6 | 6.4 | A | -- |
| | T | 363 | 549 | 151 | 13 | 5.8 | A | -- |
| | **Subtotal** | **416** | **596** | **143** | -- | **5.8** | **A** | -- |
| SB | T | 395 | 730 | 185 | 27 | 0.7 | A | -- |
| | R | 42 | 38 | 90 | 9 | 0.4 | A | -- |
| | **Subtotal** | **437** | **768** | **176** | -- | **0.7** | **A** | -- |
| EB | L | 84 | 79 | 94 | 7 | 9.7 | A | -- |
| | R | 5 | 7 | 140 | 4 | 4.9 | A | -- |
| | **Subtotal** | **89** | **86** | **97** | -- | **9.3** | **A** | -- |
| | **Total** | **942** | **1450** | **154** | -- | **3.3** | **A** | -- |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** Airport Road Widening Project **HCM:** 2000
**Scenario:** 2010 No Project **PHF:** 0.95
**TOD:** PM **Analysis Period:** Hourly **# of Runs:** 10

**Intersection:** 6: Rancho Rd. & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 126 | 117 | 93 | 10 | 47.5 | D | -- |
| | T | 416 | 405 | 97 | 12 | 23.3 | C | -- |
| | R | 26 | 26 | 100 | 6 | 14.7 | B | -- |
| | **Subtotal** | **568** | **548** | 96 | -- | **28.1** | **C** | -- |
| SB | L | 84 | 75 | 89 | 9 | 40.8 | D | -- |
| | T | 547 | 499 | 91 | 22 | 22.5 | C | -- |
| | R | 142 | 130 | 92 | 12 | 9.4 | A | -- |
| | **Subtotal** | **774** | **703** | **91** | -- | **22.1** | **C** | -- |
| EB | L | 95 | 84 | 88 | 12 | 42.4 | D | -- |
| | T | 26 | 24 | 92 | 2 | 32.2 | C | -- |
| | R | 95 | 90 | 95 | 8 | 11.2 | B | -- |
| | **Subtotal** | **216** | **198** | **92** | -- | **27.0** | **C** | -- |
| WB | L | 47 | 44 | 94 | 6 | 40.7 | D | -- |
| | T | 100 | 93 | 93 | 8 | 32.4 | C | -- |
| | R | 132 | 116 | 88 | 6 | 17.0 | B | -- |
| | **Subtotal** | 279 | **254** | 91 | -- | **26.8** | **C** | -- |
| | **Total** | 1837 | **1702** | 93 | -- | **25.3** | **C** | -- |

**Intersection:** 7: Shasta View & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 74 | 72 | 97 | 8 | 32.7 | C | -- |
| | T | 300 | 376 | 125 | 14 | 11.5 | B | -- |
| | R | 21 | 22 | 105 | 4 | 6.4 | A | -- |
| | **Subtotal** | **395** | **470** | **119** | -- | **14.5** | **B** | -- |
| SB | L | 5 | 5 | 100 | 1 | 41.7 | D | -- |
| | T | 405 | 380 | 94 | 18 | 24.7 | C | -- |
| | R | 279 | 257 | 92 | 13 | 14.5 | B | -- |
| | **Subtotal** | **689** | **641** | 93 | -- | **20.8** | **C** | -- |
| EB | L | 263 | 251 | 95 | 14 | 22.3 | C | -- |
| | T | 5 | 4 | 80 | 2 | 23.6 | C | -- |
| | R | 68 | 65 | 96 | 9 | 9.0 | A | -- |
| | **Subtotal** | **337** | **320** | **95** | -- | **19.6** | **B** | -- |
| WB | L | 32 | 31 | 97 | 3 | 33.0 | C | -- |
| | T | 5 | 6 | 120 | 3 | 31.1 | C | -- |
| | R | 5 | 5 | 100 | 2 | 8.5 | A | -- |
| | **Subtotal** | **42** | **42** | **100** | -- | **30.0** | **C** | -- |
| | **Total** | **1463** | **1473** | **101** | -- | **18.8** | **B** | -- |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** Airport Road Widening Project **HCM:** 2000
**Scenario:** 2010 No Project **PHF:** 0.95
**TOD:** PM **Analysis Period:** Hourly **# of Runs:** 10

**Intersection:** 8: Knighton Rd. & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 126 | 116 | 92 | 17 | 32.6 | C | -- |
| | T | 384 | 373 | 97 | 16 | 10.6 | B | -- |
| | R | 16 | 16 | 100 | 5 | 3.6 | A | -- |
| | **Subtotal** | **526** | **505** | **96** | **--** | **15.4** | **B** | **--** |
| SB | L | 60 | 56 | 93 | 8 | 38.4 | D | -- |
| | T | 574 | 546 | 95 | 26 | 19.7 | B | -- |
| | R | 111 | 103 | 93 | 12 | 8.8 | A | -- |
| | **Subtotal** | **744** | **705** | **95** | **--** | **19.6** | **B** | **--** |
| EB | L | 89 | 83 | 93 | 7 | 30.5 | C | -- |
| | T | 26 | 25 | 96 | 3 | 26.6 | C | -- |
| | R | 168 | 162 | 96 | 15 | 10.2 | B | -- |
| | **Subtotal** | **284** | **270** | **95** | **--** | **18.0** | **B** | **--** |
| WB | L | 26 | 28 | 108 | 2 | 30.4 | C | -- |
| | T | 37 | 38 | 103 | 6 | 30.6 | C | -- |
| | R | 16 | 17 | 100 | 5 | 5.4 | A | -- |
| | **Subtotal** | **79** | **82** | **104** | **--** | **25.4** | **C** | **--** |
| | **Total** | **1634** | **1562** | **96** | **--** | **18.3** | **B** | **--** |

**Intersection:** 9: Meadow View Dr. & Airport Road **Type:** Un-Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 53 | 46 | 87 | 6 | 7.6 | A | -- |
| | T | 421 | 404 | 96 | 14 | 3.7 | A | -- |
| | R | 5 | 6 | 120 | 2 | 1.9 | A | -- |
| | **Subtotal** | **479** | **455** | **95** | **--** | **4.1** | **A** | **--** |
| SB | L | 11 | 9 | 82 | 5 | 7.3 | A | -- |
| | T | 684 | 659 | 96 | 23 | 7.4 | A | -- |
| | R | 74 | 73 | 99 | 10 | 4.7 | A | -- |
| | **Subtotal** | **768** | **741** | **96** | **--** | **7.2** | **A** | **--** |
| EB | L | 74 | 69 | 93 | 8 | 23.7 | C | -- |
| | T | 5 | 6 | 120 | 2 | 25.7 | D | -- |
| | R | 95 | 96 | 101 | 8 | 16.2 | C | -- |
| | **Subtotal** | **174** | **171** | **98** | **--** | **19.5** | **C** | **--** |
| WB | L | 16 | 16 | 100 | 4 | 16.3 | C | -- |
| | T | 5 | 6 | 120 | 2 | 17.7 | C | -- |
| | R | 26 | 25 | 96 | 6 | 6.3 | A | -- |
| | **Subtotal** | **47** | **46** | **98** | **--** | **11.2** | **B** | **--** |
| | **Total** | **1468** | **1414** | **96** | **--** | **7.8** | **A** | **--** |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** Airport Road Widening Project **HCM:** 2000
**Scenario:** 2010 No Project **PHF:** 0.95
**TOD:** PM **Analysis Period:** Hourly **# of Runs:** 10

**Intersection:** 10: Fig Tree Lane & Airport Road **Type:** Un-Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | T | 426 | 410 | 96 | 16 | 1.8 | A | -- |
| | R | 42 | 40 | 95 | 5 | 0.2 | A | -- |
| | **Subtotal** | **468** | **450** | **96** | -- | **1.6** | **A** | -- |
| SB | L | 37 | 37 | 100 | 6 | 5.4 | A | -- |
| | T | 753 | 728 | 97 | 28 | 4.2 | A | -- |
| | **Subtotal** | **789** | **765** | **97** | -- | **4.3** | **A** | -- |
| WB | L | 84 | 82 | 98 | 9 | 18.1 | C | -- |
| | R | 53 | 53 | 100 | 5 | 9.1 | A | -- |
| | **Subtotal** | **137** | **134** | **98** | -- | **14.6** | **B** | -- |
| | **Total** | **1395** | **1349** | **97** | -- | **4.4** | **A** | -- |

**Intersection:** 11: Churn Creek Rd. & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 68 | 66 | 97 | 8 | 55.8 | E | -- |
| | T | 363 | 345 | 95 | 19 | 24.7 | C | -- |
| | R | 79 | 81 | 103 | 10 | 7.3 | A | -- |
| | **Subtotal** | **511** | **492** | **96** | -- | **26.0** | **C** | -- |
| SB | L | 147 | 143 | 97 | 12 | 61.0 | E | -- |
| | T | 653 | 632 | 97 | 35 | 41.4 | D | -- |
| | R | 37 | 33 | 89 | 6 | 18.2 | B | -- |
| | **Subtotal** | **837** | **807** | **96** | -- | **43.9** | **D** | -- |
| EB | L | 26 | 24 | 92 | 4 | 36.4 | D | -- |
| | T | 11 | 11 | 100 | 5 | 46.6 | D | -- |
| | R | 74 | 71 | 96 | 9 | 19.1 | B | -- |
| | **Subtotal** | **111** | **106** | **95** | -- | **25.9** | **C** | -- |
| WB | L | 95 | 92 | 97 | 7 | 38.0 | D | -- |
| | T | 16 | 18 | 113 | 3 | 53.6 | D | -- |
| | R | 79 | 75 | 95 | 7 | 25.4 | C | -- |
| | **Subtotal** | **189** | **185** | **98** | -- | **34.4** | **C** | -- |
| | **Total** | **1647** | **1590** | **97** | -- | **36.1** | **D** | -- |

# 2010 WITH PROJECT CONDITIONS

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** Airport Road Widening Project **HCM:** 2000
**Scenario:** 2010 Plus Project **PHF:** 0.95
**TOD:** AM **Analysis Period:** Hourly **# of Runs:** 10

**Intersection:** 1: SR 44 WB & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | T | 626 | 606 | 97 | 29 | 12.2 | B | -- |
| | **Subtotal** | **626** | 606 | 97 | -- | **12.2** | **B** | -- |
| SB | T | 416 | 393 | 94 | 18 | 4.5 | A | -- |
| | R | 316 | 296 | 94 | 14 | 2.8 | A | -- |
| | **Subtotal** | **732** | **688** | **94** | -- | **3.8** | **A** | -- |
| WB | L | 100 | 89 | 89 | 4 | 28.2 | C | -- |
| | R | 111 | 99 | 89 | 7 | 8.6 | A | -- |
| | **Subtotal** | **211** | **188** | **89** | -- | **17.9** | **B** | -- |
| | **Total** | **1568** | **1482** | **95** | -- | **9.0** | **A** | -- |

**Intersection:** 2: SR 44 EB & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | T | 716 | 686 | 96 | 23 | 6.0 | A | -- |
| | R | 179 | 168 | 94 | 12 | 1.6 | A | -- |
| | **Subtotal** | **895** | **853** | **95** | -- | **5.1** | **A** | -- |
| SB | L | 58 | 53 | 91 | 7 | 66.6 | E | -- |
| | T | 458 | 427 | 93 | 15 | 8.7 | A | -- |
| | **Subtotal** | **516** | **481** | 93 | -- | **15.2** | **B** | -- |
| EB | L | 195 | 185 | 95 | 8 | 36.6 | D | -- |
| | R | 421 | 410 | 97 | 8 | 8.0 | A | -- |
| | **Subtotal** | **616** | 595 | **97** | -- | **16.9** | B | -- |
| | **Total** | **2026** | 1929 | **95** | -- | **11.3** | B | -- |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** Airport Road Widening Project **HCM:** 2000
**Scenario:** 2010 Plus Project **PHF:** 0.95
**TOD:** AM **Analysis Period:** Hourly **# of Runs:** 10

**Intersection:** 3: Hartnell Ave. & Airport Road **Type:** Un-Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | T | 895 | 867 | 97 | 22 | 3.9 | A | -- |
| | **Subtotal** | **895** | 867 | **97** | -- | **3.9** | **A** | -- |
| SB | T | 758 | 720 | 95 | 14 | 10.3 | B | -- |
| | R | 121 | 116 | 96 | 6 | 9.5 | A | -- |
| | **Subtotal** | **879** | **837** | **95** | -- | **10.2** | **B** | -- |
| EB | R | 58 | 54 | 93 | 9 | 3.3 | A | -- |
| | **Subtotal** | **58** | **54** | **93** | -- | **3.3** | **A** | -- |
| | **Total** | **1832** | **1757** | **96** | -- | **6.9** | **A** | -- |

**Intersection:** 4: Hartnetll-Realigned & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | T | 874 | 841 | 96 | 21 | 5.2 | A | -- |
| | R | 11 | 11 | 100 | 3 | 4.8 | A | -- |
| | **Subtotal** | **884** | **852** | **96** | -- | **5.2** | **A** | -- |
| SB | L | 74 | 73 | 99 | 8 | 26.1 | C | -- |
| | T | 742 | 709 | 96 | 19 | 1.7 | A | -- |
| | **Subtotal** | 816 | 782 | **96** | -- | **4.0** | **A** | -- |
| WB | L | 11 | 10 | 91 | 4 | 34.2 | C | -- |
| | R | 21 | 22 | 105 | 4 | 6.1 | A | -- |
| | **Subtotal** | 32 | 31 | 97 | -- | **15.0** | **B** | -- |
| | **Total** | **1732** | **1666** | **96** | -- | **4.8** | **A** | -- |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** Airport Road Widening Project **HCM:** 2000
**Scenario:** 2010 Plus Project **PHF:** 0.95
**TOD:** AM **Analysis Period:** Hourly **# of Runs:** 10

**Intersection:** 5: Preserve Blvd (to Argyle Rd) & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 89 | 79 | 89 | 6 | 54.5 | D | -- |
| | T | 784 | 742 | 95 | 17 | 9.9 | A | -- |
| | R | 5 | 6 | 120 | 2 | 6.6 | A | -- |
| | **Subtotal** | **879** | 826 | **94** | -- | **14.1** | **B** | -- |
| SB | L | 5 | 5 | 100 | 1 | 46.8 | D | -- |
| | T | 695 | 665 | 96 | 16 | 9.1 | A | -- |
| | R | 53 | 52 | 98 | 9 | 3.1 | A | -- |
| | **Subtotal** | **753** | **722** | **96** | -- | **9.0** | **A** | -- |
| EB | L | 95 | 86 | 91 | 8 | 46.3 | D | -- |
| | T | 5 | 5 | 100 | 2 | 42.3 | D | -- |
| | R | 47 | 48 | 102 | 8 | 8.8 | A | -- |
| | **Subtotal** | **147** | **139** | **95** | -- | **33.2** | **C** | -- |
| WB | L | 5 | 6 | 120 | 2 | 49.0 | D | -- |
| | T | 5 | 5 | 100 | 2 | 53.7 | D | -- |
| | R | 5 | 6 | 120 | 3 | 6.1 | A | -- |
| | **Subtotal** | **16** | **17** | **106** | -- | **35.7** | **D** | -- |
| | **Total** | **1795** | **1705** | **95** | -- | **13.7** | **B** | -- |

**Intersection:** 6: Rancho Rd. & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 100 | 95 | 95 | 13 | 44.6 | D | -- |
| | T | 437 | 416 | 95 | 32 | 24.1 | C | -- |
| | R | 42 | 35 | 83 | 7 | 8.0 | A | -- |
| | **Subtotal** | **579** | **546** | **94** | -- | **26.7** | **C** | -- |
| SB | L | 142 | 137 | 96 | 12 | 56.1 | E | -- |
| | T | 374 | 477 | 128 | 19 | 14.7 | B | -- |
| | R | 100 | 94 | 94 | 13 | 7.1 | A | -- |
| | **Subtotal** | **616** | **708** | **115** | -- | **21.7** | **C** | -- |
| EB | L | 137 | 130 | 95 | 14 | 42.7 | D | -- |
| | T | 79 | 77 | 97 | 9 | 39.2 | D | -- |
| | R | 95 | 89 | 94 | 11 | 3.2 | A | -- |
| | **Subtotal** | **311** | 297 | 95 | -- | 30.0 | **C** | -- |
| WB | L | 21 | 19 | 90 | 4 | 51.2 | D | -- |
| | T | 42 | 42 | 100 | 5 | 48.0 | D | -- |
| | R | 63 | 63 | 100 | 12 | 4.3 | A | -- |
| | **Subtotal** | **126** | **123** | **98** | -- | 26.2 | **C** | -- |
| | **Total** | **1632** | **1674** | **103** | -- | **25.1** | **C** | -- |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** Airport Road Widening Project **HCM:** 2000
**Scenario:** 2010 Plus Project **PHF:** 0.95
**TOD:** AM **Analysis Period:** Hourly **# of Runs:** 10

**Intersection:** 7: Shasta View & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 74 | 69 | 93 | 7 | 46.9 | D | -- |
| | T | 305 | 499 | 163 | 22 | 8.0 | A | -- |
| | R | 26 | 26 | 100 | 4 | 4.5 | A | -- |
| | **Subtotal** | **405** | **594** | **147** | **--** | **12.4** | **B** | **--** |
| SB | L | 5 | 5 | 100 | 1 | 56.3 | E | -- |
| | T | 263 | 253 | 96 | 11 | 11.2 | B | -- |
| | R | 221 | 214 | 97 | 13 | 8.3 | A | -- |
| | **Subtotal** | **489** | **472** | **97** | **--** | **10.4** | **B** | **--** |
| EB | L | 268 | 244 | 91 | 18 | 38.9 | D | -- |
| | T | 5 | 7 | 140 | 2 | 34.9 | C | -- |
| | R | 63 | 61 | 97 | 7 | 7.7 | A | -- |
| | **Subtotal** | **337** | **312** | **93** | **--** | **32.7** | **C** | **--** |
| WB | L | 16 | 16 | 100 | 4 | 52.5 | D | -- |
| | T | 5 | 4 | 80 | 3 | 58.6 | E | -- |
| | R | 5 | 7 | 140 | 3 | 5.5 | A | -- |
| | **Subtotal** | **26** | **27** | **104** | **--** | **41.7** | **D** | **--** |
| | **Total** | **1258** | **1405** | **112** | **--** | **16.8** | **B** | **--** |

**Intersection:** 8: Knighton Rd. & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 200 | 194 | 97 | 10 | 45.9 | D | -- |
| | T | 505 | 486 | 96 | 21 | 6.0 | A | -- |
| | R | 11 | 11 | 100 | 2 | 3.6 | A | -- |
| | **Subtotal** | **716** | **691** | **97** | **--** | **17.1** | **B** | **--** |
| SB | L | 11 | 8 | 73 | 3 | 50.9 | D | -- |
| | T | 316 | 298 | 94 | 13 | 7.5 | A | -- |
| | R | 105 | 101 | 96 | 9 | 4.6 | A | -- |
| | **Subtotal** | **432** | **407** | **94** | **--** | **7.7** | **A** | **--** |
| EB | L | 111 | 101 | 91 | 11 | 46.9 | D | -- |
| | T | 16 | 15 | 94 | 5 | 38.7 | D | -- |
| | R | 100 | 95 | 95 | 7 | 2.8 | A | -- |
| | **Subtotal** | **226** | **210** | **93** | **--** | **26.4** | **C** | **--** |
| WB | L | 5 | 4 | 80 | 2 | 57.0 | E | -- |
| | T | 11 | 11 | 100 | 3 | 50.4 | D | -- |
| | R | 11 | 10 | 91 | 4 | 4.4 | A | -- |
| | **Subtotal** | **26** | **24** | **92** | **--** | **32.6** | **C** | **--** |
| | **Total** | **1400** | **1333** | **95** | **--** | **16.0** | **B** | **--** |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** Airport Road Widening Project **HCM:** 2000
**Scenario:** 2010 Plus Project **PHF:** 0.95
**TOD:** AM **Analysis Period:** Hourly **# of Runs:** 10

**Intersection:** 9: Meadow View Dr. & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 116 | 111 | 96 | 13 | 47.1 | D | -- |
| | T | 637 | 612 | 96 | 26 | 6.7 | A | -- |
| | R | 11 | 12 | 109 | 3 | 3.0 | A | -- |
| | **Subtotal** | **763** | **735** | **96** | **--** | **12.8** | **B** | **--** |
| SB | L | 16 | 16 | 100 | 3 | 48.1 | D | -- |
| | T | 332 | 319 | 96 | 18 | 6.4 | A | -- |
| | R | 74 | 70 | 95 | 4 | 4.3 | A | -- |
| | **Subtotal** | **421** | **405** | **96** | **--** | **7.7** | **A** | **--** |
| EB | L | 63 | 62 | 98 | 8 | 46.0 | D | -- |
| | T | 5 | 5 | 100 | 1 | 45.2 | D | -- |
| | R | 74 | 70 | 95 | 7 | 5.0 | A | -- |
| | **Subtotal** | **142** | **138** | **97** | **--** | **25.1** | **C** | **--** |
| WB | L | 5 | 6 | 120 | 2 | 46.0 | D | -- |
| | T | 5 | 6 | 120 | 2 | 54.3 | D | -- |
| | R | 16 | 16 | 100 | 4 | 7.5 | A | -- |
| | **Subtotal** | **26** | **28** | **108** | **--** | **26.4** | **C** | **--** |
| | **Total** | **1353** | **1305** | **96** | **--** | **12.8** | **B** | **--** |

**Intersection:** 10: Fig Tree Lane & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 16 | 16 | 100 | 5 | 29.9 | C | -- |
| | T | 726 | 708 | 98 | 27 | 2.5 | A | -- |
| | R | 95 | 87 | 92 | 12 | 0.8 | A | -- |
| | **Subtotal** | **837** | **810** | **97** | **--** | **2.9** | **A** | **--** |
| SB | L | 16 | 14 | 88 | 4 | 49.9 | D | -- |
| | T | 389 | 375 | 96 | 16 | 3.6 | A | -- |
| | R | 5 | 6 | 120 | 2 | 1.8 | A | -- |
| | **Subtotal** | **411** | **394** | **96** | **--** | **5.1** | **A** | **--** |
| EB | L | 5 | 5 | 100 | 3 | 48.4 | D | -- |
| | T | 5 | 4 | 80 | 2 | 39.3 | D | -- |
| | R | 11 | 11 | 100 | 3 | 4.3 | A | -- |
| | **Subtotal** | **21** | **21** | **100** | **--** | **22.4** | **C** | **--** |
| WB | L | 42 | 40 | 95 | 6 | 41.5 | D | -- |
| | T | 5 | 5 | 100 | 2 | 29.4 | C | -- |
| | R | 32 | 32 | 100 | 6 | 4.1 | A | -- |
| | **Subtotal** | **79** | **77** | **97** | **--** | **25.2** | **C** | **--** |
| | **Total** | **1347** | **1302** | **97** | **--** | **5.2** | **A** | **--** |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** Airport Road Widening Project **HCM:** 2000
**Scenario:** 2010 Plus Project **PHF:** 0.95
**TOD:** AM **Analysis Period:** Hourly **# of Runs:** 10

**Intersection:** 11: Churn Creek Rd. & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 42 | 37 | 88 | 6 | 42.7 | D | -- |
| | T | 626 | 602 | 96 | 23 | 13.8 | B | -- |
| | R | 111 | 106 | 95 | 11 | 4.7 | A | -- |
| | **Subtotal** | **779** | **746** | **96** | **--** | **13.9** | **B** | **--** |
| SB | L | 89 | 86 | 97 | 6 | 49.8 | D | -- |
| | T | 332 | 317 | 95 | 16 | 11.1 | B | -- |
| | R | 21 | 24 | 114 | 6 | 1.5 | A | -- |
| | **Subtotal** | **442** | **427** | **97** | **--** | **18.4** | **B** | **--** |
| EB | L | 26 | 23 | 88 | 3 | 41.1 | D | -- |
| | T | 32 | 28 | 88 | 7 | 42.3 | D | -- |
| | R | 68 | 70 | 103 | 5 | 6.2 | A | -- |
| | **Subtotal** | **126** | **121** | **96** | **--** | **21.2** | **C** | **--** |
| WB | L | 142 | 133 | 94 | 10 | 46.6 | D | -- |
| | T | 21 | 19 | 90 | 4 | 50.9 | D | -- |
| | R | 184 | 172 | 93 | 9 | 8.1 | A | -- |
| | **Subtotal** | **347** | **324** | **93** | **--** | **26.4** | **C** | **--** |
| | **Total** | **1695** | **1618** | **95** | **--** | **18.2** | **B** | **--** |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** Airport Road Widening Project **HCM:** 2000
**Scenario:** 2010 Plus Project **PHF:** 0.95
**TOD:** PM **Analysis Period:** Hourly **# of Runs:** 10

**Intersection:** 1: SR 44 WB & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | T | 553 | 522 | 94 | 16 | 5.9 | A | -- |
| | **Subtotal** | **553** | **522** | **94** | **--** | **5.9** | **A** | **--** |
| SB | T | 389 | 384 | 99 | 12 | 3.4 | A | -- |
| | R | 211 | 204 | 97 | 17 | 2.5 | A | -- |
| | **Subtotal** | **600** | **588** | **98** | **--** | **3.1** | **A** | **--** |
| WB | L | 105 | 98 | 93 | 9 | 25.1 | C | -- |
| | R | 126 | 115 | 91 | 11 | 8.3 | A | -- |
| | **Subtotal** | **232** | **213** | **92** | **--** | **16.0** | **B** | **--** |
| | **Total** | **1384** | **1323** | **96** | **--** | **6.3** | **A** | **--** |

**Intersection:** 2: SR 44 EB & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | T | 637 | 603 | 95 | 37 | 15.2 | B | -- |
| | R | 232 | 216 | 93 | 12 | 2.0 | A | -- |
| | **Subtotal** | **868** | **819** | **94** | **--** | **11.8** | **B** | **--** |
| SB | L | 63 | 62 | 98 | 9 | 41.5 | D | -- |
| | T | 432 | 421 | 97 | 16 | 6.7 | A | -- |
| | **Subtotal** | **495** | **482** | **97** | **--** | **11.1** | **B** | **--** |
| EB | L | 189 | 169 | 89 | 10 | 30.2 | C | -- |
| | R | 484 | 475 | 98 | 23 | 7.7 | A | -- |
| | **Subtotal** | **674** | **644** | **96** | **--** | **13.6** | **B** | **--** |
| | **Total** | **2037** | **1945** | **95** | **--** | **12.2** | **B** | **--** |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** Airport Road Widening Project **HCM:** 2000
**Scenario:** 2010 Plus Project **PHF:** 0.95
**TOD:** PM **Analysis Period:** Hourly **# of Runs:** 10

**Intersection:** 3: Hartnell Ave. & Airport Road **Type:** Un-Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | T | 868 | 830 | 96 | 35 | 3.9 | A | -- |
| | **Subtotal** | **868** | **830** | **96** | **--** | **3.9** | **A** | **--** |
| SB | T | 795 | 777 | 98 | 19 | 7.8 | A | -- |
| | R | 121 | 118 | 98 | 7 | 7.4 | A | -- |
| | **Subtotal** | **916** | **895** | **98** | **--** | **7.8** | **A** | **--** |
| EB | R | 63 | 59 | 94 | 7 | 3.7 | A | -- |
| | **Subtotal** | **63** | **59** | **94** | **--** | **3.7** | **A** | **--** |
| | **Total** | **1847** | **1785** | **97** | **--** | **5.8** | **A** | **--** |

**Intersection:** 4: Hartnetll-Realigned & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | T | 842 | 803 | 95 | 40 | 4.6 | A | -- |
| | R | 11 | 11 | 100 | 2 | 3.3 | A | -- |
| | **Subtotal** | **853** | **814** | **95** | **--** | **4.6** | **A** | **--** |
| SB | L | 37 | 36 | 97 | 4 | 31.7 | C | -- |
| | T | 821 | 810 | 99 | 20 | 1.3 | A | -- |
| | **Subtotal** | **858** | **845** | **98** | **--** | **2.6** | **A** | **--** |
| WB | L | 21 | 19 | 90 | 6 | 37.6 | D | -- |
| | R | 26 | 27 | 104 | 6 | 5.1 | A | -- |
| | **Subtotal** | **47** | **47** | **100** | **--** | **18.4** | **B** | **--** |
| | **Total** | **1758** | **1706** | **97** | **--** | **4.0** | **A** | **--** |

# SIMTRAFFIC LEVEL OF SERVICE REPORT

## Including Upstream Delays

**Project:** Airport Road Widening Project **HCM:** 2000
**Scenario:** 2010 Plus Project **PHF:** 0.95
**TOD:** PM **Analysis Period:** Hourly **# of Runs:** 10

**Intersection:** 5: Preserve Blvd (to Argyle Rd) & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 53 | 47 | 89 | 5 | 37.9 | D | -- |
| | T | 763 | 714 | 94 | 34 | 6.1 | A | -- |
| | R | 5 | 5 | 100 | 2 | 4.0 | A | -- |
| | **Subtotal** | **821** | **766** | **93** | **--** | **8.1** | **A** | **--** |
| SB | L | 5 | 5 | 100 | 2 | 37.1 | D | -- |
| | T | 795 | 784 | 99 | 28 | 5.6 | A | -- |
| | R | 42 | 42 | 100 | 8 | 2.0 | A | -- |
| | **Subtotal** | **842** | **831** | **99** | **--** | **5.7** | **A** | **--** |
| EB | L | 84 | 82 | 98 | 8 | 38.3 | D | -- |
| | T | 5 | 5 | 100 | 2 | 31.8 | C | -- |
| | R | 5 | 5 | 100 | 2 | 7.6 | A | -- |
| | **Subtotal** | **95** | **91** | **96** | **--** | **36.4** | **D** | **--** |
| WB | L | 5 | 4 | 80 | 2 | 42.2 | D | -- |
| | T | 5 | 3 | 60 | 2 | 48.4 | D | -- |
| | R | 5 | 5 | 100 | 3 | 5.2 | A | -- |
| | **Subtotal** | **16** | **13** | **81** | **--** | **28.8** | **C** | **--** |
| | **Total** | **1774** | **1701** | **96** | **--** | **8.6** | **A** | **--** |

**Intersection:** 6: Rancho Rd. & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 126 | 114 | 90 | 12 | 36.2 | D | -- |
| | T | 416 | 398 | 96 | 28 | 12.7 | B | -- |
| | R | 26 | 27 | 104 | 6 | 4.1 | A | -- |
| | **Subtotal** | **568** | **539** | **95** | **--** | **17.2** | **B** | **--** |
| SB | L | 84 | 81 | 96 | 8 | 42.5 | D | -- |
| | T | 547 | 559 | 102 | 28 | 12.6 | B | -- |
| | R | 142 | 135 | 94 | 12 | 7.2 | A | -- |
| | **Subtotal** | **774** | **775** | **100** | **--** | **14.8** | **B** | **--** |
| EB | L | 95 | 88 | 93 | 9 | 41.6 | D | -- |
| | T | 26 | 27 | 104 | 5 | 38.2 | D | -- |
| | R | 95 | 92 | 97 | 9 | 2.3 | A | -- |
| | **Subtotal** | **216** | **206** | **95** | **--** | **23.7** | **C** | **--** |
| WB | L | 47 | 48 | 102 | 6 | 36.6 | D | -- |
| | T | 100 | 93 | 92 | 7 | 34.0 | C | -- |
| | R | 132 | 123 | 93 | 15 | 4.2 | A | -- |
| | **Subtotal** | **279** | **263** | **94** | **--** | **20.6** | **C** | **--** |
| | **Total** | **1837** | **1784** | **97** | **--** | **17.4** | **B** | **--** |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** Airport Road Widening Project **HCM:** 2000
**Scenario:** 2010 Plus Project **PHF:** 0.95
**TOD:** PM **Analysis Period:** Hourly **# of Runs:** 10

**Intersection:** 7: Shasta View & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 74 | 67 | 91 | 6 | 41.8 | D | -- |
| | T | 300 | 372 | 124 | 17 | 7.4 | A | -- |
| | R | 21 | 21 | 100 | 2 | 3.8 | A | -- |
| | **Subtotal** | **395** | **460** | **116** | **--** | **12.2** | **B** | **--** |
| SB | L | 5 | 5 | 100 | 2 | 43.5 | D | -- |
| | T | 405 | 408 | 101 | 19 | 11.9 | B | -- |
| | R | 279 | 266 | 95 | 26 | 9.2 | A | -- |
| | **Subtotal** | **689** | **679** | **99** | **--** | **11.1** | **B** | **--** |
| EB | L | 263 | 245 | 93 | 17 | 33.5 | C | -- |
| | T | 5 | 5 | 100 | 4 | 33.6 | C | -- |
| | R | 68 | 64 | 94 | 9 | 7.4 | A | -- |
| | **Subtotal** | **337** | **315** | **93** | **--** | **28.2** | **C** | **--** |
| WB | L | 32 | 28 | 88 | 4 | 41.2 | D | -- |
| | T | 5 | 5 | 100 | 3 | 33.2 | C | -- |
| | R | 5 | 5 | 100 | 3 | 3.2 | A | -- |
| | **Subtotal** | **42** | **38** | **90** | **--** | **35.3** | **D** | **--** |
| | **Total** | **1463** | **1491** | **102** | **--** | **15.6** | **B** | **--** |

**Intersection:** 8: Knighton Rd. & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 126 | 123 | 98 | 10 | 40.3 | D | -- |
| | T | 384 | 362 | 94 | 14 | 6.6 | A | -- |
| | R | 16 | 15 | 94 | 5 | 3.2 | A | -- |
| | **Subtotal** | **526** | **500** | **95** | **--** | **14.8** | **B** | **--** |
| SB | L | 63 | 58 | 92 | 6 | 41.1 | D | -- |
| | T | 574 | 555 | 97 | 22 | 11.6 | B | -- |
| | R | 111 | 109 | 98 | 10 | 5.4 | A | -- |
| | **Subtotal** | **747** | **722** | **97** | **--** | **13.0** | **B** | **--** |
| EB | L | 95 | 87 | 92 | 7 | 37.4 | D | -- |
| | T | 26 | 27 | 104 | 3 | 35.8 | D | -- |
| | R | 168 | 164 | 98 | 14 | 3.6 | A | -- |
| | **Subtotal** | **289** | **277** | **96** | **--** | **17.3** | **B** | **--** |
| WB | L | 26 | 27 | 104 | 4 | 39.5 | D | -- |
| | T | 37 | 36 | 97 | 4 | 39.6 | D | -- |
| | R | 16 | 16 | 100 | 3 | 4.7 | A | -- |
| | **Subtotal** | **79** | **79** | **100** | **--** | **32.7** | **C** | **--** |
| | **Total** | **1642** | **1578** | **96** | **--** | **15.3** | **B** | **--** |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** Airport Road Widening Project **HCM:** 2000
**Scenario:** 2010 Plus Project **PHF:** 0.95
**TOD:** PM **Analysis Period:** Hourly **# of Runs:** 10

**Intersection:** 9: Meadow View Dr. & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 53 | 50 | 94 | 7 | 39.3 | D | -- |
| | T | 421 | 399 | 95 | 12 | 4.8 | A | -- |
| | R | 5 | 5 | 80 | 3 | 2.8 | A | -- |
| | **Subtotal** | **479** | **453** | **95** | **--** | **8.5** | **A** | **--** |
| SB | L | 11 | 10 | 91 | 1 | 37.3 | D | -- |
| | T | 684 | 671 | 98 | 23 | 8.0 | A | -- |
| | R | 74 | 72 | 97 | 11 | 5.3 | A | -- |
| | **Subtotal** | **768** | **753** | **98** | **--** | **8.1** | **A** | **--** |
| EB | L | 79 | 73 | 92 | 7 | 36.4 | D | -- |
| | T | 5 | 5 | 100 | 3 | 34.4 | C | -- |
| | R | 95 | 91 | 96 | 10 | 5.8 | A | -- |
| | **Subtotal** | **179** | **170** | **95** | **--** | 19.9 | **B** | **--** |
| WB | L | 16 | 14 | 88 | 3 | 40.7 | D | -- |
| | T | 5 | 5 | 100 | 1 | 41.6 | D | -- |
| | R | 26 | 27 | 104 | 5 | 3.9 | A | -- |
| | **Subtotal** | **47** | **45** | **96** | -- | 19.1 | **B** | **--** |
| | **Total** | **1474** | **1422** | **96** | -- | 10.0 | **B** | **--** |

**Intersection:** 10: Fig Tree Lane & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 16 | 15 | 94 | 5 | 42.0 | D | -- |
| | T | 421 | 404 | 96 | 12 | 6.4 | A | -- |
| | R | 42 | 42 | 100 | 5 | 2.3 | A | -- |
| | **Subtotal** | **479** | **462** | **96** | **--** | **7.2** | **A** | -- |
| SB | L | 37 | 35 | 95 | 6 | 45.5 | D | -- |
| | T | 753 | 731 | 97 | 20 | 5.7 | A | -- |
| | R | 5 | 5 | 100 | 3 | 3.5 | A | -- |
| | **Subtotal** | **795** | **771** | **97** | **--** | **7.5** | **A** | **--** |
| EB | L | 5 | 5 | 100 | 3 | 47.2 | D | -- |
| | T | 5 | 6 | 120 | 2 | 43.4 | D | -- |
| | R | 16 | 15 | 94 | 4 | 4.7 | A | -- |
| | **Subtotal** | **26** | **26** | **100** | **--** | **21.7** | **C** | **--** |
| WB | L | 79 | 75 | 95 | 10 | 37.9 | D | -- |
| | T | 5 | 6 | 120 | 2 | 29.6 | C | -- |
| | R | 53 | 53 | 100 | 3 | 4.0 | A | -- |
| | **Subtotal** | **137** | 134 | **98** | **--** | **24.1** | C | **--** |
| | **Total** | **1437** | 1392 | **97** | **--** | **9.3** | A | **--** |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** Airport Road Widening Project **HCM:** 2000
**Scenario:** 2010 Plus Project **PHF:** 0.95
**TOD:** PM **Analysis Period:** Hourly **# of Runs:** 10

**Intersection:** 11: Churn Creek Rd. & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 68 | 66 | 97 | 6 | 41.0 | D | -- |
| | T | 374 | 355 | 95 | 13 | 10.4 | B | -- |
| | R | 79 | 79 | 100 | 10 | 3.5 | A | -- |
| | **Subtotal** | **521** | **501** | **96** | **--** | **13.4** | **B** | **--** |
| SB | L | 147 | 146 | 99 | 8 | 36.5 | D | -- |
| | T | 663 | 643 | 97 | 26 | 11.9 | B | -- |
| | R | 37 | 32 | 86 | 5 | 3.4 | A | -- |
| | **Subtotal** | **847** | **821** | **97** | **--** | **15.9** | **B** | **--** |
| EB | L | 26 | 22 | 85 | 5 | 37.9 | D | -- |
| | T | 11 | 10 | 91 | 3 | 42.7 | D | -- |
| | R | 74 | 68 | 92 | 8 | 6.5 | A | -- |
| | **Subtotal** | **111** | **100** | **90** | **--** | **16.9** | **B** | **--** |
| WB | L | 100 | 95 | 95 | 10 | 39.1 | D | -- |
| | T | 16 | 13 | 75 | 3 | 36.2 | D | -- |
| | R | 79 | 78 | 99 | 11 | 7.0 | A | -- |
| | **Subtotal** | **195** | **185** | **95** | **--** | **25.4** | **C** | **--** |
| | **Total** | **1674** | **1607** | **96** | **--** | **16.3** | **B** | **--** |

# 2030 NO PROJECT CONDITIONS

# SIMTRAFFIC LEVEL OF SERVICE REPORT

**Project:** Airport Road Widening Project **HCM:** 2000
**Scenario:** 2030 No Project **# of Runs:** 10
**TOD:** AM **Analysis Period:** Hourly **PHF:** 0.95

**Intersection:** 1: SR 44 WB & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 221 | 128 | 58 | 8 | 40.5 | D | 4.5 |
| | T | 874 | 516 | 59 | 11 | 7.0 | A | 0.7 |
| | **Subtotal** | **1095** | **644** | **59** | -- | **13.6** | **B** | -- |
| SB | T | 674 | 609 | 90 | 27 | 35.6 | D | 3.7 |
| | R | 358 | 315 | 88 | 24 | 28.1 | C | 3.9 |
| | **Subtotal** | **1032** | **924** | **90** | -- | **33.1** | **C** | -- |
| WB | L | 105 | 99 | 94 | 11 | 42.5 | D | 5.6 |
| | R | 126 | 123 | 98 | 9 | 11.5 | B | 1.6 |
| | **Subtotal** | **232** | **222** | **96** | -- | **25.4** | **C** | -- |
| | **Total** | **2358** | **1789** | **76** | -- | **25.1** | **C** | -- |

**Intersection:** 2: SR 44 EB & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | T | 895 | 535 | 60 | 15 | 44.7 | D | 5.1 |
| | R | 347 | 213 | 61 | 17 | 34.6 | C | 6.2 |
| | **Subtotal** | **1242** | **748** | **60** | -- | **41.8** | **D** | -- |
| SB | L | 63 | 52 | 83 | 6 | 101.3 | F | 18.3 |
| | T | 716 | 626 | 87 | 31 | 40.9 | D | 10.8 |
| | **Subtotal** | **779** | **678** | **87** | -- | **45.5** | **D** | -- |
| EB | L | 200 | 108 | 54 | 13 | 1459.8 | F | 205.3 |
| | R | 874 | 503 | 57 | 36 | 1508.3 | F | 169.9 |
| | **Subtotal** | **1074** | **611** | **57** | -- | **1499.7** | **F** | -- |
| | **Total** | **3095** | **2036** | **66** | -- | **480.3** | **F** | -- |

# SIMTRAFFIC LEVEL OF SERVICE REPORT

***Project:*** *Airport Road Widening Project* ***HCM:*** *2000*
***Scenario:*** *2030 No Project* ***# of Runs:*** *10*
***TOD:*** *AM* ***Analysis Period:*** *Hourly* ***PHF:*** *0.95*

***Intersection:*** *3: Hartnell Ave. & Airport Road* ***Type:*** *Un-Signalized*

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 11 | 9 | 82 | 3 | 94.0 | F | 35.3 |
| | T | 1074 | 740 | 69 | 11 | 101.3 | F | 5.3 |
| | R | 32 | 23 | 72 | 6 | 86.6 | F | 24.3 |
| | **Subtotal** | **1116** | **772** | **69** | -- | **100.7** | **F** | -- |
| SB | L | 253 | 175 | 69 | 9 | 27.3 | D | 4.2 |
| | T | 1211 | 872 | 72 | 31 | 7.9 | A | 2.0 |
| | R | 126 | 86 | 68 | 7 | 1.4 | A | 0.4 |
| | **Subtotal** | **1589** | **1133** | **71** | -- | **10.4** | **B** | -- |
| EB | L | 105 | 1 | 1 | 1 | 12559.5 | F | 10719.2 |
| | T | 11 | 0 | 0 | 0 | 0.0 | -- | 0.0 |
| | R | 53 | 0 | 0 | 0 | 19194.1 | F | 41357.1 |
| | **Subtotal** | **168** | **1** | **1** | -- | **13580.2** | **F** | -- |
| WB | L | 42 | 4 | 10 | 3 | 12849.2 | F | 8738.4 |
| | T | 11 | 2 | 18 | 2 | 11607.0 | F | 4863.2 |
| | R | 63 | 6 | 10 | 3 | 14022.3 | F | 5750.9 |
| | **Subtotal** | **116** | **11** | **9** | -- | **13300.2** | **F** | -- |
| | **Total** | **2989** | **1917** | **64** | -- | **133.6** | **F** | -- |

***Intersection:*** *5: Preserve Blvd (to Argyle Rd) & Airport Road* ***Type:*** *Un-Signalized*

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 168 | 134 | 80 | 8 | 30.5 | D | 8.3 |
| | T | 979 | 774 | 79 | 20 | 20.6 | C | 10.8 |
| | **Subtotal** | **1147** | **908** | **79** | -- | **22.1** | **C** | -- |
| SB | T | 1179 | 723 | 61 | 34 | 93.5 | F | 30.7 |
| | R | 126 | 81 | 64 | 10 | 87.6 | F | 30.1 |
| | **Subtotal** | **1305** | **803** | **62** | -- | **92.9** | **F** | -- |
| EB | L | 137 | 39 | 28 | 13 | 4149.5 | F | 872.1 |
| | R | 116 | 34 | 29 | 10 | 4126.2 | F | 829.2 |
| | **Subtotal** | **253** | **73** | **29** | -- | **4138.7** | **F** | -- |
| | **Total** | **2705** | **1784** | **66** | -- | **221.5** | **F** | -- |

# SIMTRAFFIC LEVEL OF SERVICE REPORT

**Project:** Airport Road Widening Project **HCM:** 2000
**Scenario:** 2030 No Project **# of Runs:** 10
**TOD:** AM **Analysis Period:** Hourly **PHF:** 0.95

**Intersection:** 6: Rancho Rd. & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 147 | 96 | 65 | 11 | 148.8 | F | 70.5 |
| | T | 684 | 560 | 82 | 14 | 104.3 | F | 67.4 |
| | R | 126 | 90 | 71 | 10 | 115.9 | F | 76.0 |
| | **Subtotal** | **958** | **746** | **78** | -- | **111.4** | **F** | -- |
| SB | L | 474 | 224 | 47 | 4 | 933.5 | F | 113.8 |
| | T | 716 | 349 | 49 | 29 | 793.8 | F | 78.9 |
| | R | 105 | 47 | 45 | 9 | 790.5 | F | 93.5 |
| | **Subtotal** | **1295** | **620** | **48** | -- | **843.9** | **F** | -- |
| EB | L | 137 | 131 | 96 | 9 | 89.5 | F | 26.5 |
| | T | 253 | 241 | 95 | 18 | 65.2 | E | 22.7 |
| | R | 137 | 136 | 99 | 12 | 54.6 | D | 25.6 |
| | **Subtotal** | **526** | **509** | **97** | -- | **68.6** | **E** | -- |
| WB | L | 63 | 62 | 98 | 5 | 65.5 | E | 18.2 |
| | T | 116 | 109 | 94 | 11 | 39.2 | D | 4.2 |
| | R | 189 | 188 | 99 | 19 | 27.3 | C | 4.4 |
| | **Subtotal** | **368** | **358** | **97** | -- | **37.5** | **D** | -- |
| | **Total** | **3147** | **2233** | **71** | -- | **293.2** | **F** | -- |

**Intersection:** 7: Shasta View & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 263 | 178 | 68 | 12 | 42.3 | D | 4.9 |
| | T | 1053 | 733 | 70 | 21 | 17.8 | B | 1.9 |
| | R | 95 | 65 | 68 | 4 | 10.7 | B | 1.4 |
| | **Subtotal** | **1411** | **977** | **69** | -- | **21.8** | **C** | -- |
| SB | L | 11 | 7 | 64 | 2 | 44.7 | D | 19.8 |
| | T | 926 | 573 | 62 | 36 | 26.7 | C | 6.9 |
| | R | 11 | 6 | 55 | 1 | 18.8 | B | 7.5 |
| | **Subtotal** | **947** | **586** | **62** | -- | **26.9** | **C** | -- |
| EB | L | 11 | 10 | 91 | 3 | 22.6 | C | 10.9 |
| | T | 11 | 11 | 100 | 4 | 25.0 | C | 9.8 |
| | R | 221 | 213 | 96 | 16 | 15.2 | B | 2.1 |
| | **Subtotal** | **242** | **233** | **96** | -- | **15.9** | **B** | -- |
| WB | L | 53 | 48 | 91 | 7 | 31.7 | C | 7.3 |
| | T | 11 | 11 | 91 | 2 | 28.1 | C | 6.7 |
| | R | 11 | 10 | 91 | 3 | 10.5 | B | 6.4 |
| | **Subtotal** | **74** | **68** | **92** | -- | **28.1** | **C** | -- |
| | **Total** | **2674** | **1864** | **70** | -- | **22.9** | **C** | -- |

# SIMTRAFFIC LEVEL OF SERVICE REPORT

**Project:** Airport Road Widening Project **HCM:** 2000
**Scenario:** 2030 No Project **# of Runs:** 10
**TOD:** AM **Analysis Period:** Hourly **PHF:** 0.95

**Intersection:** 8: Knighton Rd. & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 347 | 193 | 56 | 12 | 27.4 | C | 2.7 |
| | T | 947 | 529 | 56 | 10 | 9.1 | A | 0.7 |
| | R | 11 | 5 | 36 | 1 | 4.7 | A | 3.1 |
| | **Subtotal** | **1305** | **726** | **56** | -- | **13.9** | **B** | -- |
| SB | L | 11 | 8 | 73 | 1 | 42.7 | D | 12.5 |
| | T | 474 | 690 | 146 | 33 | 12.6 | B | 1.3 |
| | R | 189 | 129 | 68 | 8 | 9.7 | A | 1.1 |
| | **Subtotal** | **674** | **826** | **123** | -- | **12.5** | **B** | -- |
| EB | L | 168 | 162 | 96 | 12 | 29.1 | C | 4.4 |
| | T | 21 | 21 | 100 | 4 | 19.9 | B | 4.1 |
| | R | 200 | 185 | 93 | 12 | 4.5 | A | 0.5 |
| | **Subtotal** | **389** | **369** | **95** | -- | **16.2** | **B** | -- |
| WB | L | 11 | 10 | 91 | 5 | 30.7 | C | 21.4 |
| | T | 11 | 11 | 100 | 3 | 30.6 | C | 10.6 |
| | R | 11 | 12 | 109 | 3 | 6.5 | A | 2.3 |
| | **Subtotal** | **32** | **32** | **100** | -- | **21.7** | **C** | -- |
| | **Total** | **2400** | **1953** | **81** | -- | **13.9** | **B** | -- |

**Intersection:** 9: Meadow View Dr. & Airport Road **Type:** Un-Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 221 | 109 | 49 | 7 | 7.4 | A | 0.7 |
| | T | 1137 | 571 | 50 | 11 | 6.2 | A | 0.2 |
| | R | 11 | 6 | 55 | 4 | 4.1 | A | 3.8 |
| | **Subtotal** | **1368** | **686** | **50** | -- | **6.4** | **A** | -- |
| SB | L | 42 | 33 | 76 | 4 | 7.6 | A | 1.8 |
| | T | 495 | 380 | 77 | 14 | 7.4 | A | 0.7 |
| | R | 147 | 112 | 76 | 10 | 4.2 | A | 0.7 |
| | **Subtotal** | **684** | **525** | **77** | -- | **6.7** | **A** | -- |
| EB | L | 126 | 121 | 95 | 8 | 37.6 | E | 10.0 |
| | T | 11 | 9 | 82 | 5 | 38.3 | E | 29.6 |
| | R | 95 | 88 | 93 | 6 | 25.9 | D | 7.3 |
| | **Subtotal** | **232** | **218** | **94** | -- | **32.9** | **D** | -- |
| WB | L | 11 | 8 | 73 | 3 | 15.9 | C | 7.8 |
| | T | 11 | 11 | 100 | 4 | 21.9 | C | 10.1 |
| | R | 32 | 26 | 81 | 6 | 8.7 | A | 2.3 |
| | **Subtotal** | **53** | **45** | **85** | -- | **13.1** | **B** | -- |
| | **Total** | **2337** | **1473** | **63** | -- | **10.6** | **B** | -- |

# SIMTRAFFIC LEVEL OF SERVICE REPORT

**Project:** Airport Road Widening Project **HCM:** 2000
**Scenario:** 2030 No Project **# of Runs:** 10
**TOD:** AM **Analysis Period:** Hourly **PHF:** 0.95

**Intersection:** 10: Fig Tree Lane & Airport Road **Type:** Un-Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | T | 1337 | 663 | 50 | 10 | 5.1 | A | 0.5 |
| | R | 305 | 150 | 49 | 16 | 2.1 | A | 0.9 |
| | **Subtotal** | **1642** | **813** | **50** | -- | **4.5** | **A** | -- |
| SB | L | 42 | 32 | 76 | 7 | 8.0 | A | 2.0 |
| | T | 558 | 443 | 79 | 16 | 3.7 | A | 0.3 |
| | **Subtotal** | **600** | **475** | **79** | -- | **4.0** | **A** | -- |
| WB | L | 105 | 98 | 93 | 8 | 24.8 | C | 6.1 |
| | R | 32 | 31 | 97 | 5 | 17.1 | C | 4.7 |
| | **Subtotal** | **137** | **128** | **93** | -- | **22.9** | **C** | -- |
| | **Total** | **2379** | **1416** | **60** | -- | **6.0** | **A** | -- |

**Intersection:** 11: Churn Creek Rd. & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 53 | 21 | 40 | 3 | 3757.9 | F | 501.3 |
| | T | 1400 | 555 | 40 | 13 | 3685.9 | F | 197.3 |
| | R | 168 | 64 | 38 | 12 | 3874.2 | F | 354.5 |
| | **Subtotal** | **1621** | **640** | **39** | -- | **3707.1** | **F** | -- |
| SB | L | 137 | 109 | 80 | 6 | 206.3 | F | 80.8 |
| | T | 505 | 409 | 81 | 23 | 42.7 | D | 28.8 |
| | R | 21 | 17 | 81 | 5 | 19.8 | B | 26.9 |
| | **Subtotal** | **663** | **535** | **81** | -- | **75.3** | **E** | -- |
| EB | L | 32 | 27 | 84 | 4 | 52.1 | D | 24.7 |
| | T | 32 | 30 | 94 | 4 | 68.5 | E | 28.0 |
| | R | 74 | 74 | 100 | 12 | 36.3 | D | 19.7 |
| | **Subtotal** | **137** | **131** | **96** | -- | **46.9** | **D** | -- |
| WB | L | 147 | 137 | 93 | 14 | 121.4 | F | 67.7 |
| | T | 21 | 22 | 105 | 5 | 138.1 | F | 87.0 |
| | R | 211 | 206 | 98 | 11 | 109.0 | F | 68.9 |
| | **Subtotal** | **379** | **366** | **97** | -- | **115.4** | **F** | -- |
| | **Total** | **2800** | **1671** | **60** | -- | **1471.4** | **F** | -- |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** Airport Road Widening Project **HCM:** 2000
**Scenario:** 2030 No Project **PHF:** 0.95
**TOD:** PM **Analysis Period:** Hourly **# of Runs:** 10

**Intersection:** 1: SR 44 WB & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 284 | 151 | 53 | 14 | 58.0 | E | -- |
| | T | 968 | 526 | 54 | 31 | 18.5 | B | -- |
| | **Subtotal** | **1253** | **677** | **54** | -- | **27.3** | **C** | -- |
| SB | T | 474 | 456 | 96 | 20 | 19.5 | B | -- |
| | R | 211 | 195 | 92 | 14 | 12.8 | B | -- |
| | **Subtotal** | **684** | **651** | **95** | -- | **17.5** | **B** | -- |
| WB | L | 189 | 175 | 93 | 11 | 52.3 | D | -- |
| | R | 337 | 328 | 97 | 23 | 33.1 | C | -- |
| | **Subtotal** | **526** | **503** | **96** | -- | **39.8** | **D** | -- |
| | **Total** | **2463** | **1831** | **74** | -- | **27.2** | **C** | -- |

**Intersection:** 2: SR 44 EB & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | T | 1063 | 553 | 52 | 13 | 42.1 | D | -- |
| | R | 558 | 290 | 52 | 12 | 34.9 | C | -- |
| | **Subtotal** | **1621** | **843** | **52** | -- | **39.6** | **D** | -- |
| SB | L | 63 | 53 | 84 | 4 | 219.0 | F | -- |
| | T | 600 | 565 | 94 | 25 | 36.2 | D | -- |
| | **Subtotal** | **663** | **618** | **93** | -- | **51.9** | **D** | -- |
| EB | L | 189 | 123 | 65 | 21 | 1136.1 | F | -- |
| | R | 937 | 632 | 67 | 34 | 1159.1 | F | -- |
| | **Subtotal** | **1126** | **755** | **67** | -- | **1155.3** | **F** | -- |
| | **Total** | **3411** | **2216** | **65** | -- | **423.3** | **F** | -- |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** Airport Road Widening Project **HCM:** 2000
**Scenario:** 2030 No Project **PHF:** 0.95
**TOD:** PM **Analysis Period:** Hourly **# of Runs:** 10

**Intersection:** 3: Hartnell Ave. & Airport Road **Type:** Un-Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 74 | 42 | 57 | 6 | 81.4 | F | -- |
| | T | 1421 | 831 | 58 | 14 | 88.9 | F | -- |
| | R | 32 | 18 | 56 | 3 | 77.0 | F | -- |
| | **Subtotal** | **1526** | **891** | **58** | **--** | **88.3** | **F** | **--** |
| SB | L | 126 | 97 | 77 | 10 | 25.5 | D | -- |
| | T | 1263 | 995 | 79 | 29 | 2.9 | A | -- |
| | R | 147 | 115 | 78 | 15 | 1.1 | A | -- |
| | **Subtotal** | **1537** | **1207** | **79** | **--** | **4.6** | **A** | **--** |
| EB | L | 105 | 1 | 1 | 1 | 19155.8 | F | -- |
| | T | 11 | 0 | 0 | 0 | 19482.0 | F | -- |
| | R | 84 | 0 | 0 | 0 | 24101.1 | F | -- |
| | **Subtotal** | **200** | **1** | **1** | **--** | **20672.0** | **F** | **--** |
| WB | L | 74 | 5 | 7 | 4 | 24775.5 | F | -- |
| | T | 11 | 1 | 9 | 1 | 27574.7 | F | -- |
| | R | 95 | 9 | 9 | 2 | 24374.2 | F | -- |
| | **Subtotal** | **179** | **15** | **8** | **--** | **24650.4** | **F** | **--** |
| | **Total** | **3442** | **2113** | **61** | **--** | **222.3** | **F** | **--** |

**Intersection:** 5: Preserve Blvd (to Argyle Rd) & Airport Road **Type:** Un-Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 105 | 72 | 69 | 13 | 173.9 | F | -- |
| | T | 1347 | 918 | 68 | 20 | 200.6 | F | -- |
| | **Subtotal** | **1453** | **990** | **68** | **--** | **198.6** | **F** | **--** |
| SB | T | 1284 | 879 | 68 | 36 | 13.3 | B | -- |
| | R | 137 | 96 | 70 | 12 | 7.9 | A | -- |
| | **Subtotal** | **1421** | **975** | **69** | **--** | **12.8** | **B** | **--** |
| EB | L | 179 | 7 | 4 | 4 | 36965.0 | F | -- |
| | R | 116 | 4 | 3 | 4 | 29454.1 | F | -- |
| | **Subtotal** | **295** | **11** | **4** | **--** | **34044.1** | **F** | **--** |
| | **Total** | **3168** | **1975** | **62** | **--** | **291.9** | **F** | **--** |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** Airport Road Widening Project **HCM:** 2000
**Scenario:** 2030 No Project **PHF:** 0.95
**TOD:** PM **Analysis Period:** Hourly **# of Runs:** 10

**Intersection:** 6: Rancho Rd. & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 189 | 144 | 76 | 6 | 273.3 | F | -- |
| | T | 737 | 606 | 82 | 16 | 216.8 | F | -- |
| | R | 74 | 54 | 73 | 5 | 218.8 | F | -- |
| | **Subtotal** | **1000** | **803** | **80** | -- | **227.1** | **F** | -- |
| SB | L | 274 | 141 | 51 | 5 | 625.7 | F | -- |
| | T | 979 | 525 | 54 | 28 | 458.6 | F | -- |
| | R | 147 | 78 | 53 | 9 | 447.5 | F | -- |
| | **Subtotal** | **1400** | **745** | **53** | -- | **489.2** | **F** | -- |
| EB | L | 95 | 89 | 94 | 8 | 86.0 | F | -- |
| | T | 95 | 92 | 97 | 9 | 41.6 | D | -- |
| | R | 158 | 143 | 91 | 14 | 28.7 | C | -- |
| | **Subtotal** | **347** | **325** | **94** | -- | **48.2** | **D** | -- |
| WB | L | 137 | 93 | 68 | 10 | 1043.5 | F | -- |
| | T | 326 | 223 | 68 | 14 | 1031.0 | F | -- |
| | R | 442 | 306 | 69 | 14 | 1013.4 | F | -- |
| | **Subtotal** | **905** | **621** | **69** | -- | **1024.2** | **F** | -- |
| | **Total** | **3653** | **2494** | **68** | -- | **480.6** | **F** | -- |

**Intersection:** 7: Shasta View & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 253 | 208 | 82 | 8 | 238.4 | F | -- |
| | T | 1042 | 820 | 79 | 28 | 150.2 | F | -- |
| | R | 74 | 60 | 81 | 7 | 148.4 | F | -- |
| | **Subtotal** | **1368** | **1088** | **80** | -- | **166.9** | **F** | -- |
| SB | L | 11 | 6 | 55 | 1 | 775.7 | F | -- |
| | T | 1421 | 729 | 51 | 8 | 700.4 | F | -- |
| | R | 11 | 5 | 45 | 2 | 703.9 | F | -- |
| | **Subtotal** | **1442** | **739** | **51** | -- | **701.0** | **F** | -- |
| EB | L | 11 | 9 | 82 | 3 | 32.4 | C | -- |
| | T | 11 | 9 | 82 | 3 | 25.5 | C | -- |
| | R | 232 | 225 | 97 | 12 | 19.9 | B | -- |
| | **Subtotal** | **253** | **243** | **96** | -- | **20.6** | **C** | -- |
| WB | L | 116 | 110 | 95 | 9 | 39.5 | D | -- |
| | T | 11 | 11 | 100 | 3 | 35.8 | D | -- |
| | R | 11 | 11 | 100 | 3 | 16.8 | B | -- |
| | **Subtotal** | **137** | **133** | **97** | -- | **37.2** | **D** | -- |
| | **Total** | **3200** | **2203** | **69** | -- | **322.2** | **F** | -- |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** Airport Road Widening Project **HCM:** 2000
**Scenario:** 2030 No Project **PHF:** 0.95
**TOD:** PM **Analysis Period:** Hourly **# of Runs:** 10

**Intersection:** 8: Knighton Rd. & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 274 | 201 | 73 | 13 | 68.0 | E | -- |
| | T | 621 | 436 | 70 | 21 | 17.0 | B | -- |
| | R | 21 | 15 | 71 | 4 | 6.6 | A | -- |
| | **Subtotal** | **916** | **652** | **71** | **--** | **32.5** | **C** | **--** |
| SB | L | 63 | 35 | 56 | 5 | 51.1 | D | -- |
| | T | 1063 | 880 | 83 | 14 | 26.4 | C | -- |
| | R | 242 | 149 | 62 | 8 | 15.3 | B | -- |
| | **Subtotal** | **1368** | **1063** | **78** | **--** | **25.6** | **C** | **--** |
| EB | L | 189 | 177 | 94 | 13 | 58.6 | E | -- |
| | T | 32 | 27 | 84 | 5 | 30.1 | C | -- |
| | R | 326 | 314 | 96 | 18 | 16.7 | B | -- |
| | **Subtotal** | **547** | **518** | **95** | **--** | **31.7** | **C** | **--** |
| WB | L | 32 | 29 | 91 | 5 | 47.9 | D | -- |
| | T | 53 | 47 | 89 | 6 | 36.8 | D | -- |
| | R | 21 | 21 | 100 | 5 | 7.6 | A | -- |
| | **Subtotal** | **105** | **97** | **92** | **--** | **33.8** | **C** | **--** |
| | **Total** | **2937** | **2330** | **79** | **--** | **29.3** | **C** | **--** |

**Intersection:** 9: Meadow View Dr. & Airport Road **Type:** Un-Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 53 | 39 | 74 | 6 | 15.9 | C | -- |
| | T | 684 | 543 | 79 | 17 | 4.8 | A | -- |
| | R | 11 | 9 | 82 | 3 | 3.3 | A | -- |
| | **Subtotal** | **747** | **591** | **79** | **--** | **5.5** | **A** | **--** |
| SB | L | 32 | 23 | 69 | 4 | 55.4 | F | -- |
| | T | 1253 | 825 | 66 | 18 | 49.3 | E | -- |
| | R | 137 | 94 | 69 | 8 | 41.2 | E | -- |
| | **Subtotal** | **1421** | **942** | **66** | **--** | **48.6** | **E** | **--** |
| EB | L | 168 | 58 | 35 | 15 | 2961.5 | F | -- |
| | T | 11 | 3 | 27 | 1 | 3432.4 | F | -- |
| | R | 200 | 65 | 33 | 11 | 3134.4 | F | -- |
| | **Subtotal** | **379** | **126** | **33** | **--** | **3062.2** | **F** | **--** |
| WB | L | 32 | 20 | 63 | 4 | 310.2 | F | -- |
| | T | 11 | 7 | 64 | 3 | 269.7 | F | -- |
| | R | 53 | 36 | 68 | 8 | 264.6 | F | -- |
| | **Subtotal** | **95** | **63** | **66** | **--** | **279.5** | **F** | **--** |
| | **Total** | **2642** | **1721** | **65** | **--** | **262.5** | **F** | **--** |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

***Project:*** *Airport Road Widening Project* ***HCM:*** *2000*
***Scenario:*** *2030 No Project* ***PHF:*** *0.95*
***TOD:*** *PM* ***Analysis Period:*** *Hourly* ***# of Runs:*** *10*

***Intersection:*** *10: Fig Tree Lane & Airport Road* ***Type:*** *Un-Signalized*

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | T | 653 | 591 | 91 | 14 | 3.4 | A | -- |
| | R | 126 | 112 | 89 | 9 | 0.9 | A | -- |
| | **Subtotal** | **779** | **703** | **90** | **--** | **3.0** | **A** | **--** |
| SB | L | 42 | 22 | 52 | 5 | 242.5 | F | -- |
| | T | 1442 | 788 | 55 | 13 | 257.2 | F | -- |
| | **Subtotal** | **1484** | **810** | **55** | **--** | **256.8** | **F** | **--** |
| WB | L | 242 | 22 | 9 | 6 | 14671.1 | F | -- |
| | R | 95 | 8 | 8 | 4 | 14158.0 | F | -- |
| | **Subtotal** | **337** | **30** | **9** | **--** | **14532.9** | **F** | **--** |
| | **Total** | **2600** | **1543** | **59** | **--** | **416.0** | **F** | **--** |

***Intersection:*** *11: Churn Creek Rd. & Airport Road* ***Type:*** *Signalized*

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 74 | 61 | 82 | 8 | 292.3 | F | -- |
| | T | 642 | 561 | 87 | 18 | 250.4 | F | -- |
| | R | 105 | 91 | 87 | 11 | 213.6 | F | -- |
| | **Subtotal** | **821** | **714** | **87** | **--** | **249.3** | **F** | **--** |
| SB | L | 211 | 92 | 44 | 11 | 392.5 | F | -- |
| | T | 1432 | 643 | 45 | 12 | 387.9 | F | -- |
| | R | 42 | 20 | 48 | 4 | 367.3 | F | -- |
| | **Subtotal** | **1684** | **755** | **45** | **--** | **387.9** | **F** | **--** |
| EB | L | 32 | 29 | 91 | 5 | 43.3 | D | -- |
| | T | 11 | 9 | 82 | 3 | 56.3 | E | -- |
| | R | 95 | 96 | 101 | 11 | 28.2 | C | -- |
| | **Subtotal** | **137** | **134** | **98** | **--** | **33.4** | **C** | **--** |
| WB | L | 200 | 188 | 94 | 12 | 75.5 | E | -- |
| | T | 21 | 23 | 110 | 5 | 98.5 | F | -- |
| | R | 105 | 99 | 94 | 11 | 65.5 | E | -- |
| | **Subtotal** | **326** | **310** | **95** | **--** | **74.0** | **E** | **--** |
| | **Total** | **2968** | **1913** | **64** | **--** | **260.4** | **F** | **--** |

# 2030 WITH PROEJCT CONDITIONS

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** Airport Road Widening Proejct
**Scenario:** 2030
**TOD:** AM **Analysis Period:** Hourly

**HCM:** 2000
**PHF:** 0.95
**# of Runs:** 10

**Intersection:** 1: SR 44 WB & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | T | 895 | 880 | 98 | 29 | 10.6 | B | -- |
| | Subtotal | 895 | 880 | 98 | -- | 10.6 | B | -- |
| SB | T | 674 | 641 | 95 | 22 | 4.2 | A | -- |
| | R | 358 | 336 | 94 | 12 | 3.2 | A | -- |
| | Subtotal | 1032 | 977 | 95 | -- | 3.9 | A | -- |
| WB | L | 105 | 99 | 94 | 6 | 35.0 | C | -- |
| | R | 126 | 124 | 98 | 14 | 18.0 | B | -- |
| | Subtotal | 232 | 223 | 96 | -- | 25.5 | C | -- |
| | Total | 2158 | 2079 | 96 | -- | 9.1 | A | -- |

**Intersection:** 2: SR 44 EB & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | T | 916 | 890 | 97 | 26 | 13.2 | B | -- |
| | R | 347 | 333 | 96 | 23 | 2.8 | A | -- |
| | Subtotal | 1263 | 1223 | 97 | -- | 10.4 | B | -- |
| SB | L | 63 | 56 | 89 | 3 | 58.9 | E | -- |
| | T | 716 | 690 | 96 | 24 | 20.1 | C | -- |
| | Subtotal | 779 | 747 | 96 | -- | 23.0 | C | -- |
| EB | L | 200 | 196 | 98 | 9 | 30.0 | C | -- |
| | R | 874 | 827 | 95 | 23 | 14.8 | B | -- |
| | Subtotal | 1074 | 1023 | 95 | -- | 17.7 | B | -- |
| | Total | 3116 | 2992 | 96 | -- | 16.1 | B | -- |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** Airport Road Widening Proejct **HCM:** 2000
**Scenario:** 2030 **PHF:** 0.95
**TOD:** AM **Analysis Period:** Hourly **# of Runs:** 10

**Intersection:** 3: Hartnell Ave. & Airport Road **Type:** Un-Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | T | 1263 | 1238 | 98 | 31 | 6.6 | A | -- |
| | **Subtotal** | **1263** | **1238** | **98** | -- | **6.6** | **A** | -- |
| SB | T | 1463 | 1397 | 95 | 16 | 22.1 | C | -- |
| | R | 126 | 119 | 94 | 12 | 21.1 | C | -- |
| | **Subtotal** | **1589** | **1516** | **95** | -- | **22.1** | **C** | -- |
| EB | R | 158 | 144 | 91 | 12 | 13.1 | B | -- |
| | **Subtotal** | **158** | **144** | **91** | -- | **13.1** | **B** | -- |
| | **Total** | **3011** | **2898** | **96** | -- | **15.0** | **C** | -- |

**Intersection:** 4: Hartnetll-Realigned & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | T | 1200 | 1175 | 98 | 32 | 12.2 | B | -- |
| | R | 32 | 31 | 97 | 5 | 8.1 | A | -- |
| | **Subtotal** | **1232** | **1206** | **98** | -- | **12.1** | **B** | -- |
| SB | L | 253 | 237 | 93 | 16 | 43.8 | D | -- |
| | T | 1368 | 1321 | 97 | 23 | 4.9 | A | -- |
| | **Subtotal** | **1621** | **1557** | **96** | -- | **10.8** | **B** | -- |
| WB | L | 42 | 36 | 86 | 6 | 51.7 | D | -- |
| | R | 63 | 59 | 94 | 5 | 11.6 | B | -- |
| | **Subtotal** | **105** | **96** | **91** | -- | **26.8** | **C** | -- |
| | **Total** | **2958** | **2859** | **97** | -- | **11.9** | **B** | -- |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** Airport Road Widening Proejct **HCM:** 2000
**Scenario:** 2030 **PHF:** 0.95
**TOD:** AM **Analysis Period:** Hourly **# of Runs:** 10

**Intersection:** 5: Preserve Blvd (to Argyle Rd) & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 168 | 158 | 94 | 9 | 58.8 | E | -- |
| | T | 979 | 957 | 98 | 24 | 14.1 | B | -- |
| | R | 11 | 11 | 100 | 3 | 8.7 | A | -- |
| | **Subtotal** | **1158** | **1125** | **97** | -- | **20.3** | **C** | -- |
| SB | L | 11 | 9 | 82 | 3 | 58.7 | E | -- |
| | T | 1274 | 1226 | 96 | 23 | 19.8 | B | -- |
| | R | 126 | 123 | 98 | 10 | 10.7 | B | -- |
| | **Subtotal** | **1411** | **1357** | **96** | -- | **19.2** | **B** | -- |
| EB | L | 242 | 226 | 93 | 10 | 50.0 | D | -- |
| | T | 11 | 9 | 82 | 3 | 38.0 | D | -- |
| | R | 11 | 12 | 109 | 4 | 16.6 | B | -- |
| | **Subtotal** | **263** | **247** | **94** | -- | **47.9** | **D** | -- |
| WB | L | 11 | 11 | 100 | 4 | 52.2 | D | -- |
| | T | 11 | 11 | 100 | 3 | 48.9 | D | -- |
| | R | 11 | 11 | 91 | 3 | 13.6 | B | -- |
| | **Subtotal** | **32** | **32** | **100** | -- | **38.5** | **D** | -- |
| | **Total** | **2863** | **2761** | **96** | -- | **22.4** | **C** | -- |

**Intersection:** 6: Rancho Rd. & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 147 | 138 | 94 | 13 | 46.7 | D | -- |
| | T | 684 | 776 | 113 | 34 | 25.3 | C | -- |
| | R | 126 | 116 | 92 | 8 | 11.5 | B | -- |
| | **Subtotal** | **958** | **1029** | **107** | -- | **26.6** | **C** | -- |
| SB | L | 474 | 442 | 93 | 22 | 57.5 | E | -- |
| | T | 716 | 693 | 97 | 26 | 28.8 | C | -- |
| | R | 105 | 98 | 93 | 13 | 14.0 | B | -- |
| | **Subtotal** | **1295** | **1233** | **95** | -- | **37.9** | **D** | -- |
| EB | L | 137 | 133 | 97 | 9 | 55.4 | E | -- |
| | T | 253 | 245 | 96 | 15 | 35.2 | D | -- |
| | R | 137 | 133 | 97 | 11 | 5.4 | A | -- |
| | **Subtotal** | **526** | **510** | **97** | -- | **32.7** | **C** | -- |
| WB | L | 63 | 59 | 94 | 4 | 48.3 | D | -- |
| | T | 116 | 108 | 93 | 11 | 34.5 | C | -- |
| | R | 189 | 185 | 98 | 22 | 7.1 | A | -- |
| | **Subtotal** | **368** | **352** | **96** | -- | **22.4** | **C** | -- |
| | **Total** | **3147** | **3124** | **99** | -- | **31.6** | **C** | -- |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** Airport Road Widening Proejct
**Scenario:** 2030
**TOD:** AM **Analysis Period:** Hourly
**HCM:** 2000
**PHF:** 0.95
**# of Runs:** 10

**Intersection:** 7: Shasta View & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 263 | 252 | 96 | 17 | 52.5 | D | -- |
| | T | 1053 | 1002 | 95 | 42 | 15.2 | B | -- |
| | R | 95 | 89 | 94 | 7 | 9.1 | A | -- |
| | **Subtotal** | **1411** | **1343** | **95** | **--** | **21.7** | **C** | **--** |
| SB | L | 11 | 9 | 82 | 2 | 58.7 | E | -- |
| | T | 926 | 898 | 97 | 27 | 16.3 | B | -- |
| | R | 11 | 11 | 100 | 3 | 11.6 | B | -- |
| | **Subtotal** | **947** | **919** | **97** | **--** | **16.7** | **B** | **--** |
| EB | L | 11 | 10 | 91 | 3 | 41.2 | D | -- |
| | T | 11 | 11 | 100 | 2 | 46.9 | D | -- |
| | R | 221 | 206 | 93 | 12 | 14.1 | B | -- |
| | **Subtotal** | **242** | **227** | **94** | **--** | **16.8** | **B** | **--** |
| WB | L | 53 | 49 | 92 | 11 | 50.5 | D | -- |
| | T | 11 | 10 | 91 | 2 | 47.1 | D | -- |
| | R | 11 | 10 | 91 | 2 | 9.5 | A | -- |
| | **Subtotal** | **74** | **70** | **95** | **--** | **44.0** | **D** | **--** |
| | **Total** | **2674** | **2558** | **96** | **--** | **20.1** | **C** | **--** |

**Intersection:** 8: Knighton Rd. & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 347 | 335 | 96 | 13 | 45.9 | D | -- |
| | T | 947 | 902 | 95 | 40 | 10.3 | B | -- |
| | R | 11 | 10 | 91 | 3 | 5.7 | A | -- |
| | **Subtotal** | **1305** | **1246** | **95** | **--** | **19.8** | **B** | **--** |
| SB | L | 11 | 9 | 82 | 3 | 50.3 | D | -- |
| | T | 474 | 945 | 199 | 35 | 9.7 | A | -- |
| | R | 189 | 180 | 95 | 16 | 8.6 | A | -- |
| | **Subtotal** | **674** | **1133** | **168** | **--** | **9.9** | **A** | **--** |
| EB | L | 168 | 159 | 95 | 15 | 46.6 | D | -- |
| | T | 21 | 23 | 110 | 3 | 40.6 | D | -- |
| | R | 200 | 195 | 98 | 12 | 4.1 | A | -- |
| | **Subtotal** | **389** | **376** | **97** | **--** | **24.2** | **C** | **--** |
| WB | L | 11 | 9 | 82 | 3 | 49.6 | D | -- |
| | T | 11 | 11 | 100 | 2 | 50.7 | D | -- |
| | R | 11 | 10 | 91 | 3 | 7.9 | A | -- |
| | **Subtotal** | **32** | **30** | **94** | **--** | **36.4** | **D** | **--** |
| | **Total** | **2400** | **2785** | **116** | **--** | **16.5** | **B** | **--** |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** Airport Road Widening Proejct **HCM:** 2000
**Scenario:** 2030 **PHF:** 0.95
**TOD:** AM **Analysis Period:** Hourly **# of Runs:** 10

**Intersection:** 9: Meadow View Dr. & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 221 | 204 | 92 | 13 | 52.1 | D | -- |
| | T | 1147 | 1095 | 95 | 35 | 13.5 | B | -- |
| | R | 11 | 12 | 109 | 3 | 6.3 | A | -- |
| | **Subtotal** | **1379** | **1311** | **95** | **--** | **19.5** | **B** | **--** |
| SB | L | 42 | 37 | 86 | 6 | 51.3 | D | -- |
| | T | 495 | 478 | 97 | 21 | 13.0 | B | -- |
| | R | 147 | 132 | 90 | 9 | 7.7 | A | -- |
| | **Subtotal** | **684** | **647** | **95** | **--** | **14.1** | **B** | **--** |
| EB | L | 126 | 121 | 96 | 12 | 44.0 | D | -- |
| | T | 11 | 10 | 91 | 2 | 41.7 | D | -- |
| | R | 95 | 95 | 99 | 11 | 8.4 | A | -- |
| | **Subtotal** | **232** | **225** | **97** | **--** | **29.0** | **C** | **--** |
| WB | L | 11 | 8 | 73 | 3 | 49.4 | D | -- |
| | T | 11 | 11 | 100 | 3 | 48.5 | D | -- |
| | R | 32 | 30 | 94 | 5 | 11.7 | B | -- |
| | **Subtotal** | **53** | **49** | **92** | **--** | **26.0** | **C** | **--** |
| | **Total** | **2347** | **2232** | **95** | **--** | **19.0** | **B** | **--** |

**Intersection:** 10: Fig Tree Lane & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 53 | 50 | 94 | 5 | 64.8 | E | -- |
| | T | 1337 | 1299 | 97 | 36 | 12.7 | B | -- |
| | R | 305 | 295 | 97 | 17 | 8.9 | A | -- |
| | **Subtotal** | **1695** | **1643** | **97** | **--** | **13.6** | **B** | **--** |
| SB | L | 42 | 34 | 81 | 6 | 62.0 | E | -- |
| | T | 547 | 530 | 97 | 21 | 7.3 | A | -- |
| | R | 11 | 11 | 100 | 3 | 4.1 | A | -- |
| | **Subtotal** | **600** | **575** | **96** | **--** | **10.4** | **B** | **--** |
| EB | L | 11 | 8 | 73 | 4 | 48.5 | D | -- |
| | T | 11 | 10 | 91 | 4 | 45.4 | D | -- |
| | R | 42 | 43 | 102 | 6 | 8.5 | A | -- |
| | **Subtotal** | **63** | **61** | **97** | **--** | **20.0** | **C** | **--** |
| WB | L | 105 | 99 | 94 | 9 | 50.3 | D | -- |
| | T | 11 | 11 | 100 | 4 | 39.3 | D | -- |
| | R | 32 | 31 | 97 | 4 | 10.2 | B | -- |
| | **Subtotal** | **147** | **140** | **95** | **--** | **40.7** | **D** | **--** |
| | **Total** | **2505** | **2419** | **97** | **--** | **14.6** | **B** | **--** |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** Airport Road Widening Proejct **HCM:** 2000
**Scenario:** 2030 **PHF:** 0.95
**TOD:** AM **Analysis Period:** Hourly **# of Runs:** 10

**Intersection:** 11: Churn Creek Rd. & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 53 | 51 | 94 | 7 | 41.6 | D | -- |
| | T | 1453 | 1383 | 95 | 30 | 22.7 | C | -- |
| | R | 168 | 162 | 96 | 14 | 9.3 | A | -- |
| | **Subtotal** | **1674** | **1596** | **95** | -- | **21.9** | **C** | -- |
| SB | L | 137 | 134 | 98 | 8 | 51.5 | D | -- |
| | T | 537 | 520 | 97 | 14 | 14.7 | B | -- |
| | R | 21 | 20 | 95 | 3 | 3.1 | A | -- |
| | **Subtotal** | **695** | **674** | **97** | -- | **21.7** | **C** | -- |
| EB | L | 32 | 29 | 91 | 8 | 54.5 | D | -- |
| | T | 32 | 28 | 88 | 6 | 48.7 | D | -- |
| | R | 74 | 72 | 97 | 6 | 7.6 | A | -- |
| | **Subtotal** | **137** | **129** | **94** | -- | **27.2** | **C** | -- |
| WB | L | 147 | 136 | 93 | 14 | 89.2 | F | -- |
| | T | 21 | 21 | 100 | 5 | 60.1 | E | -- |
| | R | 211 | 202 | 96 | 14 | 17.5 | B | -- |
| | **Subtotal** | **379** | **360** | **95** | -- | **47.2** | **D** | -- |
| | **Total** | **2884** | **2759** | **96** | -- | **25.4** | **C** | -- |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** Airport Road Widening Project **HCM:** 2000
**Scenario:** 2030 **PHF:** 0.95
**TOD:** PM **Analysis Period:** Hourly **# of Runs:** 10

**Intersection:** 1: SR 44 WB & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | T | 968 | 934 | 96 | 29 | 16.1 | B | -- |
| | **Subtotal** | **968** | **934** | **96** | -- | **16.1** | **B** | -- |
| SB | T | 474 | 448 | 95 | 28 | 6.3 | A | -- |
| | R | 211 | 200 | 95 | 14 | 2.9 | A | -- |
| | **Subtotal** | **684** | **648** | **95** | -- | **5.2** | **A** | -- |
| WB | L | 189 | 183 | 97 | 12 | 39.4 | D | -- |
| | R | 337 | 317 | 94 | 15 | 22.5 | C | -- |
| | **Subtotal** | **526** | **500** | **95** | -- | **28.7** | **C** | -- |
| | **Total** | **2179** | **2082** | **96** | -- | **15.7** | **B** | -- |

**Intersection:** 2: SR 44 EB & Airport Road **Type:** Signalized

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | T | 1063 | 1012 | 95 | 27 | 19.1 | B | -- |
| | R | 558 | 517 | 93 | 28 | 4.7 | A | -- |
| | **Subtotal** | **1621** | **1529** | **94** | -- | **14.3** | **B** | -- |
| SB | L | 63 | 54 | 86 | 9 | 68.6 | E | -- |
| | T | 600 | 576 | 96 | 33 | 17.7 | B | -- |
| | **Subtotal** | **663** | **630** | **95** | -- | **22.1** | **C** | -- |
| EB | L | 189 | 177 | 94 | 7 | 37.0 | D | -- |
| | R | 937 | 877 | 94 | 21 | 15.6 | B | -- |
| | **Subtotal** | **1126** | **1054** | **94** | -- | **19.2** | **B** | -- |
| | **Total** | **3411** | **3213** | **94** | -- | **17.4** | **B** | -- |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

***Project:*** *Airport Road Widening Project* ***HCM:*** *2000*
***Scenario:*** *2030* ***PHF:*** *0.95*
***TOD:*** *PM* ***Analysis Period:*** *Hourly* ***# of Runs:*** *10*

***Intersection:*** *3: Hartnell Ave. & Airport Road* ***Type:*** *Un-Signalized*

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | T | 1621 | 1549 | 96 | 42 | 10.7 | B | -- |
| | **Subtotal** | **1621** | **1549** | **96** | -- | **10.7** | **B** | -- |
| SB | T | 1389 | 1318 | 95 | 40 | 19.5 | C | -- |
| | R | 147 | 141 | 96 | 11 | 18.6 | C | -- |
| | **Subtotal** | **1537** | **1460** | **95** | -- | **19.4** | **C** | -- |
| EB | R | 189 | 178 | 94 | 11 | 11.0 | B | -- |
| | **Subtotal** | **189** | **178** | **94** | -- | **11.0** | **B** | -- |
| | **Total** | **3347** | **3187** | **95** | -- | **14.7** | **B** | -- |

***Intersection:*** *4: Hartnetll-Realigned & Airport Road* ***Type:*** *Signalized*

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | T | 1526 | 1449 | 95 | 39 | 16.3 | B | -- |
| | R | 32 | 29 | 91 | 4 | 12.8 | B | -- |
| | **Subtotal** | **1558** | **1478** | **95** | -- | **16.2** | **B** | -- |
| SB | L | 126 | 113 | 90 | 7 | 54.2 | D | -- |
| | T | 1453 | 1392 | 96 | 48 | 4.7 | A | -- |
| | **Subtotal** | **1579** | **1505** | **95** | -- | **8.4** | **A** | -- |
| WB | L | 74 | 71 | 95 | 11 | 54.5 | D | -- |
| | R | 95 | 91 | 96 | 14 | 22.5 | C | -- |
| | **Subtotal** | **168** | **161** | **96** | -- | **36.5** | **D** | -- |
| | **Total** | **3305** | **3144** | **95** | -- | **13.5** | **B** | -- |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

**Project:** *Airport Road Widening Project* **HCM:** *2000*
**Scenario:** *2030* **PHF:** *0.95*
**TOD:** *PM* **Analysis Period:** *Hourly* **# of Runs:** *10*

**Intersection:** *5: Preserve Blvd (to Argyle Rd) & Airport Road* **Type:** *Signalized*

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 179 | 171 | 96 | 14 | 60.1 | E | -- |
| | T | 1263 | 1181 | 94 | 36 | 25.6 | C | -- |
| | R | 11 | 9 | 73 | 3 | 13.6 | B | -- |
| | **Subtotal** | **1453** | **1361** | **94** | -- | **29.8** | **C** | -- |
| SB | L | 11 | 10 | 91 | 3 | 76.2 | E | -- |
| | T | 1379 | 1321 | 96 | 36 | 24.1 | C | -- |
| | R | 137 | 134 | 98 | 14 | 13.6 | B | -- |
| | **Subtotal** | **1526** | **1466** | **96** | -- | **23.5** | **C** | -- |
| EB | L | 284 | 265 | 93 | 18 | 61.4 | E | -- |
| | T | 11 | 10 | 91 | 3 | 43.1 | D | -- |
| | R | 11 | 11 | 100 | 4 | 19.9 | B | -- |
| | **Subtotal** | **305** | **286** | **94** | -- | **59.1** | **E** | -- |
| WB | L | 11 | 11 | 91 | 4 | 57.9 | E | -- |
| | T | 11 | 10 | 91 | 2 | 59.4 | E | -- |
| | R | 11 | 12 | 109 | 3 | 21.1 | C | -- |
| | **Subtotal** | **32** | **33** | **103** | -- | **44.8** | **D** | -- |
| | **Total** | **3316** | **3146** | **95** | -- | **29.7** | **C** | -- |

**Intersection:** *6: Rancho Rd. & Airport Road* **Type:** *Signalized*

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 189 | 178 | 94 | 11 | 62.8 | E | -- |
| | T | 737 | 765 | 104 | 25 | 30.8 | C | -- |
| | R | 74 | 70 | 95 | 8 | 19.9 | B | -- |
| | **Subtotal** | **1000** | **1013** | **101** | -- | **35.6** | **D** | -- |
| SB | L | 274 | 262 | 96 | 13 | 54.7 | D | -- |
| | T | 979 | 918 | 94 | 32 | 31.8 | C | -- |
| | R | 147 | 147 | 100 | 12 | 16.9 | B | -- |
| | **Subtotal** | **1400** | **1327** | **95** | -- | **34.7** | **C** | -- |
| EB | L | 95 | 92 | 97 | 7 | 56.3 | E | -- |
| | T | 95 | 89 | 94 | 14 | 47.9 | D | -- |
| | R | 158 | 154 | 97 | 11 | 4.0 | A | -- |
| | **Subtotal** | **347** | **334** | **96** | -- | **30.0** | **C** | -- |
| WB | L | 137 | 124 | 91 | 13 | 48.0 | D | -- |
| | T | 326 | 305 | 94 | 17 | 48.4 | D | -- |
| | R | 442 | 416 | 94 | 28 | 14.3 | B | -- |
| | **Subtotal** | **905** | **845** | **93** | -- | **31.5** | **C** | -- |
| | **Total** | **3653** | **3518** | **96** | -- | **33.8** | **C** | -- |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

***Project:*** *Airport Road Widening Project* ***HCM:*** *2000*
***Scenario:*** *2030* ***PHF:*** *0.95*
***TOD:*** *PM* ***Analysis Period:*** *Hourly* ***# of Runs:*** *10*

***Intersection:*** *7: Shasta View & Airport Road* ***Type:*** *Signalized*

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 253 | 234 | 92 | 19 | 67.5 | E | -- |
| | T | 1042 | 980 | 94 | 30 | 17.0 | B | -- |
| | R | 74 | 72 | 97 | 6 | 9.1 | A | -- |
| | **Subtotal** | **1368** | **1286** | **94** | -- | **25.8** | **C** | -- |
| SB | L | 11 | 11 | 100 | 4 | 76.7 | E | -- |
| | T | 1421 | 1346 | 95 | 34 | 30.1 | C | -- |
| | R | 11 | 11 | 100 | 4 | 22.9 | C | -- |
| | **Subtotal** | **1442** | **1368** | **95** | -- | **30.4** | **C** | -- |
| EB | L | 11 | 8 | 73 | 2 | 49.6 | D | -- |
| | T | 11 | 10 | 91 | 3 | 50.1 | D | -- |
| | R | 232 | 217 | 94 | 17 | 23.3 | C | -- |
| | **Subtotal** | **253** | **235** | **93** | -- | **25.3** | **C** | -- |
| WB | L | 116 | 111 | 96 | 8 | 57.6 | E | -- |
| | T | 11 | 10 | 91 | 3 | 47.2 | D | -- |
| | R | 11 | 9 | 82 | 3 | 9.9 | A | -- |
| | **Subtotal** | **137** | **131** | **96** | -- | **53.4** | **D** | -- |
| | **Total** | **3200** | **3020** | **94** | -- | **29.0** | **C** | -- |

***Intersection:*** *8: Knighton Rd. & Airport Road* ***Type:*** *Signalized*

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 274 | 251 | 92 | 21 | 55.1 | E | -- |
| | T | 621 | 601 | 97 | 18 | 14.0 | B | -- |
| | R | 21 | 19 | 90 | 4 | 5.4 | A | -- |
| | **Subtotal** | **916** | **871** | **95** | -- | **25.7** | **C** | -- |
| SB | L | 63 | 57 | 90 | 6 | 71.7 | E | -- |
| | T | 1063 | 1383 | 130 | 41 | 21.2 | C | -- |
| | R | 242 | 226 | 93 | 13 | 14.3 | B | -- |
| | **Subtotal** | **1368** | **1666** | **122** | -- | **22.0** | **C** | -- |
| EB | L | 189 | 169 | 89 | 16 | 56.7 | E | -- |
| | T | 32 | 28 | 88 | 5 | 48.9 | D | -- |
| | R | 326 | 306 | 94 | 16 | 7.4 | A | -- |
| | **Subtotal** | **547** | **502** | **92** | -- | **26.3** | **C** | -- |
| WB | L | 32 | 29 | 91 | 4 | 61.2 | E | -- |
| | T | 53 | 51 | 96 | 8 | 55.5 | E | -- |
| | R | 21 | 20 | 95 | 4 | 9.1 | A | -- |
| | **Subtotal** | **105** | **101** | **96** | -- | **47.7** | **D** | -- |
| | **Total** | **2937** | **3140** | **107** | -- | **24.5** | **C** | -- |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

***Project:*** *Airport Road Widening Project* ***HCM:*** *2000*
***Scenario:*** *2030* ***PHF:*** *0.95*
***TOD:*** *PM* ***Analysis Period:*** *Hourly* ***# of Runs:*** *10*

***Intersection:*** *9: Meadow View Dr. & Airport Road* ***Type:*** *Signalized*

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 53 | 54 | 102 | 8 | 70.8 | E | -- |
| | T | 695 | 659 | 95 | 24 | 11.1 | B | -- |
| | R | 11 | 12 | 109 | 5 | 5.8 | A | -- |
| | **Subtotal** | **758** | **725** | **96** | -- | **15.4** | **B** | -- |
| SB | L | 32 | 28 | 88 | 4 | 78.6 | E | -- |
| | T | 1253 | 1183 | 94 | 32 | 23.7 | C | -- |
| | R | 137 | 125 | 91 | 8 | 15.0 | B | -- |
| | **Subtotal** | **1421** | **1336** | **94** | -- | **24.0** | **C** | -- |
| EB | L | 168 | 161 | 96 | 13 | 50.8 | D | -- |
| | T | 11 | 10 | 91 | 3 | 51.3 | D | -- |
| | R | 200 | 190 | 95 | 9 | 18.6 | B | -- |
| | **Subtotal** | **379** | **360** | **95** | -- | **33.9** | **C** | -- |
| WB | L | 32 | 31 | 97 | 5 | 54.7 | D | -- |
| | T | 11 | 9 | 82 | 2 | 57.1 | E | -- |
| | R | 53 | 51 | 96 | 6 | 9.4 | A | -- |
| | **Subtotal** | **95** | **91** | **96** | -- | **29.5** | **C** | -- |
| | **Total** | **2653** | **2512** | **95** | -- | **23.1** | **C** | -- |

***Intersection:*** *10: Fig Tree Lane & Airport Road* ***Type:*** *Signalized*

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 53 | 54 | 102 | 8 | 46.9 | D | -- |
| | T | 653 | 629 | 96 | 26 | 9.1 | A | -- |
| | R | 126 | 118 | 94 | 8 | 3.2 | A | -- |
| | **Subtotal** | **832** | **801** | **96** | -- | **10.8** | **B** | -- |
| SB | L | 42 | 39 | 93 | 5 | 84.6 | F | -- |
| | T | 1432 | 1349 | 94 | 20 | 20.6 | C | -- |
| | R | 11 | 10 | 91 | 4 | 14.0 | B | -- |
| | **Subtotal** | **1484** | **1398** | **94** | -- | **22.4** | **C** | -- |
| EB | L | 11 | 11 | 100 | 3 | 59.1 | E | -- |
| | T | 11 | 11 | 100 | 3 | 59.8 | E | -- |
| | R | 53 | 49 | 92 | 7 | 21.3 | C | -- |
| | **Subtotal** | **74** | **71** | **96** | -- | **32.9** | **C** | -- |
| WB | L | 242 | 229 | 95 | 12 | 52.6 | D | -- |
| | T | 11 | 11 | 100 | 3 | 37.9 | D | -- |
| | R | 95 | 92 | 97 | 5 | 10.1 | B | -- |
| | **Subtotal** | **347** | **332** | **96** | -- | **40.3** | **D** | -- |
| | **Total** | **2737** | **2602** | **95** | -- | **21.4** | **C** | -- |

# SIMTRAFFIC LEVEL OF SERVICE REPORT
## Including Upstream Delays

***Project:*** *Airport Road Widening Project* ***HCM:*** *2000*
***Scenario:*** *2030* ***PHF:*** *0.95*
***TOD:*** *PM* ***Analysis Period:*** *Hourly* ***# of Runs:*** *10*

***Intersection:*** *11: Churn Creek Rd. & Airport Road* ***Type:*** *Signalized*

| Approach | Movement | Demand Volume | Volume Served | | | Delay/Veh (sec) | | |
|---|---|---|---|---|---|---|---|---|
| | | | Avg | % | Std Dev | Avg | LOS | Std Dev |
| NB | L | 74 | 67 | 91 | 8 | 58.2 | E | -- |
| | T | 695 | 652 | 94 | 21 | 20.0 | C | -- |
| | R | 105 | 95 | 90 | 9 | 6.0 | A | -- |
| | **Subtotal** | **874** | **814** | **93** | -- | **21.6** | **C** | -- |
| SB | L | 211 | 193 | 91 | 15 | 69.5 | E | -- |
| | T | 1474 | 1390 | 94 | 29 | 22.0 | C | -- |
| | R | 42 | 40 | 95 | 7 | 10.4 | B | -- |
| | **Subtotal** | **1726** | **1623** | **94** | -- | **27.3** | **C** | -- |
| EB | L | 32 | 30 | 94 | 8 | 45.8 | D | -- |
| | T | 11 | 10 | 91 | 4 | 54.4 | D | -- |
| | R | 95 | 95 | 100 | 12 | 20.4 | C | -- |
| | **Subtotal** | **137** | **134** | **98** | -- | **28.5** | **C** | -- |
| WB | L | 200 | 186 | 93 | 9 | 52.1 | D | -- |
| | T | 21 | 22 | 105 | 4 | 60.8 | E | -- |
| | R | 105 | 101 | 96 | 9 | 8.2 | A | -- |
| | **Subtotal** | **326** | **309** | **94** | -- | **38.4** | **D** | -- |
| | **Total** | **3063** | **2879** | **94** | -- | **26.9** | **C** | -- |

# ATTACHMENT IV

# PRELIMINARY ENVIRONMENTAL ASSESMENT REPORT (PEAR)

# Preliminary Environmental Analysis Report
# City of Redding Airport Road Widening Project

*Prepared for:*

City of Redding
Transportation and Engineering Department
777 Cypress Avenue, 1st Floor
Redding, CA 96001
Contact: Corri Zimmerman

*Prepared by:*

Jones & Stokes
2895 Churn Creek Road, Suite D
Redding, CA 96002
Contacts: Christy Corzine
and Jonathan Foster
530/223-3196

August 2007

Jones & Stokes. 2007. Preliminary Environmental Analysis Report–City of Redding Airport Road Widening Project. August. (J&S 06855.06.) Redding, CA.

# Preliminary Environmental Analysis Report
# City of Redding Airport Road Widening Project

## Project Information

**Project Title:** Airport Road Widening Project

**Lead Agency:** City of Redding, Transportation and Engineering Department

**Project Manager:** Corri Zimmerman, City of Redding

**County:** Shasta

## Introduction

The City of Redding (City) is evaluating the feasibility of widening Airport Road from just north of the North Street Bridge over the Sacramento River to north of the State Route (SR) 44 interchange in Redding, California.

The purpose of this Preliminary Environmental Analysis Report (PEAR) is to provide a qualitative description of potential environmental resources and issues that could affect identification of the recommended alternative, including the types of environmental permits that may be required. The environmental factors outlined herein may, in turn, affect project scheduling, funding, and design considerations.

This PEAR has been prepared in compliance with the California Department of Transportation's (Caltrans') December 2001 *Guidelines for Preparation of the Preliminary Environmental Analysis Report* (PEAR Handbook) (California Department of Transportation. 2001). This PEAR is based on reconnaissance-level site visits (i.e., windshield surveys) conducted by the Jones & Stokes environmental team on May 2, 2007. Existing project information was also reviewed, including preliminary design drawings prepared by PB Americas Inc. (January 2007). In addition, multiple literature reviews and record searches were conducted by the environmental team (City of Redding, 2006, 2007; Brown Butin Associates and ENPLAN, 2004; Blackburn Consulting, 2007a; Development Services Department, 2004). The information contained in this PEAR serves as the foundation for the environmental and/or engineering team to begin additional studies for the Project Report phase and may facilitate early consultation with federal and state resource agencies regarding environmental permitting issues.

## Project Location and Description

Airport Road is located at the eastern edge of the city of Redding and is currently classified as an arterial. This corridor is one of the major transportation links between the cities of Redding and Anderson, as well as unincorporated portions of Shasta County (Brown Butin Associates and ENPLAN, 2004; Shasta County Department of Public Works, 2005). The Environmental Study Limit (ESL) for the Airport Road Widening Project (Proposed Project) extend approximately 6.2 miles from the north bank of the North Street Bridge to just north of the SR 44 intersection (Figures 1 and 2).

Airport Road is currently a two- to three-lane arterial that consists of one northbound and one southbound lane, with some turn pockets and right and left turn channelization at critical intersections. The current right-of-way width ranges between a minimum of 60 feet in some areas to a maximum of up to 100 feet in

other areas. Operating speeds range from 35 to 55 miles per hour. Airport Road carries between 9,000 and 11,000 vehicles per day and is a designated commercial/industrial access route (Fehr and Peers Transportation Consultants, 2007a and 2007b). Airport Road right-of-way falls intermittently within the city of Redding and Shasta County and about 80% of the roadway is located within Redding city limits Blackburn Consulting 2007a). Land in the vicinity of Airport Road is zoned for industrial and commercial development such as Stillwater Business Park, a proposed 700-acre master-planned business park being developed by the City. Additionally, large residential subdivisions are developing near the Airport Road corridor, including Shastina Ranch and Clover Creek Estates. Finally, there are plans underway to develop an auto mall near the SR 44 interchange (Benda, 2007).

Airport Road is identified as a candidate for roadway widening in the "Transportation Element" of the *City of Redding 2000–2020 General Plan* (General Plan), adopted on October 3, 2000 (City of Redding Department of Planning and Community Development, 2000). The general plan calls for a minimum of a 4-lane expressway between SR 44 and Dersch Road, with the potential for a 6-lane expressway depending on future projected traffic volumes. The City's *Construction Standards* and General Plan provide the following definition for an expressway:

> A divided street or highway which serves volumes of through traffic with full or partial control of access and with grade separations at major intersections as necessary. Other roads may cross expressways at intersections with traffic signals, or they may have underpasses or overpasses. It is usually not possible to enter an expressway from an adjacent parcel of land. These 4- to 6- lane facilities require right-of-way generally between 110 feet and 150 feet in width. (City of Redding Department of Planning and Community Development, 2000)

The City is proposing to widen Airport Road to a four- to six-lane expressway between Dersch Road and SR 44. Both the four and six lane options would include partial to full control of access and grade-separations at major intersections, as well as median turn lanes, curbs, gutters, and sidewalks. In addition, the City anticipates widening the existing overcrossing, embankments, and culverts at the SR 44 interchange to accommodate the Airport Road widening, as needed.

The planned widening of Airport Road would require the acquisition or dedication of right-of-way through the entire length of the Proposed Project to expand to roughly 110 to 150 feet, depending on the number of lanes. Typical cross sections would require 110 feet of right of way for a four-lane expressway, with an additional 45 feet of right of way for a frontage road. The widening may occur on one or both sides of Airport Road and could affect up to 160 existing parcels within the ESL (City of Redding, 2007).

**Purpose and Need**

The purpose of the project is to widen Airport Road between SR 44 and the Sacramento River to accommodate an acceptable level of service for the 20-year traffic projection in the year 2030. This project is needed to accommodate the forecasted traffic demand while managing access to improve the overall mobility and safety along the corridor.

The Proposed Project purposes include the following:

- relieve congestion from anticipated future traffic demand,
- manage access/egress through the corridor, and
- improve safety.

**Relieve Congestion from Anticipated Future Traffic Demand.** Currently, Airport Road operates at a Level of Service (LOS) of A and B between Argyle Road and Dersch Road. As the eastern portion of Redding continues to grow and develop, the existing two-lane roadway will not be sufficient to handle the additional traffic volume projected for this facility. By 2010, if no improvements are made to the facility, Airport Road between (1) Argyle Road and Rancho Road and (2) Fig Tree Lane and Churn Creek Road-Dersch Road will be operating at the unacceptable level of LOS E. Airport Road between Rancho Road and Fig Tree Lane will be operating at LOS C. With the Proposed Project, all segments of Airport Road will operate at LOS A. By 2030, if no improvements are made to the facility, all segments of Airport Road (except South of Churn Creek Road to Dersch Road, which is anticipated to be four lanes) will operate at LOS F. With the Proposed Project, all segments of Airport Road will be operating at LOS A or B. Without the Proposed Project, by 2030 eight of the 11 intersections within the project boundary will be operating at LOS F during the peak hour. With the Proposed Project, all intersections will be working at a minimum of LOS C. (Fehr & Peers Transportation Consultants, 2007a.)

**Manage Access/Egress through the Corridor and Improve Safety.** Airport Road parallels Interstate 5 in the eastern portion of the city of Redding and provides access to multiple commercial and residential properties, as well as access to the Redding Municipal Airport and the city of Anderson. The City provided accident data from November 1, 2003, through October 30, 2006, for Airport Road from SR 44 to Churn Creek Road–Dersch Road. Airport Road between SR 44 to Argyle Road experienced 21 accidents over the 3-year period. Sixty-two percent of these accidents were broadside collisions, one of which resulted in a fatality. Twenty percent were sideswipe collisions. The area between Knighton Road to Churn Creek Road–Dersch Road experienced 23 accidents over the same 3-year period, with one fatality. Overall, the Project corridor experienced 69 accidents over the 3-year period, with forty-one percent of the accidents as broadsides. Reducing the number of direct-access driveway encroachments onto Airport Road and incorporating frontage roads into the corridor would improve mobility and safety. (Fehr & Peers Transportation Consultants, 2007b.)

**Alternatives:**

The alternatives for the Proposed Project will be evaluated based on the purpose and need, environmental considerations, and other criteria such as cost, logistics, and engineering feasibility. Generally, there may only be one overall design concept, and alternatives may develop from that concept as the project progresses. Current alternatives under consideration include a four-lane option and a six-lane option, and various configurations and lengths of frontage roads. A No-Project Alternative would provide an assessment of no additional roadway improvements being implemented through the Airport Road corridor.

**Anticipated Environmental Approval**

| | **CEQA** | | **NEPA** |
|---|---|---|---|
| ❑ | Categorical/Statutory Exemption | ❑ | Categorical Exclusion |
| ❑ | Negative Declaration (ND)/focused ND | ❑ | Environmental Assessment/Finding of No Significant Impact |
| ✓ | Environmental Impact Report | ✓ | Environmental Impact Statement |

The City is the California Environmental Quality Act (CEQA) lead agency. If federal funding becomes available, the Federal Highway Administration (FHWA) would be the National Environmental Policy Act (NEPA) lead agency. Under the NEPA Delegation Pilot Program (if it is implemented), Caltrans would act as the federal lead agency under NEPA. The City's role is to oversee the CEQA and NEPA process and decision-making and the development, review and approval of the environmental documentation being produced for this project. Because the Proposed Project has the potential to result in significant environmental effects, the anticipated environmental document needed to comply with CEQA is an

environmental impact report (EIR), and the anticipated environmental document to comply with NEPA is an environmental impact statement (EIS). More detailed studies or changes in project characteristics may change these conclusions.

**Project Schedule**

Assuming preparation of an EIS/EIR, it is estimated that approximately 24-30 months would be required to conduct the technical studies, prepare and circulate the joint environmental document for public review, and obtain environmental approvals. If an environmental assessment (EA) and finding of no significant impact (FONSI) could be prepared instead of an EIS for NEPA compliance, then the schedule could be shortened to approximately 18-24 months.

**Project Study Report Summary Statement**

The key environmental issues associated with the Proposed Project include impacts to biological resources (wetlands and special-status species), property displacement and other community impacts, noise, and cumulative effects. It is anticipated that the Proposed Project would require preparation of the following technical studies: visual assessment; community impact assessment; relocation impact study; noise study; air quality study; water quality study; Section 106 cultural resource studies (including an historic property survey report and archaeological survey report); initial site assessment; biological studies (natural environment study, including biological assessment and wetland delineation); and authorizations and approvals under the Clean Water Act, California Fish and Game Code, and state and federal Endangered Species Acts.

**Special Considerations**

The sources of funding, as well as federal and state lead agency involvement, are key issues that will need to be addressed early in the environmental review process as they could affect project delivery and scheduling.

**Anticipated Project Mitigation**

Mitigation for temporary and permanent impacts to sensitive biological resources include, but are not limited to, onsite restoration of aquatic resources including waters of the United States, offsite mitigation credits for vernal pool habitat and waters of the United States, and endangered species mitigation. Reasonable mitigation costs are generally 10-15% of the overall project construction cost. For this project, estimated mitigation costs were developed using the Stillwater Plains Mitigation Bank in Shasta County (Hawes, personal comm.). It was assumed that 3 acres of wetland/vernal pool habitat, including endangered species, would be impacted and one elderberry shrub would be removed.

Total estimated mitigation cost range: $900,000 - $1,200,000.

This estimate is contingent upon a verified wetland delineation report and endangered species surveys.

**Anticipated Permits**

The following is a list of potential regulatory agency and permit requirements.

- U.S. Army Corps of Engineers (USACE)—Clean Water Act Section 404 nationwide permit(s) 14 (linear transportation projects) or an individual permit (creek crossings and effects on wetlands).
- Central Valley Regional Water Quality Control Board (CVRWQB)—Clean Water Act Section 401 water quality certification and National Pollution Discharge Elimination System (NPDES) Construction Activity Stormwater Permit.
- U.S. Fish and Wildlife Service (USFWS)—biological opinion for effects on federally listed species.
- California Department of Fish and Game (CDFG)—Streambed Alteration Agreement (1602 Agreement) and California Endangered Species Act (CESA).
- Compliance with Section 106 of the National Historic Preservation Act (NHPA).

**Preliminary Mitigation and Compliance Cost Estimate**

Table 1 includes preliminary environmental permit costs and associated preliminary mitigation costs for the Proposed Project. The preliminary estimate for permit and mitigation costs is in the range of $922,450 to $1,222,450.

**Table 1. Preliminary Mitigation and Compliance Cost Estimate**

| | Permit/Mitigation Costs | Permit/Mitigation Assumptions |
|---|---|---|
| USACE 404 Permit- Nationwide 14 (linear transportation projects) | $900,000 - $1,200,000 | Assuming that 3 acres of wetland/vernal pool habitat, including endangered species, would be impacted and one elderberry shrub would be removed. |
| NPDES/Construction Stormwater Permit | $12,000 | $200 per acre of disturbed land, and assuming 60 acres of land would be graded. |
| CVRWQB 401 Water Quality Certification | $6,450 | Based on an estimate of 3 acres of wetlands, at $2,150 per acre. |
| Fish & Game 1602 Agreement | $4,000 | $4,000 if the project costs more than $500,000. |
| **Preliminary Cost Estimate:** | **$922,450 – $1,222,450** | |

**Disclaimer**

This report is not an environmental document. Preliminary analysis, determinations, and estimates of mitigation costs are based on the project description provided in this report. The estimates and conclusions provided are approximate and based on cursory analysis of probable effects. This report is meant to provide a preliminary level of environmental analysis to supplement the Project Study Report. Changes in project scope, alternatives, or environmental laws will require a reevaluation of this report.

**Reviewed by:**

_____ **Date:** _____

**City of Redding Project Manager**

_____ **Date:** _____

**City of Redding Environmental Compliance Manager**

_____ **Date**: _____

**Caltrans Environmental Branch Chief**

**Environmental Technical Reports or Studies Required**

| | Study | Document | N/A |
|---|---|---|---|
| **Community Impact Study** | ✓ | ❑ | ❑ |
| **Relocation Impact Report** | ✓ | ❑ | ❑ |
| **Farmland** | ❑ | ✓ | ❑ |
| **Section 4(f) Evaluation** | ❑ | ✓ | ❑ |
| **Visual Resources** | ✓ | ❑ | ❑ |
| **Water Quality** | ✓ | ❑ | ❑ |
| **Floodplain Evaluation** | | ✓ | ❑ |
| **Noise Study** | ✓ | ❑ | ❑ |
| **Air Quality Study** | ✓ | ❑ | ❑ |
| **Paleontology** | ❑ | ✓ | ❑ |
| **Wild and Scenic River Consistency** | ❑ | ❑ | ✓ |
| **Cumulative Impacts** | | ✓ | ❑ |
| **Cultural** | | | |
| ASR | ✓ | ❑ | ❑ |
| HRER | ✓ | ❑ | ❑ |
| HASR | ✓ | ❑ | ❑ |
| HPSR | ✓ | ❑ | ❑ |
| Section 106/SHPO | ✓ | ❑ | ❑ |
| Native American Coordination | ✓ | ❑ | ❑ |
| Other | | | |
| Finding of Effect: TBD_____ | ✓ | ❑ | ❑ |
| Data Recovery Plan: TBD_____ | ✓ | ❑ | ❑ |
| **Hazardous Waste** | | | |
| ISA (Additional) | ✓ | ❑ | ❑ |
| PSI | ✓ | ❑ | ❑ |
| Other_____ | ❑ | ❑ | ✓ |
| **Biological** | | | |
| Endangered Species (Federal) | ✓ | ❑ | ❑ |
| Endangered Species (State) | ✓ | ❑ | ❑ |
| Species of Concern (CNPS, USFS, BLM, S, F) | ✓ | ❑ | ❑ |
| Biological Assessment (USFWS, NMFS, State) | ✓ | ❑ | ❑ |
| Wetlands | ✓ | ❑ | ❑ |
| Invasive Species | ✓ | ❑ | ❑ |
| Natural Environment Study | ✓ | ❑ | ❑ |
| NEPA 404 Coordination | ✓ | ❑ | ❑ |
| Other | | | |
| _____ | ❑ | ❑ | ❑ |
| **Permits** | | | |
| 401 Permit Coordination | ✓ | ❑ | ❑ |
| 404 Permit Coordination | ✓ | ❑ | ❑ |
| 1601 Permit Coordination | ✓ | ❑ | ❑ |
| City/County Coastal Permit Coordination | ❑ | ❑ | ✓ |
| State Coastal Permit Coordination | ❑ | ❑ | ✓ |
| NPDES Coordination | ✓ | ❑ | ❑ |
| U.S. Coast Guard (Section 10) | ❑ | ❑ | ✓ |

**Discussion of Technical Review**

**Socioeconomic and Community Effects.** A windshield survey of the ESL was conducted on May 2, 2007, by Jones & Stokes staff to identify potential community impact issues. In addition, the preliminary design drawings provided by the engineer were also analyzed. The Proposed Project is included in the City's General Plan "Transportation Element" and is anticipated to have short- and long-term impacts on the surrounding community and businesses during construction and operation.

The Proposed Project would require acquisition or dedication of a substantial amount of right-of-way, as well as displacement of existing commercial, residential, and industrial land uses within the ESL throughout the entire length of the project corridor. Preliminary projections by the project engineer assume that the project may potentially affect two gas stations, four airplane hangers, a mobile home park, a self storage business, a commercial garden center, five to 10 commercial buildings, two fast food restaurants, and 20 plus residential properties (City of Redding, 2007). The planned widening would require the right-of-way to expand to roughly 110 to 150 feet, depending on the number of lanes, and could affect up to 160 parcels.

There are several locations where residential driveways connect directly to Airport Road. For safety reasons, some of these connections may need to be eliminated or rerouted to reduce and consolidate access points along the new alignment.

Numerous utilities exist along the entire Airport Road corridor. Overhead power, cable, and telephone lines are located on joint poles along much of the ESL. In addition, there is evidence of underground sewer, water, and telephone lines. It is likely that there are additional cross utilities at the Municipal Airport that could be classified as "high risk" depending on the size or type of the facility. Extensive overhead utility pole relocation will be required, along with other underground utilities within the ESL.

A community impact assessment (CIA) and relocation impact report (RIR) will be required to document the Proposed Project's effects related to land use compatibility, plan consistency, and impacts on the existing community. The CIA analysis should also include an analysis of environmental justice concerns, consistent with Executive Order 12898 on environmental justice. Before beginning the studies for the CIA, a public scoping meeting should be held.

**Farmlands.** Land in the vicinity of Airport Road is zoned for industrial and commercial development, such as Stillwater Business Park, as well as for large residential subdivisions, such as Shastina Ranch and Clover Creek Estates. The ESL has not recently been used for agricultural purposes, nor does the ESL contain soils that are prime agricultural soils. According to the California Department of Conservation's *Important Farmland in California* map, no portion of the ESL is within a prime or unique farmland designation (2007). In addition, no portion of the ESL is within an agricultural zoning designation in either the City or Shasta County, and none of the ESL is subject to Williamson Act contracts.

**Section 4(f) Impacts.** The Proposed Project would create Section 4(f) issues if it resulted in any temporary or permanent impacts to Section 4(f) properties. Section 4(f) of the Department of Transportation Act of 1966 (*49 U.S. Government Code 303*) governs federally funded or authorized transportation projects that require the use of publicly owned land of a public park; recreation area; or wildlife or waterfowl refuge of national, state, or local significance as determined by the federal, state, or local officials having jurisdiction thereof; or any land from a historic site of national, state, or local significance as so determined by such officials. At this time, there are no Section 4(f) properties known to exist within the ESL. However, at least one structure within the ESL appears to be over 50 years old and may need evaluation for its historic significance (see *Cultural Resources* section below for more information). Significant historic properties are considered Section 4(f) resources.

**Visual Effects.** An environmental specialist conducted a windshield survey of the ESL to identify scenic resources on May 2, 2007. The Airport Road corridor includes a mix of commercial and industrial, as well large and small lot residential development. However, there is no primary visual focal point within the ESL. Two large developed public facilities within the corridor include the Municipal Airport and the entrance to the Stillwater Wastewater Treatment Plant. Airport Road is currently a two-lane road for a majority of the ESL and is constructed predominantly at native grade, with minor cuts and fills. The corridor visually transitions between more developed areas to the north, and more rural, unincorporated development to the south. Undeveloped parcels consist of vegetation characterized as blue oak woodland community, sparse blue oak, grey pine coverage, and grasses. (Development Services Department, 2004.)

Airport Road is the gateway to the Redding Municipal Airport, a regional air traffic facility, as well as to existing and future industrial developments in the vicinity. Road widening and right-of-way acquisition will change the visual character of the area and affect existing landscaped areas. A visual assessment will be required and should include potential project effects and any appropriate visual resources mitigation, including landscaping. As such, landscape design should be included in the development and design of the Proposed Project and should integrate landscaped medians, walls, significant plantings, and street lighting.

The City has adopted a Tree Preservation Ordinance (Chapter 18.65 of the Redding Municipal Code) that promotes the conservation of mature, healthy trees in the design of new projects. Section 18.45.070 (D) encourages setting aside natural areas to further tree preservation. Tree removal in the Proposed Project right-of-way should be minimized in order to reduce impacts to the visual setting along the project corridor. Vegetation removed from any properties should be replaced at a mitigation ratio negotiated between the City and the landowner.

**Water Quality and Erosion.** The Proposed Project is located within the boundaries of the Clover Creek and Stillwater Creek watersheds, which drain to the Sacramento River. Existing road drainage along Airport Road consists of sheet flow collected in roadside ditches and/or gutters where intermittent improvements have been constructed (Blackburn Consulting 2007a). The project would have short-term effects on surface water quality associated with project construction, equipment sites, staging areas, disposal sites, and potential drainage retention or detention areas. Implementation of standard water quality control measures during construction would ensure that construction activities would not result in adverse effects on water quality. The Proposed Project would not contribute to long-term water quality degradation in either the Clover Creek or Stillwater Creek watersheds. Water quality issues should be discussed in the Natural Environment Study report, and a water quality report would be required. Since the project will disturb more than one acre of land, the Clean Water Act requires that a notice of intent must be submitted to the CVRWQCB for a NPDES Construction Activity Stormwater permit. In addition, a stormwater pollution prevention plan (SWPPP) would also need to be prepared by the contractor. If site dewatering is required for any new construction, a dewatering plan would be required. The Proposed Project will need to comply with all requirements of the City's grading ordinance, as well as the City's Stormwater Quality Improvement Plan (SWQIP).

**Floodplains.** The ESL is located outside the Federal Emergency Management Agency (FEMA) mapped 100-year floodplain for the Sacramento River, as well as Clover Creek (Federal Emergency Management Agency, 1998). Preparation of a floodplain evaluation report for the Proposed Project would therefore not be required, according to the federal executive order on floodplains.

**Air Quality.** The ESL is located in Shasta County, which is within the Sacramento Valley Air Basin. The Shasta County Air Quality Management District (SCAQMD) has jurisdiction over air quality throughout the basin.

With regard to the state air quality standards, the California Air Resources Board has designated Shasta County as a moderate nonattainment area for the state ozone standard, an unclassified area for the state CO standard, a nonattainment area for the state PM10 standard, and an unclassified area for the state PM2.5 standard. With regard to the federal air quality standards, the U.S. Environmental Protection Agency (EPA) has designated Shasta County as an unclassified/attainment area for the federal 8-hour ozone, CO, PM10 and PM2.5 standards.

Within the ESL, sensitive land uses include scattered rural residences, a mobile home park (Shady Hill), a proposed subdivision (Clover Creek Villages), and a church (Faith Assembly) located along Airport Road.

Because the project includes the addition of capacity, an air quality technical report consistent with Caltrans requirements must be prepared to assess the environmental impacts associated with the Proposed Project. The air quality technical report would document conformity with the Clean Air Act State Implementation Plan; CO, PM10, and PM2.5 hotspots; as well as compliance with mobile source air toxics (MSAT) analysis requirements.

The Proposed Project is included in the Shasta County Regional Transportation Planning Agency's *2004 Regional Transportation Plan* (RTP), adopted on July 27, 2004, which has been found to be in conformity with the Clean Air Act State Implementation Plan. The Proposed Project must be shown to not "cause or contribute to any new localized CO, PM10, or PM2.5 violations or increase the frequency or severity of any existing CO, PM10 or PM2.5 violations." The analysis of localized CO impacts would follow the methodology contained within the Caltrans' *Transportation Project-Level Carbon Monoxide Protocol* (Garza et al., 1997). The assessment of localized PM10 and PM2.5 impacts would be evaluated using EPA/FHWA's *Transportation Conformity Guidance for Qualitative Hot-spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas* (Federal Highway Administration and U.S. Environmental Protection Agency, 2006).

Based on traffic volumes along Airport Road and SR 44, it is anticipated that the Proposed Project is not considered to be a Project of Air Quality Concern and that Clean Air Act and title 40, part 93.116 of the *Code of Federal Regulations* (*CFR*) "Criteria and Procedures: Localized CO, PM10, and PM2.5 Violations (Hot-Spots)" (*40 CFR 93.116*) requirements would be met without PM10/PM2.5 hotspot analyses.

In addition, it is possible that the project would need to be evaluated for its potential emissions of MSATs. FHWA's *Interim Guidance on Air Toxic Analysis in NEPA Documents* would likely be used to evaluate the Proposed Project's MSAT impacts (Federal Highway Administration 2006). It is anticipated that the Proposed Project is a "project with low potential MSAT effects" and does not require a quantitative MSAT analysis based on traffic volumes along Airport Road and SR 44 (less than threshold of 140,000–150,000 AADT). Consequently, a qualitative assessment of MSAT emissions would be required.

Project significance with regards to air quality would be evaluated using thresholds adopted by the City. Emission thresholds applicable in Redding are contained in the "Air Quality Element" of the General Plan produced by the City (1994a) and are similar to those adopted by the SCAQMD. The City has two levels of emission thresholds, which are used to determine what appropriate level of mitigation is required, and, depending on the emissions produced from the Proposed Project, different mitigation measures would be required at different levels. The City's emission thresholds are presented in Table 2.

**Table 2. City of Redding Air Pollutant Emissions Thresholds**

| Level | ROG (pounds per day) | $NO_x$ (pounds per day) | PM10 (pounds per day) |
|---|---|---|---|
| A | 25 | 25 | 80 |
| B | 137 | 137 | 137 |

Source: City of Redding, 1994a.

If project emissions are less than the Level A thresholds, only feasible standard mitigation measures (SMMs) are required. If a project has emissions that exceed the Level A thresholds, the project applicant must apply all feasible mitigation measures for construction and/or operation from the lists of recommended SMMs and appropriate best available mitigation measures (BAMMs) as determined by the City. In addition, projects with emissions below the Level B thresholds must reduce emissions by 20%. However, Policy 1.4 from the City's General Plan "Air Quality Element" stipulates that projects are exempt from achieving the 20% emission reduction goal, provided all feasible and available BAMMs have been incorporated and the City determines that all feasible and BAMMs have been applied. If a project has emissions that exceed the Level B thresholds, the project applicant must apply Level B BAMMs and determine the degree of emission reduction. If a project's emissions are reduced to a level below the threshold of 137 pounds per day for NOx and ROG and/or the threshold of 80 pounds per day for PM10, a mitigated ND may be appropriate if other impacts are not anticipated. If project emissions are in excess of the Level B Category (Table 2), project emissions are considered to significant. However, if project emissions remain above the Level B thresholds of 137 pounds per day, emission offsets are required. A minimum of 25% of the unmitigated emissions exceeding the threshold of 137 pounds per day must be offset by reducing emissions from existing sources of air pollution. City guidance indicates that projects located within the urban boundary for air quality emission credit can receive a 15.5% emission reduction credit because the presence of transit, mixed land uses, and other trip-reducing features of urban environments (City of Redding, 1994b).

An air quality technical report would be required if Caltrans is involved in project implementation. Air quality impacts under CEQA would be evaluated in the project environmental document.

**Paleontological Resources.** Information in this section summarizes the paleontological identification report (PIR) prepared for the project (Jones & Stokes 2007).

Paleontological resources are protected through the federal Antiquities Act of 1906, NEPA, the National Natural Landmarks Program, CEQA, and the California Administrative and Public Resources Codes. Neither the City's General Plan nor that of the County addresses paleontological resources.

Redding is located at the northernmost end of the Sacramento Valley, an alluviated lowland that forms the northern portion of California's Great Valley geomorphic province. To the northeast and southeast of the city lie the southernmost volcanoes of the active Cascade Range—Mt. Shasta and Mt. Lassen—and to the west the spectacular uplifts of the northern Coast Ranges separate the central California lowlands from the Mendocino Coast (Norris and Webb 1990, Harden 1998).

The ESL is situated primarily on n**o**nmarine sedimentary units of Pleistocene age (Modesto and Red Bluff Formations). The Red Bluff Formation is of Irvingtonian age and consists of gravel with minor interbedded sand and silt. It records alluvial deposition on premodern topography. The Modesto Formation, of Rancholabrean age, consists of gravelly sand, silt, and clay, also recording deposition in an alluvial environment. Modesto deposits are nested into underlying Red Bluff strata; Modesto terraces

appear geomorphically "fresh," and the Modesto is very little dissected, suggesting that it was deposited on essentially the modern topographic surface (Strand 1962, Fraticelli et al 1987, Blake et al. 1999).

Little published information is available on the fossil content of the Red Bluff Formation, and the paleontology of the Modesto Formation is well documented in the San Joaquin Valley, but information on the Modesto within the ESL is not available. Thus, the paleontological sensitivity of the units along the project alignment is uncertain. However, based on available paleontologic databases and geologic maps, data suggest that they should probably be regarded as high or potentially high. Both units are known to contain vertebrate remains south of the ESL (University of California Museum of Paleontology 2007, PaleoPortal 2007, City of Lodi 2006; see discussion in Jones & Stokes 2007), and nonmarine sedimentary are generally considered highly sensitive throughout California, in part because the type sections for both the North American Land Mammal Stages that fall within the Pleistocene (Irvingtonian and Rancholabrean) are located in California, and vertebrate finds in Pleistocene sediments are surprisingly common. This is consistent with recommendations of the Society of Vertebrate Paleontology, which has stressed that paleontological "sites" are defined by the entire extent (both areal and stratigraphic) of a unit or formation. In other words, once a unit is identified as containing vertebrate fossils, or other rare fossils, the entire unit is a paleontological site (Society of Vertebrate Paleontology Conformable Impact Mitigation Guidelines Committee 1995).

The Proposed Project would require ground-disturbing activities along a ROW about 6.2 miles long and 150 feet wide. Because the project would follow the existing ROW, much of the project footprint has already been disturbed to some extent. However, the project would expand the ROW from a width of 60–100 feet to about 150 feet wide and thus would likely disturb areas not previously graded or excavated. A very rough calculation suggests that the new area of disturbance associated with ROW widening could be on the order of 6.2 miles x (150 feet – 80 feet) = 2,291,520 square feet. This is approximately 53 acres. The project would likely also require installation of new and/or relocated traffic signals as well as relocation of utilities and expansion of at least one culvert. Although localized, excavation for these facilities could be substantially deeper than roadbed grading. If under- or overpasses are used for major intersections, substantial additional excavation would be required. Any grading, excavation, or other ground disturbance would have the potential to damage any paleontological resources that may be present.

Caltrans requires a paleontological evaluation report (PER) where there is a potential for significant impacts to paleontological resources. Recommendations, constraints, and coordination requirements for the project PER are discussed in the Proposed Project PIR (Jones & Stokes 2007).

**Noise.** The Caltrans *Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects* (Protocol) discusses federal and state regulations, standards, and policies relating to traffic noise (California Department of Transportation, 2006). It also discusses procedures for implementing "Procedures for Abatement of Highway Traffic Noise" (*23 CFR 772*). Because the Proposed Project will increase the capacity of an existing state highway, compliance with the Protocol is required.

Under the Protocol, noise abatement must be considered for a capacity-increasing project if the project is predicted to result in a traffic noise impact. A traffic noise impact occurs when the predicted design year traffic noise level substantially exceeds the existing noise level or when the predicted design year traffic noise level approaches or exceeds a noise abatement criterion (NAC) specified in the regulation. Table 3 summarizes the NAC specified in *23 CFR 772* and the Protocol.

**Table 3. Activity Categories and Noise Abatement Criteria Specified in 23 CFR 772 and the Protocol**

| Activity Category | NAC, Hourly A-Weighted Noise Level (dBA-$L_{eq}$[h]) | Description of Activities |
|---|---|---|
| A | 57<br>Exterior | Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose |
| B | 67<br>Exterior | Picnic areas, recreation areas, playgrounds, active sport areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals |
| C | 72<br>Exterior | Developed lands, properties, or activities not included in categories A or B above |
| D | — | Undeveloped lands |
| E | 52<br>Interior | Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums |

The Protocol defines a noise increase as substantial when the predicted design year noise level with project implementation exceeds the existing noise level by 12 dBA $L_{eq}$(h) or more. The Protocol also states that a sound level is considered to approach an NAC level when the sound level is within 1 dB of the NAC. For residential areas, this corresponds to 66 dBA- $L_{eq}$(h). As defined in the Protocol, a "severe" traffic noise impact is considered to occur when a residential use is exposed to traffic noise of 72 dBA-$L_{eq}$(h) or greater.

Traffic noise impacts must be evaluated at all land uses in the ESL. Primary consideration is given to exterior uses areas. In situations in which no exterior activities are affected by traffic noise, the interior criterion (activity category E) is used as the basis for noise abatement consideration.

Noise abatement is normally only considered where frequent human use occurs and where a lowered noise level would be of benefit. Accordingly, abatement is typically considered at locations with defined outdoor activity areas, such as residential backyards, patios, and parks with defined activity areas (e.g., playgrounds and picnic tables).

For compliance with the Protocol, noise abatement measures that are reasonable, feasible, and likely to be incorporated into the project, as well as noise impacts for which no apparent solution is available, must be identified before adoption of the final environmental document for a project.

If noise abatement is not reasonable and feasible at a location with a severe traffic noise impact, the location may be eligible for "extraordinary" noise abatement as defined by Caltrans. This may include construction of a barrier that does not meet the Caltrans normal standards for cost reasonableness or implementation of nonstandard noise abatement, such as implementation of upgraded acoustical insulation for a residence. Extraordinary noise abatement is considered on a case-by-case basis.

Operational and construction noise impacts must also be evaluated under the requirements of NEPA and CEQA. Because the Proposed Project is located entirely within the city of Redding, the City's noise standards would be used to evaluate noise impacts under CEQA. The "Noise Element" of the General Plan establishes the maximum allowable noise exposure for transportation and nontransportation noise

sources. The noise standards for transportation and nontransportation sources are summarized in Tables 4 and 5, respectively.

**Table 4. City of Redding Maximum Allowable Noise Exposure from Transportation Noise Sources**

| Land Use | Outdoor Activity Area[a] $L_{dn}$ /CNEL, dB | Interior Spaces | |
|---|---|---|---|
| | | $L_{dn}$ /CNEL, dB | $L_{eq}$, dB[b] |
| Residential | 60[c] | 45 | – |
| Transient lodging | 60[c] | 45 | – |
| Hospital, nursing homes | 60[c] | 45 | – |
| Theater, auditorium, music hall | – | – | 35 |
| Church, meeting hall | 60[c] | – | 40 |
| Office building | – | – | 45 |
| School, libraries, museums | – | – | 45 |
| Playground, neighborhood parks | 70 | – | – |

[a] The exterior noise level standard will be applied to the outdoor activity area of the receiving land use. Outdoor activity areas are normally located near or adjacent to the main structure and often occupied by porches, patios, balconies, etc.

[b] As determined for a typical worst-case hour during period of use.

[c] Where it is not possible to reduce noise in outdoor activity area to 60 dB $L_{dn}$/CNEL or less, a practical application of the best-available noise-reduction measures have been implemented so that interior noise levels are in compliance with this table.

[d] In the case of hotel/motel facilities or other transient lodging, outdoor activity areas, such as pool areas, may not be included in the project design. In these cases, only the interior noise-level criterion will apply.

**Table 5. City of Redding Noise Level Performance Standard for New Projects Affected By or Including Nontransportation Noise Sources**

| Noise Level Descriptor | Day (7 a.m.–10 p.m.) | Night (10 p.m.–7 a.m.) |
|---|---|---|
| Hourly $L_{eq}$, dB | 55 | 45 |

Each of the noise levels specified above will be lowered by 5 dB for simple tone noises, noises consisting primarily of speech or music, or recurring impulsive noises (e.g., humming sounds, outdoor speaker systems). These noise level standards do not apply for residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings). The City can impose noise level standards that are more restrictive than those specified above based on determination of existing low ambient noise levels.

The City of Redding Zoning Ordinance, Section 18.40.100-A, specifies the City's exterior noise standards, which are summarized in Table 6.

**Table 6. City of Redding Zoning Ordinance Exterior Noise Standards**

| Receiving Land Use Category | Time Period | Noise Level (Hourly $L_{eq}$, dB) |
|---|---|---|
| Residential | 10 p.m.–7 a.m. | 45 |
| | 7 a.m.–10 p.m. | 55 |
| Office/commercial | 10 p.m.–7 a.m. | 55 |
| | 7 a.m.–10 p.m. | 65 |
| Industrial | 10 p.m.–7 a.m. | – |
| | 7 a.m.–10 p.m. | – |

The existing noise environment is dominated by traffic on Airport Road, as well as air traffic noise related to Redding Municipal Airport. Within the ESL, sensitive land uses include scattered rural residences, a mobile home park (Shady Hill), a proposed subdivision (Clover Creek Villages), and a church (Faith Assembly) located along Airport Road.

Scattered commercial land uses are also located along Airport Road in some areas. There are generally no noise barriers between Airport Road and adjacent uses in the ESL. In general is it unlikely that implementation of noise abatement in the form of a noise barrier would be reasonable and feasible for single isolated residences.

Because the Proposed Project will involve adding lanes, implementation of the project could potentially increase traffic noise. Accordingly, it is anticipated that noise abatement and mitigation will be evaluated at adjacent nearby noise-sensitive land uses.

There are several locations in the ESL (i.e., mobile home park, proposed subdivision, and other nonisolated residences) where traffic noise impacts are likely and noise abatement is potentially reasonable and feasible. Barriers should be considered and evaluated in several of these locations.

A noise study technical report would be required to document compliance with the Protocol. Noise impacts under CEQA would be evaluated in the project environmental document.

**Energy.** The Proposed Project is not anticipated to result in significant construction or operational impacts on energy use. The Proposed Project may require the relocation of electrical or gas lines, and impacts on existing energy lines would require discussion in a forthcoming environmental document for the project (EIR/EIS). The NEPA analysis contained in the forthcoming environmental document should qualitatively discuss the irretrievable commitment of energy resources that would be needed during construction, as required by *40 CFR 1502.16.*

**Wild and Scenic Rivers.** There are no wild and scenic rivers located in the ESL.

**Cultural Resources.** Research and prefield work conducted to identify cultural resources in the ESL included a record search of the ESL and vicinity at the Northeast Information Center of the California Historical Resources Inventory System in Chico, California, and communication with the Native American Heritage Commission (NAHC) to request a search of their Sacred Lands Inventory File and to obtain a list of Native American contacts for Shasta County. Sources consulted during the records search included the National Register of Historic Places, the California Register of Historical Resources, maps of previous cultural resource studies, and known cultural resource locations.

The purpose of this records search was to identify whether any previously identified cultural resources were located within the vicinity of the ESL. Results indicated that numerous studies have been conducted in the ESL. Sixteen cultural resources studies have been conducted within the ESL (Clewett, 1978; Dalu, 2006; Dotta, 1977; Hildebrandt, Darcangelo, and Vaughan, 2005; Jensen, 1984; Jensen ,1985; Jensen, 2000; Jensen and Jensen, 2004; Jensen, 2007a; Jensen, 2007b; Marvin, Vaughan, and Woodrum, 2005; SWCA Environmental Consultants, 2006; Vaughan, 2004a; Vaughan, 2004b; Vaughan, 2005; Vaughan and McGann, 1993). Table 7 summarizes these studies and associated resources as they apply to the ESL. (see also Appendix A).

**Table 7. Cultural Resources Studies within the ESL**

| Reference | Type of Study | Resources within ESL |
|---|---|---|
| Clewett (1978) | Survey Report | 2 lithics |
| Dalu (2006) | Survey Report | Negative (isolated flakes, historic road segment, and site CA-SHA-4041/H in project buffer) |
| Dotta (1977) | Survey Report | Negative |
| Hildebrandt, Darcangelo, and Vaughan (2005) | Subsurface Testing Report | CA-SHA-571/H |
| Jensen (1984) | Survey Report | CA-SHA-571/H |
| Jensen (1985) | Survey Report | Negative |
| Jensen (2000) | Survey Report | Negative |
| Jensen and Jensen (2004) | Survey Report | Isolated flakes |
| Jensen 2007a | Survey Report | 12 prehistoric core isolates |
| Jensen 2007b | Survey Report | 2 core isolates, historic/modern trash piles, negative for sites |
| Marvin, Vaughan, and Woodrum 2005 | Historical Resources Evaluation Report | Negative |
| SWCA Environmental Consultants 2006 | Survey Report | Negative |
| Vaughan 2004a | Survey Report | 1 historic isolate |
| Vaughan 2004b | Survey Report | Negative (2 sites within buffer; CA-SHA-3663H and CA-SHA-3664H) |
| Vaughan 2005 | Historic Property Survey | CA-SHA-571/H |
| Vaughan and McGann 1993 | Survey Report | 1 isolate |

A Jones & Stokes archaeologist conducted a windshield survey of the ESL on May 2, 2007. The survey was conducted by driving along the proposed route and viewing the larger context of the existing resources from Airport Road. The majority of the ESL is already developed specifically for multiple industrial and commercial businesses located adjacent to Airport Road as well as the Redding Municipal Airport. During the windshield survey, special note was made of any resources that appeared to be built before 1957, along with areas that could be sensitive archaeologically. Overall, the Proposed Project appears to feature a low probability of containing significant historic resources (50 years old or older).

This Proposed Project will be conducted in accordance with both CEQA and Section 106 of the NHPA. Specific technical studies/reports will be required for compliance with CEQA. A formal records search within the ESL or Area of Potential Effect (APE) and a 1-mile buffer will be required. In addition, a review of the previous studies will need to be conducted to determine if additional surveys for cultural resources are necessary. Studies older that 10 years typically need to be updated. In addition, Caltrans may require a pedestrian survey of the ESL.

An archaeological survey report, historic resources evaluation report, and historic properties survey report will likely be needed to document compliance under Section 106.

**Native American Coordination.** The NAHC was contacted on May 8, 2007, to request a search of their sacred lands files with regard to the Proposed Project (Appendix B). In addition, a list of Native Americans that may know of cultural resources in the ESL was requested from the NAHC. The NAHC responded on May 10, 2007, indicating that a search of the Sacred Lands Inventory Files did not identify any cultural resources in the ESL. The NAHC also sent a list of Native American contacts. All the individuals on the list were contacted by letter in May 2007.

On May 21, 2007, a Jones & Stokes archaeologist received a phone call from James Hayward of the Redding Rancheria. He expressed interest in the Proposed Project, specifically its potential impacts to archaeological site CA-SHA-571/H. Mr. Hayward has an existing agreement regarding monitoring of CA-SHA-571/H with the City. He will be sending follow up letter to Jones & Stokes as he gathers more information.

**Hazardous Waste/Materials.** A hazardous material, as defined by the California Department of Toxic Substances Control, is a material that poses a significant present or potential hazard to human health and safety or the environment if released because of its quantity, concentration, or physical or chemical characteristics (*26 CCR 255501*). A preliminary Phase I Initial Site Assessment (ISA) was conducted by Blackburn Consulting on June 8, 2007, to identify potential soil/groundwater contamination issues at parcels adjacent to the road alignment with the potential to influence the proposed Airport Road improvements (Blackburn Consulting 2007b). The preliminary ISA summarizes "recognized environmental conditions" that could affect land acquisition and/or construction of the Proposed Project. Parcels along the ESL are divided into the following two categories in the preliminary ISA.

> **Category 1** parcels are within the project corridor (i.e., within 150 feet of the Airport Road centerline) that have potential contamination/hazardous materials issues. Category 1 sites include the sites below.
>
> 1. *Shell Station, 9539 Old Oregon Trail.* This existing gas station has some potential underground storage tank concerns, and an additional site and records review is recommended.
>
> 2. *JMB Oil Company, 3672 Charlanne Drive*. A former service station and auto repair shop with potential soil contamination and aboveground fuel tank concerns. An additional site and records review is recommended.
>
> 3. *A. Woods Pest Control, 4460 Airport Road.* Possible shallow soil contamination from "uncontained discharge" of pesticide wash from trucks. An additional site and records review is recommended.
>
> 4. *Lester Gurr, 4540 Airport Road.* Uncertainty regarding removal of underground storage tank. An additional site and records review is recommended.
>
> 5. *Rancho Market, 5000 Airport Road.* Potential for leaking underground storage tank (LUST) at this site. An additional site and records review is recommended.
>
> 6. *Redding Jet Center, 6751 Airport Road.* This site is used as a fuel depot to refill aircraft fueling trucks. The site is located adjacent to the Airport Road, within approximately 150 feet of the east edge of the pavement. The site has the potential for leaking above and underground storage tanks. An additional site and records review is recommended.

7. *PG&E Redding Service Center, 3600 Meadowview Drive.* This PG&E property is located adjacent to the west side of Lockheed Drive, a frontage road that parallels Airport Road. The property line is approximately 60 feet west of the existing Airport Road edge of pavement. The site could have the potential to generate subsurface migration of petroleum hydrocarbons from former LUSTs. An additional site and records review is recommended.

8. *Kent's Meat & Grocery, 8080 Airport Road.* This site historically contained a LUST that was remediated in the 1990s. However, concerns remain regarding the remediation efforts, and an additional site and records review is recommended.

9. *Former Gas Station – Northeast corner of Airport Road and Prairie Lane.* This market has the appearance of a modified, post-WWII service station and raises concerns about potential underground storage tanks. An additional site and records review is recommended.

**Category 2** parcels have potential contamination/hazardous materials issues that are outside the project corridor but have the potential to impact a parcel, or parcels, within the corridor.

1. JW Wood Company Inc., 3676 Old Highway 44

2. East Redding Cardlock Facility, 3025 Crossroads Drive

3. MAACO Auto Painting, 3045 Crossroads Drive

4. California Department of Food and Agriculture, 3068 and 3689 Charlanne Drive

5. Ameritech Industries Inc., 20208 Charlanne Drive

6. Northern California Service, CE, 6101 and 6103 Airport Road

7. H&H Air Service, 3775 Flight Avenue

8. Redding Municipal Airport, 6751 Airport Road

9. Redding Army Airfield, Airport Road (historical, prior to Redding Municipal Airport)

10. Paradigm MGR. Inc., 3711 Meadowview Drive

11. Shasta Tractor & Equipment Supply, 8274 Churn Creek Rd.

12. Wyntour Gardens, 8090 Airport Road

13. Stillwater Wastewater Treatment Plant, 6475 Airport Road

Once the project alignment is finalized, and specific parcels within the project alignment are identified for acquisition, a final ISA would be conducted. A Phase II Site Assessment would likely be required based on the findings within the final ISA.

**Biological Resources.** Biologists conducted a prefield investigation to review existing sources of information regarding biological resources located within and adjacent to the ESL, including special-

status species and sensitive natural communities (e.g., riparian and wetland communities). Pertinent sources of information reviewed include:

- California Natural Diversity Database (CNDDB) records search of the Enterprise and Cottonwood 7.5-minute U.S. Geological Survey (USGS) quadrangles (California Natural Diversity Database, 2007);
- California Native Plant Society's (CNPS's) 2007 online *Inventory of Rare and Endangered Plants f*or Enterprise and Cottonwood 7.5-minute USGS quadrangles (California Native Plant Society, 2007);
- USFWS list of special-status species for Shasta County (U.S. Fish and Wildlife Service, 2007) (Appendix C); and
- environmental documents prepared for other projects in the region.

A Jones & Stokes biologist conducted a reconnaissance-level field survey of the ESL on May 2, 2007. During this field visit, the biologist conducted a windshield survey along Airport Road for the length of the ESL. The survey also included periodically turning to drive along frontage roads, occasionally stopping to take photographs and notes. The field visit did not involve any detailed field evaluations. In general, the purpose of the reconnaissance-level field survey was to:

- visually assess existing conditions and biological communities within and immediately adjacent to the ESL;
- identify areas that could support special-status species.

In summary, the ESL contains potential habitat for six special-status plant species and three special-status wildlife species (Table 8).

**Table 8. Special-Status Species Identified as Having the Potential to Occur in the ESL**

| Species (Status) | Habitat |
|---|---|
| **Wildlife Species** | |
| Vernal pool fairy shrimp (federally threatened) | Vernal pool and seasonal wetlands |
| Valley elderberry longhorn beetle (federally threatened) | Elderberry shrubs |
| Vernal pool tadpole shrimp (federally endangered) | Vernal pool and seasonal wetlands |
| **Plant Species** | |
| Slender orcutt grass (federally threatened, state endangered (CNPS 1B.1) | Vernal pool wetlands |
| Green’s tuctoria (=Orcutt grass) (federally threatened) | Vernal pool wetlands |
| Henderson’s bent grass (CNPS 3.2) | Vernal pool wetlands and foothill grasslands |
| Silky cryptantha (CNPS 1B.2) | Sandy streambeds and gravel banks |
| Red Bluff dwarf rush (CNPS 1B.1) | Vernal pools and seasonal wetlands |
| Legnere (CNPS 1B.1) | Vernal pool wetlands |

One special-status plant, slender orcutt grass, has been documented in close proximity to the ESL (California Natural Diversity Database, 2007), and the ESL is within slender orcutt grass critical habitat (Figure 3). The potential for suitable habitat exists for silky cryptantha, Henderson's bent grass, legenere, and Red Bluff dwarf rush in similar locations (California Native Plant Society, 2007). Literature research, coordination with the resource agencies, and rare plant surveys will be necessary to determine if any of the special-status plant species are present within the ESL. If plants are found, consultation and/or coordination will be necessary with USFWS, the CNPS, and CDFG to discuss mitigation and avoidance measures during construction. Rare plant surveys will need to be scheduled from March through September to correspond to the appropriate blooming periods.

One special-status wildlife species, vernal pool tadpole shrimp, has been documented in close proximity to the ESL (California Natural Diversity Database, 2007), and suitable habitat exists for vernal pool fairy shrimp in similar locations. Additionally, there is at least one cluster of elderberry shrubs located approximately 75 feet east of the Airport Road and Rancho Road intersection within the ESL (Figure 4a–c). Complete avoidance of elderberry shrubs and the beetle can be assumed if a minimum 100-foot buffer is maintained around the shrubs.

Oak trees are prevalent throughout most portions of the ESL. A comprehensive list and impact assessment of oak trees that will be affected should be developed, separating trees within city and county boundaries. Where practicable, every effort to avoid impacts to oak trees within the ESL should be made. An oak tree management plan may be required for impacts to oaks within the county boundary of the ESL.

A Natural Environment Study Report (NES) will be required to assess potential impacts to biological resources.

**Wetlands.** Seasonal wetlands, ditches and streams were identified in several locations within the ESL during the cursory review including the use of existing aerial photographs and available verified wetland delineations (Figure 4a–c). A Jones & Stokes biologist conducted a reconnaissance-level field survey of the ESL on May 2, 2007. During this field visit, the biologist conducted a windshield survey along Airport Road for the length of the ESL Area. The survey also included periodically turning to drive along frontage roads, occasionally stopping to take photographs and notes. The field visit did not involve any detailed field evaluations. In general, the purpose of the reconnaissance-level field survey was to:

- visually assess existing conditions and
- identify potential waters of the United States, including wetlands, that may be subject to federal and state regulation

A complete wetland delineation survey and report of the waters of the United States and identification of waters of the state will be required for the Proposed Project. If wetlands will be affected, alternatives must be evaluated to avoid and/or minimize impacts to the maximum extent practicable. Impacts to jurisdictional wetlands will require mitigation to restore or replace wetlands functions and values. Some wetlands are under the jurisdiction of the USACE, CDFG, and State Water Quality Control Board. Permits will likely be required from each of these agencies for impacts associated with the Proposed Project.

**Invasive Pest Plant Species.** Portions of the ESL are disturbed and have the potential to support a variety of invasive species. As part of the surveys described under *Biological Resources,* invasive species should be identified and documented in a report along with measures to avoid and minimize their spread. A NES will be required to assess potential impacts to invasive pest plant species. Compliance with Executive Order 13112 - Invasive Species, should be documented in the NES report.

**Environmental Study Area.** New right-of-way is required for this project. Equipment and material sites, staging areas, disposal sites, and any drainage retention or detention areas must be identified and analyzed as part of the study area in the environmental document.

**Mitigation.** Mitigation will be likely be required for any impacts on jurisdictional waters of the United States and waters of the state and for any impacts to special-status species. Project specific mitigation and mitigation land availability would be determined at the time of project implementation, and the following avoidance and minimization measures are recommended:

- avoid and protect sensitive biological resources, including wetlands and endangered species habitat, in designated environmentally sensitive areas;
- conduct a biological resources education program for construction crews and enforce construction restrictions;
- avoid introduction of invasive species into the ESL;
- implement erosion control and revegetation efforts to minimize the potential for the introduction of invasive species;
- avoid or limit the removal or trimming of vegetation, including oak trees; and
- avoid and compensate for direct and indirect effects on sensitive species and their associated habitats.

**Permits.** Depending on the results of future field surveys and agency coordination, the following permits and authorizations may be required for the Proposed Project.

- USACE—Clean Water Act Section 404 permit(s) (creek crossing[s] and impacts to wetlands). Nationwide permit 14 (linear transportation projects) or Standard Department of Army Permit.
- CVRWQCB—Clean Water Action Section 401 water quality certification and NPDES Construction Activity Stormwater Permit.
- USFWS—biological opinion for adverse effects on federally listed species (if they are determined to be adversely affected by the Proposed Project).
- CDFG—SAA (1602 Agreement) and CESA.
- Compliance with Section 106 of the NHPA.

**<u>List of Preparers</u>**

| | |
|---|---|
| Christy Corzine | Project Director/senior reviewer |
| Jonathan Foster | Project Manager, biology and wetlands |
| Beth Doolittle-Norby | Community impacts, water quality/floodplains, visual effects |
| Taryn Nance and Amy Fransen | Cultural resources |
| Shannon Hatcher | Noise/Air quality |
| Anna Buising | Paleontology |

**Attachments**

Figure 1: Project Vicinity Map

Figure 2. Project Location Map

Figure 3: Vernal Pool Critical Habitat

Figure 4a: Biological Resources—Southern Project Area

Figure 4b: Biological Resources—Central Project Area

Figure 4c: Biological Resources—Northern Project Area

Appendix A. Results of Cultural Resources Records Search

Appendix B. Correspondence with the Native American Heritage Commission

Appendix C. U.S. Fish and Wildlife Service Endangered and Threatened Species List for the Environmental Study Limit

Appendix D. Paleontological Identification Report

**References Cited**

***Printed References and Web Sites***


Benda, D. 2007. City drives for new auto mall. *Redding Record Searchlight* (Redding, CA). June 7. Available: <www.redding.com/news/2007/jun/07/city-drives-for-new-auto-mall/>.

Blackburn Consulting. 2007a. *Preliminary Geotechnical Assessment – Airport Road Widening Project.* Prepared for City of Redding, CA. January 31.

Blackburn Consulting. 2007b. *Initial Site Assessment, Airport Road Widening Project, City of Redding and County of Shasta, California.* June 8.

Blake, M. C., D. S. Harwood, E. J. Helley, W. P. Irwin, A. S. Jayko, and D. L. Jones. 1999. Geologic map of the Red Bluff 30 x 60 quadrangle, California (scale 1:100,000). (U.S. Geological Survey Geologic Investigations Series, Map I-2542.) Available: <http://geopubs.wr.usgs.gov/i-map/i2542/>. Accessed: June 2007.

Brown-Butin Associates and ENPLAN. 2004. *North Street/Airport Road Widening and Bridge Replacement Project – Noise Impact Analysis Report.* Prepared for Shasta County Department of Public Works. July.

California Department of Conservation. Division of Land Resources Protection. 2007. *Important Farmlands in California, 2004.* 1:4,750.000 scale map.

California Department of Transportation. 2001. *Guidelines for Preparation of the Preliminary Environmental Analysis Report.* December.

———. 2006. *Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects.* Sacramento, CA: Division of Environmental Analysis. August 14.

California Native Plant Society. 2007. *Inventory of Rare and Endangered Plants* (online edition, v7-07b). Last revised: April 14, 2007. Available: <www.cnps.org/inventory>. Accessed: June 5, 2007.

California Natural Diversity Database. 2007. RareFind 3, Version 3.1.0 (April 28, 2007). Sacramento, CA: California Department of Fish and Game. Sacramento, CA. Accessed: June 5, 2007.

City of Lodi. 2006. *Lodi Annexation Environmental Impact Report (Westside).* (Public review draft.) April. Prepared by LSA Associates, Inc. Available: <http://www.lodi.gov>. Accessed: June 2007.

City of Redding, Department of Planning and Community Development. 1994a. "Air Quality Element" of the *Redding General Plan.* Redding, CA.

———. 1994b. *Urban Boundary for Air Quality Emission Credit*. September 22. Redding, CA: Planning and Community Development Department. Report to City of Redding Planning Commission.

———. 2000. *City of Redding General Plan 2000-2020.* Adopted October 3. Resolution 2000-1666.

———. 2006. *Airport Road Widening Project Study Report – PDT Meeting Notes.* December 1. Redding, CA.

———. 2007. *Airport Road Widening Project Study Report –PDT Meeting Notes.* February 15. Redding, CA.

Development Services Department. 2004. *Initial Study Checklist for the Clover Creek Village Planned Development.* January 1.

Federal Emergency Management Agency. 1998. *Flood Insurance Rate Map, Panel Number 060358 0885E and 060360 0030 D.* Revised 1998.

Federal Highway Administration. 2006. *Interim Guidance on Air Toxic Analysis in NEPA Documents.* February 3.

Federal Highway Administration and U.S. Environmental Protection Agency. 2006. *Transportation Conformity Guidance for Qualitative Hot-spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas.* March.

Fehr & Peers Transportation Consultants. 2007a. *Final Traffic Report, Airport Road Widening Project.* Prepared for City of Redding. June 22.

———. 2007b. *Airport Road Widening Project – Existing Operations Analysis, Memorandum.* February 7.

Fraticelli, L. A., J. P. Albers, W. P. Irwin, and M. C. Blake. 1987. Geologic Map of the Redding 1 x 2 degree quadrangle, Shasta, Tehama, Humboldt, and Trinity Counties, CA. Open-File Report 87-257. U.S. Geological Survey.

Garza, V. J., P. Graney, and D. Sperling. 1997. *Transportation Project-Level Carbon Monoxide Protocol.* Davis, CA: Institute of Transportation Studies, University of California, Davis.

Harden, D. R. 1998. *California Geology*. Upper Saddle River, NJ: Prentice-Hall.

Jones & Stokes. 2007. *Draft Paleontological Identification Report—Airport Road Widening Project, City of Redding.* Redding, CA.

Norris, R. M., and R. W. Webb. 1990. *Geology of California*. 2nd edition. New York, NY: John Wiley & Sons.

PaleoPortal. 2007. *The Paleontology Portal* (web site and online database). Available: <http://www.paleoportal.org>. Accessed: June 2007.

Shasta County Department of Public Works. 2005. *Airport Road Widening and Bridge Replacement Project at the Sacramento River Initial Study, Shasta Count.* October 7.

Society of Vertebrate Paleontology Conformable Impact Mitigation Guidelines Committee. 1995. *The Society of Vertebrate Paleontology, Policy And Positions Statements, Conformable Impact Mitigation Guidelines Committee.* Available: <http://www.vertpaleo.org/policy/policy_statement_conformable_Impact.htm>. Accessed: October 4, 2006.

Strand, R. G. 1962. Geologic map of California, Redding sheet. Sacramento, CA: California Division of Mines and Geology.

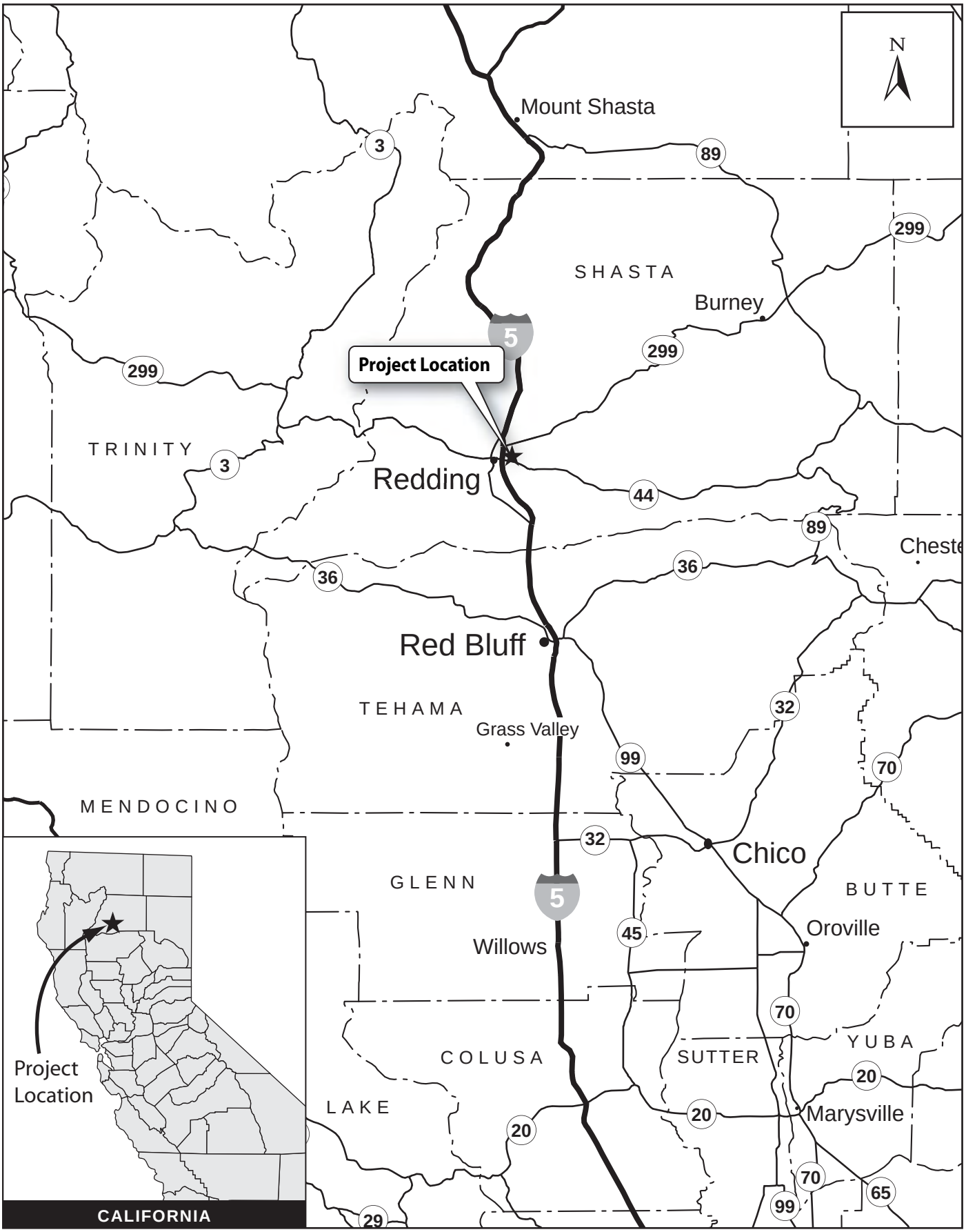
University of California Museum of Paleontology. 2007. *UCMP Specimen search.* Available: <http://www.ucmp.berkeley.edu/science/collections.php/>. Accessed: June 2007.

U.S. Fish and Wildlife Service. 2007. *Species List for Airport Road Widening.* Available: <www.fws.gov/sacramento/es/spp_lists/auto_letter.cfm>. Accessed: June 5, 2007.

***Note:*** *See Appendix A for list of Cultural Resources section references*

***Personal Communications***

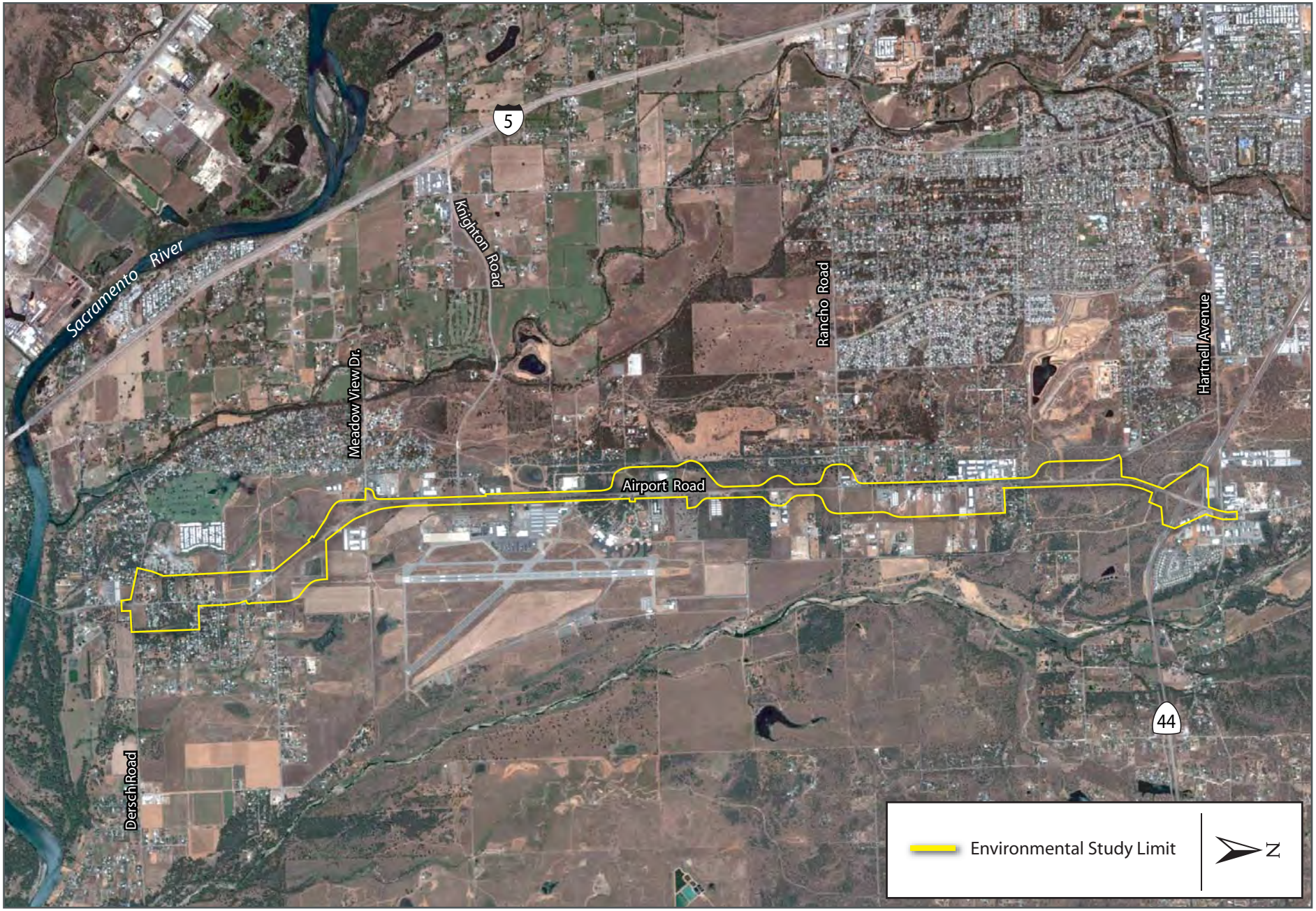
Hawes, Glenn. June 19, 2007—Telephone conversation with Jonathan Foster regarding the mitigation costs at Stillwater Plains Mitigation Bank.




00026.07 PEAR (6-07)

Jones & Stokes

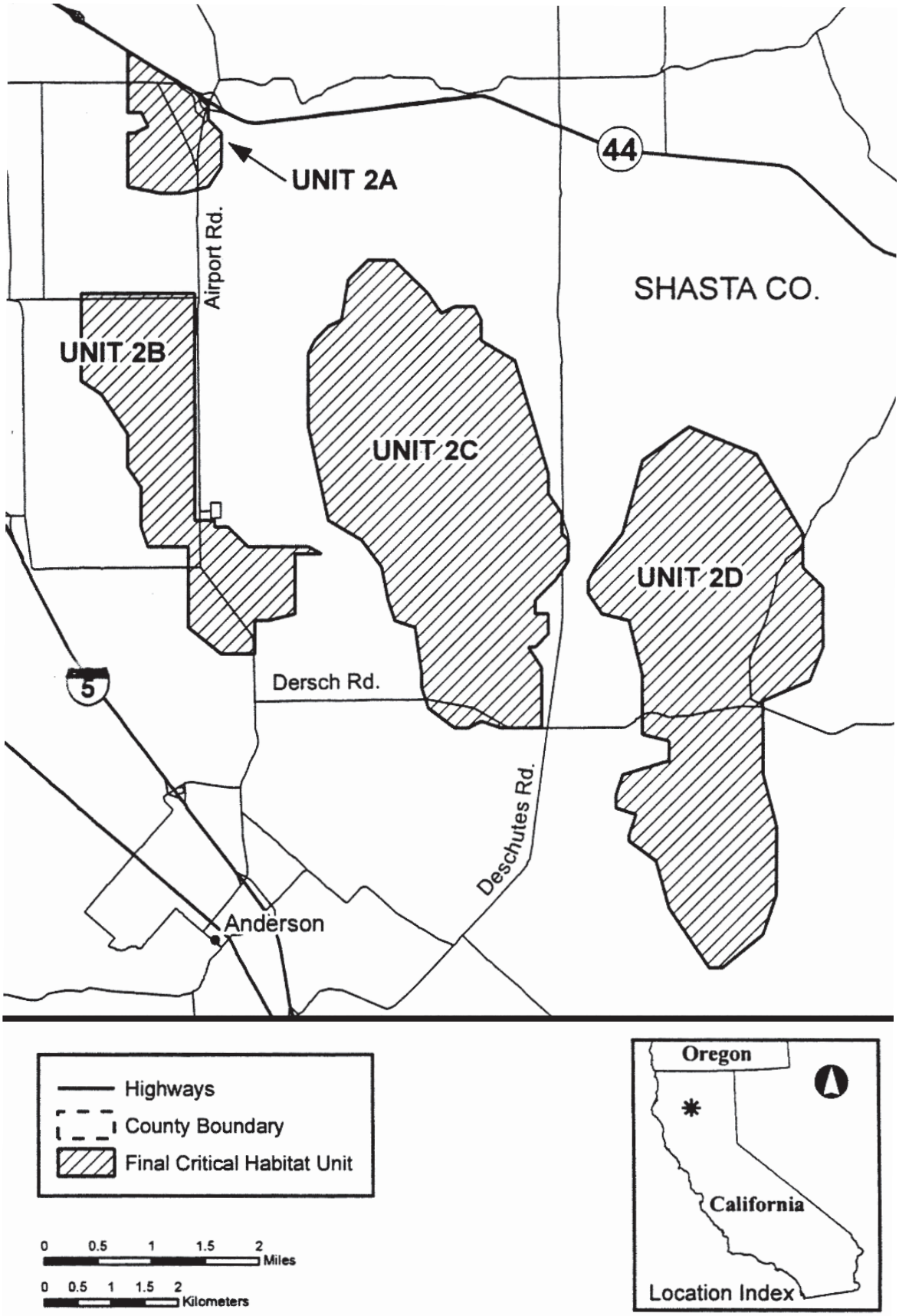
**Figure 1**
**Project Vicinity**




00026.07 PEAR (6-07)

Jones & Stokes

**Figure 2**
**Project Location**

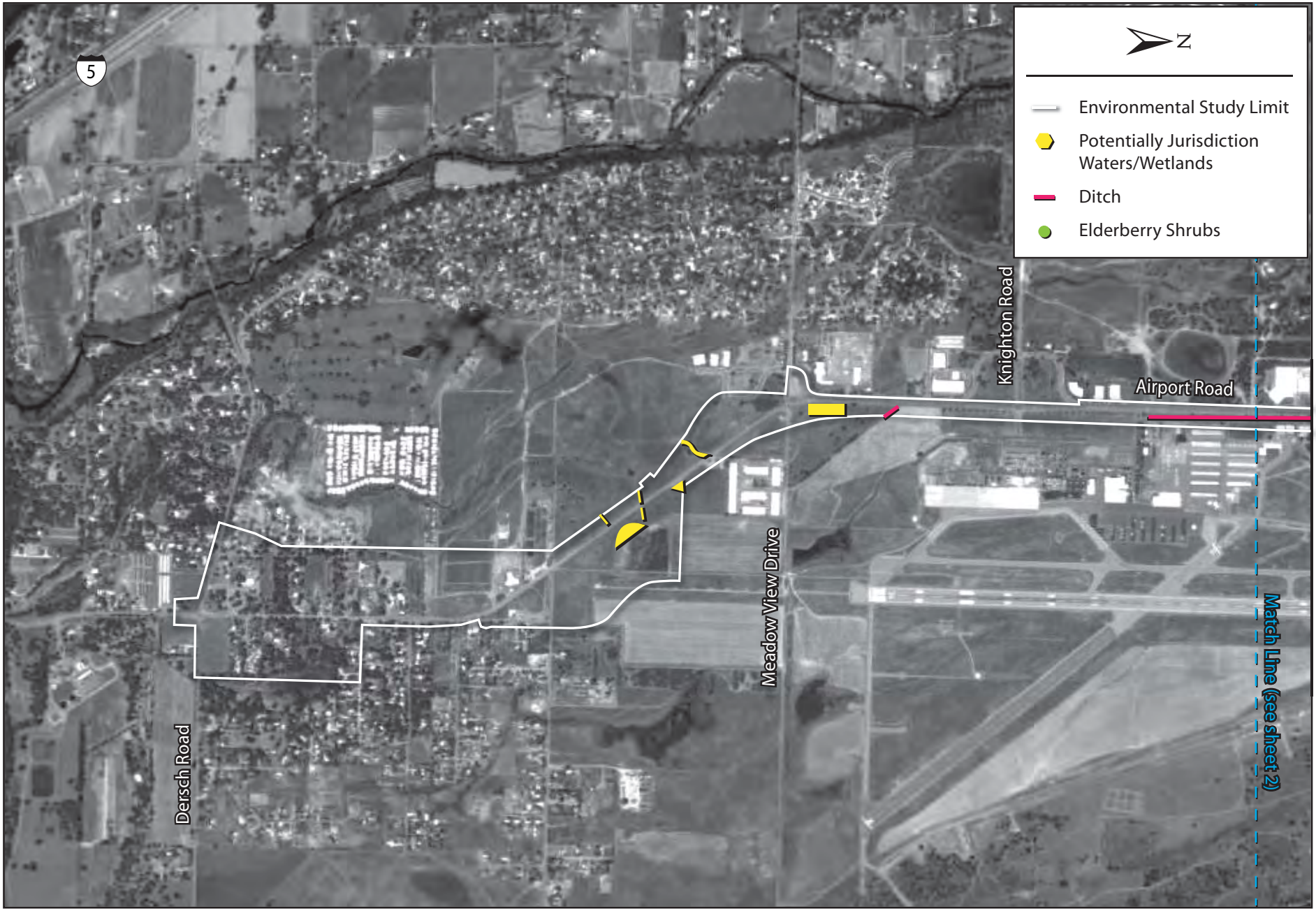



Source: www.fws.gov

00026.07 PEAR (6-07)

Jones & Stokes

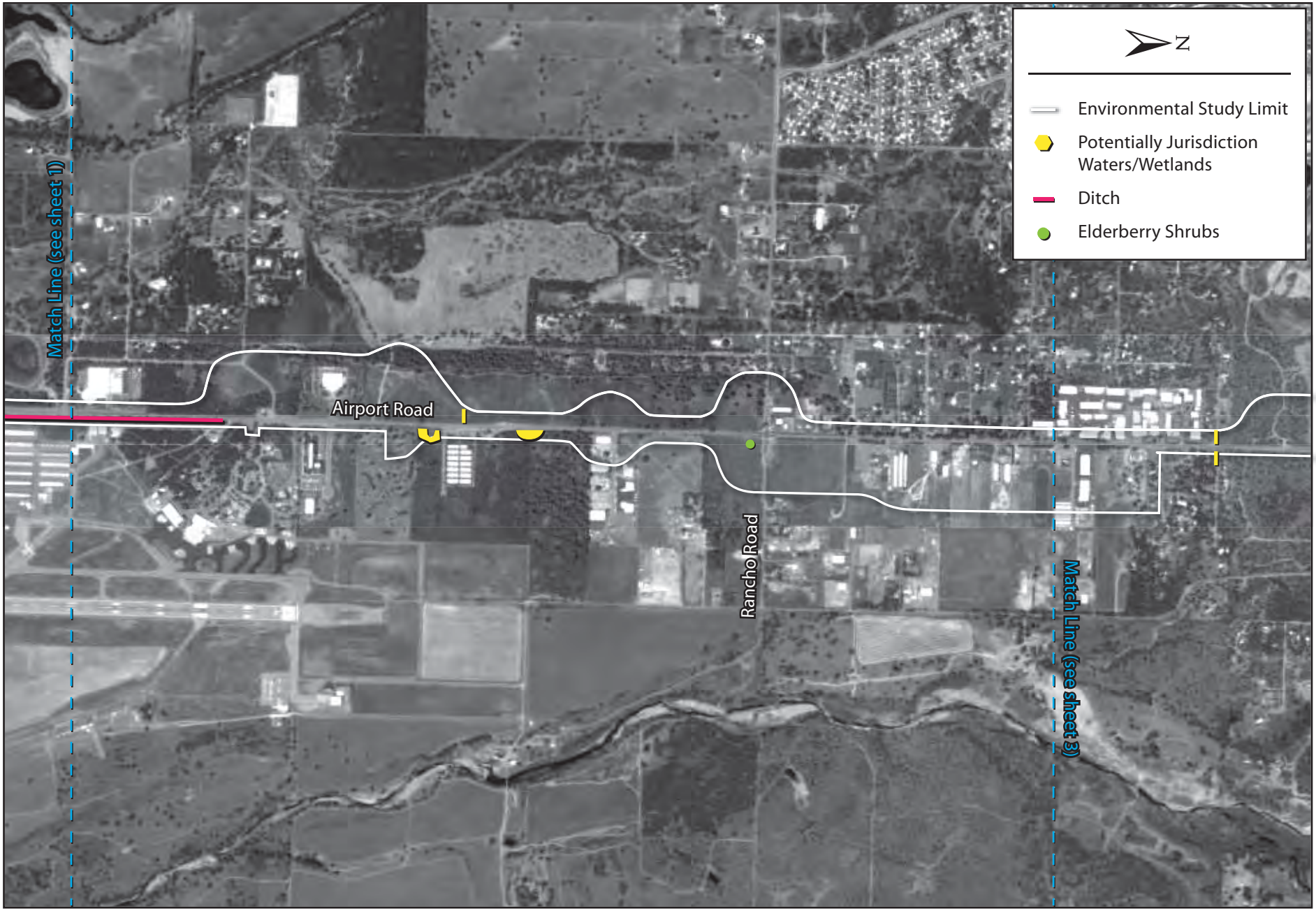
**Figure 3**
**Vernal Pool Critical Habitat**




00026.07 PEAR (6-07)

Jones & Stokes

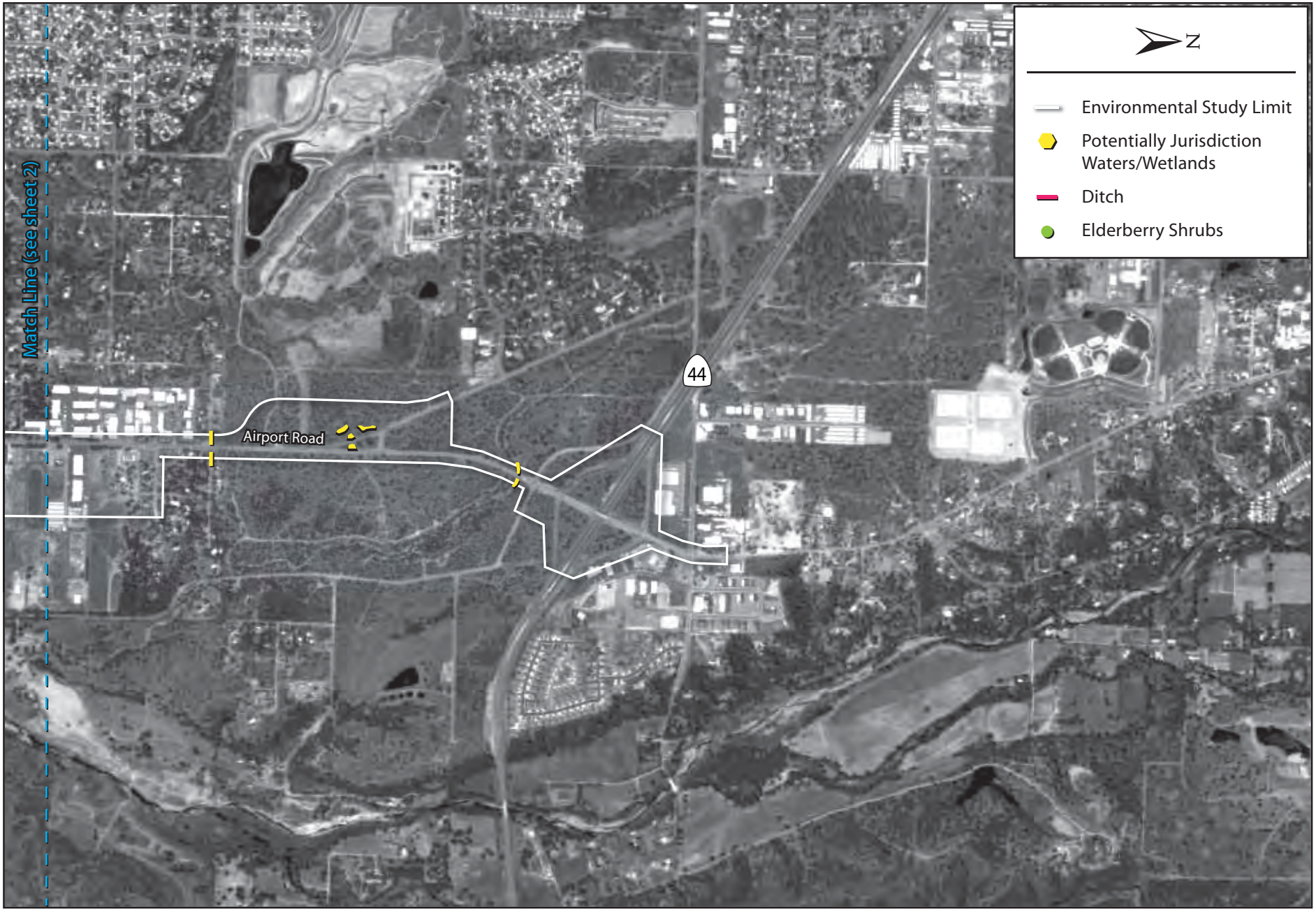
**Figure 4a**
**Bio Resources (Sheet 1)**




00026.07 PEAR (6-07)

Jones & Stokes

**Figure 4b**
**Bio Resources (Sheet 2)**




00026.07 PEAR (6-07)

Jones & Stokes

**Figure 4c**
**Bio Resources (Sheet 3)**

Appendix A

# Results of Cultural Resources Records Search

## Appendix A: Results of Cultural Resources Records Search

A records search was conducted on May 10, 2007, at the Northeast Information Center (NIC) of the California Historical Resources Information System in Chico, California, by Jones and Stokes archaeologist Amy Fransen. Sources consulted during the records search included the National Register of Historic Places, the California Register of Historical Resources, maps of previous cultural resource studies, and known cultural resource locations, as well as the sources listed in Table 1.

The records search indicated that numerous studies have been conducted within either the Project Area or within a 0.25-mile radius of the Project Area. The purpose of this records search was to identify whether any previously identified cultural resources were located within the vicinity of the project site. Sixteen cultural resources studies have been conducted within the Project Area (Clewett 1978; Dalu 2006; Dotta 1977; Hildebrandt, Darcangelo, and Vaughan 2005; Jensen 1984; Jensen 1985; Jensen 2000; Jensen and Jensen 2004; Jensen 2007a; Jensen 2007b; Marvin, Vaughan, and Woodrum 2005; SWCA Environmental Consultants 2006; Vaughan 2004a; Vaughan 2004b; Vaughan 2005; Vaughan and McGann 1993). Table 2 summarizes these studies and associated resources as they apply to the Project Area.

**Table 1.** Sources Consulted at the Northeast Information Center

| Source | Year |
|---|---|
| USGS 7.5 minute Enterprise Quadrangle | 1953 |
| USGS 7.5 minute Cottonwood Quadrangle | 1953 |
| *California Inventory of Historic Resources* | 1976 |
| *California Historical Landmarks* | 1996 |
| *California Points of Historical Interest* listing | May 1992 and updates |

**Table 2.** Cultural Resources Studies within the Project Area

| Reference | Type of Study | Resources within Project Area |
|---|---|---|
| Clewett (1978) | Survey Report | 2 lithics |
| Dalu (2006) | Survey Report | Isolated flakes, historic road segment, site CA-SHA-4041/H outside of Project Area |

| Reference | Type of Study | Resources within Project Area |
|---|---|---|
| Dotta (1977) | Survey Report | Negative |
| Hildebrandt, Darcangelo, and Vaughan (2005) | Subsurface Testing Report | CA-SHA-571/H |
| Jensen (1984) | Survey Report | CA-SHA-571/H |
| Jensen (1985) | Survey Report | Negative |
| Jensen (2000) | Survey Report | Negative |
| Jensen and Jensen (2004) | Survey Report | Isolated flakes |
| Jensen (2007a) | Survey Report | 12 prehistoric core isolates |
| Jensen (2007b) | Survey Report | 2 core isolates, historic/modern trash piles, negative for sites |
| Marvin, Vaughan, and Woodrum (2005) | Historical Resources Evaluation Report | Negative |
| SWCA Environmental Consultants (2006) | Survey Report | Negative |
| Vaughan (2004a) | Survey Report | 1 historic isolate |
| Vaughan (2004b) | Survey Report | Negative (2 sites within buffer; CA-SHA-3663H and CA-SHA-3664H) |
| Vaughan (2005) | Historic Property Survey | CA-SHA-571/H |
| Vaughan and McGann (1993) | Survey Report | 1 isolate |


Clewett, E.

1978 *Archaeological Investigation of the Proposed Redding Airport Expansion: New Terminal Building, Parking Ramp, and Industrial Park.* On file (SH-66) at the Northeast Information Center.

Dalu, C.

2006 *Historic Property Survey Report.* On file (6665) at the Northeast Information Center.

Dotta, J.

1979 *Archaeological Reconnaissance, Pullen Enterprise, Shasta County, California.* On file (SH-58) at the Northeast Information Center.

Hildebrandt, W. R., M. J. Darcangelo, and T. Vaughn.
2005 *Extended Phase I/Phase II Excavations and Determination of Eligibility on CA-SHA-571/H for the Sacramento Bridge Replacement Project (Bridge # 06C-0008) on Airport Road near Anderson, Shasta County, California.* On file (6351 V. III) at the Northeast Information Center.

Jensen, P. M.
1984 *Archaeological Reconnaissance of the Preferred Alternate Site, City of Redding's Proposed Stillwater Sewage Treatment Plant.* On file (7226) at the Northeast Information Center.

1985 *Archaeological Reconnaissance of Proposed Intersection Improvement on Airport Road and Dersch, Shasta County, California.* On file (7227) at the Northeast Information Center.

2000 *Archaeological Inventory Survey Stillwater Industrial Park Development Project, c. 480 Acres in the Stillwater Plains, Near Redding Municipal Airport, Redding, Shasta County, California.* On file (3380) at the Northeast Information Center.

2007a *Archaeological Inventory Survey North Airport Development Project, c. 40-acres, City of Redding, Shasta County, California.* On file (W07-46) at the Northeast Information Center.

2007b *Archaeological Inventory Survey Thomason Development Project, c. 120-acres, City of Redding, Shasta County, California.* On file (W07-25) at the Northeast Information Center.

Jensen, P., and S. Jensen
2004 *Archaeological Inventory Survey Proposed Shastina Ranch Development Project, c. 477 Acres Near the Redding Airport, Redding, Shasta County, California.* On file (5940) at the Northeast Information Center.

Marvin, J., T. Vaughn, and B. Woodrum
2005 *Historical Resources Evaluation Report for the Proposed Sacramento River Bridge Replacement (Bridge # 06C-0008) on Airport Road Between Redding and Anderson, Shasta County, California.* On file (6351 V. II) at the Northeast Information Center.

SWCA Environmental Consultants
2006 *Cultural Resources Survey for the Proposed Stillwater Business Park 115/kV Transmission Line Project, City of Redding, Shasta County, California.* On file (6935) at the Northeast Information Center.

Vaughn, T.

2004a *Archaeological Reconnaissance of Six Parcels on Airport Road (150 Acres) (T31N, R4W, Portion of East ½ of Section 22), Redding, Shasta County, California.* On file (5983) at the Northeast Information Center.

2004b *Archaeological Reconnaissance for the Proposed North Airport Business Park at Airport Road and State Highway 44, Redding, Shasta County, California.* On file (5972) at the Northeast Information Center.

2005 *Historic Property Survey Report for the Proposed Sacramento River Bridge Replacement (Bridge # 06C-0008) on Airport Road in Anderson, Shasta County, California.* On file (6351 V. 1) at the Northeast Information Center.

Vaughn, T., and D. McGann

1993 *Archaeological Reconnaissance for South Airport 115/12 KV Project, Redding, Shasta County, California.* On file (7230) at the Northeast Information Center.

Appendix B

# Correspondence with the Native American Heritage Commission

Jones & Stokes

## Fax Transmission

Date: May 8, 2007

Attention: Debbie Pilas-Treadway
Native American Heritage Commission

Fax Number: 916 657-5390

Number of Pages: 2 (including this page)

From: Amy Fransen

Project Number: 06855.06

Subject: **Cultural Resources Study in Shasta County**

Dear Ms. Pilas-Treadway,

Jones & Stokes is conducting a cultural resources study for a road widening project in Shasta County. The project entails widening an existing 2-4 lane road on the eastern outskirts of the City of Redding.

A map of the project area is enclosed, with highlighted buffer areas, and the location is as follows:

Enterprise USGS 7.5 Quad- T31N, R4W, S10, 15, 22, 27, 34

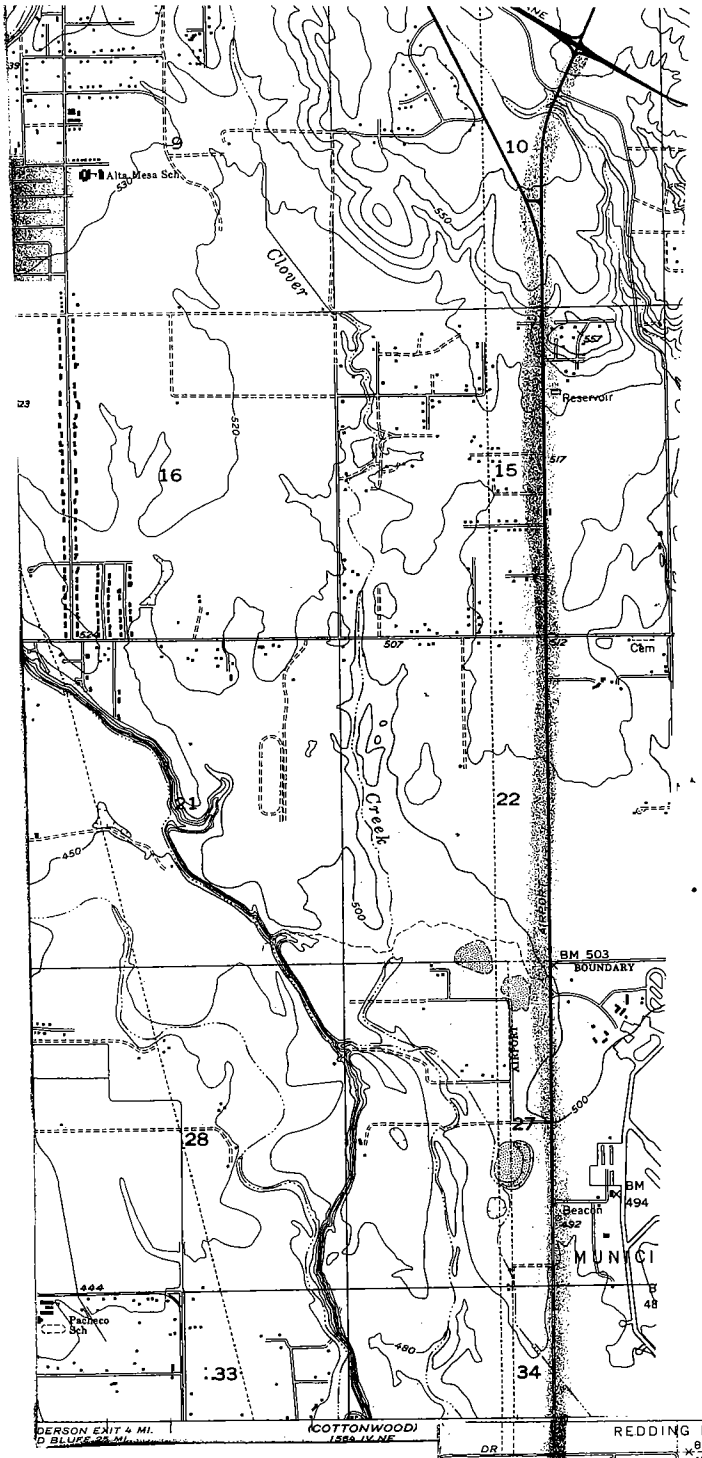
Cottonwood USGS 7.5 Quad- T31N, R4W, S34; T30N, R4W, S 2,3,10,11

We are seeking information and comments from Native American representatives and would greatly appreciate your sending me a list of those individuals that are interested in planning activities in this area. Also, please consult your inventory of sacred lands, forwarding that information to us. The record search is in process. Please contact me if you have any questions about this request: 916 737-3000 or afransen@jsanet.com. Thank you.

Amy Fransen
Archaeologist

2600 V Street • Sacramento, CA 95818-1914 • tel. 916 737.3000 • fax 916 737.3030
www.jonesandstokes.com

ENTERPRISE USGS QUAD 7.5
T31N, R4W, S 10, 15,
22, 27, 34




Cottonwood USGS QUAD 7.5
T31N, R4W, S34
T30N, R4W, S 3, 2, 10, 11

STATE OF CALIFORNIA

Arnold Schwarzenegger, Governor

**NATIVE AMERICAN HERITAGE COMMISSION**
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-4082
Fax (916) 657-5390

May 10, 2007

Amy Fransen
Archaeologist
Jones & Stokes
2600 V Street
Sacramento, CA 95818

Sent by Fax: 916-737-3030
Number of Pages: 3

RE: Proposed Road widening project, City of Redding; Shasta County.

Dear Ms. Fransen:

A record search of the sacred lands file has failed to indicate the presence of Native American cultural resources in the immediate project area. The absence of specific site information in the sacred lands file does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Enclosed is a list of Native Americans individuals/organizations who may have knowledge of cultural resources in the project area. The Commission makes no recommendation or preference of a single individual, or group over another. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated, if they cannot supply information, they might recommend others with specific knowledge. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call to ensure that the project information has been receive

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact me at (916) 653-4040.

Sincerely,

Katy Sanchez

Katy Sanchez
Program Analyst

# Native American Contacts
Shasta County
May 10, 2007

Redding Rancheria
Tracy Edwards, Chief Executive Officer
2000 Redding Rancheria Road Wintu
Redding , CA 96001 Pit River
hope@reddingrancheria.com Yana
(530) 225-8979
Fax: (530) 241-1879

Redding Rancheria
Barbara Murphy, Chair
2000 Redding Rancheria Road Wintu
Redding , CA 96001 Pit River
hope@redding-rancheria.com Yana
(530) 225-8979
(530) 241-1879 - Fax

Wintu Tribe of Northern California
Kelli Hayward
3576 Oasis Road Wintu
Redding , CA 96003
wintu_tribe@hotmail.com
(530) 245-0141

530-245-0241

United Tribe of Northern Calif., Inc., Wintu, Wintun, Wintoon
Gloria Gomes, Chairperson
20059 Parocast Wintu
Redding , CA 96003 Wintun
(530) 275-1915 Wintoon

Wintu Educational and Cultural Council
Robert Burns
PO Box 483 Wintu
Hayfork , CA 96041
(530) 628-5930

United Tribe of Northern Calif., Inc., Wintu, Wintun, Wintoon
John Castro, Cultural Liaison
20059 Parocast Wintu
Redding , CA 96003 Wintun
(530) 275-1915 Wintoon

Winnemem Wintu Tribe
Caleen Sisk-Franco, Tribal Chair
14840 Bear Mountain Road Wintu
Redding , CA 96003
winnemem@msn.com

(530) 275-2737
(530) 275-4193 FAX

United Tribe of Northern Calif., Inc., Wintu, Wintun, Wintoon
Gene Lovely
1905 Oregon Ave. Wintu
Shasta Lake , CA 96019 Wintun
(530) 275-9531 Wintoon

**This list is current only as of the date of this document.**

**Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.**

**This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed Road widening project, city of Redding; Shasta County.**

# Native American Contacts
Shasta County
May 10, 2007

United Tribe of Northern Calif., Inc., Wintu, Wintun, Wintoon
Debbie Lovely, Tribal Coordinator
2809 Riverside Dr.
Sacramento , CA 95818
(916) 947-4370

Wintu
Wintun
Wintoon

Matthew Root
16117 North St.
Keswick , CA 96001
530-247-7351

Wintu

United Tribe of Northern Calif., Inc., Wintu, Wintun, Wintoon
Velara Bowdsher, Tribal Chair
13527 Adams Ln.
Redding , CA 96002
(530) 222-6654

Wintu
Wintun
Wintoon

Loretta Root
5620 Kofford Lane
Redding , CA 96001
530-229-9203

Wintu

Redding Rancheria Cultural Resources
John Hayward, Cultural Representative
2000 Redding Rancheria Road
Redding , CA 96001
(530) 225-8979
Fax: (530) 241-1879

Wintu
Pit River
Yana

United Tribe of Northern Calif., Inc., Wintu, Wintun, Wintoon
Charlie Popejoy
2006 Hardenbrook Ave
Shasta Lake , CA 96019
(530) 275-2001

Wintu
Wintun
Wintoon

Carol Sinclair
9253 Chaparral Dr.
Redding , CA 96001
530-242-1374

Wintu

his list is current only as of the date of this document.

istribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and afety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

his list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed oad widening project, city of Redding; Shasta County.

Appendix C

# U.S. Fish and Wildlife Service Endangered and Threatened Species List for the Project Study Limits

**United States Department of the Interior**
FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825

June 5, 2007

Document Number: 070605015409

Jonathan Foster
Jones & Stokes
2895 Churn Creek Road, Suite D
Redding, CA 96002

Subject: Species List for Airport Road Widening

Dear: Mr. Foster

We are sending this official species list in response to your June 5, 2007 request for information about endangered and threatened species. The list covers the California counties and/or U.S. Geological Survey 7½ minute quad or quads you requested.

Our database was developed primarily to assist Federal agencies that are consulting with us. Therefore, our lists include all of the sensitive species that have been found in a certain area *and also ones that may be affected by projects in the area.* For example, a fish may be on the list for a quad if it lives somewhere downstream from that quad. Birds are included even if they only migrate through an area. In other words, we include all of the species we want people to consider when they do something that affects the environment.

Please read Important Information About Your Species List (below). It explains how we made the list and describes your responsibilities under the Endangered Species Act.

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be September 03, 2007.

Please contact us if your project may affect endangered or threatened species or if you have any questions about the attached list or your responsibilities under the Endangered Species Act. A list of Endangered Species Program contacts can be found at www.fws.gov/sacramento/es/branches.htm.

Endangered Species Division

TAKE PRIDE IN AMERICA

# Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 070605015200

Database Last Updated: March 5, 2007

No quad species lists requested.

## County Lists

### Shasta County

Listed Species

Invertebrates

*Branchinecta lynchi*

*Critical habitat, vernal pool fairy shrimp (X)*
*vernal pool fairy shrimp (T)*

*Desmocerus californicus dimorphus*

*valley elderberry longhorn beetle (T)*

*Lepidurus packardi*

*Critical habitat, vernal pool tadpole shrimp (X)*
*vernal pool tadpole shrimp (E)*

*Pacifastacus fortis*

*Shasta crayfish (E)*

Fish

*Hypomesus transpacificus*

*delta smelt (T)*

*Oncorhynchus mykiss*

*Central Valley steelhead (T) (NMFS)*
*Critical habitat, Central Valley steelhead (X) (NMFS)*

*Oncorhynchus tshawytscha*

*Central Valley spring-run chinook salmon (T) (NMFS)*
*Critical Habitat, Central Valley spring-run chinook (X) (NMFS)*
*Critical habitat, winter-run chinook salmon (X) (NMFS)*
*winter-run chinook salmon, Sacramento River (E) (NMFS)*

Amphibians

*Rana aurora draytonii*

*California red-legged frog (T)*

Birds

*Haliaeetus leucocephalus*

*bald eagle (T)*

*Strix occidentalis caurina*
*Critical habitat, northern spotted owl (X)*
*northern spotted owl (T)*

## Plants

*Orcuttia tenuis*
*Critical habitat, slender Orcutt grass (X)*
*slender Orcutt grass (T)*

*Tuctoria greenei*
*Critical habitat, Greene's tuctoria (=Orcutt grass) (X)*
*Greene's tuctoria (=Orcutt grass) (E)*

## Candidate Species

## Fish

*Oncorhynchus tshawytscha*
*Central Valley fall/late fall-run chinook salmon (C) (NMFS)*
*Critical habitat, Central Valley fall/late fall-run chinook (C) (NMFS)*

## Birds

*Coccyzus americanus occidentalis*
*Western yellow-billed cuckoo (C)*

## Mammals

*Martes pennanti*
*fisher (C)*

## Key:

(E) *Endangered* - Listed as being in danger of extinction.

(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.

(P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.

(NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.

*Critical Habitat* - Area essential to the conservation of a species.

(PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.

(C) *Candidate* - Candidate to become a proposed species.

(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.

(X) *Critical Habitat* designated for this species

# Important Information About Your Species List

## How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, **or may be affected by** projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

## Plants

Any plants on your list are ones that have actually been observed in the area covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Plant Society's online Inventory of Rare and Endangered Plants.

## Surveying

Some of the species on your list may not be affected by your project. A trained biologist or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list.

For plant surveys, we recommend using the Guidelines for Conducting and Reporting Botanical Inventories. The results of your surveys should be published in any environmental documents prepared for your project.

## Your Responsibilities Under the Endangered Species Act

All animals identified as listed above are fully protected under the Endangered Species Act of 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

> Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

## Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a formal consultation with the Service.

  During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.

- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.

  Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the plan in any environmental documents you file.

## Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as critical habitat. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may be found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our critical habitat page for maps.

## Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

## Species of Concern

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts. More info

## Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6580.

## Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be September 03, 2007.

Appendix D

# Paleontological Identification Report

# Paleontological Identification Report
# Airport Road Widening Project, City of Redding

*Prepared for:*

PB Americas Inc.
3840 Rosin Court, Suite 200
Sacramento, CA 95834
Contact: Kathryn Wickam
916/567-2569

*Prepared by:*

Jones & Stokes
2895 Churn Creek Road, Suite D
Redding, CA 96002
Contact: Jonathan Foster
530/223-4139

June 2007

Jones & Stokes. 2007. Paleontological Identification Report, Airport Road Widening Project, City of Redding. June. (J&S 06855.06.) Redding, CA.

# Contents

**Page**


1.0 Introduction ..... 1
2.0 Project Description ..... 2
2.1 Project Location and Footprint ..... 2
2.2 Grading and Excavation Limits ..... 2
3.0 Regulatory Background ..... 3
3.1 Federal Regulations ..... 3
3.2 State Regulations ..... 5
4.0 Methods ..... 6
4.1 Sources of Information ..... 6
4.2 Criteria Used to Determine Resource Sensitivity ..... 6
5.0 Geologic Context of Project Site ..... 7
5.1 Regional Geomorphic and Geologic Setting ..... 7
5.2 Site Geology ..... 8
7.0 Site Paleontology and Potential for Impacts ..... 9
7.1 Paleontological Sensitivity ..... 9
7.2 Potential for Impacts on Paleontological Resources ..... 10
8.0 Recommendations, Constraints, and Coordination Requirements ..... 11
8.1 Preparation of Paleontological Evaluation Report and Mitigation Strategy ..... 11
8.2 Time Estimates ..... 13
9.0 Preparer ..... 13
10.0 References ..... 13

# Tables

**Page**

1 Paleontological Sensitivity Categories and Recommended Mitigation Treatment Levels for Paleontological Resources ..... 7

2 Summary of Regulations Protecting Paleontological Resources ..... 12

# Acronyms and Abbreviations

| | |
|---|---|
| Caltrans | California Department of Transportation |
| CEQA | California Environmental Quality Act |
| City | City of Redding |
| Antiquities Act | federal Antiquities Act of 1906 |
| I-5 | Interstate 5 |
| LOS | level of service |
| NEPA | National Environmental Policy Act |
| NNL Program | National Natural Landmarks Program |
| NPS | National Park Service |
| NRNL | National Registry of Natural Landmarks |
| PER | paleontological evaluation report |
| PIR | Paleontological Identification Report |
| PSL | Project Study Limits |
| ROW | right-of-way |
| SVP | Society of Vertebrate Paleontology |
| SR | State Route |
| UCMP | University of California Museum of Paleontology |

Paleontological Identification Report

# Airport Road Widening Project, City of Redding

## 1.0 Introduction

This document is a Paleontological Identification Report (PIR) for the City of Redding's (City's) proposed project to widen Airport Road from just north of the North Street Bridge over the Sacramento River to north of the State Route (SR) 44 interchange in Redding, Shasta County, California. The Project Study Limits (PSL) for the proposed project extend approximately 6.2 miles from the north bank of the North Street Bridge to just north of the SR 44 intersection.

Consistent with the California Department of Transportation (Caltrans) requirements as described in Chapter 8 of the *Standard Environmental Reference* (California Department of Transportation 2005), this PIR

- provides an overview of the proposed project, including what is known about the project excavation/grading footprint;
- identifies paleontological resources within and surrounding the PSL and discusses the project corridor's paleontological sensitivity;
- gives a preliminary evaluation of the project's potential to affect paleontological resources (limited but potentially significant);
- makes recommendations regarding the need for further investigation, including preparation of a paleontological evaluation report (PER);
- identifies consultation and coordination requirements; and
- summarizes a proposed mitigation strategy, including approximate level of effort.

Section 10.0 lists references consulted to prepare this PIR; specific reference information is provided in text citations. The preparer's qualifications are presented in Appendix A.

# 2.0 Project Description

## 2.1 Project Location and Footprint

Airport Road parallels Interstate 5 (I-5) in the eastern portion of the city of Redding, providing access to the Redding Municipal Airport and numerous commercial and residential properties as well as the nearby city of Anderson. Airport Road now operates at a level of service (LOS) between A and B. Without additional roadway capacity, it is projected to operate at LOS C–E by 2010 and LOS F by 2030 (Fehr & Peers Transportation Consultants 2007). The proposed widening project is needed to ensure that future traffic volumes can be accommodated at an LOS consistent with City standards; to manage access/egress via the Airport Road corridor; and to improve long-term traffic safety along the Airport Road corridor.

Airport Road is presently classed as an arterial and consists of one northbound and one southbound lane, with turn pockets and right- and left-turn channelization at critical intersections. The current right-of-way (ROW) width ranges from a minimum of 60 feet to as much as 100 feet in some areas.

The City's current General Plan identifies the need to widen and upgrade Airport Road to at least a four-lane expressway between Highway 44 and Dersch Road, with the potential for a six-lane expressway, depending on future traffic projections (City of Redding Department of Planning and Community Development 2000). To meet City standards, the planned widening of Airport Road would require the ROW to expand to roughly 110 to 150 feet, depending on the number of lanes (City of Redding Department of Planning and Community Development 2000). Typical cross sections would require 110 feet of ROW for a four-lane expressway, with an additional 45 feet of ROW for a frontage road. ROW width could be greater if a six-lane alternative is adopted now or in the future.

Project alternatives have not been developed at this time. Consequently, this PIR assumes a maximum widening to six lanes plus frontage road, requiring a ROW 150 feet wide along the entire length of the project alignment.

## 2.2 Grading and Excavation Limits

Project design is still in very preliminary stages as of the preparation of this report, so the extent and depth of subsurface disturbance is difficult to determine. However, grading to a depth of several feet could be required along the entire project alignment to widen and prepare the roadbed. Localized excavation or boring would also be needed to install new traffic signals or relocate existing ones and to expand existing culverts to accommodate increased runoff. Utility relocations, if needed, could be accomplished via conventional cut and cover, directional drilling, or jack and bore techniques. In addition, if the final design

includes underpasses, excavation to depths of as much as 30–40 feet could be required; excavation would likely also be required to construct overpass footings.

Because project alternatives have not been developed yet, discussion in this PIR focuses on the proposed project. However, any alternative that would meet project goals and objectives would have grading and excavation needs broadly similar to those of the proposed project. Consequently, the discussion below is generally applicable to all alternatives except the No-Project Alternative. *[If project design changes significantly or if alternatives use a different ROW alignment or rely on a substantially different design—in particular, elevated or below-grade segments—this PIR will need to be revised accordingly.]*

# 3.0 Regulatory Background

The following sections describe federal and state regulations that protect paleontological resources and provide the context for this report. Local regulations are not discussed; neither the City's General Plan nor Shasta County's General Plan explicitly protects paleontological resources.

## 3.1 Federal Regulations

### 3.1.1 Antiquities Act and Paleontological Salvage

The federal Antiquities Act of 1906 (Antiquities Act) was enacted with the primary goal of protecting cultural resources in the United States. As such, it explicitly prohibits appropriation, excavation, injury, and destruction of "any historic or prehistoric ruin or monument, or any object of antiquity" located on lands owned or controlled by the federal government, without permission of the secretary of the federal department with jurisdiction. It also establishes criminal penalties, including fines and/or imprisonment, for these acts. Neither the Antiquities Act itself nor its implementing regulations (*Title 43, Code of Federal Regulations* [*CFR*], *Part 3*) specifically mentions paleontological resources. However, several federal agencies—including the National Park Service (NPS), the Bureau of Land Management, and the U.S. Forest Service—have interpreted *objects of antiquity* as including fossils. Consequently, the Antiquities Act represents an early cornerstone for efforts to protect the nation's paleontological resources.

Title 23 Section 305 of the *United States Code* provides a pathway to ensure that the Antiquities Act's preservation requirements are met for highway projects and specifically identifies paleontological resources, as follows.

> Funds authorized … by the highway department of any State, may be used for archaeological and paleontological salvage in that state in compliance with the Act entitled "An Act for the preservation of American Antiquities," approved June 8, 1906 … and State laws where applicable.

Any excavated materials or information recovered using state funding must be used "for public purposes without private gain to any individual or organization" (*46 Federal Register 9570*).

### 3.1.2 National Environmental Policy Act

The National Environmental Policy Act (NEPA) does not provide specific guidance regarding paleontological resources, but the NEPA requirement that federal agencies take all practicable measures to "preserve important historic, cultural, and natural aspects of our national heritage" (NEPA Sec. 101[b][4]) is interpreted as applying to paleontological materials. Under NEPA, paleontological resources are typically treated in a manner similar to that used for cultural resources.

### 3.1.3 National Natural Landmarks Program

The National Natural Landmarks Program (NNL Program) was established in 1962 under authority of the Historic Sites Act of 1935. Following are the goals of the NNL Program.

- Encourage the preservation of sites that illustrate the nation's geological and ecological character.
- Enhance the scientific and educational value of the sites preserved.
- Strengthen public appreciation of natural history and foster increased concern for the conservation of the nation's natural heritage.

Under the NNL Program, sites that represent the nation's best examples of various types of biological communities or geologic features (meaning that they are in good condition and effectively illustrate the specific character of a certain type of resource) are listed on the National Registry of Natural Landmarks (NRNL). At present, the NRNL includes 587 sites, ranging in size from 7 acres to almost 1 million acres. Examples of sites in California designated as NNLs for their paleontological value include Sharktooth Hill in Kern County; Rancho La Brea in Los Angeles; and Rainbow Basin, north of Barstow in San Bernardino County.

The NNL Program is administered by the NPS. However, most sites listed on the NRNL are not transferred to federal ownership, and most do not become units in the NPS system; in fact, most continue to be managed by their current owners following listing. At present, about 50% of the nation's NNLs are managed by public agencies, about 30% are privately owned and managed, and about 20% are managed through collaboration between agencies and private entities.

The NPS is responsible for maintaining relationships with NNL landowners and monitoring the condition of all NNLs. Based on its monitoring, NPS prepares an

annual report identifying NNLs at risk of damage or degradation for transmission via the Secretary of the Interior to Congress.

## 3.2 State Regulations

### 3.2.1 California Environmental Quality Act

The California Environmental Quality act (CEQA) encourages the protection of all aspects of the environment by requiring state and local agencies to prepare multidisciplinary environmental impact analyses about the environmental impacts of a proposed project and to make decisions based on the findings of those analyses.

CEQA includes in its definition of *historical resources* the phrase "any object [or] site … that has yielded or may be likely to yield information important in prehistory"(CEQA Guidelines Sec. 15064.5[3]), which is typically interpreted as including fossil materials and other paleontological resources. More specifically, destruction of a "unique paleontological resource or site or unique geologic feature" constitutes a significant impact under CEQA (CEQA Guidelines Appendix G). Treatment of paleontological resources under CEQA is generally similar to treatment of cultural resources, requiring evaluation of resources in a project's area of potential affect; assessment of potential impacts on significant or unique resources; and development of mitigation measures for potentially significant impacts, which may include monitoring combined with data recovery and/or avoidance.

### 3.2.2 California Public Resources and Administrative Codes

Several sections of the California Public Resources Code protect paleontological resources. Section 5097.5 prohibits knowing and willful excavation, removal, destruction, injury, and defacement of any paleontologic feature on public lands (lands under state, county, city, district, or public authority jurisdiction or the jurisdiction of a public corporation), except where the agency with jurisdiction has granted express permission. Section 30244 requires reasonable mitigation for impacts on paleontological resources that occur as a result of development on public lands.

The sections of the California Administrative Code relating to the State Division of Beaches and Parks afford protection to geologic features and paleontological materials but grant the director of the state park system authority to issue permits for specific activities that may result in damage to such resources, if the activities are in the interest of the state park system and for state park purposes (California Administrative Code Sec. 4307–4309).

# 4.0 Methods

## 4.1 Sources of Information

Information on regional and site geology, and on potential paleontologic resources at the project site, was derived from the published scientific literature and museum databases. No new fieldwork or surveys were conducted for this PIR. References are cited in the text and listed in Section 10.0.

## 4.2 Criteria Used to Determine Resource Sensitivity

The project alignment's paleontological sensitivity was evaluated based on professional judgment in light of published data. Evaluation relied on criteria and procedures developed by the Society of Vertebrate Paleontology (SVP) (Society of Vertebrate Paleontology Conformable Impact Mitigation Guidelines Committee 1995). These guidelines are generally consistent with Caltrans' in-house criteria and represent a widely accepted standard of care for paleontological resources.

SVP assesses paleontological sensitivity based on the potential that significant paleontological resources are present—if significant paleontological resources are known or likely to be present, a site is considered highly sensitive. SVP defines *significant paleontological resources* as those that

- provide important information by shedding light on evolutionary trends and/or helping to relate living organisms to extinct organisms;
- provide important information regarding the development of biological communities;
- demonstrate unusual circumstances in the history of life;
- represent a rare taxon or a rare or unique occurrence;
- are in short supply and in danger of being destroyed or depleted;
- have a special and particular quality, such as being the oldest of their type or the best available example of their type; or
- provide important information used to correlate strata for which it may be difficult to obtain other types of age dates.

Significant paleontological resources may include vertebrate fossils and their associated taphonomic and environmental indicators, invertebrate fossils, and/or plant fossils (Society of Vertebrate Paleontology Conformable Impact Mitigation Guidelines Committee 1995).

Table 1 presents SVP's sensitivity categories and the typical mitigation treatment for project sites in each category.

**Table 1.** Paleontological Sensitivity Categories and Recommended Mitigation Treatment Levels for Paleontological Resources

| Sensitivity Category | Definition | Recommended Mitigation Treatment |
|---|---|---|
| High | Areas underlain by geologic units from which vertebrate or significant invertebrate fossils or suites of plant fossils have been recovered. | ▪ Preliminary survey and surface salvage before construction begins.<br>▪ Monitoring and salvage during construction.<br>▪ Specimen preparation, identification, cataloging, curation, and storage of materials recovered.<br>▪ Preparation of final report describing finds and discussing their significance.<br>▪ All work should be supervised by a professional paleontologist who maintains the necessary collecting permits and repository agreements. |
| Undetermined | Areas underlain by geologic units for which little information is available. | ▪ Preliminary field surveys by a qualified vertebrate paleontologist to assess project area's sensitivity<br>▪ Design and implementation of mitigation if needed, based on results of field survey |
| Low | Areas underlain by geologic units that are not known to have produced a substantial body of significant paleontologic material. | Protection and salvage are generally not required. However, a qualified paleontologist should be contacted if fossils are discovered during construction, in order to salvage finds and assess the need for further mitigation. |

Source: Society of Vertebrate Paleontology Conformable Impact Mitigation Guidelines Committee 1995.

# 5.0 Geologic Context of Project Site

## 5.1 Regional Geomorphic and Geologic Setting

The city of Redding is located at the northernmost end of the Sacramento Valley, which in turn forms the northern portion of California's Great Valley geomorphic province. To the northeast and southeast of the City lie the southernmost volcanoes of the active Cascade Range—Mt. Shasta and Mt. Lassen—and to the immediate west and north the spectacular uplifts of the northern Coast Ranges separate the central California lowlands from the Mendocino Coast (Norris and Webb 1990; Harden 1998).

The Great Valley, also called the Central Valley, is an alluvial plain that lies between the Sierra Nevada on the east and the Coast Ranges on the west. Its northern end is defined by the Klamath Mountains and Cascade Range, and its southern end is defined by the Tehachapi Mountains north of Los Angeles. Subdivided into the Sacramento Valley to the north and the San Joaquin Valley to the south, the valley has an average width of about 50 miles and is about 400 miles long overall (e.g., Norris and Webb 1990; Harden 1998; Bartow 1991).

The Great Valley is floored by a thick sequence of sedimentary deposits that range in age from Jurassic through Quaternary. Under the eastern and central portions of the valley, the base of the sequence likely rests on Mesozoic crystalline rock allied to the plutons of the Sierra Nevada; to the west and north, basement rocks are believed to be Franciscan metasediments and/or mélange similar to exposures in the Coast Ranges. Where the Sacramento Valley abuts the volcanically active Cascades Province to the east, lava flows and volcanic ash deposits as young as Holocene (<10,000 years) are conspicuously exposed. The Sacramento Valley is also known for its economically important natural gas reserves, which include substantial reserves of dry gas (e.g., Norris and Webb 1990).

## 5.2 Site Geology

The project alignment is situated on nonmarine sedimentary units of Pleistocene age (Strand 1962). The central portion of the alignment, comprising most of its length, is underlain by the Red Bluff Formation of early Pleistocene (Irvingtonian) age. The northernmost end of the alignment is underlain by Holocene alluvial and overbank deposits. The southern portion of the alignment crosses a narrow outcrop belt of Modesto Formation of late Pleistocene (Rancholabrean) age and, depending on its southern terminus, may also cross into Holocene overbank deposits of the Sacramento River system (Fraticelli et al. 1987). Following are brief descriptions of each unit.

The Red Bluff Formation consists of distinctive strongly weathered red deposits of gravel with minor interbedded sand and silt. West of the Sacramento River, gravel composition reflects derivation from metamorphic units of the Klamath Mountains and Coast Ranges; east of the Sacramento River, gravel was derived from the Tuscan Formation and lava flow units. The Red Bluff Formation is exposed as a thin veneer overlying nonmarine sedimentary and volcanic strata of Pliocene age (the Tehama, Tuscan, and Laguna Formations) and is interpreted as alluvial sediments deposited on a pediment surface formed atop eroding Tertiary beds (Fraticelli et al 1987, Blake et al. 1999). Stratigraphic relationships suggest that the Red Bluff Formation is younger than about 1.08 Ma and older than about 0.4 Ma (Irvingtonian or early Pleistocene in age) (Blake et al. 1999).

The Modesto Formation consists of gravelly sand, silt, and clay. Clast composition varies widely, including material from metamorphic, sedimentary, and volcanic sources. Modesto strata are typically tan or light gray, except where the unit is dominated by sediment derived from volcanic rocks of the Tuscan Formation; such outcrops are red and black with brown clasts. The Modesto Formation is interpreted as an alluvial deposit (Fraticelli et al. 1987, Blake et al. 1999).

Modesto Formation terraces in the Red Bluff area are very little dissected and show very fresh depositional morphology (Blake et al. 1999), suggesting that this unit was deposited on essentially modern topography. A pedogenic B horizon is present in the lower portion of the Modesto Formation but is lacking in the upper

portion (Blake et al. 1999). This is consistent with the Rancholabrean (late Pleistocene) age typically assigned to the Modesto Formation (e.g., Marchand 1980, Marchand and Allwardt 1981, Bartow 1991)

The Holocene overbank deposits of the Sacramento River consist of sand, silt, and minor gravel lenses recording flood-stage deposition (Fraticelli et al. 1987).

# 7.0 Site Paleontology and Potential for Impacts

## 7.1 Paleontological Sensitivity

Little published information is available on the fossil content of the Red Bluff Formation. The paleontology of the Modesto Formation in the southern Great Valley is well documented, but information on the Modesto in the project area is sparse. The paleontological sensitivity of the units along the project alignment is thus uncertain. However, available data suggest that it should probably be regarded as high or potentially high.

The online database of the University of California Museum of Paleontology (UCMP) contains more than 5,000 records for vertebrate fossil materials from Pleistocene materials in Shasta County, almost all of which were recovered from cave fill sediments (University of California Museum of Paleontology 2007). The PaleoPortal online database shows 12 vertebrate records from the Modesto Formation, four from Stanislaus County and eight from Yolo County (PaleoPortal 2007). Discrepancies between the UCMP and PaleoPortal search results suggests that the record sets may be incomplete. In addition, the Modesto Formation is known for its vertebrate faunas elsewhere, particularly in the developing areas of the San Joaquin Valley (see for instance City of Lodi 2006). PaleoPortal also identified two vertebrate records from the Red Bluff Formation, both from the Woodland area in Yolo County, northwest of Sacramento (PaleoPortal 2007).

The relevance of these extralocal records to the potential for fossil finds in the Modesto and Red Bluff Formations of the Redding Area is difficult to assess. However, the cave faunas of Shasta County attest to the presence of abundant vertebrate life in the area during the Pleistocene. Moreover, throughout California, the general standard of care is that nonmarine sedimentary units of Pleistocene age are likely to be highly sensitive, in part because the type sections for both the North American Land Mammal Stages that fall within the Pleistocene (Irvingtonian and Rancholabrean) are located in California, and vertebrate finds in Pleistocene sediments are surprisingly common. With this in mind, the Modesto Formation in the project area is tentatively assessed as highly sensitive, and the same is probably appropriate for the Red Bluff Formation. This is consistent with recommendations of the SVP, which has stressed that paleontological “sites” are defined by the entire extent (both areal and stratigraphic) of a unit or formation. In other words, once a unit is identified as containing vertebrate fossils, or other rare fossils, the entire unit is a

paleontological site (Society of Vertebrate Paleontology Conformable Impact Mitigation Guidelines Committee 1995).

By contrast, there is no known reason to consider the area's Holocene materials sensitive for paleontological resources. *Fossil* is strictly defined as referring to materials older than 10,000 years (that is, older than the base of the Holocene section), and Holocene materials are only considered sensitive in very rare and well-documented instances. Neither the UCMP database nor PaleoPortal contains records for Holocene materials from Shasta County (University of California Museum of Paleontology 2007, PaleoPortal 2007).

## 7.2 Potential for Impacts on Paleontological Resources

The Airport Road PSL is situated primarily on the Modesto and Red Bluff Formations, both of which are tentatively identified as highly sensitive for paleontological resources.

The proposed widening project would require ground-disturbing activities along a ROW about 6.2 miles long and 150 feet wide. Because the project would follow the existing ROW, much of the project footprint has already been disturbed to some extent. However, the proposed project would expand the ROW from a width of 60–100 feet to about 150 feet wide, and thus would likely disturb areas not previously graded or excavated. A very rough calculation suggests that the new area of disturbance associated with ROW widening could be on the order of

6.2 miles x (150 feet – 80 feet) = 2,291,520 square feet

This is approximately 53 acres. The proposed project would likely also require installation of new and/or relocated traffic signals as well as relocation of utilities and expansion of several culverts. Although localized, excavation for these facilities could be substantially deeper than roadbed grading. If under- or overpasses are used for major intersections, substantial additional excavation would be required. Any grading, excavation, or other ground disturbance would have the potential to damage any paleontological resources that may be present.

Based on the proposed project's current description and its geologic context, the project would have the potential for significant impacts on paleontological resources. The potential for impact is greatest where the depth of excavation would be greatest and where the substrate is undisturbed, but even in previously disturbed areas, there may be some potential for significant impacts.

# 8.0 Recommendations, Constraints, and Coordination Requirements

## 8.1 Preparation of Paleontological Evaluation Report and Mitigation Strategy

Because the proposed project could result in significant impacts on significant paleontological resources (specifically, vertebrate fossils), a PER should be prepared to more fully evaluate the importance of resources in the PSL and the potential extent and severity of impacts. In light of the identified need to widen Airport Road, it is highly unlikely that the project can be relocated to avoid the potential for impacts—any alternate alignment that would serve the same needs currently met by Airport Road would have similar paleontological constraints. Consequently, the PER should focus on qualifying the risk to resources and delineating an appropriate, effective, and feasible mitigation strategy. This will entail coordination between the City and Caltrans; the PER will also need to evaluate whether other stakeholders should be involved, although none are identified at this time.

Because of the potential to mitigate impacts through project design and/or construction modifications, we recommend that the PER be prepared early in the environmental documentation process. However, we suggest preparing the PER concurrent with or following preparation of the project geotechnical report, to take advantage of site-specific information (local stratigraphy, unit thicknesses, existing disturbance, etc.) expected to be developed during geotechnical and engineering geologic studies at the site. If possible, the PER preparer should coordinate with the geotechnical team to maximize the recovery of useful information during any exploratory drilling or other geotechnical studies.

It will also be important for the PER preparer to coordinate with the project design team to ensure that the most current and detailed information on extent and depth of excavation is used. In the event of a need for deep excavation, such as that required for underpass construction, the PER should also evaluate the potential for impacts related to disturbance of older Pleistocene (pre-Red Bluff) strata.

Depending on the degree of flexibility that remains with regard to the choice of a preferred alternative, it may be helpful for the PER to include a map showing the portions of the project footprint most susceptible to impact under each project alternative; this would allow comparison between alternatives. Note however that because impacts on paleontological resources can typically be mitigated, paleontological resources are highly unlikely to represent the key constraint on selection of the preferred alternative.

To the extent feasible, the PER should identify the taxa expected to occur in the Modesto and Red Bluff Formations in the PSL, in order to determine what mitigation strategies may be most effective. Strategies that may be highly

effective for avoiding or minimizing damage to large vertebrate remains may be far less so for smaller remains, such as rodent teeth, that can nonetheless have substantial scientific importance in some contexts.

Several federal and state laws apply to paleontological resources, particularly vertebrate resources. These regulations are described above in *Regulatory Setting* and their applicability to the proposed project is summarized in Table 2. Preparation of the PER will need to comply with the guidance and limitations summarized in
Table 2.

**Table 2.** Summary of Regulations Protecting Paleontological Resources

| Regulation | Resources Protected | Relevant to Project? | Requirements |
|---|---|---|---|
| Federal Antiquities Act of 1906 | Primarily cultural resources, but also interpreted to include fossils | Yes | No specific requirements, but underpins requirements and protections in other federal regulations; paleontological salvage amendments address use of state funds for paleontological mitigation |
| National Environmental Policy Act | Interpreted as applying to paleontological materials | Yes | Effects must be disclosed and mitigation strategies identified; treatment typically similar to that for cultural resources |
| National Natural Landmarks Program | Natural history resources, including paleontological sites | No | NA |
| California Environmental Quality Act | Paleontological resources | Yes | Paleontological resources must be evaluated, potential for project impacts identified, and mitigation measures implemented for any significant impacts |
| California Public Resources Code | Paleontological resources | Yes | Prohibits knowing and willful excavation, removal, destruction, injury, and defacement of any paleontologic feature on public lands (lands under state, county, city, district, or public authority jurisdiction, or the jurisdiction of a public corporation), except where the agency with jurisdiction has granted express permission. Section 30244 requires reasonable mitigation for impacts on paleontological resources that occur as a result of development on public lands |

In addition to the general regulatory guidance in Table 2, we recommend that the PER develop a site- and project-appropriate mitigation strategy consistent with the SVP guidelines (Society of Vertebrate Paleontology Conformable Impact Mitigation Guidelines Committee 1995). For this project, mitigation would likely entail a combination of the following recommendations; specifics will need to be developed and modified during the PER process.

- Reconnaissance field survey to assess surface exposures and evaluate potential for surface recovery of paleontological materials; if necessary, preconstruction salvage and/or protection of exposed materials.
- Construction worker training to increase recognition of fossil materials unearthed during construction.
- Monitoring by qualified paleontologist during key portions of project (typically, those involving substantial disturbance in previously undisturbed materials with paleontological sensitivity).
- Requirement that construction crew stop work if fossil materials are encountered.
- Appropriate recovery, documentation, and/or curation of fossil materials.

## 8.2 Time Estimates

Preparation of the PER is anticipated to require 40–60 staff hours.

Paleontological monitoring will continue intermittently for the duration of site preparation and project grading, and a defined paleontological monitoring schedule can be developed in the future once a construction schedule is available. The time required for materials recovery, documentation, and curation will depend on the nature of materials discovered, if any. The PER process may help to constrain the level of effort for this phase of work, but estimates will likely need to be finalized “on the fly” as earthwork proceeds.

# 9.0 Preparer

This PIR was prepared by Anna Buising (CA PG-7955; B.S., Earth Sciences, University of California, Los Angeles, 1983; Ph.D., Geology, University of California, Santa Barbara, 1988). A brief resume is attached as Appendix A.

# 10.0 References

Bartow, J.A. 1991. *The Cenozoic Evolution of the San Joaquin Valley, California.* (U.S. Geological Survey Professional Paper 1501.) Washington DC: United States Printing Office.

Blake, M. C., D. S. Harwood, E. J. Helley, W. P. Irwin, A. S. Jayko, and D. L. Jones. 1999. Geologic map of the Red Bluff 30 x 60 quadrangle, California (scale 1:100,000). (U.S. Geological Survey Geologic Investigations Series, Map I-2542.) Available: <http://geopubs.wr.usgs.gov/i-map/i2542/>. Accessed: June 2007.

California Department of Transportation. 2005. Paleontology. *Standard environmental reference, v. 1*. Available: <http://www.dot.ca.gov/ser/vol1/sec3/physical/ Ch08Paleo/chap08paleo.htm>. Accessed: October 4, 2006.

City of Lodi. 2006. *Lodi Annexation Environmental Impact Report (Westside).* (Public review draft.) April. Prepared by LSA Associates, Inc. Available: <http://www.lodi.gov>. Accessed: June 2007.

City of Redding Department of Planning and Community Development. 2000. *City of Redding General Plan 2000–2020.* Adopted October 3. Resolution 2000-1666.

Fehr & Peers Transportation Consultants. 2007. *Final Traffic Report, Airport Road Widening Project.* Prepared for City of Redding. June 22.

Fraticelli, L. A., J. P. Albers, W. P. Irwin, and M. C. Blake. 1987. Geologic Map of the Redding 1 x 2 degree quadrangle, Shasta, Tehama, Humboldt, and Trinity Counties, CA. Open-File Report 87-257. U.S. Geological Survey.

Harden, D. R. 1998. *California Geology*. Upper Saddle River, NJ: Prentice-Hall.

Marchand, D.E. 1980. Preliminary geologic maps showing Quaternary deposits of the Ceres, Denair and Montpelier 7 ½ quadrangles, Stanislaus and Merced Counties, California. Open-File Report 80-607. U.S. Geological Survey.

Marchand, D.E., and A. Allwardt. 1981. *Late Cenozoic Stratigraphic Units, Northeastern San Joaquin Valley, California.* Geological Survey Bulletin 1470. Washington, DC: United States Government Printing Office.

Norris, R. M., and R. W. Webb. 1990. *Geology of California*. 2nd edition. New York, NY: John Wiley & Sons.

PaleoPortal. 2007. *The Paleontology Portal* (web site and online database). Available: <http://www.paleoportal.org>. Accessed: June 2007.

Society of Vertebrate Paleontology Conformable Impact Mitigation Guidelines Committee. 1995. *The Society of Vertebrate Paleontology, Policy And Positions Statements, Conformable Impact Mitigation Guidelines Committee*. Available: <http://www.vertpaleo.org/policy/policy_statement_conformable _Impact.htm>. Accessed: October 4, 2006.

Strand, R. G. 1962. Geologic map of California, Redding sheet. Sacramento, CA: California Division of Mines and Geology.

University of California Museum of Paleontology. 2007. *UCMP Specimen Search.* Available: <http://www.ucmp.berkeley.edu/science/ collections.php/>. Accessed: June 2007.

Appendix A

# Preparer Qualifications

# Anna Buising, PhD, PG

## Senior Project Manager

Anna Buising is a senior CEQA/NEPA compliance expert who specializes in leading teams responsible for large and challenging environmental documents. Anna is active in stream management, geohazards abatement planning, and post-reclamation management of mined lands, and has taught CEQA compliance strategy through the University of California Extension and other venues. She is also a member of the Jones & Stokes Climate Change Focus Group (www.climatechangefocusgroup.com). One of her key roles is to provide peer review and mentorship for geology, geologic hazards, mineral resources, and paleontology.

Before joining Jones & Stokes, Anna was an independent consultant offering services in applied sedimentology and stratigraphy. Prior to that, as a tenured faculty member at California State University, Hayward (now California State University, East Bay), she led student research teams and taught a variety of classes ranging from introductory geology for non-majors to senior field geology courses and advanced graduate-level seminars. She also developed a highly regarded workshop in writing skills for geoscience professionals. She and her students were among the first researchers to use the Neogene stratigraphic record to test quantitative reconstructions of past movement on the San Andreas Fault system.

## Selected Project Experience

### Multiple Water Infrastructure Projects CEQA Compliance and Permitting Services—Dublin San Ramon Services District (DSRSD), Alameda and Contra Costa Counties, CA

Client manager supporting District for all CEQA compliance and permitting advisement and management needs. Currently managing several projects for District, including CEQA compliance (IS/MND), biological constraints studies, and permitting support for proposed new aboveground reservoir and pump station serving development in east Dublin; CEQA compliance (IS/MND) for proposed new corporation yard and administration building; and permitting for removal of stormwater management structures on Tassajara Creek conservation easement adjacent to proposed new development in east Dublin.

### Education

PhD, Geological Sciences, University of California, Santa Barbara, 1988

BS, Geology, University of California, Los Angeles, 1983

### Licenses

California Professional Geologist (PG-7955)

### Permanente Creek Clean, Safe Creeks Project EIR—Santa Clara Valley Water District (SCVWD), CA

Leading Jones & Stokes team supporting SCVWD in constraints analysis, development, and screening of flood protection alternatives for highly impacted urban creek corridor. Managing preparation of project EIR and permitting documentation. Permanente Creek Clean, Safe Creeks Project is the first major undertaking to use the District's Natural Flood Protection screening system, which stresses the provision of "environmental quality, community benefit and protection from flooding in a cost-effective manner through integrated planning and management that considers the physical, hydrologic and ecologic functions and processes of streams within the community setting." Alternatives considered include a combination of channel improvements, up- and downstream detention, bypasses/diversions, and riparian restoration.

### River Islands at Lathrop EIS—U.S. Army Corps of Engineers, Sacramento District

Managing preparation of EIS for phased development of mixed-use master planned community encompassing approximately 4,905 acres of agricultural land, open space, and flood protection levees located on the Stewart Tract and Paradise Cut within Lathrop city limits (southern Sacramento–San Joaquin Delta). Development is proposed to include residential districts; an employment center and town center; golf courses; dock facilities; a central lake and other water features; and preservation, restoration, and creation of terrestrial and aquatic habitat. It would also include work along adjacent reaches of the San Joaquin River, Old River, and Paradise Cut to increase flood conveyance capacity, rebuild and strengthen existing levees, and construct a new 300 foot–wide "super-levee" high-ground perimeter. Key issues for EIS analysis include flood hydraulic modeling; potential impacts on sensitive species, including riparian brush rabbit and Swainson's hawk; and traffic, noise, and air quality impacts.

### Stream Maintenance Program (SMP) Development, CEQA Compliance, and Environmental Permitting—Sonoma County Water Agency (SCWA), Santa Rosa, CA

Technical lead for maintenance activities and BMP/environmental measures development, and project manager for CEQA compliance. SCWA's new SMP will use an integrated, process-oriented approach to identify appropriate sediment, vegetation, and bank stabilization

maintenance activities, balancing stream function and habitat needs with the need for flood protection and public safety. It will also provide the basis to obtain long-term (10-year) regulatory permitting for SCWA's maintenance activities and support an update to Sonoma County's flood control design criteria and hydrology manual. Development of the new SMP is drawing on recent related experience at SCVWD, Bay Area Stormwater Management Agencies Association (BASMAA), and other agencies and collaboratives throughout the Bay Area.

### Quail Hollow Quarry Long-Term Maintenance and Management Plan, Santa Cruz Mountains—Graniterock, Inc., Santa Cruz County, CA

Managing preparation of plan providing for in-perpetuity post–SMARA reclamation maintenance program mandated by HCP requirements to support conservation of six special-status species (Zayante band-winged grasshopper, Mount Hermon June beetle, and four rare sandhills plant species) at sand quarry adjacent to parkland and residential properties. Challenges have included balancing perspectives of species experts with financial feasibility constraints, and meeting needs of diverse stakeholders.

### General Plan Update and Baseline Studies—City of La Cañada Flintridge, CA

Leading development of geology and soils baseline report to support upcoming revisions to City's General Plan. Report includes recommendations for geohazards abatement planning through the general plan process and community outreach. Key hazards affecting the City include earthquake shaking, liquefaction, debris flows, seismic and non-seismic landslides, and accelerated erosion in hillside areas.

### PG&E San Joaquin Valley O&M Program HCP—USFWS and CDFG, Central Valley, CA

Led preparation of EIS/EIR for proposed habitat conservation plan, Section 10 and Section 2081 permits, and master streambed alteration agreement to cover pacific Gas & Electric Company's (PG&E's) operations, maintenance, and minor construction activities in nine Central Valley counties (San Joaquin, Stanislaus, Merced, Fresno, Kings, Kern, Mariposa, Madera, and Tulare). This EIS/EIR is providing the NEPA/CEQA compliance template for multiple additional Habitat Conservation Plans (HCPs) now in preparation to cover PG&E's Operations and Maintenance (O&M) operations in

other parts of California, including the San Francisco Bay area. The San Joaquin Valley HCP and permits and similar upcoming documents are intended as a comprehensive long-term alternative to piecemeal environmental compliance for PG&E's O&M program. The key EIS/EIR challenge was balancing the document's programmatic scope and extended planning horizon (30-year permit term) with the need to provide project-level detail and avoid triggering tiered NEPA or CEQA analysis for individual activities. Standout topics for analysis included biological resources, aesthetics, water resources, cultural and paleontological resources, transportation and circulation, noise and vibration, and air quality, as well as cumulative impacts.

### Lake Elsinore General Plan Update General Plan Update—City of Lake Elsinore, CA

Prepared geology and mineral resources baseline report for proposed general plan update, including recommendations for geohazards abatement planning through the general plan process. Key hazards in the Lake Elsinore area include surface fault rupture; seismic groundshaking; slope instability, including seismically induced landslides; and liquefaction.

### Clear Lake Integrated Aquatic Plant Management Plan Programmatic EIR—County of Lake, CA

Managed development of program document analyzing herbicide application and harvesting activities to address nuisance aquatic macrophyte growth in Clear Lake. To minimize need for tiering and streamline compliance, PEIR combined program-level analysis of watershed-scale and outreach activities with project-level analysis of herbicide use and harvesting. Key issues included effects of herbicide on sensitive habitats, special-status species, and lake ecology; conflicts with recreational use, including effects on recreational fisheries; concerns about the effect of algicide application and vegetation harvesting on Native American use of lake resources; and potential for combinatory effects with existing mercury contamination in the lake. Management efforts have been complicated by the presence of *Hydrilla verticillata*, first reported in the lake in 1994.

### Paradise Mains Project New Sewer Force Mains—Tiburon Sanitary District, CA

Provided CEQA strategy advising for controversial proposal to construct new sanitary sewer force mains connecting residents

served by an aging and inadequate package treatment plant to SD5's main plant on Paradise Drive in Tiburon. Schedule and budget were important concerns for SD5; public sentiment focused on potential impacts to sensitive biological resources if mains were routed across open space, and the potential for growth inducement as a result of the project.

### Fairway 6 Channel Permitting and Restoration Design—Los Altos Golf and Country Club, Santa Clara County, CA

Managed development of designs to repair/restore recently daylighted but non-functional intermittent stream drainage traversing golf course fairway. Worked with Los Altos Golf and Country Club stakeholders and agency representatives to evaluate alternative approaches to meet recreational, water quality, habitat, and public health needs. Led dialogue to ensure agency buy-in and successful completion of permitting.

### Alameda Siphons/Irvington Tunnel EIR—San Francisco Public Utilities Commission (SFPUC), Alameda County, CA

Provided senior peer review services for paleontology and other earth resources in support of technical studies and CEQA compliance for 3.4–mile long water supply pipeline between Sunol Valley and Fremont, and modifications to associated siphons in Sunol Valley, proposed as part of SFPUC's seismic upgrades to Hetch Hetchy water delivery infrastructure. Key issues included seismic safety of new pipeline across the active Calaveras fault; potential impacts of pipeline tunnel on groundwater flow and quality; effects of construction on special-status species, including Alameda whipsnake and steelhead; and potential to disturb archaeological and historical resources.

### Graham Middle School Reservoir Project IS/MND—City of Mountain View, CA

Managed preparation of IS/MND for construction of 8–million gallon underground reservoir, installation of backup well, and improvements to school's athletic fields. Key issues included impacts related to groundwater use and well operation; potential for growth inducement; effects on area traffic; construction noise; disruption of physical education activities during construction; and impacts of nighttime lighting original proposed in athletic fields upgrade. Project was controversial because of adjacent residents' concerns about disturbance as a result of field lighting; spectator noise at athletic

events; and event traffic and parking. Additional work included construction noise modeling in support of mitigation design.

### Highway 238 Corridor Improvement Project—City of Hayward, CA

Senior peer reviewer for the geology section; key issues included potential impacts and design measures to address active fault creep, seismic groundshaking, liquefaction, and landslide hazards. Jones & Stokes is preparing an EIR for improvements to circulation along Foothill and Mission Boulevards, and the downtown area. Key EIR issues include impacts on downtown and corridor businesses, traffic circulation changes, access, impacts on transit, and alternatives analysis.

### Shoreline Sailing Lake Water Supply Project IS/MND—City of Mountain View, CA

Managed preparation of IS/MND for construction of new water supply intake/pump station on Charleston Slough, underground pipeline, and in-lake discharge to improve water quality and supply reliability in Shoreline Sailing Lake, Shoreline at Mountain View Regional Park. Key issues included construction traffic, air quality, and noise impacts; effects of proposed backflushing to clear sediment accumulation on water quality in Charleston Slough; and potential effects on special-status species, including western burrowing owls known to use grassland areas at the park, and Pacific oysters in Shoreline Lake.

### Warm Springs Extension Project SEIR/SEIS—Bay Area Rapid Transit (BART), Oakland, CA

Provided senior QA review for SEIR and SEIS teams. Co-developed paleontology mitigation strategy to address potential effects of construction on Pleistocene vertebrate fossil resources in Irvington Gravels (type section for Irvingtonian North American Land Mammal Stage) in Fremont area.

## Selected Previous Experience

### Church on the Hill Alquist-Priolo Site Study—Geolith Consultants, Inc., San Ramon, CA

Managed student crews logging trench exposures of landslide and fault features on geologically complex site adjacent to active Calaveras fault. Identified Neogene sedimentary bedrock exposed in fault trench walls and contributed interpretations of site structure and tectonics. Designed and performed conglomerate clast counts as a

key technique to identify bedrock strata; clast-count data were a linchpin in conclusions regarding position of active Calaveras trace with respect to proposed development site.

### Elworthy Ranch Alquist-Priolo Site Study—Geolith Consultants, Inc., Danville, CA

Bedrock consultant responsible for stratigraphy of Neogene sedimentary units exposed in trench walls; assisted in developing structural interpretations for site on trace of active northern Calaveras fault.

### Grand and Lakeshore Avenue Storm Drains Sediment Source Analysis—ANWest, Inc., Piedmont, CA

Provided forensic sedimentology services, designing and implementing cost-effective techniques to identify source(s) of sediment accumulating in City of Piedmont storm drains. Used clast lithology and texture to demonstrate that sediment was entering storm drain lines at multiple points. Developed approaches for further assessment and management of storm drain sedimentation.

# ATTACHMENT V

# INITIAL SITE ASSESSMENT (ISA)

File No. 1067.1
June 8, 2007

Ms. Kathy Wickam
Parsons Brinckerhoff
3840 Rosin Court, Suite 200
Sacramento, CA 95834

Subject: **Initial Site Assessment**
**Airport Road Widening Project**
**City of Redding and County of Shasta, California**

Dear Ms. Wickham:

In accordance with our November 21, 2006 contract agreement, Blackburn Consulting (BCI) prepared this Initial Site Assessment (ISA) for the Airport Road Widening project located in the City of Redding and County of Shasta, California. The purpose of this assessment is to identify potential soil/groundwater contamination issues at parcels adjacent to the road alignment with the potential to influence the proposed improvements.

Thank you for selecting BCI to assist you on this important project. Please call if you have questions or require additional information.

Sincerely,

**BLACKBURN CONSULTING**

Reviewed by:

Alfred P. Worcester, C.E.G.
Senior Project Manager

Jeff S. Patton, P.E.
Principal Engineer

**Initial Site Assessment**
AIRPORT ROAD WIDENING PROJECT
City of Redding and County of Shasta, California

## TABLE OF CONTENTS


INVESTIGATIVE SUMMARY ..... I
Sites with Recognized Environmental Conditions ..... I
Generally Recognized Environmental Conditions ..... VII

1.0 INTRODUCTION ..... 1
1.1 Purpose & Scope ..... 1

2.0 PROJECT DESCRIPTION AND LOCATION ..... 2
2.1 Description ..... 2
2.2 Location ..... 3
2.3 Current Land Use ..... 3
2.4 Historical Land Use ..... 3

3.0 RECORDS REVIEW ..... 9
3.1 Review of County, State, and Federal Records ..... 9
3.2 Summary of Records Search ..... 11
3.3 Review of Title Documents ..... 19
3.4 Prior Environmental Investigations ..... 19
3.5 Well Search ..... 20

4.0 RECONNAISSANCE AND OTHER INFORMATION ..... 20
4.1 Visual Observations ..... 20

5.0 FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS ..... 21
5.1 Sites with Recognized Environmental Conditions ..... 21
5.2 Generally Recognized Environmental Conditions ..... 27

6.0 LIMITATIONS ..... 29


**FIGURES**


Figure 1 – Vicinity Map
Figures 2A and 2B – Areas of Concern Map


**APPENDICES**


Appendix A – EDR Corridor Study Report
Appendix B – Photos of Parcels with Potential Impacts

## INVESTIGATIVE SUMMARY

This section summarizes "recognized environmental conditions" that could affect land acquisition and/or construction of the proposed Airport Road Widening project. We identify impacted parcels by business name, an alias if applicable, and the street address. We show the parcel locations on Figures 2A and 2B.
We further divide these parcels into two categories:

- Category 1 – Parcels within the project corridor (i.e. within 150 feet of the Airport Road centerline) that have potential contamination/hazardous materials issues.
- Category 2 – Parcels with potential contamination/hazardous materials issues that are outside the project corridor, but have the potential to impact a parcel, or parcels, within the corridor.

### Sites with Recognized Environmental Conditions

Category 1 Sites:

- "SHELL STATION", 9539 OLD OREGON TRAIL

Also known as "Fast Track Food and Fuel." We identified probable underground storage tank (UST) conditions during our site reconnaissance. Partial acquisition is possible, based on the site's proximity to Airport Road. We did not observe any signs of obvious soil and/or groundwater contamination at the site. The environmental database records do not list the site.

To determine compliance with environmental regulations, or the status of possible leaking underground storage tank (LUST) remediation activities, we recommend a review of appropriate documents at the local Regional Water Quality Control Board (RWQCB) and Shasta County Environmental Health Department (SCEHD).

- "JMB OIL COMPANY" – 3672 CHARLANNE DR.

A former service station and auto repair shop. Based on its location adjacent to Airport Road, the site is subject to possible partial acquisition. In 1986, "JMB" installed two, 1,000-gal tanks to replace smaller UST at the fueling station. The database search records indicate the presence of soil contamination from LUST in 1995. Subsequently, the owner excavated seventeen feet of contaminated soil to remediate the site. Review of the SCEHD records confirms the presence of soil contamination. It appears that the County oversaw the remediation effort, and subsequently, the County closed the case in 1997.

There is a potential for residual contamination, including the potential for off-site contaminant migration beneath the proposed right-of-way acquisition area. To confirm that the leak did not affect groundwater, we recommend a review of environmental records at the RWQCB and owner interview. Based on the results of the owner interview and file review, a subsurface screening investigation for petroleum hydrocarbons in the proposed right-of-way (ROW) area may be appropriate prior to site acquisition.

We also list the site as Category 2, due to the presence of an aboveground fuel storage tank (AST) located on a separate, nearby parcel within the business park.

- "A. WOODS PEST CONTROL" – 4460 AIRPORT ROAD

We did not identify any specific hazardous material issues during our site visit. However, the commercial database search documents registered complaints of "uncontained discharge" of pesticide wash from trucks.

Based on its proximity to Airport Road, the site may be subject to partial acquisition. Current and past site uses could have resulted in shallow soil contamination and/or hazardous materials issues, including commercial and residential-use pesticides. Therefore, we recommend an owner interview, a review of the complaint at the County, and in the proposed acquisition area, we recommend shallow soil (upper 2 feet) sampling and analysis for pesticide residue.

- "LESTER GURR" – 4540 AIRPORT ROAD

There are no records of leaks or contamination shown in the database search. The database records indicate a historic 1,000-gal underground gasoline fuel tank existed on site, with no record of removal. Based on its proximity to the project alignment, the site is subject to possible partial acquisition.

The City of Redding has renumbered many addresses along Airport Road, and we were unable to make a positive identification of this property in the field. Based on old mailbox address numbers, we believe that a new commercial development has replaced the original residence.

We recommend a review of existing environmental records at the SCEHD and the RWQCB. We recommend performing a review of older assessor parcel maps and an owner interview to confirm that the new development is the old "Lester Gurr" property. Based on our interpretation of the airphotos, the original "Lester Gurr" residential structure was located adjacent to Airport Road. Unless previous redevelopment removed the entire residence and the 1,000-gal tank during demolition and grading there is a potential for the subgrade to contain residual building materials such as lead-based paint (LBP), asbestos containing building materials (ACM), the 1,000-gal UST, and old septic tanks.

- "RANCHO MARKET", 5000 AIRPORT ROAD

Also known as "Union 76" and "Don's Rancho Market". We identified possible LUST issues in the database search. Partial acquisition is possible based on the site's proximity to Airport Road. The original underground petroleum-fuel storage tanks were installed in 1984. In 1992, three new tanks replaced the original tanks. Petroleum hydrocarbon leaks were discovered during tank replacement. The responsible party performed remediation by over-excavating and disposing of impacted soil. Based on reviewed SCEHD records, petroleum hydrocarbons did not appear to impact groundwater. Based on data on the GeoTracker website, the RWQCB considers the case file closed.
To determine compliance with environmental regulations, or the status of possible new remediation activities, we recommend a review of existing documentation at the local RWQCB and an owner interview.

- "REDDING JET CENTER" – 6751 AIRPORT ROAD

This site also has the address of 6700 Airport Road. This site is used is a fuel depot to re-fill aircraft fueling trucks. The site is located adjacent to Airport Road, within about 150 feet of the east edge of pavement: therefore, it is subject to partial acquisition.

We identified leaking above- and underground storage tanks issues in the database search. The subject tanks include three 20,000-gals above ground storage tanks (ASTs), one 500-gal AST, and a 500-gal UST. The aboveground and belowground tanks leaked, impacting both soil and groundwater beneath the facility. A soil vapor survey conducted in 1989 found 150 ppm volatile organic compounds at 15 to 20 feet bgs. Soil samples tested have a maximum detection of 900 ppm total petroleum hydrocarbons (TPH); groundwater samples have concentrations between 1-2 mg/L TPH. The responsible parties conducted remediation and monitoring, and then requested site closure based on the results of groundwater monitoring conducted through 1997. Reviewed files indicate a general groundwater flow direction to the southwest (i.e. towards Airport Road). The RWQCB closed the case file in May 1997.

The reviewed files report the site as no longer in use. However, during our field reconnaissance, we observed numerous ASTs present on the site. The tanks appear new and active, although we did not observe any fuel trucks within the tank farm. We observed individuals conducting what appeared to be measurement and maintenance activities around the existing ASTs. We recommend an additional review of tank registration files at the County, and an interview with the appropriate Redding Airport personnel to determine the current use of the facility. Due to its close proximity to the potential ROW acquisition for Airport Road, we also recommend a limited subsurface screening for petroleum hydrocarbons, where Airport Road is located adjacent to the tank farm.

- "PG&E REDDING SERVICE CENTER" – 3600 MEADOWVIEW DRIVE

This PG&E property is located adjacent to the west side of Lockheed Drive, a frontage road that parallels Airport Road. The PG&E property line is about 60 feet west of the existing Airport Road edge of pavement. Based on its location, it appears the site is potentially subject to partial acquisition. We include the site in our review due to the potential for subsurface migration of petroleum hydrocarbons from former LUSTs.

During the mid-1990s, active USTs included a 550-gal waste oil tank, a 10,000-gal diesel fuel tank, and a 20,000-gal unleaded gasoline tank. These tanks were "closed" (as reviewed in the SCEHD files) around 1998. The responsible party conducted a Phase II investigation in 1999. The investigation revealed petroleum hydrocarbon contamination in soil and groundwater. Analytical test for soil ranged from 3 to 11 ppm diesel and 7 to 36 ug/L MTBE. Groundwater concentrations range from 24,000 to 64,000 ug/L diesel, and 19,000 to 60,000 ug/L MTBE. The records indicate remediation by excavation and disposal. We found no record for treatment of groundwater.

We recommended PG&E provide records confirming UST removal, as the records we reviewed at SCEHD are inconclusive. If no records are provided, then, based on the site's proximity to Airport Road, and the possibility that the existing frontage road (Lockheed Drive) may become a

part of the ultimate ROW for Airport Road, we recommend petroleum hydrocarbon screening of the subsurface of Lockheed Drive.

- "KENT'S MEAT & GROCERY" – 8080 AIRPORT ROAD

Based on this property's close proximity to Airport Road, acquisition of ROW is possible. Database records indicate a 1992 discovery of leaking underground fuel tanks (one 10,000-gal and three 4,000-gal) at this retail gas station. Gasoline-impacted soil was excavated and treated onsite between 1992 and 1996. Remediation activities appear contradictory; one "letter of record" indicates the case was closed in 1996 (SCEHD), and another record indicates remediation was conducted in 2000 (RWQCB). The records indicate the responsible party remediated by over-excavating and disposing impact soil during 2000. Based on the reviewed files and database records, petroleum hydrocarbons do not appear to impact groundwater. The RWQCB considers the case file closed.

Due to the size of the leaking tanks, the multiple entries for remediation activities, and the contradictory nature of some of the available information, there is a potential for remnant soil contamination. If the City plans to acquire the site, we recommend a detailed records review followed by an owner interview. Based on these new findings, we may also recommend soil sampling and analyses.

- "FORMER GAS STATION" – NORTHEAST CORNER OF AIRPORT RD & PRAIRIE LANE

This market has the appearance of a modified, post WWII service station, with the dispensing islands removed. The site is not listed on the commercial database search. Based on it's close proximity to Airport Road, the property is likely subject to acquisition.

We recommend an owner interview, additional air photo review, and a further search of environmental database records at the SCEHD. Past BCI investigations have unearthed small, 1,000-gal UST at sites with similar characteristics and conditions.

Category 2 Sites:

- "JW WOOD COMPANY, INC" – 3676 OLD HIGHWAY 44

Located 1,000+ feet west of Airport Road. The file reports the site with soil impacted by gasoline from a leaking UST. The impacts occurred around 1994. SCEHD closed the case file in 1998.

- "EAST REDDING CARDLOCK FACILITY" – 3025 CROSSROADS DRIVE

Located 400 feet east of Airport Road and south of Old Highway 44. The site has six (6) UST ranging in size from 5,000 to 15,000-gal. There are no reported leaks.

- "MAACO AUTO PAINTING" – 3045 CROSSROADS DRIVE

Located 400 feet east of Airport Road and south of Old Highway 44. The site is a small quantity generator of oxygenated solvents for hazmat disposal. The business emits organic gases and carbon dioxide.

- "CALIFORNIA DEPT. OF FOOD AND AGRICULTURE"– 3608 AND 3689 CHARLANNE DRIVE

The property is located in the "Charlanne" business park, about 400 feet west of Airport Road. In 1984, the operators installed a 1,000-gal UST. Current records do not indicate tank removal status, or reports of any leaks. Records indicate a small quantity of hazardous waste was generated and properly disposed. There are no reported violations.

- "AMERITECH INDUSTRIES, INC" – 20208 CHARLANNE DRIVE

Located about 300+ feet west of Airport Road, inside of the "Charlanne Business Park". Previous address was 4311 Airport Road. The business is a small quantity generator of oxygenated solvents. There are no reported violations.

- "NORTHERN CALIFORNIA SERVICE, CE" – 6101 AND 6103 AIRPORT ROAD

The site is located about 700 feet east of Airport Road. Also known as "CDF Fire Station No. 43", "Redding Forest Fire Station and Air Tanker Base", and "USDA Forest Service". We identified LUST issues in the database search. The LUST conditions resulted in impacts to soil and groundwater. More than 20 small (100- to 5,000-gal) underground fuel storage tanks were installed before 1984. We consider partial property acquisition unlikely, due to distance from Airport Road.

The records indicate many tanks are removed and have been replaced. The site owners conducted remediation and groundwater monitoring until 2002. Subsequently, the RWQCB issued a NFAR letter for the site.

- "H&H AIR SERVICE" – 3775 FLIGHT AVENUE

The site is located about 300 feet east of Airport Road. Although the site is likely not subject to partial acquisition, subsurface contaminant migration towards Airport Road is feasible within shallow perched groundwater conditions. From the records, we identified leaking underground storage tanks in the database search, which resulted in impacts to soil and groundwater. Impacts include "Jet fuel A" and aviation gasoline, measured at 50 and 390 ppm in soil, respectively, and MTBE at 3400 to 6,900 ug/L in groundwater. The owner subsequently removed two 12,000-gal tanks. A leaking waste oil tank also impacted soil with 36,000 ppm total oil and grease (TOG), and groundwater with 1,450 mg/L TOG. Monitoring wells were installed at the site, and were subsequently non-detect for petroleum hydrocarbons by March 1999. In 2004, the RWQCB issued a No Further Action Required (NFAR) letter, based on the reported corrective actions and existing conditions.

Based on the reviewed information, there is a potential for unidentified residual soil contamination around the site. Variable depth, shallow perched groundwater conditions are prevalent, as we noted in numerous remediation reports along Airport Road, thereby aiding potential contaminant migration. Although the site may be outside of potential ROW acquisition, it is proximal to the future road. We recommend an owner interview to confirm past activities, and to determine if USTs remain active on the site. At a minimum, construction documents must make the contractor aware of the potential for subsurface petroleum hydrocarbons if the proposed future Airport Road widening encroaches on this site.

- "REDDING MUNICIPAL AIRPORT" – 6751 AIRPORT ROAD

Based on the location of these sites, all of which are located more than 500 feet from Airport Road, we consider partial property acquisition unlikely. Other business names listed under the EDR database entry for the airport include "City of Redding Municipal Airport", "Redding Jet Center", "Iasco Flight Center", "Federal Express", "Sierra Pacific Ind. Airport" "Redding Army Airfield" and "Northstate Enterprises/Aviation Inc."

We identified possible LUST issues at the multiple listings of the database search. Existing and removed USTs vary from a single 500-gal to multiple 20,000-gal tanks. We identified other, ASTs and USTs at the airport during our review of records at SCEHD. Fuel leaks were discovered between 1990 and 1997, which subsequent investigations confirmed impacted soil and groundwater. The records indicate groundwater flow is to the south and southeast. The "Geotracker" webpage (SWRCB, 2007) indicates "no further action" is required, and they closed the case in 2004. Records reviewed at the SCEHD confirm remediation activities at the site. Their records show the site as "inactive."

We did not find definitive records of complete tank removal. We also did not see records indicating site closure at all locations at the airport. Consequently, we believe some tanks remain active. Based on this conclusion, there is a potential for unidentified residual soil contamination at the individual airport sites.

The property owner at the time of the release is responsible for remediation of any soil and groundwater contamination, including possible contaminant migration towards Airport Road. The potentially hazardous materials-impacted sites are at least 300 feet from Airport Road; therefore, we consider it a low possibility that subsurface contaminants have migrated under Airport Road. We recommend that the construction documents for the road widening project indicate that LUST conditions occurred at multiple sites at the airport. The documents shall have a response plan to protect worker safety in the event of encountering unexpected subsurface contamination, and a plan to provide appropriate notification to the fire department and the SCEHD.

- "REDDING ARMY AIRFIELD" – AIRPORT ROAD, REDDING, CA

This is a database entry for an Army Airfield that began operations in 1942. The airfield is located at the site of the current Redding Municipal Airport. The airfield was quit-claimed to the City of Redding in 1947. The file indicates removal and/or abandonment of the old tanks. The SCEHD issued a closure letter in March 2006.

- "PARADIGM MGR., INC" – 3711 MEADOWVIEW DRIVE

The parcel's improvements (commercial building, pavement, etc.) are located about 1,000 feet east of Airport Road. The records indicate the presence of two, 3,000-gal historic USTs (used for diesel and gasoline) on the site. There are no reported leaks. The undeveloped, southwestern portion of the property abuts Airport Road.

- "SHASTA TRACTOR & EQUIPMENT SUPPLY" – 8274 CHURN CREEK RD.

Located about 500 feet west of Airport Road. A leaking UST tank was removed around 1990. In 1997, MTBE is reported present in groundwater at 5 ppb. There are no other reported violations. A 1,000-gal gasoline tank and 10,000-gal diesel tank remain active onsite.

- "WYNTOUR GARDENS" – 8090 AIRPORT ROAD

We observed a commercial nursery at the northwest corner of Airport Road and Marvel Lane, called "Wyntour Gardens." The business likely uses herbicides and pesticides. We did not observe signs of obvious contamination from the front entrance. We show the site on Figure 2B as "Wyntour Gardens", Category 2.

- "STILLWATER WWTP" – 6475 AIRPORT ROAD

The impacted area of the plant is located more than 1,000 feet east of Airport Road. The site was reported to have 5 yards of gasoline-impacted soil from a leaking 200-gal UST. The site owners received a closure letter from the SCEHD in 1995. There is no report of clean-up activities in the reviewed file.

The facility operates under a RWQCB-issued Waste Discharge Requirements, who consider the site a minor threat to groundwater. The plant operates a registered AST. They also produce small quantities of hazardous waste for disposal.

**Generally Recognized Environmental Conditions**

- "OLDER RESIDENTIAL STRUCTURES"

The road widening may require the acquisition of a number of older residential properties located adjacent to Airport Road, particularly along the southern one-quarter of the identified road alignment. Old building foundations and water wells are also potentially present at residential sites. There is the potential for leach fields/septic tanks within the frontage of these parcels. Other potential hazardous materials issues include buried heating oil tanks, a common occurrence at older rural homes. If the proposed improvements require acquisition and/or demolition of these existing residential structures, then hazardous materials associated with the building materials include LCP and ACM. The design team estimates the width of proposed property acquisition at 50 to 150 feet along either side of Airport Road. Many residences are present within this distance. This report does not catalogue individual residence or structures that may be impacted.

- AERIALLY DEPOSITED LEAD (ADL)

Proposed project improvements include widening and grading adjacent to a 50+ year-old roadway. South of the Argyle Road intersection, Airport Road has existed since at least 1944. It is possible that ADL has accumulated in the shallow subsurface soil along the existing shoulders. Portions of Airport Road, where past road improvements have re-aligned or widened the older road, may have ADL accumulated beneath the existing pavement.

Guidelines for performing ADL investigations are generally lacking for cities and other local agencies. ADL associated with emissions from past use of leaded fuel has resulted in lead accumulation in the shoulder areas of heavily traveled roads prior to the ban of tetraethyl-lead.

High concentrations of ADL are a potential worker safety issue during grading. Lead in soil is typically the responsibility of the Contractor, who must address worker safety issues. If the City believes Airport Road to be a heavily traveled route, it may be in their best interest to perform an ADL assessment prior to construction, and incorporate this data into the construction documents. Including this information in the contract provides possible protection against ADL-related change-orders during construction.

- TRANSFORMERS

The scope of this assessment did not include an inventory of past and present transformers on parcels adjacent to Airport Road. However, BCI observed several pole-mounted and ground-based electrical transformers within either existing or proposed right-of-way. We recommend that the utility owners provide data to the City, warranting that these transformers are free of PCB contaminated oil, prior to pole removal or relocation. If PCBs are present, they are the responsibility of the transformer owner, and should be disposed of in accordance with current regulations.

- YELLOW TRAFFIC STRIPES

The existing yellow traffic striping may contain heavy metals such as lead and chromium at concentrations above the hazardous waste level defined by the California Code of Regulations (CCR). Consequently, removed yellow traffic striping require proper disposal at a Class 1 hazardous-waste disposal facility.

- PESTICIDES

Land use along Airport Road is a mix of agricultural use, and includes row crops, orchards, and possible grazing land. We observe historic orchards in the air photos. The project includes acquisition of former agricultural land. Therefore, there is a potential for the presence of residual pesticides, herbicides, and fungicides on land proposed for acquisition. Based on reviewed data (air photos and site visit), there is no obvious evidence of pesticide mixing, storage and/or misuse within the right-of-way acquisition areas. We recommend shallow subsurface screening for residual pesticides along the shoulders, where Airport Road is located adjacent to former orchards along the southern portion of the alignment.

Based on our experience, Caltrans does not typically require a pesticide investigation for right-of-way acquisition. However, that does not release the City of potential liability. The City must make their own risk assessment as the ultimate owners of the property.

## 1.0 INTRODUCTION

Parsons Brinckerhoff (PB) retained Blackburn Consulting (BCI) to perform this Initial Site Assessment (ISA) for the Airport Road Widening project in Redding, California. The proposed improvements are still conceptual (i.e. the final alignment is not yet established). However, in general, the proposed improvements include street widening up to 6-lanes along a 6.2 mile section. Because the project plans are preliminary, it's not clear which parcels, or portions of parcels, are needed to facilitate project construction; consequently, this ISA focuses on a corridor that extends approximately 150 feet in each direction from the Airport Road centerline.

Parcels identified in this ISA are those that have "recognized environmental conditions" (REC) [1] that may impact the subject corridor. We further divide these parcels into two categories:

- Category 1 – Parcels within the project corridor (i.e. within 150 feet of the Airport Road centerline) that have REC.

- Category 2 – Parcels with REC that are outside the project corridor, but have the potential to impact a parcel, or parcels, within the corridor.

We identify parcels by street address, and where possible, we identify them by a commercial business or alias name. Figure 1 is a project Vicinity Map. Figures 2A and 2B combined are a Site Map, showing parcels with REC.

### 1.1 Purpose & Scope

The purpose of this ISA is to:

- Identify REC that may influence property acquisition and/or project design.
- Identify REC that could influence project construction.

Therefore, to conduct this ISA, BCI:

- Discussed and coordinated the project with PB.
- Reviewed published literature regarding site geology and groundwater conditions.

[1] Recognized Environmental Condition (REC) as used in this report is defined in general, but not strict, compliance with ASTM E1527-05, which defines the meaning as *"the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on a property or into the ground, ground water, or surface water of the property. The term includes hazardous substances or petroleum products even under conditions in compliance with laws. The term is not intended to include de minimus conditions that generally do not present a threat to human health or the environment and generally would not be the subject of an enforcement action if brought to the attention of the appropriate regulatory agencies. Conditions determined to be de minimus are not recognized environmental conditions."* BCI includes this definition to clarify conditions addressed in this ISA, but, it does not imply that this ISA is compliant with ASTM E 1527 – 05.

- Conducted a site reconnaissance to observe current land use and potential indications of contamination on or adjacent to the project site. This includes documentation of areas showing evidence of surface staining; dumping; handling and mixing areas for hazardous materials such as pesticides, insecticides, and fuel products; apparent locations of fuel tanks and wells; and noted the presence of transformers.
- Reviewed historical aerial photographic coverage and topographic map coverage of the road alignment and adjacent properties for indications of potential sources for contamination.
- Reviewed a commercial database including federal, state, and county records for indications of the use, misuse, or storage of hazardous and/or potentially hazardous materials on or near the alignment.
- Attempted to identify past and present operations conducted on the properties to assess the potential for hazardous materials impacts, and their impact to future right-of-way acquisition. Our findings are limited by the tasks conducted to prepare this report. We did not exhaust all resources. If more information is needed regarding specific historic site use, added research may be needed.
- Conducted limited interviews with available persons knowledgeable about the history of the sites to determine potential environmental liabilities.
- Reviewed available environmental records at the Shasta County Environmental Health Department (SCEHD) and the Redding-area Regional Water Quality Control Board (RWQCB).
- Prepared this report, summarizing the findings of our review, site reconnaissance, historical photograph evaluation, and regulatory records review. Identified potential hazardous materials impacts and provided recommendation for further investigation and analysis, as needed.

## 2.0 PROJECT DESCRIPTION AND LOCATION

### 2.1 Description

The City of Redding (City) plans to widen Airport Road, from Old 44 Drive (just north of State Route 44) south to the Sacramento River. The proposed road improvements include sections located within Redding city limits and Shasta County. Airport Road is a major transportation link between the cities of Anderson and Redding, and consists of one northbound and one southbound lane, with turn pockets and turn lanes at intersections.

The City proposes to upgrade and widen Airport Road to create a divided street or highway, with partial to full control of access, and grade-separations at major intersections. A 4-lane or 6-lane widening is proposed. Future right-of-way needs vary from 110 to 150 feet in width along the existing road. The approximate length of the project is 6.2 miles.

The City of Redding and Parsons Brinckerhoff have developed preliminary plans defining the proposed improvements. The plans indicate improvements will affect

undeveloped parcels along both sides of Airport Road, including parcels with existing improvements. Some of these adjacent parcels have already dedicated frontage for future road improvements.

## 2.2 Location

Topography within the project corridor is relatively flat. Ground surface elevations (DWR, 2006) across the project corridor vary from a low of approximately 470 feet above mean sea level (msl) near Churn Creek Road (south end of the alignment), to a high of approximately 520 feet msl near Old 44 Drive (at the north end of the alignment). We show the site location on Figure 1.

## 2.3 Current Land Use

Land use within the "study area" includes:

- Retail gas sales
- Public Utility (PG&E Service Center)
- Convenience Stores (food, nursery, etc.)
- Commercial businesses (storage, painting, auto repair, bakery, etc.)
- Specialty businesses (irrigation, pumps, aircraft and airline services, etc.)
- Business parks and storage facilities
- Specialty Manufacture (Frozen Food)
- Public Infrastructure (public water wells, wastewater treatment, etc.)
- Rural and semi-rural residential
- Undeveloped land, non-agricultural (zoned for commercial and/or residential development)

Land use in the surrounding area includes commercial, light industrial, urban and rural residential, agricultural, and fallow non-agricultural property. Many businesses along Airport Road serve the airport/aircraft industry, or appear related to the operations of Redding Airport.

## 2.4 Historical Land Use

Aerial Photograph Review

BCI's aerial photo review included photos from 1952 and 1998. The following summary describes the most significant changes along the Airport Road corridor.

We reviewed the following photographic years:

*1952* *Photo by Robinson, Scale 1 inch = 1,000 feet*

*1998* *Photo by USGS, Scale 1 inch = 1,000 feet*

This summary of our aerial photograph review divides the subject corridor into four (4) roughly equal-sized segments. We list the segments in order from north to south.

- Segment 1 – covers the section from Old 44 Drive south to Lupine Drive.
- Segment 2 – covers the section from Lupine Drive south to Devere Road.
- Segment 3 – covers the section from Devere Road south to Fig Tree Lane.
- Segment 4 – covers the section from Fig Tree Lane south to the Sacramento River.

*1952 Aerial Photographs –Segment 1*

- Airport Road appears as a relatively narrow, two-lane, asphalt-paved road. Airport Road is located predominately as it exists today, with the following exceptions; at the north end Airport Road follows what is presently Argyle Road, and terminates at Old 44 Drive (then SR44). The current alignment of SR 44 does not exist. The present alignment is located predominately in an undeveloped area with oak trees and grassland. None of the present-day commercial businesses, infrastructure improvements, or residential structures are present along the northern 7,000 feet of the road alignment, except for a large farm-type structure and barn along the east side of Airport Road.
- Topographically, the northern one-quarter of the road alignment appears similar to today. We note a small area of agriculture adjacent to the previously noted farm building(s). An area of residential development is present to the west of Airport Road, just north of Lupine Drive.

*1952 Aerial Photographs –Segment 2*

- For this segment, the alignment of Airport Road appears as it exists today. Predominate land use is a mixture of fallow land and active agriculture. Residential development is rural, with homes located along Rancho Road, and a semi-rural residential development north and west of the intersection of Airport Road and Rancho Road.
- The channel for Stillwater Creek is present along the east side of the photograph, east of Airport Road. Churn Creek is visible to the west of Airport Road. Other, unnamed ephemeral stream channels and shallow drainages flow predominately from north to south in the land area between the two creek channels.
- No commercial structures are present. Along the east side of Airport Road, agricultural-land uses have the appearance of rice fields and orchards. Most roads intersecting Airport road appear unpaved. Vegetation and topography appear similar to that observed in the present.

*1952 Aerial Photographs –Segment 3*

- The majority of the Redding Airport and associated runway, taxiways, and aprons are visible in the photograph. The only structure at the airport is a small terminal along the west side of the airport property. Older, military aircraft-style holding aprons are visible along the south property line.
- The majority of the photograph exhibits undeveloped land, mostly covered with shrubs and trees. A small area of farmland is visible in the southeast corner of the photograph, just north of Fig Tree Lane. Churn Creek is visible along the west side of the photo, with farmland shown to the west of Churn Creek.
- The photo shows Airport Road following an old alignment, running east along the present-day Meadowview Road, then south along Aero Street. The old alignment then jogs east along Fig Tree Lane, south along present-day Skyway Street, and intersects the current alignment of Airport Road north of Lassen Lane. The current road alignment is located in barren, undeveloped land.

*1952 Aerial Photographs –Segment 4*

- Airport Road is bordered by orchards and other, deciduous trees, from south of Fig Tree Lane to River Valley Drive. Rural and semi-rural residences are visible, mostly close to Airport Road. Previously described shallow drainage to the north begin to consolidated to form a prominent stream channel that intersects the Sacramento River just east of its confluence with Churn Creek.
- About 1,000 feet west of Airport Road, most land use appears fallow and undeveloped. West of Churn Creek (about 3,000 to 5,000 feet west of Airport Road), land use is agricultural. Around River Valley Drive, semi-rural residences are present. Non-orchard, agricultural land use is intermittently present east of Airport Road, from Churn Creek Road to the Sacramento River.

*1998 Aerial Photographs – Segment 1*

- Most of Airport Road appears as it does today. However, Airport Road no longer follows Argyle Road (as in 1952), but is routed to the east along its present alignment. The new SR44 alignment is complete, with an overpass and interchange at Airport Road. Commercial and residential development at the intersection of Old 44 Drive and Airport Road is nearly identical to the improvements present today.
- There is a commercial business park along the west side of Airport Road, between Skypark Drive and Charlanne Drive. The City of Redding has constructed a waste transfer station along Old Oregon Trail, located about 1,000+ feet east of Airport Road. Residential development is present to the west of Argyle Road.

- Residential development borders the east and west sides of the Charlanne Drive business park. New commercial buildings are present along the east side of Airport Road. Open space appears similar to today. More land is in agricultural use compared to 1952.

*1998 Aerial Photographs – Segment 2*

- Rural residences and semi-rural residential development are present east and west of Airport Road. Most commercial structures and related driveway/road improvements appear as they do today. These include: 1) a retail gasoline station at Rancho Road, 2) a mini-storage facility along Airport Road, 3) a California Department of Forestry (CDF) flight-line fire fighting facility located at the north end of the Redding Airport (and adjacent to the east side of Airport Road), 4) a small business park at Electro Way, and 5) a frozen food facility opposite of the Avetech Parkway intersection with Airport Road. Avtech Parkway is an asphalt-paved road that dead-ends about 500-feet east of Airport Road. Building pads are visible, but there are no commercial structures along the road.
- More agricultural land is under production compared to 1952. However, a previously described large orchard area is no longer visible. The Redding Airport runway extends approximately 1,000 feet north of its previous northern terminus. Some of the airport's current infrastructure improvements (such as stripping, taxiways, aircraft hangers, aprons, etc) are visible in the 1998 photograph.
- Topographically, Airport Road appears unchanged from 1952. Some portions of Airport Road appear repaved and widened. Trees have matured. Vegetation along the west side of Airport Road is clear-cut about 500 feet wide for three-quarter of a mile between Rancho Road and Avtech Parkway.

*1998 Aerial Photographs – Segment 3*

- The Redding Airport has expanded significantly, with infrastructure improvements and numerous new commercial structures on the airport property. The layout of new access roads and buildings appear much as they do today. Lockheed Drive is present along the west side of Airport Road, serving as a frontage road for a future commercial business park, not yet developed.
- Near the intersection of Meadowview Road, the PG&E Service Center is present west of Airport Road. A few new commercial structures are present along the south side of Meadowview Road, both east and west of Airport Road.
- Medium-density residential development is present west of Airport Road, and extends nearly to Churn Creek.

- Topographically, Airport Road appears unchanged from the 1952 photograph. Vegetation has matured, and agricultural land use is slightly expanded from that observed in the 1952 photograph. Overall, Airport Road is similar to its present appearance, including the diagonal road realignment located between Meadowview Road and Skyway Street.

*1998 Aerial Photographs – Segment 4*

- This area has undergone significant development compared to the 1952 photo. Semi-rural and suburban style residential development is prominent throughout this portion of the road alignment. Significant changes include a wastewater treatment facility located east of Airport Road and north of the Sacramento River, a new gas station at the Marvel Lane intersection, and a plant nursery located adjacent to the new gas station. Other small, commercial buildings and businesses are also present.
- A residential trailer park is visible about 1,500 feet west of Airport Road, near the intersection of Hole-in-One Drive. A nine-hole golf course is adjacent and west of the trailer park.
- The 1952 photograph shows the removal of nearly all of the orchards. Remnants of the orchards are still visible as less than ½-acre size geometric tree patterns, mostly east of Airport Road.

Topographic Map Review

BCI's topographic map review includes 7½-minute, 15-minute, 30-minute, and 60-minute scale, USGS quad maps from 1894, 1913, 1944, 1948, 1957, 1965, and 1969. This summary includes the noted changes within the project area as recorded on the maps:

*1894 - Red Bluff Quad, Scale 1:250,000*

- The map shows the location of the Cities of Redding and Anderson, relative to the approximate alignment of Airport Road. The map shows a road that appears similar in alignment to present-day Airport Road where it crosses the Sacramento River just north of Anderson. This road continues due north to intersect an east-west oriented road near the present-day Highway 44. Stillwater Creek and Churn Creek are shown east and west of the present Airport Road alignment.
- Topographically, the Airport road alignment appears similar to today. Other roads around the City of Redding, include a north-south trending, linear feature that appears to be a travel route between the cities of Chico and Sacramento. The Oregon Division Central Pacific Railroad links Redding and Anderson, along the west side of the Sacramento River.

*1913 - Redding Quad, Scale 1:125,000*

- The map shows a portion of Airport Road, extending from pre-Highway 44 (called Loomis Corners) to about the location of the present-day Redding Airport. The road appears as a single lane, unpaved roadway.
- The map exhibits six structures along the Airport Road.

*1944 - Redding Quad, Scale 1:62,500*

- Airport Road is shown as a single-lane, paved road, from Highway 44 to south of the Redding Airport. At the north end, Airport Road follows the alignment of the present-day Argyle Road. The present day alignment is characterized as unimproved woodland area.
- Except for the airport improvements and a high-power, overhead electric transmission line located about 800 feet west and parallel to the road, no other significant, new development is shown along Airport Road.

*1948 - Anderson Quad, Scale 1:62,500*

- This map includes only the southern half of the section of Airport Road addressed in this report. From south of the Redding Airport, Airport Road is shown following an old alignment of the present-day Meadowview Road, Aero Street, Fig Tree Lane, and Skyway Street, prior to continuing along the current alignment south of Skyway Street.
- The map shows a few additional residential structures adjacent to this portion of Airport Road, mostly between Aero Street and Skyway Street.

*1957 - Enterprise Quad, Scale 1:24,000*

- This map shows Airport Road from Highway 44 to south of the Redding Airport. North of the Redding Airport, about 20 new residential structures are present within 150 feet of Airport Road.
- A small reservoir is present along the east side of Airport Road, located opposite of the intersection of Charlanne Drive and Airport Road.
- A cemetery is present along the south side of Rancho Road, about 1,500 feet east of the road's intersection with Airport Road.
- The map shows the Airport Road alignment following the same topographic contours as today.
- The map shows Clover Creek located between Airport Road and Churn Creek. A tributary from this drainage flows beneath Airport Road, about 1,500 feet north of the intersection with Meadowview Drive. Other drainages follow courses similar to that exhibited on current maps.

*1965 - Cottonwood Quad, Scale 1:24,000*

- This map shows only the south portion of Airport Road, from the Sacramento River to slightly north of Meadowview Drive.

- Significant semi-rural residential development is present in the area between the intersections of Fig Tree Lane and Churn Creek Road.
- An orchard is present along the east side of Airport Road, between the intersections of Dersch Road and Churn Creek Road.
- Clover Creek crosses beneath Airport Road near the entrance to the Wastewater Treatment plant.

*1969 – Enterprise Quad, Scale 1:24,000*

- The road alignment extends from Old 44 Drive to south of the Redding Airport. Short, 500- to 1,000-feet sections of new roadway are shown intersecting Airport Road. These serve small business parks and/or residential developments.
- The new alignment of State Route 44 is shown on the map, including the non-Argyle Road alignment of the Airport Road Over-crossing of SR44. We note residential and commercial development along Airport Road, from Rancho Road to 300 feet north of Pickford Way. The previously noted reservoir and cemetery are unchanged from the 1957 topographic map.
- The waste transfer station along Old Oregon Trail is on the map.
- The map shows Redding Airport with new improvements including parking aprons, control tower, and aircraft operations structures. The CDF fire station and Forest Service buildings are present at the northwest corner of the Redding Airport property.

## 3.0 RECORDS REVIEW

### 3.1 Review of County, State, and Federal Records

We requested EDR perform a corridor search for the study area. The search includes a search and review of Tribal, County, State, and Federal databases. The report searched the following databases:

- National Priorities List (NPL)
- NPL Delisted
- Resource Conservation and Recovery Act Information (RCRAS-TSDF)
- DTSC's Hazardous Waste & Substances Site List (CORTESE)
- Comprehensive Environmental Response, Compensation, And Liability Information (CERLCIS)
- Comprehensive Environmental Response, Compensation, And Liability Information (CERC-NFRAP)
- US engineering Controls (US ENG CONTROLS)
- US Institutional Controls (US INST CONSTROLS)
- California FID (Ca. FID)

- Above Ground Petroleum Storage Tank Facilities (AST)
- Leaking Underground Storage Tank Information System (LUST)
- Hazardous Substance Storage Container Database (UST)
- Cal Sites Database (CALSITES)
- DTSC's Registered Hazardous Waste Transporters (DTSCHWT)
- Resource Conservation And Recovery Information System, Small Quantity Generator (RCRIS-SQG)
- Resource Conservation And Recovery Information System, Large Quantity Generator (RCRIS-LQG)
- DTSC's DEED Restrictions (DTSCDR)
- Solid Waste Information System (SWIS)
- Waste Management Unit Database (WMUDS/SWAT)
- California Hazardous Materials Information Reporting System (CHMIRS)
- Underground Storage Tanks Facility Index Database (USTFID)
- Emergency Response Notification System (ERNS)
- Facility Index System (FINDS)
- Underground Storage Tank Certified Unified Program Agencies (USTCUPA)
- Waterwell Database (WATERWELL)
- Hazardous Waste Tanner Summary (HWTS)
- Records Of Decision (ROD)
- Spills, Leaks, Investigation, and Cleanup Recovery Listing ( SLIC)
- Hazardous Waste & Substances Site List (HWSSL)
- Open Dump Inventory (ODI)
- AIRS Facility Subsystem (AFS)
- Historical Underground storage Tanks (HUST)
- School Property Evaluation Form (SCH)
- Unconfirmed Properties Referred to Another Agency (REF)
- No Further Action Determination (NFA)
- Properties Needing Further Evaluation (NFE)
- Statewide SLIC Cases (SLIC)
- Statewide Environmental Evaluation and Planning System(SWEEPS UST)
- Deed Restriction Listing (DEED)
- Cleaner facilities (DRYCLEANER)
- Clandestine Drug Lab (CDL)
- Facility and Manifest Data (HAZNET)
- Emissions Inventory Data (EMI)
- Recycler Database (SWRCY)
- EnviroStor Database of Brownsfield Sites (ENVIROSTOR)
- Indian Reservation LUST and UST

EDR conducted a database search for a one-mile width along Airport Road. The north end of the alignment starts near the intersection of Airport Road with Old 44 Drive, and the south end is located at the Sacramento River. EDR plotted sites with adequate

address information on a site plan titled "EDR Data Map – Corridor Study", attached in the appendix. BCI reviewed the complete list of "orphan sites" (sites without proper address) identified by EDR. None of these sites are located within the "study area". Two listings in the main database search were found to be outside of the alignment and improperly placed within the search radius; they were therefore, dismissed from our review. Sites not discussed are beyond the one-mile boundary of the study area. An electronic copy of the EDR report is included in Appendix A.

Where appropriate, we note significant changes related to potential soil/groundwater contamination and/or hazardous materials issues at properties exhibited in the commercial database search report, sites subject to potential acquisition, or that warrant further study due to known contamination issues.

### 3.2 Summary of Records Search

To generate this summary, we reviewed commercial and public database search records for sites within ¼-mile of the project's proposed roadway improvements. This summary discusses parcels within the study area where the records search identified contamination and/or known or potentially soil/groundwater contamination and/or hazardous materials issues. It includes a brief description of each listed parcel, the parcel address (if known), why we list the parcel, and which database record included the site.

Where applicable, the compiled summary information includes data reviewed at the local Shasta County Environmental Health Department (SCEHD) and the Redding branch office of the Regional Water Quality Control Board (RWQCB). We base our property descriptions and parcel locations on the results of our field review of physical site conditions. We include photographs of specific parcels of interest in Appendix B.

According to the breakdown described in the Introduction (Section 1.0), we divide this summary into two categories:

- Category 1 – Parcels within the project corridor (i.e. within 150 feet of the Airport Road centerline) that have RECs, and

- Category 2 – Parcels with RECs that are outside the project corridor, but have the potential to impact a parcel, or parcels, within the corridor.

We show the approximate Category 1 and 2 parcels locations on Figures 2A and 2B.

<u>Category 1 Sites</u>:

- "JMB OIL COMPANY" –3672 CHARLANNE DRIVE

JMB Oil Company has two listed addresses. The first address, 3672 Charlanne Drive, is located within 150 feet of Airport Road (Category 1). The second address, 20266 Charlanne Drive, has an AST, and is located more than 150 feet from Airport Road. Therefore, we also include the site on the Category 2 list of parcels.

At 3672 Charlanne Drive, the first documentation of USTs is in 1986 when the owner replaced the original tanks with larger, 1,000-gal tanks. The site plan on file with the County shows these tanks located adjacent to Airport Road. A leak was detected in 1995.

At that time, the site owner submitted an application to destroy (remove) the tanks. It was determined sometime during the tank removal/remediation investigation that gasoline and diesel leaks from the tanks created soil contamination. Remediation included a 17-foot deep excavation to remove impacted soil. The tanks were removed and site remediation was completed by 1997. SCEHD closed the case file in September 1997.

This site is included on the following lists:

- AST
- SWEEPS UST
- LUST
- CORTESE
- CA FID UST

- "A. WOODS PEST CONTROL" – 4460 AIRPORT ROAD

This parcels distance off Airport Road is unclear; however, based on the EDR map, this parcel appears to be located adjacent to the east side of Airport Road near the location depicted on Figure 2A. However, we could not locate this address or this business in the field. At appears to us that sometime in the past, the County or City renumbered parcel addresses along Airport Road. Based on addresses observed on old mailboxes along the west side of Airport Road, it appears that the A. Woods Pest Control building is gone. A new business development replaced the original structures.

This property was the subject of private-party complaints of "discharge of pesticide wash from trucks." In 1988, the SCEHD forwarded their complaint review report to the RWQCB. Subsequently, the RWQCB issued a NFAR letter.

The site is included on the following list:

- ENVIROSTOR

- "LESTER GURR" – 4540 AIRPORT ROAD

Based on the EDR maps, this property is located adjacent to the east side of Airport Road. However, we could not locate the property in the field. Sometime in the past, the County or City appears to have renumbered parcel addresses along Airport Road. Based on what appears to be the original addresses (observed on old mailboxes) along the west side of Airport Road, it appears that this property's residential structure was removed and replaced with a new commercial structure, the "Amigo Supplier" business, located at 8693 Airport Road.

Based on the EDR database, regular gasoline was stored in a 1,000-gal UST. The database report does not indicate the tank installation date. The status of tank removal is unknown. There are no reported impacts to soil or groundwater.

The site is included on the following list:

- HIST UST

- "RANCHO MARKET"– 5000 AIRPORT ROAD

The property is located at the northwest corner of the intersection of Rancho Road and Airport Road. Also known as the "Don's Rancho Market", address 8510 Airport Road. The site is reported with a 10,000-gal UST in 1984. In 1992, two additional tanks were added; a 6,000-and a 10,000-gal. The owner added a new fuel inventory system with leak sensors to meet new standards in 1998. Based on a review of the SCEHD records, there are no reported leaks at the site.

The site is included on the following lists:

- HIST UST
- CA FID UST
- SWEEPS UST

- "REDDING JET CENTER" – 6751 AIRPORT ROAD

This site appears to be located within approximately 150 feet of the east side of Airport Road. In addition to 6751 Airport Road, the parcel appears to be listed as 6700 Airport Road. The City of Redding (aka: Redding Municipal Airport) owns the site. Originally, Chevron (Facility No. 1001568) operated and leased the facility from the City.

This is a fuel depot used to re-fill aircraft fueling trucks. The site is located adjacent to Airport Road, within about 150 feet of the east edge of pavement. The site is adjacent and south of the "CDF Fire Station and Air Tanker Base", and "USDA Forest Service".

We identified leaking above- and underground storage tanks issues in the database search. Based on the SCEHD records, Chevron constructed the fuel depot facility at the present location around mid-1970, and included three, 20,000-gal AST, one, 500-gal AST, and a 500-gal UST. Chevron operated the facility until the mid-1980s. The aboveground and belowground tanks leaked, impacting both soil and groundwater beneath the facility. A soil vapor survey conducted in 1989 found 150 ppm volatile organic compounds at 15 to 20 feet bgs. Soil samples detected 900 ppm total petroleum hydrocarbons (TPH); groundwater samples detected 1-2 ppm TPH. Chevron performed remediation and monitoring at the site, and then requested site closure based on the results of groundwater monitoring conducted through 1997. The RWQCB closed the

case file in May 1997. The files report the site as no longer in use. However, during our field reconnaissance, we noted individuals conducting what appeared to be measurements/maintenance around the existing ASTs.

The site is included on the following lists:

- CHIMRS
- LUST
- HIST UST
- HAZNET

- "PG&E REDDING SERVICE CENTER" – 3600 MEADOWVIEW DRIVE

The PG&E service center property line is about 80 feet west of the Airport Road. The PG&E property is located adjacent to the west side of Lockheed Drive, a frontage road that parallels Airport Road.

We conducted a field visit and a file review at the SCEHD. During the mid-1990s, active USTs included a 550-gal waste oil tank, a 10,000-gal diesel fuel tank, and a 20,000-gal unleaded gasoline tank. Based on the records, these tanks were closed (removed?) around 1998. The responsible party conducted a Phase II investigation in 1999. The investigation revealed petroleum hydrocarbon contamination in soil and groundwater. Soil analyses detected 3 to 11 ppm diesel and 7 to 36 ppb MTBE. Groundwater analyses detected 24,000 to 64,000 ug/L diesel, and 19,000 to 60,000 ug/L MTBE. Complete remediation by excavation and disposal is indicated in the records. We found no records indicating that a regulatory over-site agency issued a NFAR letter.

We also observed large soil stockpiles in the maintenance yard. These may be environmentally-impacted soils excavated for remediation purposes.

The property is listed on the following database lists:

- CA FIND UST
- AST
- HAZNET
- SWEEPS UST
- RCRA-SQG
- LUST
- FINDS
- CORTESE

- "KENT'S MEAT & GROCERY" – 8080 AIRPORT ROAD

This parcel is located immediately adjacent Airport Road at Marvel Lane. In addition to the Meat and Grocery Store the parcel hosts a "Union 76 Station."

SCEHD records indicate a leak was found during tank removal and two (2) USTs were replaced. Petroleum contaminated soil was excavated and disposed. The RWQCB issued a NFAR letter in 1996. Currently, the site has four registered tanks, including one, 10,000-gal and three 4,000-gal USTs.

The property is listed on the following database lists:

- CA FIND UST
- SWEEPS UST
- GEOTRACKER
- LUST
- CORTESE
- SWRCY
- HIST UST

Category 2 Sites:

- "JMB OIL COMPANY" – 20266 CHARLANNE DRIVE

The JMB Oil Company has two sites within the business park (see listing in Category 1). This site is located approximately 300 feet west of Airport Road. SCEHD records for this parcel indicate that the local fire department denied an application for installation of two, 10,000-gal tanks, for a new "cardlock" facility. Based on the reviewed records, it does not appear that the "cardlock" fuel facility was constructed. The records do note that the parcel contains an active 10,000-gal above ground storage tank.

This site is included on the following lists:

- AST
- SWEEPS UST
- CORTESE
- CA FID UST

- "JW WOOD COMPANY, INC" – 3676 OLD HIGHWAY 44

Located 1,000+ feet west of Airport Road. The file reports the site with soil impacted by gasoline from a leaking UST. The impacts occurred around 1994. SCEHD closed the case file in 1998.

The site is included on the following lists:

- LUST
- CORTESE

- "EAST REDDING CARDLOCK" – 3025 CROSSROADS DRIVE

Located 400 feet east of Airport Road and south of Old Highway 44. The site has six (6) UST ranging in size from 5,000 to 15,000-gal. There are no reported leaks.

The site is included on the following lists:

  - SWEEPS
  - UST

- "MAACO AUTO PAINTING" – 3045 CROSSROADS DRIVE

Located 400 feet east of Airport Road and south of Old Highway 44. The site is a small quantity generator of oxygenated solvents for hazmat disposal. The business emits organic gases and carbon dioxide.

The site is included on the following lists:

  - RCRA
  - FIND
  - HAZNET
  - EMI

- "CALIFORNIA DEPT. OF FOOD AND AGRICULTURE"– 3608 AND 3689 CHARLANNE DR.

The property is located in the "Charlanne" business park, about 400 feet west of Airport Road. In 1984, the operators installed a 1,000-gal UST. Current records do not indicate tank removal status, or reports of any leaks. Records indicate a small quantity of hazardous waste was generated and properly disposed. There are no reported violations.

The site is included on the following lists:

  - HIST UST
  - RCRA-SQG
  - FINDS

- "AMERITECH INDUSTRIES, INC" – 20208 CHARLANNE DR.

Located about 300+ feet west of Airport Road, inside of the "Charlanne Business Park". Previous address was 4311 Airport Road. The business is a small quantity generator of oxygenated solvents. There are no reported violations.

The site is included on the following lists:

  - RCRA
  - FINDS
  - HAZNET

- "NORTHERN CALIFORNIA SERVICE, CE" – 6101 AND 6103 AIRPORT ROAD

The site is located about 700 feet east of Airport Road. Also known as "CDF Fire Station No. 43", "Redding Forest Fire Station and Air Tanker Base", and "USDA Forest Service". We identified LUST issues in the database search. The LUST conditions resulted in impacts to soil and groundwater. More than 20 small (100- to 5,000-gal) underground fuel storage tanks were installed before 1984. We consider partial property acquisition unlikely, due to distance from Airport Road.
The records indicate many tanks are removed and have been replaced. The site owners conducted remediation and groundwater monitoring until 2002. Subsequently, the RWQCB issued a NFAR letter for the site.

The sites are included on the following lists:

- HIST UST
- LUST
- HWTS
- CA FID UST
- FIND
- HAZNET

- "H & H AIR SERVICE" – 3775 FLIGHT AVENUE

The site is located about 300 feet east of Airport Road. We identified leaking underground storage tank issues in the database search. LUST conditions, discovered in 1997, resulted in impacts to soil and groundwater. To assess conditions, five borings were drilled around the existing UST. "Jet fuel A" and aviation gasoline was measured at 50 and 390 ppm in soil, respectively. Impacts consist of MTBE measured at 3,400 to 6,900 ug/L in groundwater. The owner subsequently removed two, 12,000-gal tanks.

A leaking waste oil tank, located on the adjacent City of Redding property, was also removed. Soil and groundwater impacts equaled 36,000 ppm total oil and grease (TOG) in soil, and 1,450 mg/L TOG in groundwater. By 1999, the values were non-detect in soil samples and groundwater samples tested from three new wells. In 2004, the RWQCB issued an NFAR letter, based on the reported corrective actions and existing conditions.

The site is included on the following lists:

- HAZNET
- LUST
- CORTESE

- "REDDING MUNICIPAL AIRPORT" – 6751 AIRPORT ROAD

The following described businesses are located at least 500 feet east of Airport Road. Multiple sites are found at this address, including "Iasco Flight Center", "Jet Air", "MillionAir", "Sierra Pacific Enterprises", Northstate Enterprises/Aviation Inc.", and "Federal Express". An alternative site address is 6749 Airport Road. The multiple sites are located along Flight Avenue, Airway Avenue, Woodward Circle, and Muni Boulevard. We observed each site in the field.

Based on our review of database records and records from the SCEHD, it appears that the tank leaks at the individual sites impacted local soil and groundwater. Contaminants include gasoline, diesel and fuel oxygenates. At each of the sites, the responsible party performed a Phase II assessment, and subsequently conducted tank removal and remediation activities. Groundwater was present at relatively shallow depths, typically between 8 to 12 feet bgs. Groundwater flow is predominately to the south. Remediation consisted predominately of contaminated soil removal, and of pump and treat systems for impacted groundwater. The leaking tanks were discovered in the mid 1990s, and all remediation activities are reported as complete by 2001. All sites have received a closure letter or a "No further action required" (NFAR) letter from the oversight agencies (SCEHD or the RWQCB).

The sites are included on the following lists:

- CA FIND UST
- SWEEPS UST
- HAZNET
- LUST
- CORTESE
- CHIMRS
- HIST UST

- "REDDING ARMY AIRFIELD" – AIRPORT ROAD, REDDING, CA

This is a database entry for an Army Airfield that began operations in 1942. The airfield is located at the site of the current Redding Municipal Airport. The airfield was quit-claimed to the City of Redding in 1947. The file indicates removal and/or abandonment of the old tanks. The SCEHD issued a closure letter in March 2006.

The site is included on the following list:

- FUDS

- "PARADIGM MGR., INC" – 3711 MEADOWVIEW DRIVE

The parcel's improvements (commercial building, pavement, etc.) are located about 1,000 feet east of Airport Road. The records indicate the presence of two, 3,000-gal

historic USTs (used for diesel and gasoline) on the site. There are no reported leaks. The undeveloped, southwestern portion of the property abuts Airport Road. The site is included on the following list:

- HIST UST

- "SHASTA TRACTOR & EQUIPMENT SUPPLY" – 8274 CHURN CREEK RD.

Located about 500 feet west of Airport Road. A leaking UST tank was removed around 1990. In 1997, MTBE is reported present in groundwater at 5 ppb. There are no other reported violations. A 1,000-gal gasoline tank and 10,000-gal diesel tank remain active onsite.

The site is included on the following lists:

- LUST
- CORTESE

- "STILLWATER WWTP" – 6475 AIRPORT ROAD

The impacted area of the plant is located more than 1,000 feet east of Airport Road. The site was reported to have 5 yards of gasoline-impacted soil from a leaking 200-gal UST. The site owners received a closure letter from the SCEHD in 1995. There is no report of clean-up activities in the reviewed file.

The facility operates under a RWQCB-issued Waste Discharge Requirements, who consider the site a minor threat to groundwater. The plant operates a registered AST. They also produce small quantities of hazardous waste for disposal.

The site is included on the following lists:

- HAZNET
- AST
- FINDS
- TCA WDS
- LUST
- CORTESE

### 3.3 Review of Title Documents

BCI's scope for this assessment does not include review of title documents.

### 3.4 Prior Environmental Investigations

We reviewed select environmental reporting and investigation documents at the RWQCB and the SCEHD. Where appropriate, we note the reviewed files in our summary of conditions at the respective Category 1 and Category 2 sites.

We did not review any other environmental assessment documents conducted for Airport Road or other nearby projects. If they are available, please submit them for our review during the next phase of the study.

### 3.5 Well Search

A well search was not included in the scope of this study.

## 4.0 RECONNAISSANCE AND OTHER INFORMATION

### 4.1 Visual Observations

We made our visual observations from publicly accessible areas (i.e. Airport Road and nearby roads, publicly accessible driveways and parking lots, access roads through business parks, and other public right-of-ways). Consequently, our observations are limited to features readily observable from parcel perimeters.

The two main objectives of our visual observations were:

- Observe sites with already identified RECs.
- Observe the project corridor for evidence of RECs not identified by other tasks used to develop the findings presented in this ISA.

For sites with previously identified RECs (i.e. sites discussed in Sections 2.4 and 3.2), our visual observations are consistent with the previous description, so the site descriptions are not repeated hear.

Following is a list of sites with RECs not previously identified in this report.

- SHELL SERVICE STATION - We observed a Shell service station called the "Fast Track Food & Fuel" located at 9539 Airport Road. Although not listed on the commercial database search, the business must be registered with the SCEHD, and likely produces small quantities of hazardous waste. We did not observe obvious signs of contamination, groundwater monitoring wells, or remediation equipment. We show the site on Figure 2A as "Shell Station", Category 1.
- WYNTOUR GARDENS - We observed a commercial nursery at the northwest corner of Airport Road and Marvel Lane, called "Wyntour Gardens." The business likely uses herbicides and pesticides. We did not observe signs of obvious contamination from the front entrance. We show the site on Figure 2B as "Wyntour Gardens", Category 2.
- FORMER SERVICE STATION - A small food market located at the northeast corner of Airport Road and Prairie Lane has the appearance of a 1950s style service station. The commercial database search does not list the property. We did not observe obvious signs of contamination or groundwater monitoring wells. Based

on it's close proximity to Airport Road, this property is likely subject to site acquisition. We show the site on the Figure 2B as "Former Gas Station", Category 1.

- UNDERGROUND UTILITIES - At numerous locations, we observed underground utilities adjacent and parallel to Airport Road, including petroleum product pipelines, sanitary sewer lines, and utility manholes.

## 5.0 FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

We directed the scope of this initial site assessment at:

- Determining whether there may be recognized environmental conditions on or near the proposed roadway improvements at levels that are likely to warrant mitigation pursuant to regulations, and
- Identifying sites with recognized environmental condition issues that may impact property acquisition and redevelopment.

Our assessment identified the following environmental conditions that Parsons Brinckerhoff and the City of Redding should consider during planning and design for the proposed Airport Road Widening.

### 5.1 Sites with Recognized Environmental Conditions

Category 1 Sites:

- "SHELL STATION", 9539 OLD OREGON TRAIL

Also known as "Fast Track Food and Fuel." We identified probable underground storage tank (UST) conditions during our site reconnaissance. Partial acquisition is possible, based on the site's proximity to Airport Road. We did not observe any signs of obvious soil and/or groundwater contamination at the site. The environmental database records do not list the site. Service stations typically generate small quantities of hazardous waste.

To determine compliance with environmental regulations, or the status of possible leaking underground storage tanks (LUST) remediation activities, we recommend a review of appropriate documents at the local Regional Water Quality Control Board (RWQCB) and Shasta County Environmental Health Department (SCEHD).

- "JMB OIL COMPANY" – 3672 CHARLANNE DR.

A former service station and auto repair shop. Based on its location adjacent to Airport Road, the site is subject to possible partial acquisition. In 1986, "JMB" installed two, 1,000-gal tanks to replace smaller UST at the fueling station. The database search records indicate the presence of soil contamination from LUST in 1995. Subsequently, the owner excavated seventeen feet of contaminated soil to remediate the site. Review of

the SCEHD records confirms the presence of soil contamination. It appears that the County oversaw the remediation effort, and subsequently, the County closed the case in 1997.

There is a potential for residual contamination, including the potential for off-site contaminant migration beneath the proposed right-of-way acquisition area. To confirm that the leak did not affect groundwater, we recommend a review of environmental records at the RWQCB and owner interview. Based on the results of the owner interview and file review, a subsurface screening investigation for petroleum hydrocarbons in the proposed right-of-way (ROW) area may be appropriate prior to site acquisition.

We also list the site as Category 2, due to the presence of an aboveground fuel storage tank (AST) located on a separate, nearby parcel within the business park.

- "A. WOODS PEST CONTROL" – 4460 AIRPORT ROAD

We did not identify any specific hazardous material issues during our site visit. However, the commercial database search documents registered complaints of "uncontained discharge" of pesticide wash from trucks.

Based on its proximity to Airport Road, the site may be subject to partial acquisition. Current and past site uses could have resulted in shallow soil contamination and/or hazardous materials issues, including commercial and residential-use pesticides. Therefore, we recommend an owner interview, a review of the complaint at the County, and in the proposed acquisition area, we recommend shallow soil (upper 2 feet) sampling and analysis for pesticide residue.

- "LESTER GURR" – 4540 AIRPORT ROAD

There are no records of leaks or contamination shown in the database search. The database records indicate a historic 1,000-gal underground gasoline fuel tank existed on site, with no record of removal. Based on its proximity to the project alignment, the site is subject to possible partial acquisition.

The City of Redding has renumbered many addresses along Airport Road, and we were unable to make a positive identification of this property in the field. Based on old mailbox address numbers, we believe that a new commercial development has replaced the original residence.

We recommend a review of existing environmental records at the SCEHD and the RWQCB. We recommend performing a review of older assessor parcel maps and an owner interview to confirm that the new development is the old "Lester Gurr" property. Based on our interpretation of the airphotos, the original "Lester Gurr" residential structure was located adjacent to Airport Road. Unless previous redevelopment removed the entire residence and the 1,000-gal tank during demolition and grading there is a potential for the subgrade to contain residual building materials such as lead-based paint (LBP), asbestos containing building materials (ACM), the 1,000-gal UST, and old septic tanks.

- "RANCHO MARKET", 5000 AIRPORT ROAD

Also known as "Union 76" and "Don's Rancho Market". We identified possible LUST issues in the database search. Partial acquisition is possible based on the site's proximity to Airport Road. The original underground petroleum-fuel storage tanks were installed in 1984. In 1992, three new tanks replaced the original tanks. Petroleum hydrocarbon leaks were discovered during tank replacement. The responsible party performed remediation by over-excavating and disposing of impacted soil. Based on reviewed SCEHD records, petroleum hydrocarbons did not appear to impact groundwater. Based on data on the GeoTracker website, the RWQCB considers the case file closed.

To determine compliance with environmental regulations, or the status of possible new remediation activities, we recommend a review of existing documentation at the local RWQCB and an owner interview.

- "REDDING JET CENTER" – 6751 AIRPORT ROAD

This site also has the address of 6700 Airport Road. This site is used is a fuel depot to re-fill aircraft fueling trucks. The site is located adjacent to Airport Road, within about 150 feet of the east edge of pavement: therefore, it is subject to partial acquisition.

We identified leaking above- and underground storage tanks issues in the database search. The subject tanks include three 20,000-gals above ground storage tanks (ASTs), one 500-gal AST, and a 500-gal UST. The aboveground and belowground tanks leaked, impacting both soil and groundwater beneath the facility. A soil vapor survey conducted in 1989 found 150 ppm volatile organic compounds at 15 to 20 feet bgs. Soil samples tested have a maximum detection of 900 ppm total petroleum hydrocarbons (TPH); groundwater samples have concentrations between 1-2 mg/L TPH. The responsible parties conducted remediation and monitoring, and then requested site closure based on the results of groundwater monitoring conducted through 1997. Reviewed files indicate a general groundwater flow direction to the southwest (i.e. towards Airport Road). The RWQCB closed the case file in May 1997.

The reviewed files report the site as no longer in use. However, during our field reconnaissance, we observed numerous ASTs present on the site. The tanks appear new and active, although we did not observe any fuel trucks within the tank farm. We observed individuals conducting what appeared to be measurement and maintenance activities around the existing ASTs. We recommend an additional review of tank registration files at the County, and an interview with the appropriate Redding Airport personnel to determine the current use of the facility. Due to its close proximity to the potential ROW acquisition for Airport Road, we also recommend a limited subsurface screening for petroleum hydrocarbons, where Airport Road is located adjacent to the tank farm.

- "PG&E REDDING SERVICE CENTER" – 3600 MEADOWVIEW DRIVE

This PG&E property is located adjacent to the west side of Lockheed Drive, a frontage road that parallels Airport Road. The PG&E property line is about 60 feet west of the existing Airport Road edge of pavement. Based on its location, it appears the site is

potentially subject to partial acquisition. We include the site in our review due to the potential for subsurface migration of petroleum hydrocarbons from former LUSTs.

During the mid-1990s, active USTs included a 550-gal waste oil tank, a 10,000-gal diesel fuel tank, and a 20,000-gal unleaded gasoline tank. These tanks were "closed" (as reviewed in the SCEHD files) around 1998. The responsible party conducted a Phase II investigation in 1999. The investigation revealed petroleum hydrocarbon contamination in soil and groundwater. Analytical test for soil ranged from 3 to 11 ppm diesel and 7 to 36 ug/L MTBE. Groundwater concentrations range from 24,000 to 64,000 ug/L diesel, and 19,000 to 60,000 ug/L MTBE. The records indicate remediation by excavation and disposal. We found no record for treatment of groundwater.

We recommended PG&E provide records confirming UST removal, as the records we reviewed at SCEHD are inconclusive. If no records are provided, then, based on the site's proximity to Airport Road, and the possibility that the existing frontage road (Lockheed Drive) may become a part of the ultimate ROW for Airport Road, we recommend petroleum hydrocarbon screening of the subsurface of Lockheed Drive.

- "KENT'S MEAT & GROCERY" – 8080 AIRPORT ROAD

Based on this property's close proximity to Airport Road, acquisition of ROW is possible. Database records indicate a 1992 discovery of leaking underground fuel tanks (one 10,000-gal and three 4,000-gal) at this retail gas station. Gasoline-impacted soil was excavated and treated onsite between 1992 and 1996. Remediation activities appear contradictory; one "letter of record" indicates the case was closed in 1996 (SCEHD), and another record indicates remediation was conducted in 2000 (RWQCB). The records indicate the responsible party remediated by over-excavating and disposing impact soil during 2000. Based on the reviewed files and database records, petroleum hydrocarbons do not appear to impact groundwater. The RWQCB considers the case file closed.
Due to the size of the leaking tanks, the multiple entries for remediation activities, and the contradictory nature of some of the available information, there is a potential for remnant soil contamination. If the City plans to acquire the site, we recommend a detailed records review followed by an owner interview. Based on these new findings, we may also recommend soil sampling and analyses.

- "FORMER GAS STATION" – NORTHEAST CORNER OF AIRPORT RD & PRAIRIE LANE

This market has the appearance of a modified, post WWII service station, with the dispensing islands removed. The site is not listed on the commercial database search. Based on it's close proximity to Airport Road, the property is likely subject to acquisition.
We recommend an owner interview, additional air photo review, and a further search of environmental database records at the SCEHD. Past BCI investigations have unearthed small, 1,000-gal UST at sites with similar characteristics and conditions.

Category 2 Sites:

- "JW WOOD COMPANY, INC" – 3676 OLD HIGHWAY 44

Located 1,000+ feet west of Airport Road. The file reports the site with soil impacted by gasoline from a leaking UST. The impacts occurred around 1994. SCEHD closed the case file in 1998.

- "EAST REDDING CARDLOCK FACILITY" – 3025 CROSSROADS DRIVE

Located 400 feet east of Airport Road and south of Old Highway 44. The site has six (6) UST ranging in size from 5,000 to 15,000-gal. There are no reported leaks.

- "MAACO AUTO PAINTING" – 3045 CROSSROADS DRIVE

Located 400 feet east of Airport Road and south of Old Highway 44. The site is a small quantity generator of oxygenated solvents for hazmat disposal. The business emits organic gases and carbon dioxide.

- "CALIFORNIA DEPT. OF FOOD AND AGRICULTURE"– 3608 AND 3689 CHARLANNE DR.

The property is located in the "Charlanne" business park, about 400 feet west of Airport Road. In 1984, the operators installed a 1,000-gal UST. Current records do not indicate tank removal status, or reports of any leaks. Records indicate a small quantity of hazardous waste was generated and properly disposed. There are no reported violations.

- "AMERITECH INDUSTRIES, INC" – 20208 CHARLANNE DR.

Located about 300+ feet west of Airport Road, inside of the "Charlanne Business Park". Previous address was 4311 Airport Road. The business is a small quantity generator of oxygenated solvents. There are no reported violations.

- "NORTHERN CALIFORNIA SERVICE, CE" – 6101 AND 6103 AIRPORT ROAD

The site is located about 700 feet east of Airport Road. Also known as "CDF Fire Station No. 43", "Redding Forest Fire Station and Air Tanker Base", and "USDA Forest Service". We identified LUST issues in the database search. The LUST conditions resulted in impacts to soil and groundwater. More than 20 small (100- to 5,000-gal) underground fuel storage tanks were installed before 1984. We consider partial property acquisition unlikely, due to distance from Airport Road.

The records indicate many tanks are removed and have been replaced. The site owners conducted remediation and groundwater monitoring until 2002. Subsequently, the RWQCB issued a NFAR letter for the site.

- "H&H AIR SERVICE" – 3775 FLIGHT AVENUE

The site is located about 300 feet east of Airport Road. Although the site is likely not subject to partial acquisition, subsurface contaminant migration towards Airport Road is feasible within shallow perched groundwater conditions. From the records, we identified leaking underground storage tanks in the database search, which resulted in impacts to soil and groundwater. Impacts include "Jet fuel A" and aviation gasoline, measured at 50 and 390 ppm in soil, respectively, and MTBE at 3400 to 6,900 ug/L in groundwater. The

owner subsequently removed two 12,000-gal tanks. A leaking waste oil tank also impacted soil with 36,000 ppm total oil and grease (TOG), and groundwater with 1,450 mg/L TOG. Monitoring wells were installed at the site, and were subsequently non-detect for petroleum hydrocarbons by March 1999. In 2004, the RWQCB issued a No Further Action Required (NFAR) letter, based on the reported corrective actions and existing conditions.

Based on the reviewed information, there is a potential for unidentified residual soil contamination around the site. Variable depth, shallow perched groundwater conditions are prevalent, as we noted in numerous remediation reports along Airport Road, thereby aiding potential contaminant migration. Although the site may be outside of potential ROW acquisition, it is proximal to the future road. We recommend an owner interview to confirm past activities, and to determine if USTs remain active on the site. At a minimum, construction documents must make the contractor aware of the potential for subsurface petroleum hydrocarbons if the proposed future Airport Road widening encroaches on this site.

- "REDDING MUNICIPAL AIRPORT" – 6751 AIRPORT ROAD

Based on the location of these sites, all of which are located more than 500 feet from Airport Road, we consider partial property acquisition unlikely. Other business names listed under the EDR database entry for the airport include "City of Redding Municipal Airport", "Redding Jet Center", "Iasco Flight Center", "Federal Express", "Sierra Pacific Ind. Airport" "Redding Army Airfield" and "Northstate Enterprises/Aviation Inc."

We identified possible LUST issues at the multiple listings of the database search. Existing and removed USTs vary from a single 500-gal to multiple 20,000-gal tanks. We identified other, ASTs and USTs at the airport during our review of records at SCEHD. Fuel leaks were discovered between 1990 and 1997, which subsequent investigations confirmed impacted soil and groundwater. The records indicate groundwater flow is to the south and southeast. The "Geotracker" webpage (SWRCB, 2007) indicates "no further action" is required, and they closed the case in 2004. Records reviewed at the SCEHD confirm remediation activities at the site. Their records show the site as "inactive."

We did not find definitive records of complete tank removal. We also did not see records indicating site closure at all locations at the airport. Consequently, we believe some tanks remain active. Based on this conclusion, there is a potential for unidentified residual soil contamination at the individual airport sites.

The property owner at the time of the release is responsible for remediation of any soil and groundwater contamination, including possible contaminant migration towards Airport Road. The potentially hazardous materials-impacted sites are at least 300 feet from Airport Road; therefore, we consider it a low possibility that subsurface contaminants have migrated under Airport Road. We recommend that the construction documents for the road widening project indicate that LUST conditions occurred at

multiple sites at the airport. The documents shall have a response plan to protect worker safety in the event of encountering unexpected subsurface contamination, and a plan to provide appropriate notification to the fire department and the SCEHD.

- "REDDING ARMY AIRFIELD" – AIRPORT ROAD, REDDING, CA

This is a database entry for an Army Airfield that began operations in 1942. The airfield is located at the site of the current Redding Municipal Airport. The airfield was quit-claimed to the City of Redding in 1947. The file indicates removal and/or abandonment of the old tanks. The SCEHD issued a closure letter in March 2006.

- "PARADIGM MGR., INC" – 3711 MEADOWVIEW DRIVE

The parcel's improvements (commercial building, pavement, etc.) are located about 1,000 feet east of Airport Road. The records indicate the presence of two, 3,000-gal historic USTs (used for diesel and gasoline) on the site. There are no reported leaks. The undeveloped, southwestern portion of the property abuts Airport Road.

- "SHASTA TRACTOR & EQUIPMENT SUPPLY" – 8274 CHURN CREEK RD.

Located about 500 feet west of Airport Road. A leaking UST tank was removed around 1990. In 1997, MTBE is reported present in groundwater at 5 ppb. There are no other reported violations. A 1,000-gal gasoline tank and 10,000-gal diesel tank remain active onsite.

- "WYNTOUR GARDENS" – 8090 AIRPORT ROAD

We observed a commercial nursery at the northwest corner of Airport Road and Marvel Lane, called "Wyntour Gardens." The business likely uses herbicides and pesticides. We did not observe signs of obvious contamination from the front entrance. We show the site on Figure 2B as "Wyntour Gardens", Category 2.

- "STILLWATER WWTP" – 6475 AIRPORT ROAD

The impacted area of the plant is located more than 1,000 feet east of Airport Road. The site was reported to have 5 yards of gasoline-impacted soil from a leaking 200-gal UST. The site owners received a closure letter from the SCEHD in 1995. There is no report of clean-up activities in the reviewed file.

The facility operates under a RWQCB-issued Waste Discharge Requirements, who consider the site a minor threat to groundwater. The plant operates a registered AST. They also produce small quantities of hazardous waste for disposal.

## 5.2 Generally Recognized Environmental Conditions

- "OLDER RESIDENTIAL STRUCTURES"

The road widening may require the acquisition of a number of older residential properties located adjacent to Airport Road, particularly along the southern one-quarter of the identified road alignment. Old building foundations and water wells are also potentially present at residential sites. There is the potential for leach fields/septic tanks within the frontage of these parcels. Other potential hazardous materials issues include buried

heating oil tanks, a common occurrence at older rural homes. If the proposed improvements require acquisition of and grading through the existing residential structures, then hazardous materials associated with the building materials include LCP and ACM. The design team estimates the width of proposed property acquisition at 50 to 150 feet either side of Airport Road. Many residences are present within this distance; however, we do not identify individual residential structures.

- AERIALLY DEPOSITED LEAD (ADL)

Proposed project improvements include widening and grading adjacent to a 50+ year-old roadway. South of the Argyle Road intersection, Airport Road has existed since at least 1944. It is possible that ADL has accumulated in the shallow subsurface soil along the existing shoulders. Portions of Airport Road, where past road improvements have re-aligned or widened the older road, accumulated ADL may be present beneath the existing pavement.

Guidelines for performing ADL investigations are generally lacking for cities and other local agencies. ADL associated with emissions from past use of leaded fuel has resulted in lead accumulation in the shoulder areas of heavily traveled roads prior to the ban of tetraethyl-lead. High concentrations of ADL are a potential worker safety issue during grading. Lead in soil is typically the responsibility of the Contractor, who must address worker safety issues. If the City believes Airport Road to be a heavily traveled route, it may be in their best interest to perform an ADL assessment prior to construction, and incorporate this data into the construction documents. Including this information in the contract provides possible protection against ADL-related change-orders during construction.

- TRANSFORMERS

The scope of this assessment did not include an inventory of past and present transformers on parcels adjacent to Airport Road. However, BCI observed several pole-mounted and ground-based electrical transformers within either existing or proposed right-of-way. We recommend that the utility owners provide data to the City, warranting that these transformers are free of PCB contaminated oil, prior to pole removal or relocation. If PCBs are present, they are the responsibility of the transformer owner, and should be disposed of in accordance with current regulations.

- YELLOW TRAFFIC STRIPES

The existing yellow traffic striping may contain heavy metals such as lead and chromium at concentrations above the hazardous waste level defined by the California Code of Regulations (CCR). Consequently, removed yellow traffic striping require proper disposal at a Class 1 hazardous-waste disposal facility.

- PESTICIDES

Land use along Airport Road is a mix of agricultural use, and includes row crops, orchards, and possible grazing land. We observe historic orchards in the air photos, mostly between the intersections of Lassen View Lane and River Valley Road with Airport Road. The project includes acquisition of former agricultural land. Therefore,

there is a potential for the presence of residual pesticides, herbicides, and fungicides on land proposed for acquisition. Based on reviewed data (air photos and site visit), there is no obvious evidence of pesticide mixing, storage and/or misuse within the right-of-way acquisition areas. We recommend shallow subsurface screening for residual pesticides along the shoulders, where Airport Road is located adjacent to former orchards along the southern portion of the alignment.
Based on our experience, Caltrans does not typically require a pesticide investigation for right-of-way acquisition located in agricultural land used for production of row crops. However, the City must make their own risk assessment as the ultimate owners of the property.

## 6.0 LIMITATIONS

The accompanying report summarizes the findings and opinions of Blackburn Consulting (BCI), with regard to the potential for hazardous materials to be present on the properties at concentrations likely to warrant mitigation under current statutes and guidelines. Our findings and opinions are based on information obtained on given dates or provided by specified individuals, through records review, site review, and related activities. Our information is only as good as the information provided to us. Conditions can change after we have made our observations. We cannot warrant or guarantee that hazardous materials do not exist at the described site. To reduce your risk, an extensive invasive exploration may be necessary.

This report was prepared for the specific use of our client. The report applies only to the subject corridor. We are not responsible for interpretations by others of data presented in this report. This report does not represent a legal opinion. BCI does no express or imply a warranty. We base our conclusions in this report on judgment and experience. We performed this work in accordance with generally accepted standards of practice existing in northern California at the time of the assessment.

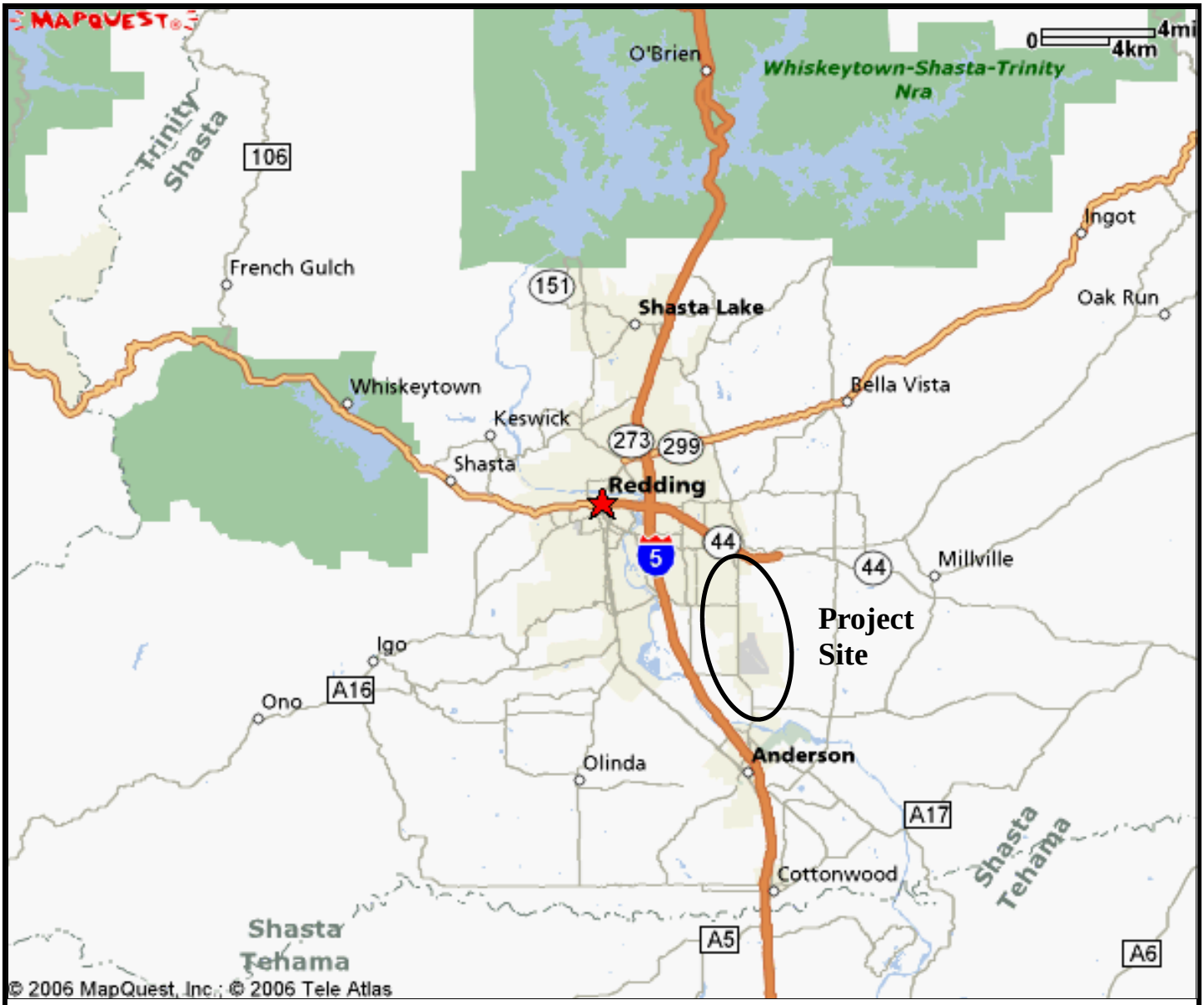
The scope of our investigation did not include determining the presence of radon, lead-based paint, or asbestos-containing materials. Identifying endangered species, geologic hazards, archeological sites, wetlands habitat, or ecologically sensitive areas are also beyond the scope of this report.

The governmental records portion of this report is derived from public records and is updated on a continual basis. For this reason, we do not advise you to use this information to base a decision after 90 days of the issue date of this report. Also, conditions at the site can and will change over time. Please contact BCI to revise this report to reflect new information.

FIGURES

**Figure 1 – Vicinity Map**

**Figure 2A and 2B – Areas of Concern Map**




N

No Scale

blackburn consulting

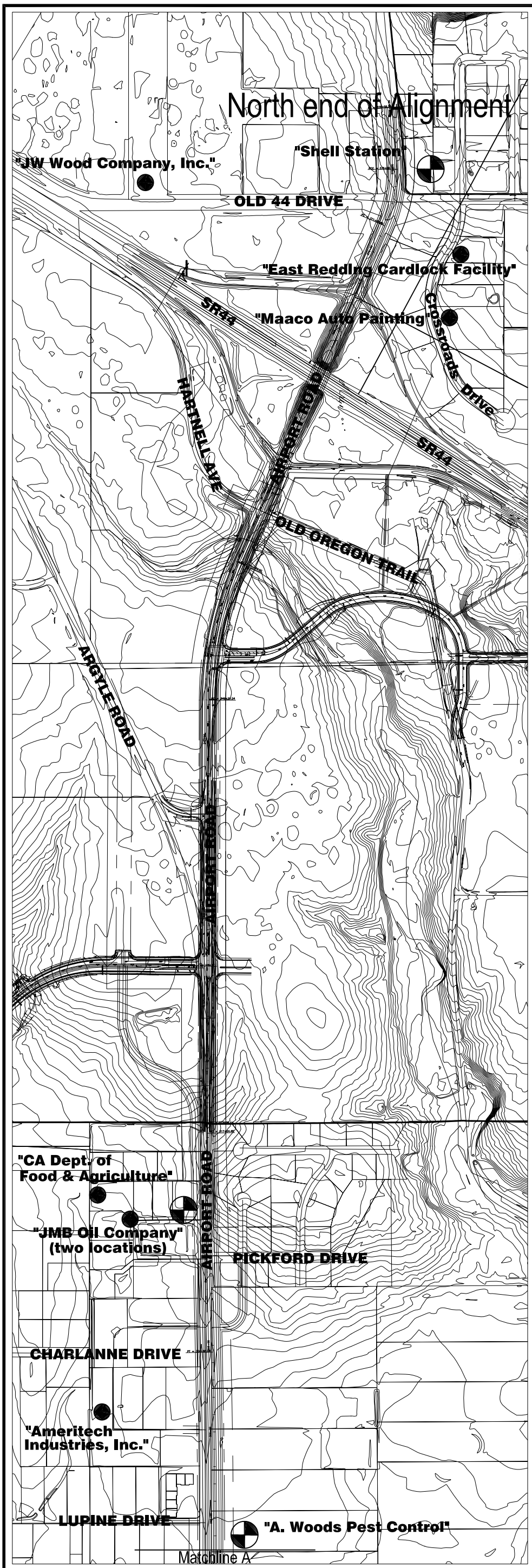
11521 Blocker Drive, Suite 110
Auburn, CA 95603
(530) 887-1494
(530) 887-1495-Fax
www.blackburnconsulting.com

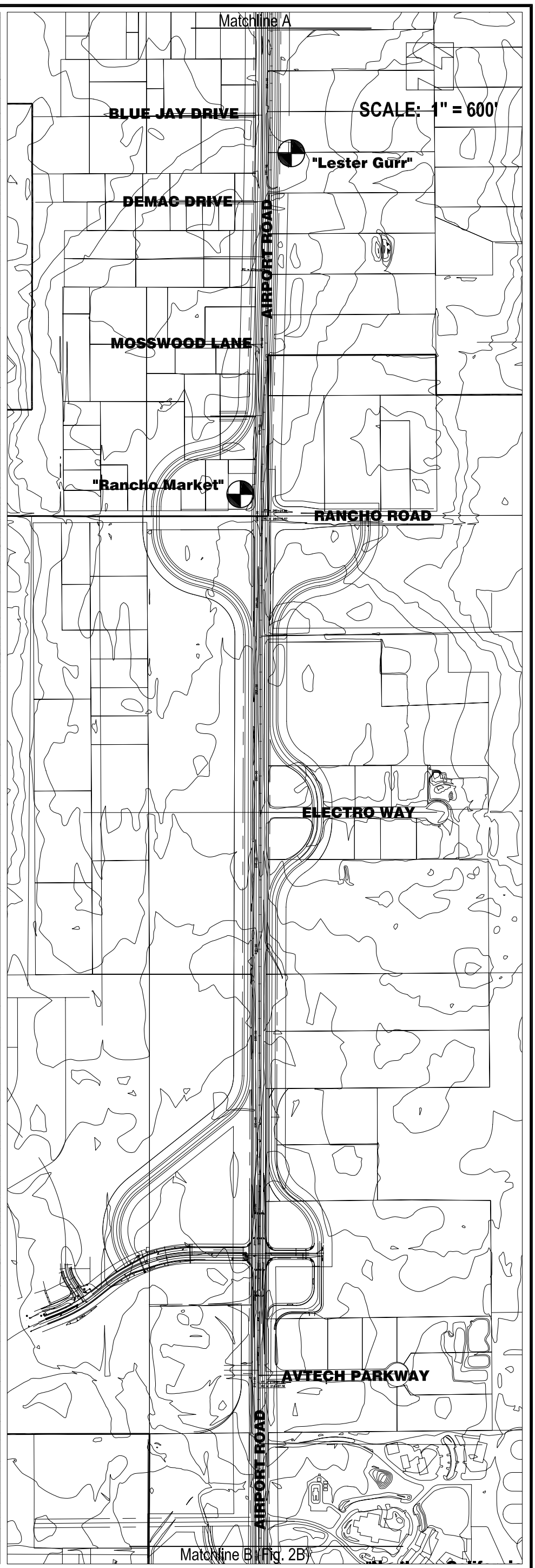
# VICINITY MAP
## Airport Road ISA
### Airport Road Widening Project
### City of Redding, Shasta County, CA

Job: 1067.1

June 2007

Figure 1




Original mapping by : Parsons Brinckerhoff, 2006

**LEGEND**

CATEGORY 1 AREA OF CONCERN

CATEGORY 2 AREA OF CONCERN

blackburn consulting

Blackburn Consulting, Inc.
11521 Blocker Drive, Ste 110
Auburn, CA 95603
Phone: (530) 887-1494
Fax: (530) 887-1495
www.blackburnconsulting.com

**AREAS OF CONCERN**

Airport Road ISA

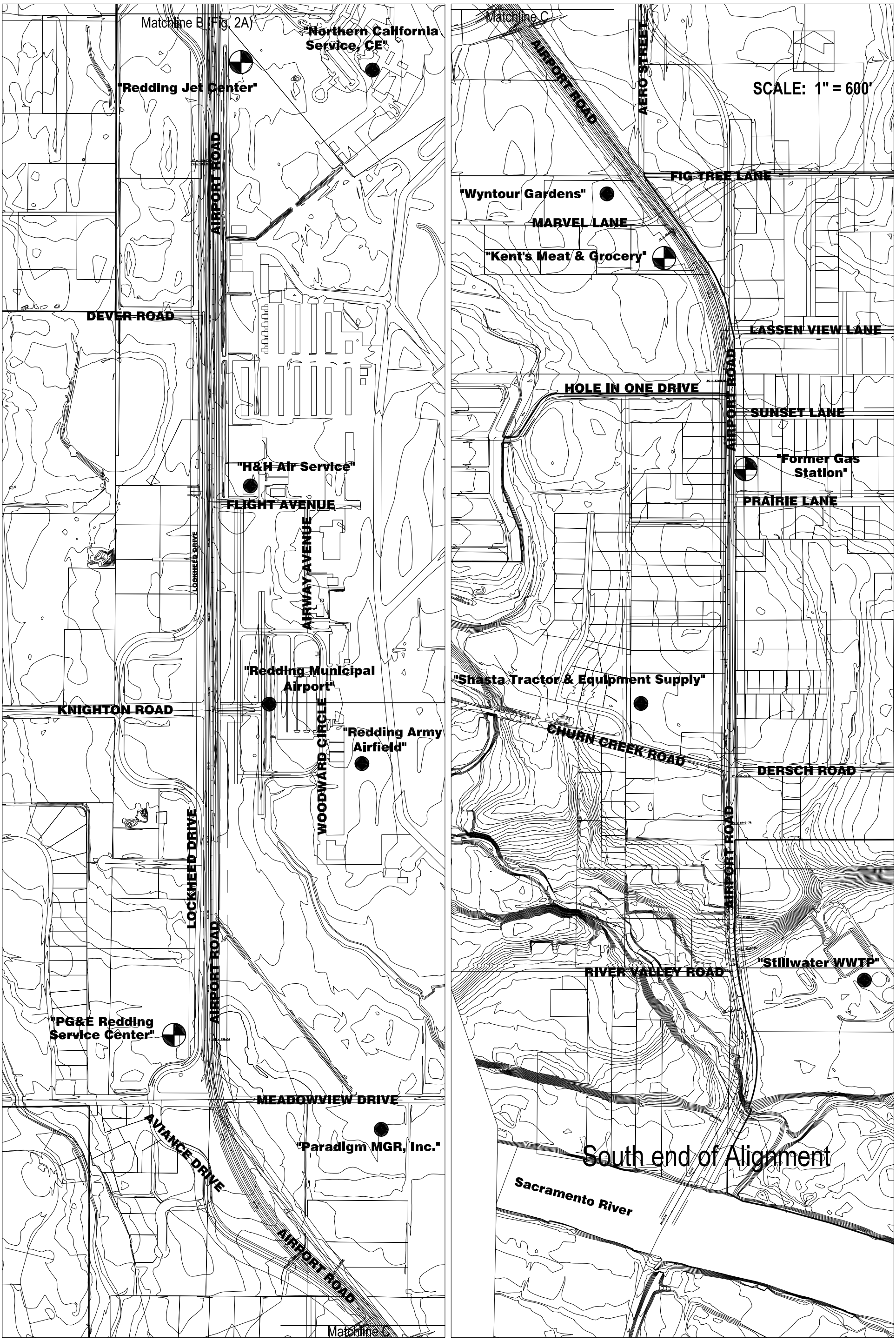
Airport Road Widening Project

Shasta County, California

File No. 1067.1

June 2007

Figure 2A




Original mapping by : Parsons Brinckerhoff, 2006

**LEGEND**

CATEGORY 1 AREA OF CONCERN

CATEGORY 2 AREA OF CONCERN

blackburn consulting

Blackburn Consulting, Inc.
11521 Blocker Drive, Ste 110
Auburn, CA 95603
Phone: (530) 887-1494
Fax: (530) 887-1495
www.balckburnconsulting.com

**AREAS OF CONCERN**
Airport Road ISA
Airport Road Widening Project
Shasta County, California

File No. 1067.1

June 2007

Figure 2B