

[NOTE: the map ("Figure 1") referred to in this document is available on this website; the remaining documentation (Figures, Tables, and Appendices) have not been posted, but can be obtained by sending a request by email to vbrandon@lakelive.org.]

I. INTRODUCTION

This traffic and parking analysis has been prepared for the City of Clearlake as part of the EIR analysis of the Provinsalia Golf Community. The project would be located just north of Cache Creek in the southeast section of the City (see **Figure 1**). Existing weekday AM and PM peak hour traffic counts have been conducted and operating conditions determined at nine major intersections in the project vicinity, including all major intersections along State Route 53 in the City of Clearlake and in the community of Lower Lake. Pre- and post-school traffic and pedestrian surveys have also been conducted in the vicinity of the Lower Lake elementary and high schools along Lake Street near the project. Project traffic impacts have been determined in relation to year 2010 (half project buildout), year 2015 (full project buildout) and year 2020 (cumulative area development) traffic conditions. Measures have then been recommended to mitigate any significant project impacts for each analysis horizon year.

II. PROJECT DESCRIPTION AND PROPOSED ACCESS

The Provinsalia Golf Community will contain 720 single family residential units and a nine-hole public golf course. There will be a small snack shop at the golf course for use by players or local residents. It is doubtful if this restaurant facility will attract any significant number of customers from outside the project's immediate area. At least 35 percent of the project units are projected by the project applicant to be occupied by seniors/active retirees.

Project access will be provided via Dam Road, which now ends as a two-lane paved street at the project's western boundary, while emergency vehicle access will be provided to 18th Avenue (see **Figure 2—Site Plan**) via a connection to Dam Road to the west of the project (i.e. the emergency vehicle access will not directly connect into the project site). The existing narrow sections of Dam Road from the project site to west of Lake Street will be widened to provide a 24-foot-wide pavement within a 60-foot right-of-way. An eight-foot-wide pedestrian/bicycle path will also be provided along one side of the improved Dam Road.

III. SETTING

This section describes the circulation system network that will be potentially impacted by project traffic and its existing operation.

A. ROADWAYS

Project traffic will potentially produce significant volume increases along Dam Road, Lake Street, Main Street, State Route 53, State Route 29 and Lakeshore Drive, while 18th Avenue would serve as part of the project's emergency vehicle access route connection to State Route 53. Each roadway is briefly described below, while **Figure 3** provides a schematic presentation of lanes and control at each intersection evaluated in the study.

State Route 53 (S.R.53) extends northerly for about 7.5 miles between State Route 29 (in Lower Lake) and State Route 20. It is the only state highway in the City of Clearlake. S.R.53 has four travel lanes from Lower Lake to just north of the Lakeshore Drive/40th Avenue intersection in Clearlake; it continues as a two-lane highway to State Route 20. S.R.53 has signalized intersections with State Route 29/Main Street in Lower Lake and with Dam Road/Old Highway 53, 18th Avenue and Lakeshore Drive/40th Avenue in the City of Clearlake. At the next major intersection (with Olympic Drive) north of Lakeshore Drive/40th Avenue, Olympic Drive is stop sign controlled on its eastbound "Tee" approach to the state highway. Single or dual left turn lanes are provided on the S.R.53 approaches to all major intersections in Clearlake or Lower Lake.

State Route 29 (S.R.29) is a two-lane highway extending south of Lower Lake into Napa and Solano counties and northwesterly from Lower Lake to the City of Lakeport and its ultimate termination at State Route 20.

Lakeshore Drive is a two-lane arterial street extending westerly from the S.R.53 highway into the central section of the City of Clearlake. It has a signalized intersection with Old Highway 53 about a quarter mile west of its intersection with the new S.R.53 highway. Left turn lanes are provided on the approaches to many intersections. Commercial/retail or motel uses line much of the street.

Dam Road extends one short block (240 feet) east of its signalized intersection with S.R.53 to an all-way-stop intersection with a driveway serving a Wal-Mart Food store shopping center. Dam Road forms the west and south legs of this all-way-stop intersection, while the east leg serves Wal-Mart and the north leg (named Dam Road Extension) provides access to a middle school, school district headquarters, Yuba College and some offices. Dam Road Extension provides the only access to these uses. Dam Road continues as a two-lane collector road in a southerly and then easterly direction

from the Wal-Mart all-way-stop to a second all-way-stop with Lake Street. Dam Road extends easterly of Lake Street for about 4,500 feet before ending at the project's western boundary. In the section between Lake Street and the project boundary, Dam Road has two adequate to poorly paved travel lanes, each about nine to 10 feet wide. There are intermittent dirt shoulders but no paved shoulders. The roadway is intersected by numerous residential driveways, many at acute angles and with restricted sight lines at their connections. Intermittent horizontal and vertical curves are also present along this segment and there are no off-road pedestrian walkways or bicycle paths. Dam Road also has a narrow section with no shoulders or walkways just west of its intersection with Lake Street. The posted speed limit is 25 miles per hour between Lake Street and the project site and 35 miles per hour the majority of the distance between Lake Street and the Wal-Mart/Dam Road Extension intersection.

Lake Street is a two-lane collector roadway connecting Dam Road to Main Street (in Lower Lake). It has good pavement condition the majority of its length except for one segment south of Dam Road (just south of its new bridge across Cache Creek). This segment is schedule for improvement in the near future. The well paved segments of Lake Street are lined by Class II bicycle lanes, but no off-road walking paths or sidewalks. Children walking to the two schools served by Lake Street must walk in the bicycle lanes. There are no turn lanes on Lake Street on any intersection approach. There is no posted speed limit along the north end of the road. In the vicinity of Lower Lake elementary and high schools it is 20 mph when children are present and near Main Street in Lower Lake it is 25 mph. Lake Street is stop sign controlled on its southbound approach to Main Street and at its all-way-stop with Dam Road.

18th Avenue is a two-lane roadway extending easterly from a signalized intersection with the State Route 53 highway for about three-quarters of a mile before dead-ending. It serves the function of a collector street and provides access to the Redbud Hospital (near the state highway) as well as numerous streets serving a partially built-out rural residential area. Pavement condition is adequate to poor. The roadway has intermittent dirt shoulders and significant vertical curves. In addition, the roadway traverses a horizontal "S" curve just east of its intersection with State Route 53.

B. VOLUMES

Weekday AM peak period (7:00-9:00), mid-afternoon after school peak period (2:00-4:00 PM) and PM peak period (4:00-6:00) traffic turn movement counts were conducted on Tuesday, Wednesday or Thursday, February 1, 2 or 3, 2005 at the following locations.

S.R.53/S.R.29/Main Street
S.R.53/Dam Road/Old Highway 53
S.R.53/40th Avenue/Lakeshore Drive
S.R.53/Olympic Drive
Lakeshore Drive/Old Highway 53
Dam Road/Dam Road Extension/Wal-Mart Driveway
Dam Road/Lake Street
Lake Street/Main Street

In addition, vehicle, pedestrian and bicycle rider counts were also conducted along Lake Street in the vicinity of Lower Lake Elementary School and Lower Lake High School during the same periods. The AM and PM peak traffic hours were determined to be 7:30 -8:30 AM and 4:30-5:30 PM at the vast majority of intersections. A comparison was then made to determine whether mid-afternoon peak hour volumes were higher than those during the PM commute peak. Overall, with the exception of volumes along Lake Street from Dam Road to Main Street, volumes during 4:30 to 5:30 PM were about the same or higher than volumes during any given hour between 2:00 and 4:00 PM. Therefore, for analysis purposes, all intersections in this study have been evaluated for AM commute and PM commute peak hour conditions, while locations along Lake Street have also been evaluated for the peak traffic hour between 2:00 and 4:00 PM.

In order to evaluate peak season traffic conditions, February counts were adjusted to reflect late May or mid-September conditions when schools would still be in session, but tourist traffic would be higher than in February. Based upon available seasonal traffic count information supplied by Caltrans for Routes 53 and 29 within or near the City of Clearlake, February AM peak hour counts were adjusted upwards by seven percent, while February mid-afternoon and PM peak hour counts were adjusted upwards by 10 percent to reflect peak tourist season conditions.

Resultant year 2005 peak season weekday AM peak hour, mid-afternoon peak hour and PM peak hour volumes are presented in **Figures 4, 5 and 6**, respectively. February 2005 AM, mid-afternoon and PM peak hour volumes are presented in **Appendix A**. Weekday pre- and post-school peak hour pedestrian and bicycle volumes along Lake Street associated with the Lower Lake Elementary School and Lower Lake High School are

also presented in **Appendix A**.

C. INTERSECTION LEVEL OF SERVICE

1. Methodology

Signalized Intersections. Intersections, rather than roadway segments between intersections, are almost always the capacity controlling locations for any circulation system. Signalized intersection operation is graded based upon two different scales. The first scale employs a grading system called Level of Service (LOS) which ranges from Level A, indicating uncongested flow and minimum delay to drivers, down to Level F, indicating significant congestion and delay on most or all intersection approaches. The Level of Service scale is also associated with a control delay tabulation (year 2000 Transportation Research Board [TRB] *Highway Capacity Manual* [HCM] operations method) at each intersection. The control delay designation allows a more detailed examination of the impacts of a particular project. Greater detail regarding the LOS/control delay relationship is provided in **Appendix B**.

Unsignalized Intersections. Unsignalized intersection operation is also typically graded using the Level of Service A through F scale. LOS ratings for all-way stop intersections are determined using a methodology outlined in the year 2000 TRB *Highway Capacity Manual*. Under this methodology, all-way stop intersections receive one LOS designation reflecting operation of the entire intersection. Average control delay values are also calculated. Intersections with side streets only stop sign controlled (two-way stop control) are also evaluated using the LOS and average control delay scales using a methodology outlined in the year 2000 TRB *Highway Capacity Manual*. However, unlike signalized or all-way stop analysis where the LOS and control delay designations only pertain to the entire intersection, in side street stop sign control analysis LOS and delay designations are computed for only the stop sign controlled approaches or individual turn and through movements. **Appendix B** provides greater detail about unsignalized analysis methodologies.

2. Minimum Acceptable Operation

The City of Clearlake, Lake County and Caltrans all use LOS C as the poorest acceptable operation at signalized, all-way-stop and side street stop sign controlled intersections.

3. Year 2005 Peak Season Operation

Tables 1, 2 and 3 show that currently all analyzed intersections would be operating at acceptable levels of service during both the AM and PM tourist season commute peak traffic hours as well as at intersections along Lake Street during the mid-afternoon peak

traffic hour.

D. INTERSECTION SIGNALIZATION NEEDS (PEAK HOUR SIGNAL WARRANT EVALUATION)

1. Methodology

Traffic signals are used to provide an orderly flow of traffic through an intersection. Many times they are needed to offer side street traffic an opportunity to access a major road where high volumes and/or high vehicle speeds block crossing or turn movements. They do not, however, increase the capacity of an intersection (i.e., increase the overall intersection's ability to accommodate additional vehicles) and, in fact, often slightly reduce the number of total vehicles that can pass through an intersection in a given period of time. Signals can also cause an increase in traffic accidents if installed at inappropriate locations.

There are 11 possible tests for determining whether a traffic signal should be considered for installation. These tests, called "warrants", consider criteria such as actual traffic volume, pedestrian volume, presence of school children, and accident history. Usually, two or more warrants must be met before a signal is installed. In this report, the test for Peak Hour Volumes (Warrant #11) has been applied. When a warrant is met, there is a strong indication that a detailed signal warrant analysis covering all possible warrants would be appropriate. These rigorous analyses are described in Chapter 9 of the Caltrans Traffic Manual while Warrant 11 is presented in **Appendix C** of this report. It should also be noted that Warrant #11 has separate criteria for urban versus rural conditions. Rural conditions apply when speeds on the uncontrolled intersection approach are greater than 40 miles per hour or when the local area population is less than 10,000 people. Since the speed criteria apply to the S.R.53/Olympic Drive intersection, rural criteria have been utilized to evaluate this location, while urban criteria have been used to evaluate all other unsignalized intersections analyzed in this study.

2. Year 2005 Peak Season—Intersections Meeting Signal Warrant Criteria

Table 4 shows that the following intersection would have year 2005 peak tourist season volumes exceeding Caltrans peak hour Warrant #11 criteria levels.

S.R.53/Olympic Drive

E. OBSERVED OPERATIONAL CONCERNS

The following observations were made by a registered traffic engineer or were reported by the City of Clearlake City Engineer.

The close (240-foot) spacing along Dam Road between its signalized intersection with S.R.53 and its all-way-stop intersection with the Wal-Mart access driveway/Dam Road Extension results in one or more occasions during peak traffic hours when westbound vehicles back up from the S.R.53 signal through the all-way-stop intersection (during the PM peak hour) and when eastbound vehicles back up from the all-way-stop left turn to the S.R.53 signalized intersection (during the AM peak hour).

The S.R.53/Olympic Drive unsignalized intersection has had a higher than average accident problem over recent years.

Pre- and post-school traffic conditions along Lake Street in the vicinity of Lower Lake Elementary School and Lower Lake High School can be somewhat chaotic. Pedestrians and bike riders are crossing the street at numerous locations (many unmarked). In addition, parents dropping off/picking up students conduct U-turns at a wide variety of locations along both school frontages.

Some residential driveway connections to Dam Road (east of Lake Street) provide limited sight lines for drivers backing from the driveway onto Dam Road.

F. PLANNED CIRCULATION SYSTEM IMPROVEMENTS

Caltrans and the City of Clearlake have two planned and funded improvements in the project area.

S.R.53/Olympic Drive

The left turn lane on the northbound S.R.53 intersection approach will be lengthened. This improvement is scheduled to be constructed by 2010 and possibly as early as 2008.

S.R.53/Lakeshore Drive/40th Avenue

Left turn lanes will be provided on the Lakeshore Drive and 40th Avenue intersection approaches. In addition, protected left turn phasing will be provided for these turn movements. This improvement is scheduled to be constructed by 2010 and possibly as early as 2008

G. TRANSIT SERVICE

Lake Transit provides the following fixed route service in the project area.

Route 1: Extends from the Wal-Mart Center at the Dam Road intersection northerly through the City of Clearlake and then along S.R.20

along the north side of Clearlake to Upper Lake and then southerly to Lakeport. There are six buses each direction on weekdays.

- Route 2: Extends southerly from the Wal-Mart Center along S.R.53 and S.R.29 to Middletown and then westerly on S.R.175 to Cobb. There are four buses each direction on weekdays.
- Route 3: Extends southerly from the Wal-Mart Center along S.R.53 and S.R.29 to Middletown and then continues southerly on S.R.29 to the cities of Calistoga and St. Helena as well as St. Helena Hospital. There is one bus each direction on Monday, Wednesday and Thursday. The Thursday route goes to/from Santa Rosa rather than St. Helena.
- Route 4: Extends southerly from the Wal-Mart Center along S.R.53 to Lower Lake and then westerly along S.R.29 to Lakeport. There are eight buses each direction on weekdays and four buses each direction on Saturdays.
- Route 4A: Extends southerly from the Wal-Mart Center along S.R.53 to Lower Lake and then westerly via S.R.29 and non-state routes to Lakeport. There are two buses each direction on weekdays.
- Route 5: Extends northerly from the Wal-Mart Center to loop through various neighborhoods in the City of Clearlake. There are 12 buses daily (on one-hour headways).
- Route 6: Extends from Lower Lake along Lake Street and Dam Road to the Wal-Mart Center and then loops through various neighborhoods in the City of Clearlake. There are 11 buses daily (on one-hour headways).

H. FUTURE HORIZON YEAR BASE CASE (WITHOUT PROJECT) CONDITIONS

At the request of City of Clearlake staff, proposed project traffic impacts have been evaluated in the context of background (Base Case) traffic conditions for three horizon years:

- Year 2010 (Provinsalia ± half completed)
- Year 2015 (Provinsalia fully completed)
- Year 2020 (cumulative area evaluation)

Projected intersection geometrics and control for future conditions are presented in **Figure 7** and incorporate all planned and funded improvements.

1. Volumes

Year 2010, 2015 and 2020 Base Case AM commute peak hour, mid-afternoon and PM commute peak hour volumes were developed using traffic growth rates provided by Caltrans District 1 for State Highways 53 and 29 and by growth rates for City streets approved by the City of Clearlake based upon Department of Finance population growth rates for communities within Lake County. Resultant growth rates are as follows.

PROJECTED % GROWTH IN TRAFFIC

			S.R.29*				
S.R.53*	CITY OF CLEARLAKE STREETS**					2005-2010	20%
22.5%	10.5%	2005-2015	40%	45%	21.0%	2005-2020	60%
			67.5%	31.5%			

* Caltrans.

** Based upon Department of Finance Population Growth in Lake County—
Straight line growth 2005 to 2020.

Resultant year **2010** Base Case (without project) AM commute peak hour, mid-afternoon peak hour and PM commute peak hour volumes are provided in **Figures 8, 9 and 10**, respectively. Resultant year **2015** Base Case (without project) AM commute peak hour, mid-afternoon peak hour and PM commute peak hour volumes are provided in **Figures 11, 12 and 13**, respectively, while year **2020** Base Case (without project) AM commute peak hour, mid-afternoon peak hour and PM commute peak hour volumes are provided in **Figures 14, 15 and 16**, respectively.

2. Base Case (Without Project) Intersection Level of Service

a. Year 2010

1) AM Commute Peak Hour (Table 1)

All analyzed intersections would be experiencing acceptable operation.

2) Mid-afternoon Peak Hour (Table 2)

All analyzed intersections would be experiencing acceptable operation.

3) PM Commute Peak Hour (Table 3)

All analyzed intersections would be experiencing acceptable operation, with one exception.

S.R.53/Olympic Drive: LOS F operation and unacceptable delay on the stop sign controlled Olympic Drive intersection approach.

b. Year 2015

1) AM Commute Peak Hour (Table 1)

All analyzed intersections would be experiencing acceptable operation with the following exception.

Dam Road/Dam Road Extension/Wal-Mart Driveway: LOS D all-way stop operation.

2) Mid-afternoon Peak Hour (Table 2)

All analyzed intersections would be experiencing acceptable operation.

3) PM Commute Peak Hour (Table 3)

All analyzed intersections would be experiencing acceptable operation with the following exceptions.

S.R.53/Olympic Drive: LOS F operation and unacceptable delay on the stop sign controlled Olympic Drive intersection approach.

S.R.53/Lakeshore Drive/40th Avenue: LOS D signalized operation.

Lakeshore Drive/Old Highway 53: LOS D signalized operation.

Dam Road/Dam Road Extension/Wal-Mart Driveway: LOS D all-way-stop operation.

c. Year 2020 (Table 1)

1) AM Commute Peak Hour

All analyzed intersections would be experiencing acceptable operation with the following exception.

Dam Road/Dam Road Extension/Wal-Mart Driveway: LOS D all-way stop operation.

2) Mid-afternoon Peak Hour (Table 2)

All analyzed intersections would be experiencing acceptable operation.

3) PM Commute Peak Hour (Table 3)

All analyzed intersections would be experiencing acceptable operation with the following exceptions.

S.R.53/Olympic Drive: LOS F operation and unacceptable delay on the stop sign controlled Olympic Drive intersection approach.

S.R.53/Lakeshore Drive/40th Avenue: LOS D signalized operation.

Lakeshore Drive/Old Highway 53: LOS D signalized operation.

Dam Road/Dam Road Extension/Wal-Mart Driveway: LOS E all-way-stop operation.

S.R.53/Dam Road/Old Highway 53: LOS D signalized operation.

3. Base Case (Without Project) Intersection Signalization Needs

a. Year 2010 (Table 4)

The following unsignalized intersections would have either AM and/or PM peak hour volumes exceeding Caltrans peak hour Warrant #11 criteria levels.

S.R.53/Olympic Drive

Dam Road/Dam Road Extension/Wal-Mart Driveway (PM volumes approaching warrant levels)

b. Year 2015 (Table 4)

The following unsignalized intersections would have either AM and/or PM peak hour volumes exceeding Caltrans peak hour Warrant #11 criteria levels.

S.R.53/Olympic Drive

Dam Road/Dam Road Extension/Wal-Mart Driveway

c. Year 2020 (Table 4)

The following unsignalized intersections would have either AM and/or PM peak hour volumes exceeding Caltrans peak hour Warrant #11 criteria levels.

S.R.53/Olympic Drive

Dam Road/Dam Road Extension/Wal-Mart Driveway

IV. PROJECT IMPACTS

A. SIGNIFICANCE CRITERIA

A project-related traffic impact or cumulative traffic impact is considered to be significant if:

1. A *signalized or all-way-stop intersection* with Base Case (without project) volumes is operating at LOS A, B or C and deteriorates to LOS D operation (or worse) with the addition of project traffic.
2. A Base Case (without project) *stop sign-controlled turn movement or approach* at an unsignalized side street stop sign controlled intersection is operating at LOS A, B or C and deteriorates to LOS D operation (or worse) with the addition of project traffic.
3. The Base Case (without project) LOS at a *signalized intersection* is already at LOS D, E or F, and there is an increase in vehicle delay of 7.5 seconds or more due to the project with LOS D or E Base Case operation or 5 seconds or more due to the project with LOS F Base Case operation.
4. The Base Case (without project) LOS for an unsignalized intersection is already at LOS D, E or F and there is an increase in vehicle delay of 5 seconds or more due to the project.
5. Base Case (without project) traffic volume levels at an *unsignalized intersection* are increased above Caltrans Peak Hour Warrant #11 criteria levels with the addition of project traffic.
6. Base Case (without project) signalization is already warranted, and there is an increase in traffic of one percent or more due to the project.
7. There are substantial increases in hazards due to a design feature (e.g., sharp

curves or dangerous intersections).

8. It results in inadequate emergency access.
9. It results in inadequate parking capacity.
10. It conflicts with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle lanes).
11. It increases Base Case traffic levels more than five percent on roadways adjacent to schools during pre- and post-school periods when children are walking or biking along local roads.
12. In the opinion of the registered traffic engineer conducting the study or the City of Clearlake City Engineer, a significant safety concern is created.

B. PROJECT TRIP GENERATION

Project trip generation was developed for half buildout conditions expected no sooner than 2010 as well as for full buildout conditions expected no sooner than 2015. Half buildout would include half of all residential units (360 total), as well as the entire nine-hole golf course operation.

As shown in **Table 5**, the proposed project at half buildout (by 2010) would be expected to generate 3,030 daily trips (1,515 inbound and 1,515 outbound) with about 70 inbound and 150 outbound trips during the AM peak hour along with about 180 inbound and 115 outbound trips during the PM peak hour. **Table 6** shows that the project at full buildout (by 2015) would be expected to generate 5,740 daily trips (2,870 inbound and 2,870 outbound) with about 125 inbound and 295 outbound trips during the AM peak hour along with about 350 inbound and 215 outbound trips during the PM peak hour.

Project trip generation was developed using trip rates from the traffic engineering profession's standard source of trip rate data: *Trip Generation*, 7th Edition by the Institute of Transportation Engineers (ITE) 2003. It should be noted that the 35 percent of project residential units projected to be occupied by retirees/active seniors were assigned lower trip rates than those remaining residential units that would contain one or two commuters as well as children. These lower "senior" trip rates were also obtained from the above-referenced ITE source.

C. PROJECT TRIP DISTRIBUTION

Project traffic was assigned to the local roadway network during each peak traffic hour analyzed based upon existing traffic flow patterns as well as input from City of Clearlake

Planning and Public Works staff in regards to likely work destinations for project residents as well as local retail, school and recreational opportunities. All project traffic will use Dam Road between the project entrance and the Lake Street intersection. The vast majority of traffic destined to/from the south and west on S.R.29 would then be expected to use Lake Street, with the remaining using Dam Road to/from S.R.53 or the Wal-Mart Center. City staff projected that the vast majority of project workers will travel to/from south of the City on S.R.29, with smaller numbers traveling on S.R.29 to/from the west (towards Lakeport and the U.S.101 corridor) or to/from the City of Clearlake. It should be noted that many commuters destined to/from the Napa Valley or Santa Rosa areas will leave earlier and arrive home later than the local peak traffic hours. While the local school district will provide busing for project children to all public schools, it was also projected that some parents would still drop off/pick up students and that some project high school students would drive their own cars.

The projected increment of half buildout project traffic for AM commute peak hour, mid-afternoon peak hour and PM commute peak hour traffic conditions is presented in **Figures 17, 18 and 19** respectively, while the full project buildout traffic increment for AM commute peak hour, mid-afternoon peak hour and PM commute peak hour conditions is presented in **Figures 20, 21 and 22**, respectively. Future year Base Case + project volumes are presented in the following figures.

Year 2010 Base Case + Half Project Buildout Volumes

AM Commute Peak Hour	Figure 23
Mid-afternoon Peak Hour	Figure 24
PM Commute Peak Hour	Figure 25

Year 2015 Base Case + Full Project Buildout Volumes

AM Commute Peak Hour	Figure 26
Mid-afternoon Peak Hour	Figure 27
PM Commute Peak Hour	Figure 28

Year 2020 Base Case + Full Project Buildout Volumes

AM Commute Peak Hour	Figure 29
Mid-afternoon Peak Hour	Figure 30
PM Commute Peak Hour	Figure 31

D. PROJECT SIGNIFICANT TRAFFIC IMPACTS

IMPACT 1: INTERSECTION LEVEL OF SERVICE

a. Year 2010

Half buildout's project traffic would produce significant level of service impacts at the following locations.

S.R.53/Olympic Drive (see **Table 3**)

PM Peak: Project traffic would increase delay on the stop sign controlled Olympic Drive approach by more than five seconds at a location where Base Case operation would already be an unacceptable LOS F.

Dam Road/Dam Road Extension/Wal-Mart Driveway (see **Table 3**)

PM Peak: Project traffic would degrade all-way-stop operation from an acceptable LOS C to an unacceptable LOS D.

b. Year 2015

Full buildout project traffic would produce significant level of service impacts at the following locations.

S.R.53/Olympic Drive (see **Table 3**)

PM Peak: Project traffic would increase delay on the stop sign controlled Olympic Drive approach by more than five seconds at a location where Base Case operation would already be an unacceptable LOS F.

Dam Road/Dam Road Extension/Wal-Mart Driveway (see **Tables 1 and 3**)

AM Peak: Project traffic would degrade all-way-stop operation from LOS D to LOS E and increase delay by more than five seconds.

PM Peak: Project traffic would degrade all-way-stop operation from LOS D to LOS F and increase delay by more than five seconds.

c. Year 2020

Full buildout project traffic would produce significant level of service impacts at the following locations.

S.R.53/Olympic Drive (see **Table 3**)

PM Peak: Project traffic would increase delay on the stop sign controlled Olympic Drive approach by more than five seconds at a location where Base Case operation would already be an unacceptable LOS F.

Dam Road/Dam Road Extension/Wal-Mart Driveway (see **Tables 1 and 3**)

AM Peak: Project traffic would degrade all-way-stop operation from LOS D to

LOS F and increase delay by more than five seconds.

PM Peak: Project traffic would degrade all-way-stop operation from LOS E to LOS F and increase delay by more than five seconds.

S.R.53/Dam Road/Old Highway 53 (see **Table 3**)

PM Peak: Project traffic would increase signalized delay by more than 7.5 seconds at a location where Base Case operation would already be an unacceptable LOS D.

These would be significant impacts.

IMPACT 2: INTERSECTION SIGNALIZATION NEEDS (see Table 4)

a. Year 2010

Half buildout project traffic would produce significant signalization needs impacts at the following locations.

S.R.53/Olympic Drive

Project traffic would increase volumes by more than one percent at a location where Base Case volumes would already be exceeding peak hour signal warrant criteria levels (+2.6 percent during the AM peak hour and +3.4 percent during the PM peak hour).

Dam Road/Dam Road Extension/Wal-Mart Driveway

Project traffic would increase Base Case PM volumes to exceed peak hour signal warrant criteria levels.

b. Year 2015

Full buildout project traffic would produce significant signalization needs impacts at the following locations.

S.R.53/Olympic Drive

Project traffic would increase volumes by more than one percent at a location where Base Case volumes would already be exceeding peak hour signal warrant criteria levels (+4.2 percent during the AM peak hour and +5.5 percent during the PM peak hour).

Dam Road/Dam Road Extension/Wal-Mart Driveway

Project traffic would increase Base Case AM volumes to exceed peak hour signal

warrant criteria levels and would increase traffic by more than one percent during the PM peak hour when Base Case volumes would already be exceeding peak hour signal warrant criteria levels (+15 percent during the AM peak hour and +24 percent during the PM peak hour).

c. Year 2020

Full buildout project traffic would produce significant signalization needs impacts at the following locations.

S.R.53/Olympic Drive

Project traffic would increase volumes by more than one percent at a location where Base Case volumes would already be exceeding peak hour signal warrant criteria levels (+3.6 percent during the AM peak hour and +4.8 percent during the PM peak hour).

Dam Road/Dam Road Extension/Wal-Mart Driveway

Project traffic would increase traffic by more than one percent during the AM and PM peak hours when Base Case volumes would already be exceeding peak hour signal warrant criteria levels (+14 percent during the AM peak hour and +22 percent during the PM peak hour).

These would be significant impacts.

IMPACT 3: VEHICLE QUEUING ON DAM ROAD BETWEEN S.R.53 AND DAM ROAD EXTENSION/WAL-MART DRIVEWAY INTERSECTIONS

The 240-foot distance along Dam Road between its signalized intersection with S.R.53 and its all-way-stop intersection with Dam Road Extension/Wal-Mart Driveway will experience increased frequencies of vehicles backing from one intersection through the adjacent intersection with the addition of project traffic (with up to an additional 280 two-way vehicles per hour being added to the year 2020 Base Case volume of 1,800 vehicles per hour along this segment of Dam Road).

This would be a significant impact.

IMPACT 4: SIGNIFICANT IMPACTS TO TRAFFIC, PEDESTRIAN AND BICYCLE ACTIVITY ALONG LAKE STREET ADJACENT TO LOWER LAKE ELEMENTARY AND HIGH SCHOOLS

a. Year 2010

AM Peak: Half buildout project traffic would increase volumes more than five percent along Lake Street during the start of school drop-off arrival time (+22 percent at the elementary school and 11 percent at the high school).

After School Peak: Half buildout project traffic would increase volumes more than five percent along Lake Street during the end of school pickup period (+29 percent at the elementary school and +12 percent at the high school).

b. Year 2015

AM Peak: Full buildout project traffic would increase volumes more than five percent along Lake Street during the start of school drop-off arrival time (+39 percent at the elementary school and 19 percent at the high school).

After School Peak: Full buildout project traffic would increase volumes more than five percent along Lake Street during the end of school pickup period (+50 percent at the elementary school and +18 percent at the high school).

c. Year 2020

AM Peak: Full buildout project traffic would increase volumes more than five percent along Lake Street during the start of school drop-off arrival time (+36 percent at the elementary school and 18 percent at the high school).

After School Peak: Full buildout project traffic would increase volumes more than five percent along Lake Street during the end of school pickup period (+46 percent at the elementary school and +17 percent at the high school).

These would be significant impacts.

IMPACT 5: SIGNIFICANT IMPACT TO DAM ROAD (OFF-SITE)

The project applicant is proposing to widen those narrow sections of Dam Road (west of the project site) to a 24-foot paved width. No paved shoulders or paved Class II bike lanes would be provided, although five-foot gravel shoulders would be provided along both sides of the roadway. In addition, an eight-foot-wide pedestrian/bicycle pathway would be provided along one side of the road. The ultimate roadway right-of-way would be 60 feet. This would require right-of-way purchase in several areas. The proposed curb-to-curb width would not allow provision of a median continuous two-way left turn lane that would serve local residents turning to and from the driveways that now line

Dam Road.

The proposed plan for Dam Road (off-site) would result in the following significant safety impacts.

The lack of a continuous turn lane would be a major concern for vehicles turning to driveways now lining Dam Road. With the proposed project, volumes will increase from an existing 55 to 80 to between 500 and 650+ vehicles per hour during commute periods along Dam Road east of Lake Street (and to between around 700 to 800 vehicles per hour along Dam Road just west of Lake Street).

The elimination of the few dirt shoulder areas wide enough for parking adjacent to Dam Road could provide a hardship for some local residents.

Vehicle backing from existing driveways onto Dam Road (particularly at locations with limited sight lines) would experience significant safety concerns due to projected heavy volume levels with project development.

IMPACT 6: SIGNIFICANT IMPACT—DAM ROAD ON-SITE DESIGN

Dam Road within the project site would have a 60-foot right-of-way and a 24-foot-wide pavement. A five-foot gravel shoulder would be provided on both sides of the road and an eight-foot-wide bike/pedestrian path would be provided on one side of the road (separated from the travel lanes by a gutter and a five-foot gravel shoulder). Assuming no residential units would be fronting Dam Road, the five-foot gravel shoulders and adjacent three-foot swales or gutter could be used for emergency vehicle breakdown parking. If residential units will front Dam Road or if Dam Road will likely be used for on-street parking in select areas, a five-foot gravel shoulder would not provide a sufficient width on-street parking area. In addition, left turn lanes will potentially be needed on the eastbound approaches to intersections within the western and central part of the project site.

These would be significant impacts.

IMPACT 7: SIGNIFICANT IMPACT—ALL INTERIOR STREETS OTHER THAN DAM ROAD

All interior project streets other than Dam Road are proposed to have a 24-foot-wide pavement within a 40-foot-wide right-of-way. An asphalt walkway would be provided along one side of the street. The proposed interior street cross section is acceptable with the exception that no room is provided for on-street parking (i.e. either a continuous

parking row or parking bays in select areas throughout the site). Use of the 24-foot-wide street for parking could limit the available travel way to only 16 or 17 feet for two-way travel flow.

This would be a significant impact.

IMPACT 8: PROJECT ROADWAY GRADES

The Specific Plan does not detail maximum proposed internal roadway grades nor whether proposed grades meet City and emergency services maximum allowable standards.

This would be a potentially significant impact.

IMPACT 9: LENGTH OF ON-SITE CUL-DE-SAC ROADWAYS & EMERGENCY VEHICLE ACCESS

With no emergency vehicle access (EVA) provided directly into the project site, most site roadways (including Dam Road) exceed the City's maximum allowable length of 1,000 feet for a cul-de-sac. The proposed EVA connection to Dam Road would be constructed west of the project entrance. This connection would extend in a general northwesterly direction to 18th Avenue. The lack of a second access directly to the project site would not meet fire district standards and would pose a significant safety concern should Dam Road in the vicinity of the project entrance ever be blocked. While Dam Road continues as a one-lane dirt road to the east of the site into remote mountainous areas, this is not considered an acceptable emergency access that could be used if Dam Road near the project entrance is blocked.

This would be a significant impact.

IMPACT 10: PUBLIC TRANSIT/SCHOOL BUS PROVISIONS ON PROJECT ROADWAYS

The Specific Plan does not indicate whether public transit stop/school bus pickup facilities will be provided along internal roadways or whether contact has been made with the local transit agency in regards to the possibility of service to the site from the local transit route now serving the south side of the City of Clearlake. In addition, no indication has been given that project culs-de-sac would provide adequate turnaround areas for transit or school buses.

This would be a significant impact.

V. MITIGATION MEASURES

The following measures will either bring Base Case + project operation back to minimum acceptable levels if Base Case operation was acceptable before the addition of project traffic, or will bring Base Case + project operation back to Base Case operation or better than Base Case operation, if Base Case (without project) operation was unacceptable before the addition of project traffic.

MITIGATION 1: INTERSECTION LEVEL OF SERVICE (see Table 7)

a) Year 2010

S.R.53/Olympic Drive

Provide a second lane on the Olympic Drive stop sign controlled approach to S.R.53. Stripe one lane for left turns and one lane for right turns.

Resultant Olympic Drive Stop Sign Controlled Approach Operation (Base Case + Project):

PM Peak Hour: LOS F—93.4 seconds average vehicle delay
[Base Case operation would be LOS F—172 seconds average vehicle delay; therefore, mitigation improves Base Case + project operation to better level than just Base Case operation.]

Dam Road/Dam Road Extension/Wal-Mart Driveway in Conjunction with S.R.53/ Dam Road/Old Highway 53 (System Operation)

Signalize the intersection and restripe the northbound Dam Road approach to provide an exclusive left turn lane and a shared through/right turn lane.

Extend the left turn lane on the eastbound Dam Road approach to Dam Road Extension the full 240 feet between S.R.53 and Dam Road Extension. This would allow extending the second left turn lane on the westbound Dam Road approach to S.R.53 to 240 feet. This measure would require widening Dam Road by 12 feet between S.R.53 and Dam Road Extension.

Resultant Signalized Operation of S.R.53/Dam Road and Dam Road/Dam Road Extension/Wal-Mart Driveway System:

PM Peak Hour:

S.R.53/Dam Road: LOS C—33.1 seconds average vehicle delay

Dam Road/Dam Road Extension/Wal-Mart Driveway: LOS B—19.0 seconds average vehicle delay

—or—

Maintain all-way-stop control and provide a third lane on the westbound Wal-Mart Driveway approach to Dam Road.

Resultant All-Way-Stop Control Operation of the Dam Road/Dam Road Extension/Wal-Mart Driveway Intersection:

PM Peak Hour: LOS C—24.2 seconds average vehicle delay

b) Year 2015

S.R.53/Olympic Drive

Provide a second lane on the Olympic Drive stop sign controlled approach to S.R.53. Stripe one lane for left turns and one lane for right turns.

Resultant Olympic Drive Stop Sign Controlled Approach Operation (Base Case + Project):

PM Peak Hour: LOS F—235 seconds average vehicle delay

[Base Case operation would be LOS F—635 seconds average vehicle delay; therefore, mitigation improves Base Case + project operation to better level than just Base Case operation.]

Dam Road/Dam Road Extension/Wal-Mart Driveway

There are no incremental mitigation measures that do not include signalization of the Dam Road/Dam Road Extension/Wal-Mart Driveway intersection that would bring Base Case + Project all-way-stop operation to levels the same or better than Base Case all-way-stop operation. Therefore, signalization has been included as the first part of the improvement package. With signalization, the Dam Road/Dam Road Extension/ Wal-Mart Driveway and S.R.53/Dam Road intersections must work as a coordinated system due to their proximity (240 feet apart). Listed mitigation measures not only provide for acceptable level of service at each intersection, but also provide acceptable 95th percentile vehicle storage in both directions along Dam Road between the two intersections. Therefore, measures are also listed for the S.R.53/Dam Road intersection, which are required to make the system of two intersections work acceptably. All new local developments should be required to provide a

fair share contribution to these measures or to provide paybacks to the Provinsalia applicants if they complete these measures. Evaluation has been conducted using the Synchro software program to evaluate coordinated intersection operation.

Provide all 2010 measures accompanying signalization of the Dam Road/Dam Road Extension intersection.

Provide an exclusive right turn lane on the northbound S.R.53 approach to Dam Road.

Provide a third lane on the westbound Wal-Mart Driveway approach to Dam Road.

The above measures would provide acceptable AM and PM peak hour levels of service at both intersections as well as provide acceptable 95th percentile vehicle queue storage on Dam Road between S.R.53 and Dam Road Extension, with one exception. During the PM peak hour the single right turn lane on the westbound Dam Road approach to S.R.53 would have its 95th percentile queue about half a car length longer than the available 240-foot storage distance. In order to mitigate this final problem, complete the following additional mitigation.

Provide a second right turn lane on the westbound Dam Road approach to S.R.53. This will also require 12 feet of widening, which, in addition to the 2010 mitigation measures, will require a total of 24 feet of widening of Dam Road between S.R.53 and Dam Road Extension.

Resultant Signalized Operation of S.R.53/Dam Road and Dam Road/Dam Road Extension/Wal-Mart Driveway System (with first three mitigations):

AM Peak Hour:

S.R.53/Dam Road: LOS C—29.0 seconds average vehicle delay

Dam Road/Dam Road Extension/Wal-Mart Driveway: LOS B—18.4 seconds average vehicle delay

PM Peak Hour:

S.R.53/Dam Road: LOS C—33.5 seconds average vehicle delay

Dam Road/Dam Road Extension/Wal-Mart Driveway: LOS C—23.5 seconds average vehicle delay

Resultant Signalized Operation of S.R.53/Dam Road and Dam Road/Dam Road Extension/Wal-Mart Driveway System (with all four mitigations):

AM Peak Hour:

S.R.53/Dam Road: LOS C—27.1 seconds average vehicle delay

Dam Road/Dam Road Extension/Wal-Mart Driveway: LOS B—17.1 seconds average vehicle delay

PM Peak Hour:

S.R.53/Dam Road: LOS C—30.6 seconds average vehicle delay

Dam Road/Dam Road Extension/Wal-Mart Driveway: LOS C—20.9 seconds average vehicle delay

c) Year 2020

S.R.53/Olympic Drive

Provide a second lane on the Olympic Drive stop sign controlled approach to S.R.53. Stripe one lane for left turns and one lane for right turns.

Resultant Olympic Drive Stop Sign Controlled Approach Operation (Base Case + Project):

PM Peak Hour: LOS F—475 seconds average vehicle delay

[Base Case operation would be LOS F with delay beyond range of software.]

Dam Road/Dam Road Extension/Wal-Mart Driveway and S.R.53/Dam Road

There are no incremental mitigation measures that do not include signalization of the Dam Road/Dam Road Extension/Wal-Mart Driveway intersection that would bring Base Case + Project all-way-stop operation to levels the same or better than Base Case all-way-stop operation. Therefore, signalization has been included as the first part of the improvement package. With signalization, the Dam Road/Dam Road Extension/ Wal-Mart Driveway and S.R.53/Dam Road intersections must work as a coordinated system due to their proximity (240 feet apart). Listed mitigation measures not only provide for acceptable level of service at each intersection, but also provide acceptable 95th percentile vehicle storage in both directions along Dam Road between the two intersections. Therefore, measures are also listed for the S.R.53/Dam Road intersection, which are required to make the system of two intersections work acceptably. All new local developments should be required to provide a fair share contribution to these measures or to provide paybacks to the Provinsalia applicants if they complete these measures.

Provide all four measures required for 2015.

Provide a second left turn lane on the northbound S.R.53 approach to the

Dam Road/Old Highway 53 intersection.

Resultant Signalized Operation of S.R.53/Dam Road and Dam Road/Dam Road Extension/Wal-Mart Driveway System:

AM Peak Hour:

S.R.53/Dam Road: LOS C—24.0 seconds average vehicle delay

Dam Road/Dam Road Extension/Wal-Mart Driveway: LOS B—17.7 seconds average vehicle delay

PM Peak Hour:

S.R.53/Dam Road: LOS C—26.6 seconds average vehicle delay

Dam Road/Dam Road Extension/Wal-Mart Driveway: LOS C—20.6 seconds average vehicle delay

These measures would reduce level of service impacts to a less-than-significant level.

MITIGATION 2: INTERSECTION SIGNALIZATION NEEDS

a) Year 2010

S.R.53/Olympic Drive

The project should provide a fair share contribution towards signalization of this intersection by 2010 (if approved by Caltrans). If remaining funds are not available for signalization by 2010, the project should provide needed funding for the entire signalization project and then receive paybacks from other new local development.

Please note that Caltrans has indicated to the City Engineer that they would not be in favor of signalizing this intersection due to its proximity to a curve in S.R.53 just south of the intersection. Other alternatives may include a grade separated partial interchange configuration to eliminate left turn movements from the intersection (as suggested by the City Engineer) or the ultimate provision of a new intersection farther to the north on S.R.53 that has better sight lines and would receive Caltrans approval for signalization.

Resultant Signalized Operation of S.R.53/Olympic Drive intersection:

PM Peak Hour: LOS B—13.1 seconds average vehicle delay

Dam Road/Dam Road Extension/Wal-Mart Driveway

Please see discussion of signalization under Mitigation Measure #1.

b) Year 2015

S.R.53/Olympic Drive

The project should provide a fair share contribution towards signalization of this intersection by 2015 (if approved by Caltrans). If remaining funds are not available for signalization by 2015, the project should provide needed funding for the entire signalization project and then receive paybacks from other new local development.

Resultant Signalized Operation of S.R.53/Olympic Drive intersection:
PM Peak Hour: LOS B—14.9 seconds average vehicle delay

Dam Road/Dam Road Extension/Wal-Mart Driveway

Please see discussion of signalization under Mitigation Measure #1.

c) Year 2020

S.R.53/Olympic Drive

The project should provide a fair share contribution towards signalization of this intersection by 2020 (if approved by Caltrans). If remaining funds are not available for signalization by 2020, the project should provide needed funding for the entire signalization project and then receive paybacks from other new local development.

Resultant Signalized Operation of S.R.53/Olympic Drive intersection:
PM Peak Hour: LOS B—17.5 seconds average vehicle delay

Dam Road/Dam Road Extension/Wal-Mart Driveway

Please see discussion of signalization under Mitigation Measure #1.

These measures would reduce project impacts to a less-than-significant level.

MITIGATION 3: VEHICLE QUEUING ON DAM ROAD EAST OF S.R.53

Measures listed under Mitigation #1 would reduce queuing impacts along Dam Road between S.R.53 and Dam Road Extension (after signalization of the Dam Road/Dam Road Extension/Wal-Mart driveway intersection) to a *less-than-significant level*.

MITIGATION 4: IMPACTS TO LAKE STREET

a) Years 2010/2015/2020

The project applicant should work with Lake County Public Works staff to develop a series of traffic calming (speed reducing) measures in the vicinity of both Lower Lake elementary School and Lower Lake High School.

The project should provide a pedestrian pathway along the east side of Lake Street between Lower Lake Elementary School and Dam Road and between Main Street and Lower Lake High School.

These measures would reduce project impacts to a less-than-significant level.

MITIGATION 5: IMPACTS TO DAM ROAD (OFF-SITE)

Provide a continuous turn lane along those segments of Dam Road serving existing single family residential driveways.

Provide a seven- to eight-foot all-weather or paved parking strip along at least one side of Dam Road in areas with existing single family residences.

Provide acceptable sight lines at all driveway connections to improved sections of Dam Road based upon the design speed of the roadway after improvement and acceptable AASHTO sight line criteria (on wet pavement).

These measures would reduce project impacts to a less-than-significant level.

MITIGATION 6: DAM ROAD ON-SITE DESIGN

Provide left turn lanes on the eastbound Dam Road approaches to all intersections in the central and western part of the site (which would experience left turns). There is room within the proposed right-of-way for this measure.

Provide an eight-foot all-weather parking strip adjacent to any residential areas that may require on-street parking.

These measures would reduce project impacts to a less-than-significant level.

MITIGATION 7: INTERNAL PROJECT STREETS OTHER THAN DAM ROAD

Provide an eight-foot-wide parking strip on one side of the road or intermittent parking

bays in all areas with residential units.

This measure would reduce project impact to a less-than-significant level.

MITIGATION 8: PROJECT ROADWAY GRADES

Maintain City standards of maximum allowable grades on all internal streets. Standards indicate a maximum 16 percent grade allowed on all “local roads” and a maximum 12 percent grade on all “other roads.” In addition, the grade of pavement through any intersection shall not be more than seven percent within a distance of 25 feet of the intersection.

This measure would reduce project impact to a less-than-significant level.

MITIGATION 9: EMERGENCY VEHICLE ACCESS (EVA)

Provide a second access directly to the project site other than Dam Road. Connect this second access to 18th Avenue, use for EVA purposes only, and design to emergency services standards. All culs-de-sac or dead-end roads within the site shall be no longer than 1,000 feet and each shall terminate in a cul-de-sac with a turning radius of not less than 45 feet.

This measure would reduce project impact to a less-than-significant level.

MITIGATION 10: TRANSIT STOP/SCHOOL BUS PICKUP FACILITIES AND TURNAROUND AREAS ALONG PROJECT ROADWAYS

The project applicant shall work with the local transit agency to determine the possibility of transit service to the project site and then (if service is likely), work with the transit agency to provide appropriate transit stop facilities. In addition, the applicant shall work with the school district to ensure adequate school bus pickup facilities. Finally, adequate turnaround areas shall be provided along or at the end of project roadways that may be served by public transit or school bus service.

This measure would reduce project impact to a less-than-significant level.

Counts conducted by “All Traffic Data” of Roseville, California.
Ms. Alicia Brundage, City Engineer, City of Clearlake.
Mr. Rex Jackman, Caltrans District 1.
Mr. Rex Jackman, Caltrans District 1.

Please note that delay results reported by the software extending more than 100 to 120 seconds become speculative at best because drivers experiencing this level of delay on a regular basis will find alternate travel routes. However, the main purpose of the LOS F delay findings is to note that a moderate addition of traffic to an intersection already experiencing extended delay for a stop sign controlled movement should have those delays extended significantly due to the reduction in available gaps of traffic flow on the uncontrolled roadway for turn movements from the side street.

See footnote 3.

See footnote 3.

See footnote 3.

County of Lake Road Design and Construction Standards, December 2004 by the County of Lake Public Works Department (used by the City of Clearlake).

See footnote 7.