

This section analyzes the existing transportation system in the vicinity of the Specific Plan area and addresses the potential transportation and circulation impacts resulting from development of the Vineyards at Anderson. Traffic analysis for the proposed project was completed by Fehr and Peers Transportation Consultants. *Technical datasheets* utilized for analysis are included as **Appendix 4.4-1**.

4.4.1 ENVIRONMENTAL SETTING

EXISTING TRANSPORTATION SYSTEM

The proposed project site is located in southern Shasta County between the City of Anderson and the community of Cottonwood. (See **Figure 3.0-1, Project Location**.) The site is generally located south of Olinda Road, west of Rhonda Road, and north of Gas Point Road. The first phase of the Specific Plan is the previously approved Sanderson Subdivision, which entails development of 242 single-family homes on 194 acres. Phase 2 of the Specific Plan entails development of 722 single-family homes, a public park, a private recreation center, a fire station, and 20,000 square feet of commercial on approximately 293 acres adjacent to Phase 1. (See **Figure 3.0-6**.) Because the Sanderson Subdivision (i.e., Phase 1) is currently under construction and not yet occupied, future traffic associated with Phase 1 has been incorporated into the analysis contained herein in order to provide a more complete view of project-related transportation and circulation. This differs from the approach taken elsewhere in the EIR because Phase 1 was previously analyzed under CEQA (State Clearinghouse No. 2004042047). For the purposes of analyzing traffic-related impacts, however, the two Phases are referenced as a single "Phase 1 & 2" scenario of the proposed project. The development associated with Phase 1 & 2 is substantially within existing City of Anderson city limits, while the remaining project area is within unincorporated Shasta County and planned for annexation as a part of the proposed project.

The project site is approximately 0.5 miles west of Interstate 5, which provides the major north-south regional access to the County. Existing access to the project site is via Olinda Road (South Street), West Anderson Drive, and Rhonda Road. As part of the Phase 1 & 2 construction, the project will construct a roadway (Anderson Hills Parkway) from the existing Rhonda Road to the development area. (See **Figure 4.4-1, Area Roadways**.)

Transportation System Planning

Planning for regional and local transportation improvements has been underway in Shasta and Tehama County for a number of years. In 2005 the Regional Transportation Planning Agency (RTPA) prepared the *Southern Region Transportation Planning Study and Traffic Impact Fee/Program* which evaluated the potential for alternative routes to Interstate 5 and apportioned costs associated with transportation improvements. The Impact fees were adopted by both Shasta County and the City of Anderson (CCR 06-109, 11-21-06) and will apply to the proposed project. The *Planning Study* identifies improvements to Rhonda Road and plans for extension of a north/south arterial from SR 273 to Gas Point Road in Cottonwood. The *Planning Study* also identifies improvements needed at the Gas Point Road/I-5 Interchange. Fees collected as part of this program are intended to fund roadway improvements in the South County Area.

The proposed Tehama County General Plan also includes proposed routes that would parallel I-5. Parallel routes were also discussed in the Del Webb project approved by Tehama County in 2007. The north/south arterial from SR 273 to Gas Point Road identified by the *Planning Study* is

4.4 TRANSPORTATION AND CIRCULATION

part of the parallel road concept supported by Tehama County and Caltrans in an effort to relieve impacts on I-5 mainline.

Increases to mainline I-5 traffic capacity are also proposed through the Fix-5 project, which is a coalition of cities in, and the counties of, Shasta and Tehama and Caltrans. Fees charged as a result of the Fix-5 project will apply to building permits and the revenue would be used to construct mainline improvements on Interstate 5 designed to increase capacity. The format of the fee program, and the extent of improvements covered by the Fix-5 project, has yet to be defined. Caltrans does not currently have the ability to collect the fees directly so each agency would be responsible for fee collection. The agencies themselves do not have the ability to construct improvements on state facilities, and it is currently unclear how revenue would move from the participants of Fix-5 to Caltrans for construction of improvements. At this early stage it is also uncertain when the improvements would be constructed or even the extent of improvements on I-5. The City of Anderson believes that the Fix-5 program is a good method of addressing cumulative local impacts on a regional transportation route.

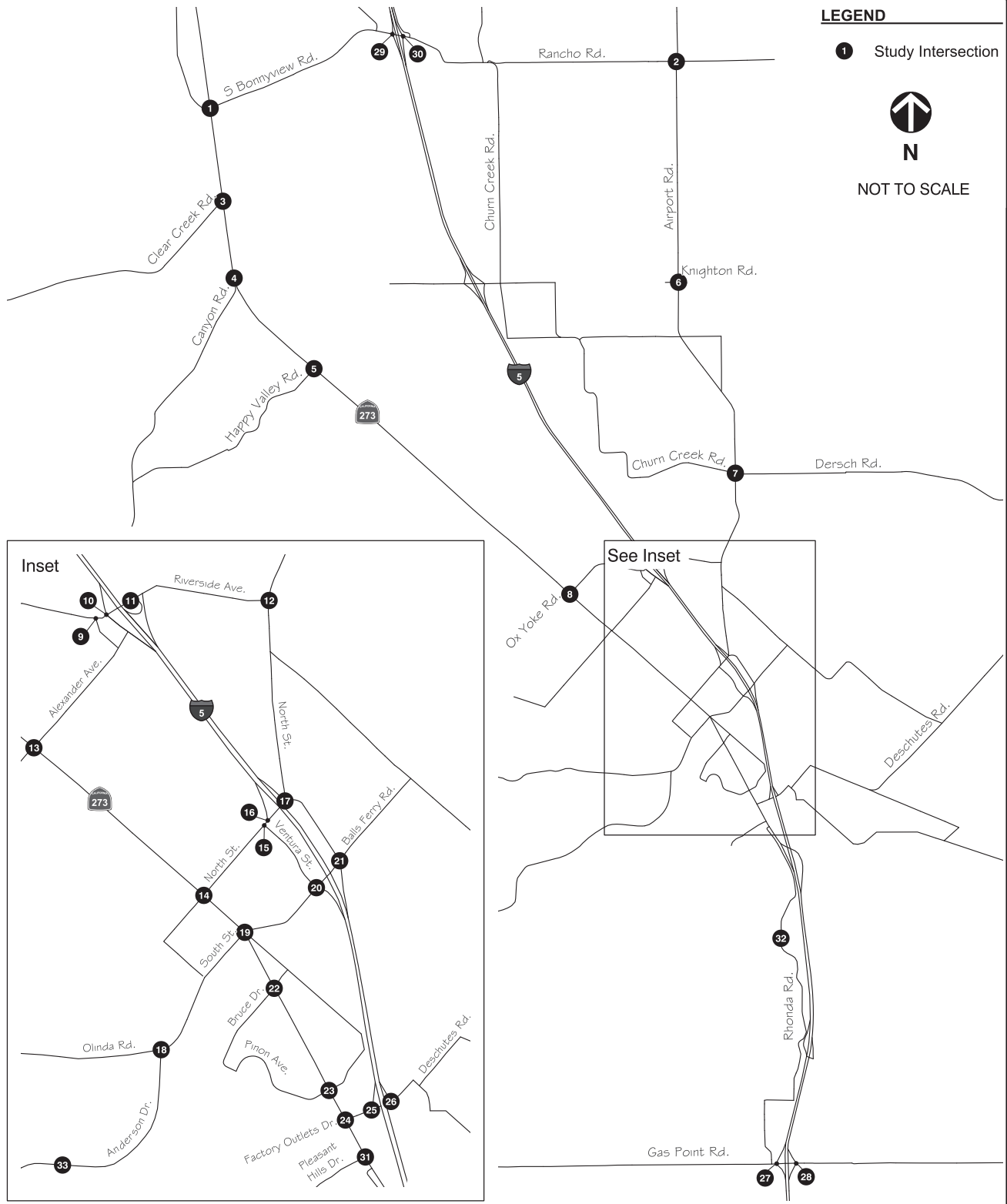
Roadway Network

Regional access to the project site is provided from I-5 and its interchanges with SR 273 and Deschutes Road, and SR 273. Local access is provided from Rhonda Road and West Anderson Drive, and Olinda Road via South Street. See **Figure 4.4-1, Area Roadways** for the existing roadway network within and adjacent to the Specific Plan area. A brief description of the key roadway facilities in the vicinity of the proposed project is provided below.

- *Interstate 5 (I-5)* is the main north-south facility through Shasta County. It extends the entire length of Shasta County, from its southern border with Tehama County to its northern border with Siskiyou County. Near the project site, I-5 is a four-lane freeway with interchanges at SR 273, Deschutes Road, and Balls Ferry Road.
- *State Route 273 (SR 273)* is a major north-south four-lane roadway intersecting with I-5 in the City of Anderson. SR 273 extends northward, parallel to I-5, and again intersects I-5 north of the City of Redding.
- *Olinda Road* is a two-lane roadway beginning west of SR 273 at the intersection of South Street and West Anderson Drive and extending west into Happy Valley.
- *Rhonda Road* is a two-lane rural roadway beginning at SR 273 and extending south toward Cottonwood.
- *South Street* is a two-lane roadway beginning at the intersection of Olinda Road and West Anderson Drive in the west and extending to Oak Street to the east. South Street crosses SR 273 and the Union Pacific Railroad Tracks. The roadway connects to Balls Ferry Road which has an interchange with I-5.
- *West Anderson Drive* is a two-lane rural roadway beginning at Olinda Road and extending southwest to Gas Point Road through the proposed site.

Transit System

Public transportation within Shasta County is provided by the Redding Area Bus Authority (RABA), which offers both fixed route and demand-response transit services to the City of Anderson. RABA currently operates fixed routes for the cities of Redding, Shasta Lake and Anderson, and para-transit vehicles for demand response service. All fixed routes operate Monday through



Source: Fehr and Peers

Figure 4.4-1
Area Roadways



4.4 TRANSPORTATION AND CIRCULATION

Friday on one-hour headways. According to RABA, the City of Anderson is served by Route #9, which provides access between Redding and Anderson. Route #9 includes 22 stops between downtown Redding and the Wal-Mart Supercenter in the City of Anderson. Route #9's Anderson terminus (i.e., the Wal-Mart Supercenter) is in the immediate vicinity of the project site. According to the *RABA Master Transit Plan Study* (2001), Route #9 carries 111,330 passengers per year and 13% of RABA's total passenger trips.

Rail System

Shasta County is served by the Union Pacific Railroad (a single track main line which parallels I-5). The Union Pacific rail line carries both passengers and freight. In the vicinity of the proposed project, the railroad tracks parallel SR 273 from the SR 299 junction to the I-5 junction. Amtrak provides passenger rail service to Shasta County with a stop in Redding. The Shasta County Regional Transportation Planning Agency's *Regional Transportation Plan* (2004) states that 6,403 boardings were made at the Amtrak station in Redding for the 2002/2003 fiscal year, with an additional 11,646 Amtrak bus connections to the Capital Corridor and San Joaquin trains.

Bikeway System

The *Regional Transportation Plan* (2004) outlines existing bicycle facilities within Shasta County and the City of Anderson. Bicycle facilities are generally categorized as being of one of three types, with each classification defined by the particular degree of separation from the roadway that the facility affords bicyclists. Specifically, Class I facilities are bicycle trails that are fully separate and independent of the vehicular travel way. Class II facilities are on-street bicycle lanes that are delineated by road striping and other pavement markings. Class III facilities are bicycle routes where bicycles share the roadway with vehicles and the facility is typically identified only by signage.

According to the RTP, there are 1.7 miles of bicycle paths (Class I), 0.5 miles of bicycle lanes (Class II), and 1.14 miles of bicycle routes (Class III) within the City of Anderson's city limits. Twenty miles of bicycle routes are located near the proposed project site, since five miles of I-5 from Cottonwood to Anderson and 15 miles of SR 273 from Anderson to Redding are open to bicyclists.

In addition to the RTP's bike plan, the City of Anderson adopted its own *Bicycle Transportation Plan* in October 2007. The City's plan identifies 2.8 miles of existing Class 1 bicycle trails, 2.5 miles of which are located within Anderson River Park, 3.5 miles of Class 2 bike lanes and one-mile of Class 3 bicycle routes inside city limits.

Traffic Study Area

The following study locations were included in the assessment of project-related impacts:

Roadway Segments (daily operations)

1. Rhonda Road: SR 273 to West Anderson Drive
2. Rhonda Road: West Anderson Drive to Gas Point Road
3. West Anderson Drive: Anderson Hills Parkway to Olinda Road
4. Olinda Road: West of West Anderson Drive
5. South Street: West Anderson Drive to SR 273
6. Balls Ferry Road: SR 273 to I-5
7. SR 273: Balls Ferry Road to North Street
8. North Street: SR 273 to I-5
9. SR 273: North Street to Ox Yoke Street

10. North Street: I-5 to Riverside Avenue
11. Ox Yoke Street/Riverside Avenue: SR 273 to I-5
12. Riverside Avenue: I-5 to Airport Road
13. Airport Road: Riverside Avenue to Dersch Road
14. SR 273: Ox Yoke Street to South Bonnyview Road
15. Airport Road: Dersch Road to Knighton Road

Intersections (AM and PM peak hour operations)

1. SR 273/South Bonnyview Road
2. Airport Road/Rancho Road
3. SR 273/Clear Creek Road
4. SR 273/Canyon Road
5. SR 273/Happy Valley Road
6. Airport Road/Knighton Road
7. Airport Road/Churn Creek Road
8. SR 273/Ox Yoke Street
9. Riverside Avenue/Little Street
10. Riverside Avenue/I-5 Southbound Ramps
11. Riverside Avenue/I-5 Northbound Ramps
12. Riverside Avenue/Airport Road
13. SR 273/Alexander Avenue
14. SR 273/North Street
15. Ventura Street/North Street
16. North Street/I-5 Southbound Ramps
17. North Street/I-5 Northbound Ramp (McMurry Drive)
18. Olinda Road/West Anderson Drive
19. SR 273/South Street (Balls Ferry Road)
20. Balls Ferry Road/I-5 Southbound Ramp (Ventura Road)
21. Balls Ferry Road/I-5 Northbound Ramp (McMurry Drive)
22. SR 273/Bruce Drive
23. SR 273/Pinon Avenue
24. SR 273/Factory Outlet Drive
25. Factory Outlet Drive/I-5 Southbound Ramp
26. Factory Outlet Drive/I-5 Northbound Ramp (Locust Road)
27. Gas Point Road/I-5 Southbound Ramps
28. Gas Point Road/I-5 Northbound Ramps
29. South Bonnyview Road/I-5 Southbound Ramp
30. South Bonnyview Road/I-5 Northbound Ramp
31. SR 273/Pleasant Hills Drive
32. Rhonda Road/ Anderson Hills Parkway
33. West Anderson Drive/Anderson Hills Parkway

Freeway Facilities (AM and PM peak hour operations)

1. I-5/Bowman Interchange (Northern Ramps Only)
2. I-5/Gas Point Road Interchange
3. I-5/Main Street Interchange
4. I-5/SR 273 Interchange
5. I-5/Deschutes Road Interchange
6. I-5/Balls Ferry Road Interchange
7. I-5/North Street Interchange

4.4 TRANSPORTATION AND CIRCULATION

8. I-5/Riverside Avenue Interchange
9. I-5/Knighton Road Interchange
10. I-5/Bonnyview Road Interchange
11. I-5/Cypress Avenue Interchange
12. I-5/SR 44 Interchange

Existing Traffic Volumes

Fehr & Peers obtained existing daily traffic counts as well as AM and PM peak hour traffic counts for I-5 and SR 273 from the Caltrans District 2 database. Fehr & Peers also conducted independent traffic counts of local and city roads on Tuesday, November 14th 2006. The AM peak hour is defined as the one hour of peak traffic flow counted between 7:00 AM and 9:00 AM on a typical weekday. The PM peak hour is defined as the one hour of peak traffic flow counted between 4:00 PM and 6:00 PM on a typical weekday. **Figure 4.4-2, Peak Hour Traffic Volumes, Lane Configurations, Traffic Control and Average Daily Volumes Under Existing Conditions**, shows existing daily roadway segment traffic volumes and AM and PM peak hour intersection turning movement volumes.

Existing Traffic Conditions

Traffic operations have been quantified through the determination of "level of service" (LOS). Level of service is a qualitative measure of traffic operating conditions, whereby a letter grade "A" through "F" is assigned to an intersection or roadway segment representing progressively worsening traffic conditions.

Fehr & Peers conducted a detailed analysis of the study roadway segments, intersections and freeway facilities under existing conditions. Areas identified as operating acceptably do not exceed the level of service (LOS) threshold for the jurisdiction or agency operating the roadway as shown below:

1. County of Shasta – LOS C
2. City of Redding – LOS C
3. City of Anderson – LOS D
4. Caltrans – LOS C

Tables 4.4-7 through 4.4-9A summarize the existing conditions of roadways, intersections and freeway merge/diverge within the study area. These tables are also shown in **Appendix 4.4-1** of this EIR.

4.4.2 REGULATORY CONTEXT

Existing transportation policies, laws, and regulations that would apply to the proposed project are summarized below. This information provides a context for the input discussion related to the project's consistency with applicable regulatory conditions.

STATE

California Department of Transportation (Caltrans)

Caltrans policies are applicable to I-5, SR 273, and SR 44 and are summarized in the Caltrans' *Guide for the Preparation of Traffic Impact Studies* (State of California Department of Transportation, December 2002). These guidelines identify when a traffic impact study is

required, what should be included in the study, analysis scenarios, and guidance on acceptable analysis methodologies.

Caltrans endeavors to maintain a target service level of LOS C on State highway facilities. However, this may not always be feasible and, as the project progresses, Caltrans and the City of Anderson will need to consult regularly to determine the appropriate target LOS for a given improvement. For the purposes of this EIR, LOS C is considered the minimum acceptable operating level for Caltrans' controlled facilities (i.e., SR 273 intersections/roadway segments, I-5 merge/ diverge/weave, and I-5 ramp terminal intersections).

LOCAL

Shasta County General Plan

Most of the roadways proposed with the project will be within and maintained by the City of Anderson. However, a number of the existing roadways are within Shasta County's jurisdiction. The *Shasta County General Plan*, as amended September 2004, sets forth future plans for the transportation system in the County. This document seeks to coordinate transportation planning with the cities of Anderson, Redding, and Shasta Lake, as well as the unincorporated portions of the County through the implementation of its goals and objectives. Policies and implementation programs pertaining to the County's circulatory system and the proposed project include:

Development Standards and Improvements

Policy C-6a Future road and street development including future right-of-way shall comply with the adopted County Development Standards.

Policy C-6j New development shall provide circulation improvements for emergency access by police, fire, and medical vehicles; and shall provide for escape by residents/occupants in accordance with the Fire Safety Standards.

Policy C-6k Shasta County shall adopt the following Level of Service (LOS) standards for considering any new roads:

- Rural arterials and collectors – *LOS C*
- Urban/suburban arterials and collectors – *LOS C*

For the purposes of this analysis, LOS C is considered the minimum acceptable level of service standard for roadways and intersections.

Policy C-6l New development, which may result in exceeding LOS E on existing facilities, shall demonstrate that all feasible methods of reducing travel demand have been attempted to reach LOS C. New development shall not be approved unless traffic impacts are adequately mitigated. Such mitigation may take the form of, but not be limited to, the following:

- Provision of capacity improvements to the specific road link to be impacted, the transit system, or any reasonable combination;

Provision of demand reduction measures included as part of the project design or project operation or any feasible combination.

City of Anderson General Plan

The City of Anderson General Plan provides the following policies to address traffic and circulation issues such as LOS standards, roadway funding, growth impacts, road standards, transit, and access. **Table 4.4-1** identifies General Plan policies and implementation measures for transportation and circulation that are relevant to the proposed project. While this EIR analyzes the Specific Plan’s consistency with the City of Anderson General Plan pursuant to CEQA Section 15125(d), the determination of the Specific Plan’s consistency with this General Plan rests with the City of Anderson City Council.

**TABLE 4.4-1
SPECIFIC PLAN CONSISTENCY WITH CITY OF ANDERSON GENERAL PLAN POLICIES
TRANSPORTATION AND CIRCULATION**

General Plan Goals and Policies	Consistency with the General Plan	Analysis
Provide a street system which will adequately serve homes, business, industry, recreation and other uses as they develop in accordance with the Land Use Plan. (SP-1)	Yes	The Specific Plan provides a roadway system sufficient to serve the expected land use. Additionally, the circulation system is consistent with the City’s Circulation element.
Provide an overall street pattern that has a functional relationship to land uses, accommodates future traffic volumes, and includes a wide variety of street types and designs to foster connectivity and walkability. (SP-4)	Yes	The Specific Plan provides a street pattern such that appropriate streets provide service to adjacent land uses. Additionally, connectivity and walkability are accommodated for in the Specific Plan area (where appropriate).
Provide bicycle and pedestrian trails and facilities within and between residential areas. (SP-5)	Yes	The Specific Plan has an extensive bicycle and pedestrian network.
Promote modification of the Standards in Old Town Core, Special Planning areas and other suitable areas to allow special designs which promote smart growth and walkability. (SP-6)	Yes	Standards are modified, as appropriate, within the Specific Plan area. Specifically, the modifications provide for smarter growth and better opportunities for all modes of travel.
Coordinate design standards with area-wide construction standards to promote regional planning and efficiency. (SP-7)	Yes	The Specific Plan provides design standards to integrate all modes of travel on-site while conforming to County and City standards off-site where existing and future roadways connect.
Strive to maintain Level of Service (LOS) D as the minimum acceptable service standard for intersections during peak periods. (SP-8)	Yes	While on-site, LOS D or better is maintained, LOS at some locations may occasionally operate below D particularly in the interim period before identified improvements are completed. These impacts are summarized later in this chapter by detailed evaluation of the roadway, intersection, and freeway facilities.
Provide adequate capacity (such as bike lanes and bus turn-outs) on collector and arterial streets to accommodate multi-modal travel within the City. (SP-12)	Yes	The Specific Plan identifies locations for bicycle facilities and bus locations on the major arterial/collector system.
Address future roadway needs through both new road construction and management of existing and planned roadway capacity. (SP-13)	Yes	The proposed project includes construction of new roadways as well as modification to existing roads to result in acceptable LOS.
Adopt standards to allow narrow street sections in areas featuring grid systems and redundant parallel streets when combined with group parking and other safety features. (SI-6)	Yes	Due to the ridgetop development nature of the project, grid systems and parallel streets cannot feasibly be required in all areas. However, narrow streets are incorporated into the Specific Plan area, where appropriate,

4.4 TRANSPORTATION AND CIRCULATION

General Plan Goals and Policies	Consistency with the General Plan	Analysis
		including the grid-street area.
Maintain and develop a network of arterial and collector streets with proper consideration for existing and proposed circulation and land use patterns. (SI-7)	Yes	The Specific Plan provides a network of arterial and collector streets, as appropriate. Appropriate integration with existing and future circulation systems is provided.
Ensure that developers fund traffic impact studies that identify on-site and off-site effects and mitigations, and that they contribute appropriate funding to ensure that on-site and off-site improvements are constructed. (SI-14)	Yes	The results presented later in this chapter summarize the results of the transportation impact assessment that addresses on- and off-site facilities. Funding for on- and off-site improvements will be identified in the project's conditions of approval.
If it cannot be demonstrated prior to project approval that levels of service will be met, the City may consider the development based on payment of traffic impact fees targeted for the specific impacts. (SI-15)	Yes	All improvements have a City-identified funding source. However the City may not have jurisdiction over the improvement itself.
In the event that a signalized intersection exceeds the applicable level of service standard, the City may approve projects if the City can establish appropriate conditions of approval and/or mitigation measures to address the service standard. (SI-16)	Yes	All improvements have a City-identified funding source. However the City may not have jurisdiction over the improvement itself.
Provide bicycle and pedestrian transportation areas on all arterial and collector streets. (BP-1)	Yes	The Specific Plan provides appropriate bicycle and pedestrian facilities along arterial and collector streets within the plan area.
Bicycle and pedestrian routes shall lead to schools, shopping centers, recreational areas and connect with regional bikeway systems. (BP-2)	Yes	The Specific Plan provides bicycle and pedestrian facilities to all uses within the Specific Plan area, including parks, schools, shopping centers, and recreational areas. Additionally, the project does not interfere with the regional bikeway system.
Design new roadway facilities to accommodate bicycle and pedestrian traffic. Include Class I, II or III bicycle facilities as appropriate. Through the Design Review process, provide sidewalks to all roads, except in cases where very low pedestrian volumes and/or safety considerations preclude sidewalks. (BP-6)	Yes	The Specific Plan provides Class I, II, or III bicycle facilities, as appropriate.
During the site plan review process, require new development to incorporate design features that support bicycling and walking, particularly in those areas that could provide access to and between major destinations. This could include bicycle racks, lockers, showers and other support facilities; continuous sidewalks; an internal pedestrian circulation plan; walkways for pedestrians and bicyclist between cul-de-sacs; and at least one major entrance adjacent to a sidewalk, wherever possible. (BI-4)	Yes	The Specific Plan provides for design elements that support alternative modes of travel, including pedestrian and bicycle facilities, policies for bicycle racks, lockers, showers, and other support facilities.
Design trails to avoid unnecessary impacts to wetlands, drainages and sensitive species. (BI-6)	Yes	Trails within areas with wetlands, drainages, and sensitive species will be designed to minimize these impacts as much as possible.
Ensure that new roadways and facilities can accommodate public transit. (TP-1)	Yes	Proposed arterial and collector roadways will be designed to accommodate public transit.

General Plan Goals and Policies	Consistency with the General Plan	Analysis
Coordinate with public schools to promote access and roadway designs that support school bus requirements. (TI-2)	Yes	Schools are located in areas where appropriate roadway designs will provide for school bus requirements.

City of Redding General Plan

Because of the proximity of the project to the City of Redding, and the potential impact to regional transportation resources including those in the City of Redding, the City of Redding's appropriate General Plan Policies are included in this analysis. The *City of Redding General Plan* was adopted October 3, 2000 and contains objectives for the City's transportation system until the year 2020. Policies and implementation programs pertaining to the City's circulation system are shown below:

Streets and Highways

Policy T1-A Establish the following peak-hour LOS standards for transportation planning and project review. They reflect the special circumstances of various areas of the community, as described below:

- Use LOS "C"—"acceptable delays"—for most arterial streets and their intersections.
- Use LOS "D"—"tolerable delays"—for the Downtown area where vitality, activity, and pedestrian and transit use are primary goals.
- Use LOS "D"—"tolerable delays"—for streets within the State highway system and interchanges. *Please note that, for the purposes of this EIR, Caltrans' LOS C standard supersedes this standard.*
- Use LOS "D"—"tolerable delays"—for river-crossing street corridors whose capacity is affected by adjacent intersections.

The Vineyards at Anderson Specific Plan

The proposed Vineyards at Anderson Specific Plan contains various goals and policies regarding transportation and circulation. Once the Specific Plan is adopted, future development phases will need to comply with those goals and policies. This EIR evaluates both the programs in the Specific Plan and the impacts of the Phase 2 project. Specific Plan policies relevant to transportation and circulation within Phase 2 of the proposed project area in the context of CEQA are summarized in **Table 4.4-2**. This table also provides an evaluation of Phase 2 relative to its consistency with the pertinent Specific Plan policies as required by State CEQA Guidelines Section 15125(d). The final authority for interpretation of these policy statements, and determination of the project's consistency, ultimately rests with the City of Anderson City Council.

**TABLE 4.4-2
PROJECT LEVEL (PHASE 2) CONSISTENCY WITH VINEYARDS AT ANDERSON SPECIFIC PLAN POLICIES
TRANSPORTATION AND CIRCULATION**

Specific Plan Policies	Consistency with the Specific Plan	Analysis
Phase development within the Specific Plan area to maintain LOS thresholds consistent with	Yes	The phasing of the project is consistent with the phasing analysis prepared for the project.

4.4 TRANSPORTATION AND CIRCULATION

Specific Plan Policies	Consistency with the Specific Plan	Analysis
General Plan goals and policies. The phasing will be directly tied to the constraints analysis prepared by the City of Anderson. (Policy 4.3.3)		Additionally, as part of the Conditions of Approval for the project, project phasing will be readdressed to identify triggers for mitigation measures consistent with logical phasing of the project.
Implement roadway system and pedestrian/bicycle system as shown on Figures 4-1 through 4.15 of the Specific Plan. (Policy 4.4.3)	Yes	Phase 2 of the project implements the roadway system identified on Figures 4-1 through 4.15 within the Specific Plan.
Maintain a minimum of LOS D service on area roadways. (Policy 4.4.4)	Yes	Roadways within Phase 2 of the proposed project operate at LOS D or better (on-site intersection analyses are presented in the appendix).
Implement Anderson Hills Parkway cross-sections and roundabout design recommendations similar to that shown on Figures 4-2 and 4-10. (Policy 4.4.5)	Yes	The project incorporates design configurations identified in Figures 4-2 and 4-10 within the Specific Plan.
Local streets serving ridgeline areas shall be designed to minimize the need for grading while providing for safety and emergency access. Such roadways shall follow ridges to minimize the need for grading and site disturbance. Secondary access roads consisting of 20'foot wide, paved all-weather surface roadways shall provide egress and ingress from ridgeline cul-de-sacs and accommodate emergency vehicles (see Figure 4-15: Secondary Access Road in Section 4.5: Trails) of the Specific Plan. These roads shall be designed with a maximum slope of 12%, maximum design speed of 10 mph, and minimum centerline radius of 60 feet. (Policy 4.4.15)	Yes	The project incorporates appropriate roadways for ridgeline development. Additionally, secondary access roadways are provided to interconnect dead-ends at the end of the ridgeline roadways. Additionally, these roadways are designed according to the design criteria described.
All streets shall provide concrete sidewalks on both sides; exceptions may be made for roadways with Class 1 Bicycle facilities, and portions of West Anderson Drive, during the Tentative Map process. (Policy 4.4.17)	Yes	The proposed plan, and Phase 2, includes a mixture of street and trail designs intended to encourage non-motorized transportation as well as provide for efficient motorized circulation.
All local streets (excluding alleys) shall have curb-separated concrete sidewalks creating continuous street tree planting strips between curb and sidewalk. These planting strips shall be a minimum of seven feet in width, measured to face of curb. (Policy 4.4.18)	Yes	The proposed project incorporates planting strips along all local roadways, between the roadway and the edge of the sidewalk.

4.4.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

CEQA states that a project may have significant impacts on traffic and circulation if it does any of the following:

- Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections).

- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- Result in inadequate emergency access.
- Result in inadequate parking capacity.
- Conflict with adopted policies, plans or programs supporting bicycle, pedestrian, and/or public transportation (e.g., bus turnouts, bicycle racks).

In addition to the thresholds of significance identified above, conditions with and without the project were compared to the following significance criteria for the appropriate jurisdiction in order to identify significant impacts specific to the Specific Plan area. A significant traffic impact would occur if:

Signalized Intersections

- City of Anderson Facilities – An intersection that operates acceptably (LOS A, B, C or D) without the project is degraded to an unacceptable level (LOS E or F) due to the additional traffic from the project.
- County of Shasta, City of Redding, or Caltrans Facilities – An intersection that operates acceptably (LOS A, B or C) without the project is degraded to an unacceptable level (LOS D, E or F) due to the additional traffic from the project.
- For All Jurisdictions - An intersection that is operating at an unacceptable LOS without the project, experiences an increase of five (5) or more seconds of control delay due to the addition of project traffic.

Unsignalized Intersections

- City of Anderson Facilities – An intersection that operates acceptably (LOS A, B, C, or D) without the project is degraded to an unacceptable level (LOS E or F) due to the additional traffic from the project and the intersection satisfies the Manual on Uniform Traffic Control Devices (MUTCD) peak hour volume warrant for traffic signal installation.¹
- County of Shasta, City of Redding, or Caltrans Facilities – An intersection that operates acceptably (LOS A, B, or C) without the project is degraded to an unacceptable level (LOS D, E, or F) due to the additional traffic from the project and the intersection satisfies the MUTCD peak hour volume warrant.
- For all Jurisdictions - An intersection that is operating at an unacceptable LOS without the project, experiences an increase of five or more seconds of control delay due to the

¹ The peak-hour warrant is a subset of the standard traffic-signal warrants recommended in the *Manual on Uniform Traffic Control Devices* and associated Caltrans guidelines. The peak-hour signal warrant analysis should not serve as the only basis for deciding whether and when to install a signal. To reach such a decision, the full set of warrants should be investigated based on field-measured, rather than forecasted, traffic data, and on a thorough study of traffic and roadway conditions conducted by an experienced engineer. Furthermore, the decision to install a signal should not be based solely upon the warrants, because the installation of signals can lead to certain types of collisions (such as rear-end collisions). Although signals provide increased capacity at intersections and may be needed (from a capacity perspective) to serve predicted volume demands at the intersection, the potential safety implications associated with signal installation should be reviewed by the responsible state or local agency (depending on whether the intersection is controlled by the state, the County, or the City). The responsible agency should undertake regular monitoring of actual traffic conditions and accident data, and a timely reevaluation of the full set of warrants to prioritize and program intersections that may be identified for signalization in this study.

4.4 TRANSPORTATION AND CIRCULATION

addition of project traffic and the intersection satisfies the MUTCD peak hour volume warrant.

Roadway Segments

- City of Anderson Facilities – A roadway segment that operates acceptably (LOS A, B, C, or D) without the project is degraded to an unacceptable level (LOS E or F) due to the additional traffic from the project.
- County of Shasta, City of Redding, or Caltrans Facilities – A roadway segment that operates acceptably (LOS A, B, or C) without the project is degraded to an unacceptable level (LOS D, E, or F) due to the additional traffic from the project.
- For all Jurisdictions - A roadway segment that operates unacceptably experiences an increase in its daily volume to capacity ratio (V/C) of 0.05 or greater due to the addition of project traffic.

Freeway Ramp Merge, Diverge, Weave

- A freeway ramp that is operating at an acceptable level (LOS A, B, or C) deteriorates to an unacceptable level (LOS D, E, or F) due to the addition of project traffic.
- A freeway ramp that is operating at an unacceptable level experiences an increase of 10 or more passenger car equivalents (PCE's) during the PM peak hour.

METHODOLOGY

The operations of roadway facilities are described with the term *level of service*. Level of service (LOS) is a qualitative description of traffic flow from the perspective of motorists based on factors such as speed, delay, freedom to maneuver, traffic volume, and the capacity of the roadway. Six levels are defined from LOS A, as the least congested operating conditions, to LOS F, or the most congested operating conditions. LOS E represents "at-capacity" operations. When volumes exceed capacity, stop-and-go conditions result and operations are designated as LOS F.

Because of the size and scope of the project, the impacts are discussed in the context of the City of Anderson as well as areas that may partially or wholly be outside the jurisdiction of the City. As noted above, different agencies have different standards for levels of service. The EIR identifies impacts and needed improvements regardless of agency jurisdiction. However, as the City of Anderson does not have complete authority over all related improvement(s), the EIR must assume that another agency *might* not authorize the requisite improvement, therefore resulting in a significant and unavoidable impact as a result of the project. This is not to suggest that the City is ignoring the responsibility for the improvement, only that the City lacks authority in constructing the improvement and must assume the worse possible case wherein the agency with jurisdiction either does not authorize the improvement, or takes longer to make the improvement than assumed in the EIR.

Roadway Segments

Roadway segments were analyzed by comparing the average daily traffic (ADT) volume to daily volume thresholds. **Table 4.4-3, Roadway Segment Daily Volume Thresholds**, displays the daily volume thresholds for various facility types. These thresholds are used as guidelines to identify the need for new or upgraded facilities. In general, intersection operations analysis

provides a more realistic assessment of traffic conditions on a road than the roadway segment analysis.

**TABLE 4.4-3
ROADWAY SEGMENT DAILY VOLUME THRESHOLDS ¹**

Facility Type	Daily Volume Threshold (Two Way Volume)				
	LOS A	LOS B	LOS C	LOS D	LOS E
Freeway (4 Lanes)	24,000	28,000	32,000	36,000	40,000
Minor Arterial (4 lanes)	22,000	25,000	29,000	32,500	36,000
Major Collector	11,000	12,500	14,500	16,000	18,000
Minor Collector (2 lanes)	9,000	10,500	12,000	13,500	15,000
Local Street (2 lanes)	2,200	2,600	3,000	3,400	3,800

Notes:

1. All volume thresholds are approximate and assume ideal roadway characteristics. Actual thresholds for each LOS listed above may vary depending on a variety of factors including (but not limited to) roadway curvature and grade, intersection or interchange spacing, driveway spacing, percentage of trucks and other heavy vehicles, lane widths, signal timing, on-street parking, volume of cross traffic and pedestrians, etc.

Source: *Highway Capacity Manual*, Transportation Research Board, 2000, Table 4.3-3 City of Anderson General Plan EIR.

Intersections

Both signalized and unsignalized intersections were analyzed using the methodology contained in Chapter 17 of the *Highway Capacity Manual (HCM) – Special Report 209* (Transportation Research Board, 2000). The LOS is based on the average control delay expressed in seconds per vehicle. At two-way or side street stop controlled intersections, level of service is calculated for each movement, not for the intersection as a whole. For approaches composed of a single lane, the control delay is computed as the average of all movements in that lane. At all-way stop-controlled intersections, LOS is based on the average delay experienced on all approaches. **Table 4.4-4, Intersection Level of Service Definitions**, summarizes the relationship between delay and LOS for signalized and unsignalized intersections.

**TABLE 4.4-4
INTERSECTION LEVEL OF SERVICE DEFINITIONS**

Level of Service	Description	Average Control Delay (seconds/vehicle)	
		Signalized Intersections	Unsignalized Intersections
A	Represents free flow. Individual users are virtually unaffected by others in the traffic stream.	≤ 10.0	≤10.0
B	Stable flow, but the presence of other users in the traffic stream begins to be noticeable	10.1 – 20.0	10.1 – 15.0
C	Stable flow, but the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream.	20.1 – 35.0	15.1 – 25.0
D	Represents high-density, but stable flow.	35.1 – 55.0	25.1 – 35.0
E	Represents operating conditions at or near the capacity level.	55.1 – 80.0	35.1 – 50.0
F	Represents forced or breakdown flow.	> 80.0	> 50.0

Source: *Highway Capacity Manual*, Transportation Research Board, 2000.

4.4 TRANSPORTATION AND CIRCULATION

The Synchro 6.0 software was used to evaluate the study intersections as it is consistent with HCM methodologies. The remaining assumptions were incorporated into the analysis:

- Peak hour factors (PHF) were based on the collected count data. For cumulative conditions, a PHF of 0.95 was assumed.
- Ideal saturation flow was assumed to be 1,900 vehicles per lane per hour, consistent with HCM methodologies.
- Where available, signal timing sheets were acquired and input into the analysis software.

Roundabout analyses, to evaluate the planned roundabouts at the Deschutes Road interchange, were conducted using the aaSIDRA roundabout level of service software. This program provides an effective tool for analyzing roundabouts with moderate to low levels of congestion (i.e., V/C ratios less than 0.85). This software is very consistent with HCM methodologies as it uses gap acceptance parameters. Please note that the environmental factor was modified for use in this assessment to reflect American driver behavior, as recommended by the software developer.

Freeway Ramp Merge/Diverge/Weave Analysis

Freeway ramp merge/diverge analyses were conducted using the methodologies contained in Chapters 24 and 25 of the *Highway Capacity Manual* (Transportation Research Board, 2000). These methodologies correlate the LOS to the expected density of vehicles in passenger cars per mile per lane (pc/mi/ln). **Table 4.4-5, Freeway Ramp Merge/Diverge Level of Service Definitions**, summarizes the relationship between density and LOS for freeway merge/diverge operations.

The weaving analysis for the freeway segment between SR 44 and Cypress Road was conducted using the nomograph presented in Figure 507.7A in the Highway Design Manual (Caltrans 2004b). This methodology is referred to as the Leisch Method for Weaving Analysis and was chosen because it is the methodology typically used by Caltrans to evaluate the effectiveness of weaving segments.

The merge/diverge/weave analysis is an assessment of operations that accounts for mainline operations (in addition to the operations of traffic entering and exiting the mainline). Therefore, this analysis is comprehensive enough to reflect capacity constraints on the freeway mainline (in addition to the merge/diverge/weave segment).

**TABLE 4.4-5
FREEWAY RAMP MERGE/DIVERGE LEVEL OF SERVICE DEFINITIONS**

Level of Service	Density (pc/mi/ln)*
A	≤10.0
B	> 10.0 and ≤20.0
C	> 20.0 and ≤28.0
D	> 28.0 and ≤ 35.0
E	> 35.0
F	Demand Exceeds Capacity

* Density measured in passenger cars per mile per lane.
Source: *Highway Capacity Manual, Transportation Research Board, 2000.*

PARKING ANALYSIS

Since a project-level parking analysis could not be conducted without a more detailed site plan, a program-level methodology will be used to analyze parking impacts within the non-residential areas of the Vineyards at Anderson project. When appropriate, the City of Anderson will utilize a shared parking methodology to determine if there are potentially significant impacts to parking at the mixed-use village center. (See Specific Plan Policy 4.4.21) Impacts for the limited commercial portions of the site plan will be determined at time of development using base parking rates for the various land uses contained within the Institute of Transportation Engineer's *Parking Generation, 3rd ed.* (2004) or the City's published parking standards.

PEDESTRIAN, BICYCLE AND TRANSIT ANALYSIS

Planned pedestrian, bicycle and transit facilities within the Vineyards at Anderson project were reviewed for consistency with the goals and policies contained within the following documents: 1) *City of Anderson General Plan* (2007), 2) *County of Shasta General Plan* (2004), 3) *City of Anderson Bicycle Transportation Plan* (2007), 4) *Shasta County Bikeway Plan* (2003), and 5) *Regional Transportation Plan* (2004), and 6) *Vineyards at Anderson Draft Specific Plan* (2007).

TRAVEL DEMAND FORECASTS

Shasta County Travel Demand Model

The Shasta County Travel Demand Model (2006 model update) is a conventional three-step travel demand forecasting model that is similar in structure to many county-wide models used throughout Northern California. The model uses land use and road network data generated by planners in various agencies to estimate travel patterns for base year (2004) and future year conditions and covers all of Shasta County. The county is divided into 1,600 transportation analysis zones (TAZs). External travel to and from Shasta County is represented by 15 gateway zones (external stations) at major road crossings of the county line. The software platform is Citilabs Cube Voyager.

The updated Traffic Demand Model was a collaborative effort between the Shasta County Regional Transportation Agency (RTPA), Caltrans, Shasta County, City of Anderson, City of Redding, City of Shasta Lake, and the model developer. Specifically, all model assumptions and results have been reviewed by all responsible agencies in the area which have "approved" the model for use.

Three sequential steps, acting as sub-models, are involved in the travel demand forecasting process:

1. Trip Generation – This initial step translates household and employment data into the number of trips that will be produced and attracted by each zone. The model uses trip generation rates from the 2001 California Statewide Travel Survey and is generally consistent with rates published in ITE's *Trip Generation*. The model includes seven trip purposes: Home-Work, Home-School, Home-Shop, Home-Other, Other-Work, Other-Other, and Commercial Vehicle. The trip generation module is separated out from the main Cube Voyager model, and is a stand-alone Microsoft Excel spreadsheet.
2. Trip Distribution – This step estimates travel between TAZs. A standard gravity model formulation is used, that distributes trips based on the amount and type of land development and the spatial separation between zones. Initial friction factors were borrowed from NCHRP

4.4 TRANSPORTATION AND CIRCULATION

365,² and then adjusted during the calibration process to match 2001 Caltrans survey trip length frequencies.

3. Trip Assignment – In this final step, vehicle trips from one zone to another are assigned to the road network. The model uses an equilibrium assignment algorithm, with a maximum of 20 iterations.

TDF Modifications

Travel Demand Forecasting (TDF) models incorporate land use information and roadway network characteristics (roadway alignments, roadway capacities, speeds) to forecast existing and future volumes on area roadways. Before the TDF model could be used for this study, the land use and roadway network components of the model were modified to accurately reflect each scenario. These modifications are refinements to the model, and are intended to enable the model to more accurately reflect the land uses proposed in the vicinity of the Specific Plan area.

The first refinement was to the zone system. The existing zones in the vicinity of the Specific Plan area were subdivided, or “split”. Splitting zones results in smaller zones, that in many cases can represent distinct traffic generators, like an office park, or shopping center. Specifically, the refined zone structure for the proposed project enabled the model to more accurately assign project trips to the surrounding roadway network.

The second refinement is to the road network. The zone system and the road network are interconnected. As more detail is added to the zone system, additional detail was added to the road network.

Approved/Pending Projects

The Shasta County Travel Demand Model (2006 model update) incorporates large-scale developments and several “pending/ approved” roadway improvement projects located within the study area (**Tables 4.4-6A and 4.4-6B**). Major land use projects included in the forecasts include North Fork Ranch, Morgan Ranch, Tehama Del Webb, Stillwater Business Park, and other major development throughout the County. Additional growth (beyond the major developments described above) within the county is already included in the Shasta County Travel Demand Forecasting model, as shown in **Tables 4.4-6A and 4.4-6B**.

² Travel Estimation Techniques for Urban Planning, National Cooperative Highway Research Program (NCHRP) Report 365, Transportation Research Board, 1998.

4.4 TRANSPORTATION AND CIRCULATION

**TABLE 4.4-6A
SHASTA COUNTY ROAD IMPROVEMENTS**

Name	Location	Description	Year	Source
SR151	Locust - Shasta	Narrow from 4 to 2 lanes	2007	Caltrans
Redding Downtown	Liberty - Trinity/California	Add turn lanes, modify one-way	2007	Caltrans
Gateway Drive	Deschutes - Balls Ferry	Construct two-lane road	2025	City of Anderson
I-5 NB Off-Ramp	Deschutes	Construct off-ramp	2008	City of Anderson
Airport Road	Riverside - Dersch	Widen from 2 to 4 lanes	2010	City of Anderson
Rhonda Road	South of Deschutes	Relocation intersection to Deschutes	2010	City of Anderson
Eastside Road	North of South Bonnyview	Delete connection east of Railroad	< 2004	City of Redding
Shasta Street	East of Manzanita Hills	Construct 2-Lane Road	2005	City of Redding
Stillwater Business Park Road	North Portion	Construct 2-Lane Road	2010	City of Redding
Cypress Avenue	Athens - Hartnell	Widen from 4 to 6 Lanes	2010	City of Redding
Market Street	Placer - Tehama	Construct 2-Lane Road	2012	City of Redding
Tarmac Road	Oak Mesa - Shasta View	Construct 2-Lane Road	2015	City of Redding
Oak Mesa Lane	Tarmac - Candlewood	Construct 2-Lane Road	2015	City of Redding
Cedars Road	El Reno - Westside	Construct 2-Lane Road	2025	City of Redding
Stillwater Business Park Road	South Portion	Construct 2-Lane Road	2030	City of Redding
Shasta View Drive	Collyer - Oasis	Complete 4-Lane Road	2015	City of Redding
Shasta View Drive	College View - Collyer	4-Lane Overcrossing	2035	City of Redding
Shasta Gateway	Ashby - Cascade	Construct 2-Lane Road	2012	City of Shasta Lake
Casdcade Drive	North of Union School	Construct 2-Lane Road	2012	City of Shasta Lake
Pine Grove Avenue	Leona - Akrich	Construct 2-Lane Road	2012	City of Shasta Lake
Gas Point Road	New North/South Road - Rhonda	Widen from 2 to 4(5) Lanes	2010	Shasta County RTPA
Rhonda Road	Gas Point - I-5/Main	New/Realigned 2(3) Lane Road	2010	Shasta County RTPA
New North/South Road	First - New East/West Road	Construct 2(3) Lane Road	2010	Shasta County RTPA
New East/West Road	New North/South Road - Rhonda	Construct 2(3) Lane Road	2010	Shasta County RTPA
I-5 Interchange	Main Street	Connect to West, Add Roundabouts	2010	Shasta County RTPA
Dana Drive	Hilltop - SR 44	Construct Connector to Ramp	2012	Shasta County RTPA
New North/South Road	New East/West Road - Rhonda	Construct 2(3) Lane Road	2015	Shasta County RTPA
Gas Point Road	Rhonda - Main Over I-5	Widen from 2 to 4(5) Lanes	2020	Shasta County RTPA

4.4 TRANSPORTATION AND CIRCULATION

**TABLE 4.4-6B
SHASTA COUNTY LAND USE PROJECTIONS**

Development	Land Use	Units	2005	2010	2015	2020	2025	2030	After 2030	TOTAL	Percent by 2030
Anderson Potential Target Site	Retail	SF	0	0	0	130,000	0	130,000	66,000	326,000	80%
	Fast Food	SF	0	0	2,500	0	0	2,500	0	5,000	100%
City of Redding (7251 Eastside)	Industrial	SF	0	0	0	198,000	0	298,000	496,000	992,000	50%
Clover Creek (3901 Airport)	Office	SF	0	0	72,700	0	0	0	0	72,700	100%
	Retail	SF	0	0	0	72,700	0	0	0	72,700	100%
Cobblestone Business Park	Office	SF	0	187,000	0	0	0	0	0	187,000	100%
Lasata	MF Attached	DU	0	0	150	151	0	0	0	301	100%
Manor Crest (Cottonwood Hills)	SF Detached	DU	0	64	64	0	0	0	0	128	100%
McConnell Land (350 Old Oregon)	SF Detached	DU	0	0	223	1,165	0	0	0	1,388	100%
Mountain Gate Meadows	SF Detached	DU	0	0	0	0	250	500	250	1,000	75%
	MF Attached	DU	0	0	0	250	250	0	0	500	100%
	Service Commercial	SF	0	0	0	100,000	0	0	0	100,000	100%
North Fork	SF Detached	DU	0	47	47	460	314	532	0	1,400	100%
	Retail	SF	0	0	0	0	180,000	290,000	472,000	942,000	50%
	Office	SF	0	0	0	145,000	0	0	0	145,000	100%
	Equestrian Center	Emps	0	0	0	0	10	0	0	10	100%
Oak Ranch Estates	SF Detached	DU	0	66	66	0	0	0	0	132	100%
Oasis Road Specific Plan	SF 1-5 DU/Acre	DU	0	0	6	3	3	0	0	12	100%
	SF 2-3.5 DU/Acre	DU	0	0	16	0	16	0	0	32	100%
	SF 6-10 DU/Acre	DU	0	0	30	30	0	0	0	60	100%
	MF 15 DU/Acre	DU	0	0	593	296	296	0	0	1,185	100%
	MF 18 DU/Acre	DU	0	0	448	280	168	0	0	896	100%
	Regional Commercial	SF	0	188,500	188,500	188,500	377,000	0	1,342,222	2,284,722	41%
	General Commercial	SF	0	0	143,500	143,500	0	143,500	143,500	574,000	75%
	Shopping Center	SF	0	0	0	0	0	113,500	113,500	227,000	50%
	General Office	SF	0	0	0	0	19,800	0	0	19,800	100%
	Limited Office	SF	0	0	13,100	0	0	0	0	13,100	100%
Palo Cedro Silverbridge Oaks	SF Detached	DU	0	0	0	100	200	0	0	300	100%
Palomar Davis Ridge	SF Detached	DU	0	197	197	0	0	0	0	394	100%
	MF Attached	DU	0	56	0	0	0	0	0	56	100%
Park Marina Drive Specific Plan	SF Detached	DU	0	22	0	0	0	0	0	22	100%
	MF Attached	DU	0	0	99	14	10	0	0	123	100%
	Retail	SF	0	0	50,000	39,200	42,500	55,500	0	187,200	100%
	Office	SF	0	0	0	0	42,500	0	0	42,500	100%
	Hotel	SF	0	0	0	55,500	42,500	0	0	98,000	100%
Shasta Gateway Industrial Park	Industrial	SF	0	49,000	49,000	94,000	94,000	94,000	1,590,000	1,970,000	19%
	Office	SF	0	24,500	24,500	24,500	24,500	0	0	98,000	100%
Shastina Ranch	SF Detached	DU	0	328	0	94	0	0	0	422	100%
	School	Emps	0	0	50	0	0	0	0	50	100%
Shingletown Sierra Pacific	SF Detached	DU	0	66	66	0	0	0	0	132	100%
Stillwater Business Park	Industrial	SF	0	0	0	224,000	224,000	199,000	3,554,000	4,201,000	15%
	Office	SF	0	0	205,200	563,900	223,600	593,900	510,900	2,097,500	76%
VA Home Property (Knighton)	Industrial	SF	0	365,000	138,000	0	0	132,000	0	635,000	100%
	Office	SF	0	191,800	127,900	0	179,100	0	0	498,800	100%
Vineyards	SF Detached	DU	0	682	422	1,166	1,029	666	330	4,295	92%
	MF Attached	DU	0	0	640	0	287	287	0	1,214	100%
	Retail	SF	0	20,000	0	50,000	20,000	50,000	0	140,000	100%
	Office	SF	0	0	50,000	50,000	0	0	0	100,000	100%
	School	Emps	0	0	0	50	50	0	0	100	100%
Woodridge Lake	Retail	SF	0	0	30,000	30,000	0	0	0	60,000	100%

Source: *Shasta County Travel Demand Model*, Dowling Associates, Inc., 2006

Proposed Project

For this study, the Shasta County Regional Travel Demand Model was used to generate daily and peak hour traffic volume forecasts for the following scenarios:

Project Buildout – The proposed land uses and roadway network planned at full buildout and as identified in the Vineyards at Anderson Specific Plan, was incorporated into the Shasta County Travel Demand Forecasting (TDF) model to develop project volumes at the study locations. The TDF model performed trip generation, trip distribution, and trip assignment for the proposed project. Specifically, the land use plan incorporates a balance of residential, support commercial (in the Village Center) and schools to maximize internalization potential. Internal trips are accounted for within the TDF model. Additionally, the Specific Plan incorporates policies and facilities to utilize travel modes other than the single occupant vehicle. However, the TDF model is not sensitive enough to account for utilization of travel modes other than personal vehicles, and likely underestimates the non-automotive travel behavior for the project. The TDF model, therefore, over-estimates vehicle trips, which is considered a conservative approach for this CEQA assessment.

For the purposes of the traffic demand forecasting, the buildout scenario³ incorporated into the model is described below:

- 4,316 Single-Family Homes
- 1,214 Multi-Family Homes
- 600 Retail/Office Employees
- 90 School Employees

Phase 1 & 2 Project – As noted above, the first “phase” of the project is considered to be the existing Sanderson Subdivision, a 242-unit single-family subdivision currently under construction. While this subdivision has been approved, no homes are yet occupied and, as the project will be subject to the policies of the Specific Plan and planned development ordinance, the subdivision is considered the first phase of the proposed project. Phase 2 of the proposed project includes development of 722-unit single-family homes, a 9.2-acre park, a 3.3-acre private recreation area, a fire station and 20,000 square feet of commercial development on approximately two acres. For the purposes of the traffic demand forecasting, the combined Phase 1 & 2 project scenario is described below:

- 964 Single-Family Homes
 - a. Sanderson Subdivision, 242 Single-Family Homes
 - b. Proposed Subdivision, 722 Single-Family Homes
- 50 Retail/Office Employees

Cumulative Conditions – Year 2030 conditions were developed using the Shasta County Travel Demand Forecasting model. Land use and highway network assumptions were updated to account for pending projects in the area and roadway improvements identified by the Regional Transportation Planning Authority (RTPA), City of Anderson, Shasta County, and the City of Redding.

After incorporating the appropriate modifications, the Shasta County TDF Model was run for each of the analysis scenarios to determine the estimated number of vehicle trips that will be generated from the proposed project.

PROGRAM LEVEL (PROJECT BUILDOUT) IMPACTS AND MITIGATION MEASURES

Impact 4.4.1 The project causes an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system, or the project exceeds an established level of service standard (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, congestion at intersections, and/or the level of service). This impact is considered **potentially significant**.

Roadways

Occupancy of the homes constructed as part of Phase 1 & 2 of the proposed project will generate substantial new traffic. **Table 4.4-7** illustrates the Existing, Phase 1 & 2 and Cumulative

³ Please note that the actual model inputs were slightly higher than the proposed project at buildout as the model development occurred prior to finalizing land use assumptions for the Specific Plan. The differences (an additional ten single family homes and one multi family home) will not affect the results of the impact analysis.

4.4 TRANSPORTATION AND CIRCULATION

Buildout Roadway impacts associated with the proposed project. All roadway segments operate acceptably under existing conditions, and will continue to operate acceptably through Phase 1 and 2 of the project.

As shown in the table, at full buildout of the proposed project, a number of roadways drop below acceptable levels of service. **Table 4.4-7A** shows the proposed mitigation associated with the roadway segments. The table also indicates whether an agency or the applicant has responsibility for the improvement.

Significance after Mitigation

The impacts identified in **Table 4.4-7** are mitigated to a **less than significant** level by the improvements identified in **Table 4.4-7a**. As noted in the table, the project is responsible for the improvements. Timing of the improvements will occur between Phase 2 and Phase 3 of the proposed project, estimated to occur when between 1,500 and 2,000 dwelling unit equivalents are constructed.

Intersections

Table 4.4-8 illustrates the intersections affected by the proposed project. As shown in the table, three intersections identified in the study area currently operate below the accepted level of service. All three intersections are associated with Interstate 5. Phase 1 & 2 of the project will increase the impact at these intersections and will reduce two intersections with State Route 273 (Bruce Drive and Alexander Avenue) to LOS D. While LOS D is acceptable for the City, these intersections are within Caltrans Jurisdiction and have a target LOS of C.

Mitigation Measures included in **Table 4.4-8A** would improve the level of service at all intersections to acceptable levels under Phase 1 & Phase 2 conditions. The table indicates funding sources for the improvements, some of which are wholly outside the City of Anderson's jurisdiction. As such, all of the intersections that are outside the City's jurisdiction are classified as **significant and unavoidable** because the City cannot be certain that improvements will be made consistent with this EIR.

Buildout of the proposed project will impact additional intersections. Of the intersections identified in **Table 4.4-8** only three (3) are reduced to an unacceptable LOS as a direct result of the proposed project. The remaining intersections are all predicted to operate at an unacceptable level of service under the cumulative no project scenario.

As shown in **Table 4.4-8A**, improvements at these intersections can improve operations to an acceptable level in all instances. Note that funding for these improvements include the project itself, as well as participation in regional programs. In the case of improvements in the City of Redding, there is no fee program in place that would apply to the proposed project. The improvements identified in **Table 4.4-8A** are already scheduled to occur by the City of Redding within the buildout timeframe of the proposed project.

Significance after Mitigation

The impacts identified in **Table 4.4-8** are mitigated to a less than significant level by the improvements identified in **Table 4.4-8A**. As noted in the table, the project is responsible for the improvements. However, there may be other funding sources to which the project is responsible for its pro-rata or fair share of improvement cost. This cost and allocation is established by the agency with jurisdiction over the improvement. As noted in the text, the City of Anderson can

not ensure that the improvements will be made when the intersection is outside of its jurisdiction. As such, impacts to these intersections are considered significant and unavoidable. Timing of the improvements will occur between Phase 2 and Phase 3 of the proposed project, estimated to occur when between 1,500 and 2,000 dwelling unit equivalents are constructed.

Freeway Merge/Diverge Analysis

Table 4.4-9 identifies impacts at merge/diverge/weave segments along I-5 at area interchanges. As shown in the table, the interstate will operate at unacceptable levels as growth continues in the region. The Fix 5 Partnership is in the process of developing an improvement program and associated impact fee that will address mainline capacity on Interstate 5. The City of Anderson is participating in Fix 5, and anticipates charging impact fees at the time of building permit issuance to support mainline capacity enhancement. The Fix-5 program is not in place at the time of writing of this EIR. Several meetings have been held and the concept of regional-wide impact fees for mainline improvements has been considered by the agencies involved. The exact amount of the fee has not yet been determined and it is likely that the fee itself would not be sufficient to construct all of the mainline improvements planned as part of Fix-5.

Partially because of the uncertainty surrounding Interstate 5 capacity, the City's General Plan focuses on parallel transportation routes including State Route 273. This four lane highway leads from downtown Anderson to downtown Redding and provides connection to other roadways that lead to business parks and areas of future employment such as the Stillwater Business Park. This approach is consistent with efforts by Caltrans and the Shasta County RTPA to develop new north/south roadways in southern Shasta County. The draft Tehama County General Plan also indicates future routes parallel to I-5 that would connect to the Shasta County routes. The City of Anderson is also encouraging balanced growth so that fewer Anderson residents have the need to shop or work outside of the community. The proposed project was designed consistent with this approach and identifies impacts on SR 273 as well as routes that cross Interstate 5 and lead to employment centers in the County.

It is important to note that, as currently envisioned, Fix-5 does not include improvements to interchanges along the mainline system. As noted in Table 4.4-8, many of the interchanges in the study area will have unacceptable levels of service under "no-project" cumulative conditions. This means that existing traffic, or traffic attributed to future growth, causes the interchange to operate at an unacceptable level of service. There is currently no funding source or program identified at the local, state or federal that would pay for interchange improvements. Some agencies are beginning to identify improvements to interchanges as part of a capital improvement program or benefit assessment district as a means of addressing impacts associated with projects within their jurisdiction.

Local agencies find this approach difficult to implement because only Caltrans can make improvements to the highway system. The issue becomes further complicated as the traditional means of addressing an impact is to collect an impact fee equal to the project's pro-rata share of improvement needed to address the impact. Once sufficient funds are collected the improvement is then installed by the agency. Caltrans cannot currently adopt and collect impact fees, and for many of the interchanges a project's pro-rata share is far less than what is needed to construct the improvement. As a result, funds collected from a new project might not be sufficient to fund the improvement. If the improvement cannot be constructed, the impact is not fully mitigated and the agency can only conclude that the impact is significant and unavoidable.

4.4 TRANSPORTATION AND CIRCULATION

TABLE 4.4-7
ROADWAY SEGMENT ANALYSIS, EXISTING, PHASE 1 & 2 AND PROPOSED BUILDOUT

Roadway Segments (daily operations)		Existing			Phase 1 & 2			Change From Existing	Cumulative No Project			Cumulative Plus Project			Change From Cumulative No Project
		Volume	V/C	LOS	Volume	V/C	LOS		Volume	V/C	LOS	Volume	V/C	LOS	
1	Rhonda Road: SR 273 to West Anderson Drive	1,341	0.09	A	7,382	0.49	A	+0.40	4,940	0.33	A	16,570	1.10	F	0.77
2	Rhonda Road: West Anderson Drive to Gas Point Road	2,706	0.14	A	4,370	0.29	A	+0.15	2,710	0.18	A	11,780	0.79	C	0.61
3	West Anderson Drive: Anderson Hills Parkway to Olinda Road	761	0.05	A	781	0.05	A	+0.00	1,830	0.12	A	19,590	1.31	F	1.19
4	Olinda Road: West of West Anderson Drive	3,574	0.24	A	3,647	0.24	A	+0.00	6,770	0.45	A	10,720	0.71	C	0.26
5	South Street: West Anderson Drive to SR 273	5,886	0.33	A	5,978	0.33	A	+0.00	9,670	0.54	A	21,100	1.17	F	0.63
6	Balls Ferry Road: SR 273 to I-5	6,262	0.35	A	6,279	0.35	A	+0.00	10,740	0.60	A	14,850	0.83	D	0.23
7	SR 273: Balls Ferry Road to North Street	11,767	0.33	A	12,507	0.35	A	+0.02	17,300	0.48	A	25,500	0.71	C	0.23
8	North Street: SR 273 to I-5	10,511	0.58	A	10,573	0.59	A	+0.01	14,300	0.79	C	20,070	1.12	F	0.33
9	SR 273: North Street to Ox Yoke Street	11,217	0.31	A	11,822	0.33	A	+0.02	22,320	0.62	A	26,620	0.74	C	0.12
10	North Street: I-5 to Riverside Avenue	7,161	0.40	A	7,542	0.42	A	+0.02	17,800	0.99	E	21,060	1.17	F	0.18
11	Ox Yoke Street/Riverside Avenue: SR 273 to I-5	9,786	0.54	A	10,005	0.56	A	+0.02	19,080	1.19	F	19,240	1.20	F	0.01
12	Riverside Avenue: I-5 to Airport Road	4,914	0.27	A	4,921	0.27	A	+0.00	17,120	0.95	E	17,810	0.99	E	0.04
13	Airport Road: Riverside Avenue to Dersch Road	9,977	0.55	A	10,329	0.57	A	+0.01	24,970	1.39	F	27,690	1.54	F	0.15
14	SR 273: Ox Yoke Street to South Bonnyview Road	14,628	0.41	A	15,116	0.42	A	+0.01	23,230	0.65	B	24,310	0.68	B	0.03
15	Airport Road: Dersch Road to Knighton Road	9,145	0.51	A	9,418	0.52	A	+0.01	22,300	1.24	F	23,740	1.32	F	0.08

TABLE 4.4-7A
ROADWAY IMPACT AND PROPOSED MITIGATION

Impact	Funding Source	Mitigation Measure	LOS With Mitigation	Environmental Determination
1 Rhonda Road: SR 273 to West Anderson Drive	SCFP	New north/south roadway extending from SR 273 to Gas Point Road	C	SU
3 West Anderson Drive: Anderson Hills Parkway to Olinda Road	Project	Expansion from two (2) lanes to four (4) lanes	A	LS
5 South Street: West Anderson Drive to SR 273	Project	Either: (1) widen South Street, between West Anderson Drive and SR 273, from two- to four-lanes; or (2) extend Bruce Drive from the Cottonwood/Anderson flume to West Anderson Drive and utilize South Street (westbound) and Bruce Drive (eastbound) as a one-way couplet.	A	LS
8 North Street: SR 273 to I-5	Fair Share	Widen from two to four lanes.	A	LS
10 North Street: I-5 to Riverside Avenue	Fair Share	Widen from two to four lanes.	A	LS
11 Ox Yoke Street/Riverside Avenue: SR 273 to I-5	Fair Share	Widen from two to four lanes.	A	LS
12 Riverside Avenue: I-5 to North Street	Project	Widen from two to four lanes.	A	LS
13 Airport Road: Riverside Avenue to Dersch Road	SCFP	Widen from two to four lanes.	C	LS
15 Airport Road: Dersch Road to Knighton Road	Redding	Widen from two to four lanes.	B	LS

Shaded Areas indicate operations below the applicable level of service. SCFP = South County Fee Program, Redding = City of Redding TIF funded program, Project = Responsibility of the proposed project.

TABLE 4.4-8
INTERSECTION IMPACTS: EXISTING, PHASE 1 & 2, AND PROPOSED BUILDOUT

Intersection	Control	Existing No Project				Existing Plus Phase 1 & 2				Cumulative No Project				Cumulative Plus Project				
		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		
		Delay ¹	LOS ²	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	
1	SR 273/South Bonnyview Road	Signal	31	C	31	C	31	C	32	C	33	C	46	D	35	D	47	D
2	Airport Road/Rancho Road	Signal	20	B	17	B	20	B	17	B	35	C	40	D	36	D	41	D
3	SR 273/Clear Creek Road	Signal	8	A	9	A	9	A	9	A	16	B	9	A	17	B	9	A
4	SR 273/Canyon Road	Signal	24	C	22	C	25	C	22	C	14	B	14	B	14	B	15	B
5	SR 273/Happy Valley Road	Signal	10	A	11	B	10	A	11	B	16	B	16	B	17	B	18	B
6	Airport Road/Knighton Road	Signal	14	B	13	B	14	B	13	B	27	C	61	E	30	C	70	E
7	Airport Road/Churn Creek Road	Signal	21	C	22	C	22	C	22	C	>100	F	>100	F	>100	F	>100	F
8	SR 273/Ox Yoke Street	Signal	18	B	19	B	18	B	19	B	27	C	32	C	32	C	40	D
9	Riverside Avenue/Little Street Stop Control	SS-SC	12	B	14	B	12	B	14	B	53	F	>100	F	53	F	>100	F
10	Riverside Avenue/I-5 Southbound Ramps	SS-SC	16	C	23	C	17	C	24	C	>100	F	>100	F	>100	F	>100	F
11	Riverside Avenue/I-5 Northbound Ramps	SS-SC	48	E	16	C	62	F	17	C	>100	F	97	F	>100	F	>100	F
12	Riverside Avenue/North Street	Signal	14	B	13	B	14	B	13	B	47	D	49	D	57	E	69	E
13	SR 273/Alexander Avenue	SS-SC	20	C	25	C	22	C	27	D	>100	F	>100	F	>100	F	>100	F
14	SR 273/North Street	Signal	30	C	24	C	32	C	24	C	46	D	43	D	73	E	79	E
15	Ventura Street/North Street*	SS-SC	21	C	23	C	21	C	23	C	20	C	>100	F	67	F	>100	F
16	North Street/I-5 Southbound Ramp	SS-SC	27	D	>100	F	27	D	>100	F	63	F	>100	F	>100	F	>100	F
17	North Street/I-5 Northbound Ramp (McMurry Dr.)	AW-SC	14	B	14	B	14	B	14	B	17	C	97	F	66	F	>100	F
18	Olinda Road/West Anderson Drive*	SS-SC	11	B	9	A	11	B	9	A	13	B	13	B	>100	F	>100	F
19	SR 273/South Street (Balls Ferry Road)	Signal	24	C	21	C	25	C	22	C	44	D	37	D	>100	F	>100	F
20	Balls Ferry Road/I-5 Southbound Ramp (Ventura Rd.)	Signal	11	B	14	B	11	B	15	B	14	B	30	C	16	B	39	D
21	Balls Ferry Road/I-5 Northbound Ramp (McMurry Dr.)	Signal	18	B	27	C	18	B	27	C	35	C	37	D	51	D	57	E
22	SR 273/Bruce Drive ³	Signal	18	C	23	C	21	C	27	D	99	F	>100	F	>100	F	>100	F
23	SR 273/Pinon Avenue	Signal	14	B	12	B	15	B	12	B	18	B	19	B	20	C	20	B
24	SR 273/Factory Outlet Drive	Signal	13	B	12	B	15	B	14	B	14	B	15	B	18	B	21	C
25	Factory Outlet Drive/I-5 Southbound Off-Ramp	Signal	6	A	6	A	7	A	8	A	2	A	2	A	2	A	2	A
26	Factory Outlet Drive/Locust Road	AW-SC	10	A	11	B	22	C	12	B	4	A	4	A	5	A	4	A
27	Gas Point Road/I-5 Southbound Ramps	SS-SC	12	B	15	C	13	B	18	C	50	E	22	C	49	E	22	C
28	Gas Point Road/ I-5 Northbound Ramps	SS-SC	46	E	25	D	66	F	51	F	>100	F	>100	F	>100	F	>100	F
29	South Bonnyview Road/I-5 Southbound Ramp	Signal	20	C	28	C	21	C	28	C	49	D	81	F	49	D	87	F
30	South Bonnyview Road/I-5 Northbound Ramp	Signal	33	C	21	C	35	C	21	C	73	E	65	E	79	E	71	E
31	SR 273/Pleasant Hills	Signal	15	B	17	B	18	B	19	B	15	B	22	C	25	C	>100	F
32	Rhonda Road/Anderson Hills Parkway	Signal	--	--	--	--	20	C	15	B	--	--	--	--	11	B	24	C
33	West Anderson Drive/Anderson Hills Parkway	Signal	--	--	--	--	--	--	--	--	--	--	--	--	18	B	13	B

n/a indicates areas where volumes are too high for the LOS calculation to be valid. SS-SC=Side Street Stop Control, AW-SC=All-Way Stop Control

¹ Average intersection delay in seconds per vehicle for signalized and AW-SC intersections. Minor street movement/approach with greatest delay in seconds per vehicle for SS-SC intersections.

² Level of Service based on Highway Capacity Manual (Transportation Research Board, 2000).

³ A signal was installed at the intersection of SR 273 and Bruce Drive during preparation of this EIR. No additional mitigation is necessary.

Shaded LOS indicates intersection operations are below the applicable level of service.

* No minor street delay due to zero side-street traffic during the AM peak hour.

4.4 TRANSPORTATION AND CIRCULATION

TABLE 4.4-8A
INTERSECTION MITIGATION

Intersection: Phase 1 & 2		Funding Source	Mitigation Measure	LOS With Mitigation	Environmental Determination
11	Riverside Avenue/I-5 Northbound Ramps	AFP	Traffic Signal or roundabout.	C	LS
13	SR 273/Alexander Avenue	COOP	Signal under construction, scheduled completion 12/07.	D	SU
16	North Street/I-5 Southbound Ramp	Project	Install a traffic signal at the intersection re-stripe the left-turn lane as a shared left/right-turn lane, install a second receiving lane on North Street, west of the intersection.	C	SU
22	SR 273/Bruce Drive ¹	City	Install a traffic signal with protected north/south left-turn phasing. Traffic signal under construction, scheduled completion 11/07.	C	SU
27	Gas Point Road/ I-5 Northbound Ramps	SCFP	Install a traffic control signal and a dedicated eastbound left-turn lane would need to be added (with protected left-turn phasing).	C	SU
Intersection: Buildout		Funding Source	Mitigation Measure	LOS With Mitigation	Environmental Determination
6	Airport Road/Knighton Road	SHASTEC	Add additional north/south through lane.	C	LS
7	Airport Road/Riverside Avenue to Dersch Road	Shasta County	Add additional lane capacity to the intersection, widen bridge and improve approaches. Funded for start in 2008.	C	LS
9	Riverside Avenue/Little Street Stop Control	AFP	Signalize intersection.	B	LS
10	Riverside Avenue/I-5 Southbound Ramps	AFP	Traffic Signal or roundabout.	C	SU
12	Riverside Avenue/North Street	AFP	Add additional lanes to intersection.	C	LS
14	SR 273/North Street	Project	Improve SR 273/North Street by adding a northbound green arrow concurrent with the westbound left-turn phase (known as an overlap right-turn phase) and optimize signal timings at this location.	C	SU
15	Ventura Street/North Street	AFP	Install a traffic signal.	C	LS
17	North Street/I-5 Northbound Ramp (McMurry Drive)	AFP	Install a traffic signal with protected eastbound/westbound left-turn phasing; Maintain two left-turn lanes and a shared through/right-turn lane on the eastbound approach. This will require two receiving lanes on the northbound on-ramp; Maintain a shared through/left-turn lane and one right-turn lane on the northbound approach	C	SU
18	Olinda Road/West Anderson Drive	Project	Signalize the intersection with protected left-turn phasing for the westbound approach; Provide two left-turn lanes and one through lane on the westbound approach; Provide one through lane and one right-turn lane on the eastbound approach; Provide one left-turn lane and a "free" right-turn lane on the northbound approach. This will require a second eastbound lane on Olinda Road to receive the free right-turn movement	C	LS
19	SR 273/South Street (Balls Ferry Road)		Provide protected left-turn phasing on all approaches; Provide two left-turn, two through, and one right-turn lane on the northbound and eastbound approaches; Provide one left-turn, one through, and one right-turn lane on the westbound approach; Provide one left-turn, two through, and on right turn lane on the southbound approach; Provide overlap right-turn phasing on all approaches. This will require prohibiting U-turns on all approaches to the intersection.	C	SU
21	Balls Ferry Road/I-5 Northbound Ramp (McMurry Dr.)	AFP	Add additional lane capacity to the intersection.	C	SU
26	Factory Outlet Drive/Locust Road	AFP	Install a two-lane roundabout.	C	SU
28	Gas Point Road/ I-5 Northbound Ramps	SCFP	Install a traffic control signal and a dedicated eastbound left-turn lane with protected left-turn phasing.	C	SU
29	South Bonnyview Road/I-5 Southbound Ramp	Redding	Add additional lane capacity to the intersection.	C	SU
30	South Bonnyview Road/I-5 Northbound Ramp	Redding	Install a second northbound left-turn lane.	C	SU
31	SR 273/Pleasant Hills	Project	Extend Factory Outlets Drive to Pleasant Hills Road at its intersection with Rhonda Road.	C	SU

AFP = City of Anderson Fee Program, SCFP = South County Fee Program, Redding = City of Redding TIF funded program, Project = Responsibility of the proposed project, Coop = Cooperative Funding Agreement.

¹ A signal was installed at the intersection of SR 273 and Bruce Drive during preparation of this EIR. No additional mitigation is necessary.

TABLE 4.4-9
FREEWAY MERGE DIVERGE ANALYSIS

NORTHBOUND I-5			Existing				Phase 1 & 2				Cumulative No Project				Cumulative Plus Project			
			AM		PM		AM		PM		AM		PM		AM		PM	
Freeway Facilities (AM and PM peak hour operations)		Analysis Type	Density ¹	LOS ²	Density	LOS	Density	LOS	Density	LOS	Density	LOS	Density	LOS	Density	LOS		
1	SR 44 Interchange	Merge (On-ramp)	27	C	30	D	27	C	30	D	47	F	53	F	49	F	53	F
		Merge (Loop-On Ramp)	22	C	24	C	22	C	24	C	40	F	43	F	41	F	44	F
2	I-5/SR 44 Interchange ¹	Weaving Section ³	19	B	26	C	26	C	38	E	35	E	47	E	39	E	49	F
3	Cypress Avenue Interchange	Diverge (Off-ramp)	28	C	25	C	30	D	25	C	48	F	44	F	52	F	46	F
4	Bonnyview Road Interchange	Diverge (Off-ramp)	27	C	23	C	29	C	23	C	46	F	42	E	51	F	44	F
		Merge (On-ramp)	26	C	23	C	27	C	23	C	43	F	40	F	47	F	41	F
5	Churn Creek Road/ Knighton Road Interchange	Diverge (Off-ramp)	24	C	22	C	26	C	23	C	44	F	37	E	50	F	39	E
		Merge (On-ramp)	26	C	23	C	28	D	24	C	44	F	40	E	48	F	41	F
6	Riverside Avenue Interchange	Diverge (Off-ramp)	23	C	22	C	25	C	22	C	45	F	37	E	51	F	40	E
		Merge (Loop-on ramp)	18	B	17	B	20	C	17	B	37	F	30	D	42	F	32	D
7	North Street Interchange	Merge (On-ramp)	22	C	21	C	24	C	21	C	41	F	35	D	47	F	37	E
8	Balls Ferry Road Interchange	Diverge (Off-ramp)	21	C	21	C	24	C	22	C	44	F	36	E	49	F	37	E
9	Deschutes Road Interchange	Merge (On-ramp)	20	B	19	B	22	C	20	B	45	F	33	D	47	F	33	D
10	SR 273 Interchange	Diverge (Off-ramp)	20	C	20	B	20	C	20	B	49	F	38	E	51	F	39	E
11	Main Street Interchange	Merge (On-ramp)	18	B	18	B	18	B	18	B	40	F	31	D	42	F	31	D
12	Gas Point Road Interchange	Diverge (Off-ramp)	14	B	16	B	14	B	17	B	42	E	35	E	43	E	37	E
		Merge (On-ramp)	15	B	14	B	15	B	14	B	37	E	29	D	38	E	29	D
13	Bowman Road Interchange	Diverge (Off-ramp)	10	B	15	B	10	B	15	B	25	C	24	C	26	C	26	C
		Merge (On-ramp)	10	B	12	B	10	B	13	B	34	D	28	D	35	D	30	D

SOUTHBOUND I-5			Existing				Phase 1 & 2				Cumulative No Project				Cumulative Plus Project			
			AM		PM		AM		PM		AM		PM		AM		PM	
Freeway Facilities (AM and PM peak hour operations)		Analysis Type	Density	LOS	Density	LOS	Density	LOS	Density	LOS	Density	LOS	Density	LOS	Density	LOS		
1	SR 44 Interchange	Merge (On-ramp)	25	C	25	C	25	C	24	C	43	F	47	F	44	F	48	F
		Merge (Loop-On Ramp)	22	C	25	C	22	C	25	C	37	E	46	E	38	E	48	F
2	I-5/SR 44 Interchange ¹	Weaving Section 3	21	B	26	C	27	B	36	E	34	D	46	F	35	D	49	F
3	Cypress Avenue Interchange	Diverge (Off-ramp)	21	C	26	C	22	C	27	C	32	D	43	F	33	D	46	F
4	Bonnyview Road Interchange	Diverge (Off-ramp)	21	C	27	C	22	C	29	D	33	D	46	F	35	D	50	F
		Merge (On-ramp)	19	B	28	D	20	B	30	D	30	D	45	F	31	D	49	F
5	Churn Creek Road/ Knighton Road Interchange	Diverge (Off-ramp)	19	B	29	D	20	B	31	D	31	D	49	F	33	D	53	F
		Merge (On-ramp)	20	B	28	C	20	C	30	D	27	C	47	F	29	D	52	F
6	Riverside Avenue Interchange	Diverge (Off-ramp)	15	B	24	C	16	B	26	C	23	C	46	F	25	C	51	F
		Merge (Loop-on ramp)	17	B	25	C	18	B	28	C	24	C	45	F	26	C	50	F
7	North Street Interchange	Merge (On-ramp)	19	B	28	D	20	B	31	D	27	C	50	F	29	D	56	F
8	Balls Ferry Road Interchange	Diverge (Off-ramp)	16	B	24	C	17	B	27	C	23	C	47	F	24	C	50	F
9	Deschutes Road Interchange	Merge (On-ramp)	18	B	27	C	19	B	30	D	26	C	52	F	27	C	56	F
10	SR 273 Interchange	Diverge (Off-ramp)	18	B	23	C	18	B	23	C	25	C	48	F	26	C	49	F
11	Main Street Interchange	Merge (On-ramp)	20	B	26	C	20	B	26	C	28	D	53	F	29	D	54	F
12	Gas Point Road Interchange	Diverge (Off-ramp)	12	B	17	B	12	B	17	B	20	B	40	F	21	C	40	F
		Merge (On-ramp)	19	B	21	C	19	B	21	C	27	C	45	F	29	D	45	F
13	Bowman Road Interchange	Diverge (Off-ramp)	18	B	20	C	19	B	21	C	28	C	47	F	30	D	48	F
		Merge (On-ramp)	18	B	17	B	18	B	17	B	22	C	31	D	23	C	32	D

Shaded LOS indicates freeway facilities are operating at unacceptable levels of service

¹ Density reported in passenger cars per lane per mile.

² Level of Service (LOS) based on Highway Capacity Manual (Transportation Research Board, 2000).

³ Weaving section level of service based on the Leisch Method as presented in Figure 504.7A in the Highway Design Manual.

Source: Fehr & Peers, 2007.

4.4 TRANSPORTATION AND CIRCULATION

Of the interchanges in the study area, the City of Anderson has adopted an assessment district for Deschutes/Factory Outlets and is in the process of creating a similar district for the Riverside Interchange. The intent of the districts is to fund improvements to the interchanges needed to accommodate growth. Regardless, the city cannot be certain that the improvements will in fact be built. As such, the EIR must assume that the improvements are not constructed and the impacts remain significant and unavoidable. This has the unfortunate result of appearing that the impacts of the project are being ignored by the City of Anderson, which is not the case. The City is requiring that the project contribute toward interchange improvements as well as participate in both the Fix-5 and South County Improvement Fee Program.

Mitigation Measures

As noted above, the City of Anderson does not have the ability to construct improvements on Interstate 5, or on any facility within Caltrans jurisdiction. By participating in the Fix-5 program, the South County Fee program, as well as collecting fees for improvements at interchanges, the City is addressing the impacts associated with the proposed project. **Table 4.4-9A** identifies the improvements proposed with the Fix-5 program to expand mainline capacity.

**TABLE 4.4-9A
INTERSTATE 5 MAINLINE IMPROVEMENTS NEEDED AT PROJECT BUILDOUT**

To ensure that I-5 operates at an acceptable LOS in the study area, the following improvements are required:	Funding Source	LOS With Mitigation ¹	Environmental Determination
<ul style="list-style-type: none"> • Ramp metering could be added on ramps identified as operating at an unacceptable level • Auxiliary lanes could be constructed through the study corridor • Additional mixed flow capacity could be added to I-5 • Traffic-signal timing at freeway interchanges should be coordinated with adjacent City and County intersections to minimize impacts of vehicle queue spillback I-5 • Parallel facilities to I-5 should be constructed, including improvements to Airport Road, Balls Ferry Road, and Rhonda Road • HOV lanes could be added through the study corridor • HOV enhancements to existing interchanges could be provided, such as bypass lanes at on-ramps 	Fix 5	C	SU

¹LOS is determined by CALTRANS and may vary depending on location and physical constraints.

Significance after Mitigation

The improvements listed in **Table 4.4-9A** would ensure that Interstate 5 would have sufficient capacity to meet the needs of the proposed project. As the City does not have jurisdiction over Interstate 5 or the Fix-5 program, the City can not ensure that the improvements will be made. Therefore, even though the City participates in Fix-5, and has confidence that the program will improve mainline conditions, the project impacts on Interstate 5 remain **significant and unavoidable**. If the improvements are made, this impact would be classified as significant in the short term but would eventually be reduced to a less-than-significant in the long term after the improvements are constructed.

Impact 4.4.2 The project may exceed, either individually or cumulatively, a level of service standard established by the city congestion management agency for designated roads, highways and intersections. This impact is considered **potentially significant**.

Roadways and intersections within the project area have been designed to ensure an LOS of C or better at buildout of the project. Phasing of roadway construction may increase or decrease LOS temporarily as portions of the roadway are widened and improved to accommodate buildout traffic.

As shown in Tables 4.4-7, 4.4-8 and 4.4-9, implementation of Phase 1 & 2 of the proposed project could result in a reduction of levels of service for intersections and certain freeway movements. Roadway levels of service would remain acceptable during Phase 1 & 2 of the proposed project. Table 4.4-8A identifies improvements to intersections needed to ensure an adequate level of service. As noted in the tables, and the discussion for Impact 4.4-1, the City of Anderson does not have jurisdiction over all of the intersections within the study area. The City is implementing measures designed to ensure the project's contribution to the impact is fully addressed. However, the City cannot assure that the impacts will be addressed for all intersections. Therefore, the City identifies the impacts as **significant and unavoidable** for the intersections where it cannot guarantee mitigation.

Mitigation Measures

Improvements identified in **Tables 4.4-7A, 4.4.8A** and **4.4-9A** will reduce impacts to a less than significant level where the City has sufficient authority to assure completion and where interagency cooperation will be successful. The improvements will be needed prior to occupancy of the proposed project.

Impact 4.4-3 Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment). This impact is considered **less than significant**.

The City of Anderson implements subdivision standards designed to ensure that standard engineering practices are used for all improvements. The Specific Plan provides a selection of roadway segments that differ slightly from the City's adopted standards that are shown in the Specific Plan as Figures 4-2 through 4-9, and generally provide for narrower paved sections between curbs. While narrower roadways slow traffic and provide a more pedestrian scale for neighborhoods, the City's typical development standards call for a minimum 10-foot traffic lane. The Specific Plan allows for a lane width as low as eight (8) feet for some low-volume non-ridgeline areas. (See Specific Plan Figure 4-7.) This roadway is limited, per the standard in the Specific Plan, to serving less than 1,000 vehicles per day, or roughly 100 single-family homes. (See Chapter Four of Specific Plan.) On ridgeline roadways the travel lane width is ten (10) feet. (See Specific Plan Figure 4-6). These are the smallest of the roadway sections, with the remaining roadway sections larger to accommodate more vehicle lanes, or bicycle lanes, or both. The narrow roadway is limited to areas with limited development within the PD. For all roadways turning radii and intersection geometrics are designed to accommodate larger vehicles. This impact is considered **less than significant**.

Mitigation Measures

None required.

Impact 4.4-4 The project could result in inadequate emergency access. This impact is considered **less than significant**.

As shown in **Figure 3.0-7, Vesting Phase 2 Tentative Map**, the project includes secondary access routes. Figure 4.15 of the Specific Plan illustrates how secondary access would be provided to

4.4 TRANSPORTATION AND CIRCULATION

the remainder of the development. As discussed in Impact 4.4-3, the Specific Plan includes provisions for narrower roadways but the roadways are adequate to provide emergency access. The City will require through conditions of map approval that the secondary access roadways be constructed as appropriate with each phase of the project. Also, timing of other major roadways will be as set forth in the development agreement and map approvals. Generally, the Anderson Hills Parkway facility will be constructed as part of Phase 2 construction, and will connect to Rhonda Road. As roadways and emergency access points are shown in the Specific Plan and on the tentative map, this impact is considered **less than significant**.

Mitigation Measures

None required.

Impact 4.4-5 The project could result in inadequate parking capacity. This impact is considered **less than significant**.

The City of Anderson General Plan Policies PI-1 and PI-2 state that adequate parking shall be provided and that shared parking solutions should be encouraged. The methodology to evaluate adequate parking supply is described within this transportation assessment and within the Specific Plan. The Specific Plan establishes general parking standards for use within the developed area. (See Policies 4.4-19 through 4.4-23) The Planned Development Ordinance also establishes parking standards for residential and some traditional uses based on the standards in the Specific Plan. Both the Specific Plan and the Planned Development Ordinance encourage flexibility in parking standards and provide discretion to the City in developing standards for mixed use or shared parking. This impact is considered **less than significant**.

Mitigation Measures

None required.

Impact 4.4-6 The project will not conflict with adopted policies, plans or programs supporting bicycle, pedestrian, and/or public transportation (e.g., bus turnouts, bicycle racks). This impact is considered **less than significant**.

The City of Anderson General Plan Policies PB-6 and PB-4 state that new roadway facilities will be designed to accommodate bicycle and pedestrian traffic and facilities through the Design Review. The proposed project provides for bicycle and pedestrian pathways throughout the development and open space areas. (See **Figure 3.0-6**.) The pathways are linked to major roadways and will lead to bus turnouts as well as commercial, parkland, schools and professional office uses.

The City of Anderson General Plan Policies TP-1 and TI-1 state that new roadways and developments should accommodate for future transit. Specific Plan Policy 4.4.7 also requires that appropriate locations for bus turn-outs and sheltered stops be coordinated with RABA. Construction of these facilities will occur as the roadways and adjacent land uses are developed. Expansion of RABA routes, however, is a function of ridership, population density and revenue. The proposed project does not create impediments to the expansion of RABA into the development area. This impact is considered **less than significant**.

Mitigation Measures

None required.

CUMULATIVE IMPACTS

Impact 4.4-7 Development of the Specific Plan, and the roadway improvements required as mitigation for traffic impacts, has the potential to result in significant environmental impacts. This impact is considered **significant**.

As noted in this EIR, buildout of the proposed project will occur over a number years and traffic impacts will occur within the context of regional growth. A number of agencies, including the City of Anderson, are already addressing regional growth and the roadway network will be improved over time to meet regional growth needs. While the City of Anderson does not have jurisdiction over the improvements outside of its boundaries, the City is working with other agencies in both the planning and funding of future improvements. This analysis assumes that roadways will continue to be widened and intersections signalized and improved to meet future traffic needs, regardless of agency. As noted in the impact analysis above, with improvements to the roadway system the overall impacts of the proposed project at buildout will be within acceptable levels of service. A number of project-specific environmental studies will be needed to construct the roadway improvements, and these will occur as appropriate to the project and by the agency directly responsible for the improvement. The following is brief discussion of the environmental impacts associated with improvements needed to ensure continued acceptable levels of service at full buildout.

Roadways

The proposed project will result in the construction of a new roadway (i.e., Anderson Hills Parkway) leading east from Phase 1 & 2 to Rhonda Road, with the construction of a traffic signal at the new intersection. (See **Figure 3.0-5**.) The new roadway will primarily follow the existing alignment of a dirt road that leads from the Phase 1 & Phase 2 area to Rhonda Road. The alignment of this roadway was evaluated during consideration of the Sanderson Subdivision (SCH #2004042047) and its construction was found to have a less than significant environmental impact. The new roadway will intersect the new north/south roadway contemplated as a part of the Shasta County Southern Region Transportation Planning Study and Traffic Impact Fee Program Project Final Report (Southern Region Fee Program). The new roadway would extend from the eastern boundary of the Specific Plan area northeast to the existing Rhonda Road. (See **Figure 3.0-5**.) As envisioned by the program, the new north-south roadway that would “replace” Rhonda Road would eventually extend south to Gas Point Road and provide for eventual connection south through Tehama County. The timing of the roadway is unknown at this time as it relies on local development and there is no identified funding source. The Southern Region Fee Program includes the alignment in its long-range planning, but does not include the cost of the roadway in the fee calculations.⁴ Alternative 3 to the proposed project discussed in Section 6.0 of this EIR, would construct a portion of the roadway, and associated intersection (either roundabout or traffic signal), instead of the planned extension to Rhonda Road as currently *planned with the proposed project*. Ideally, the proposed project could further the plans of the South County Study. However, issues of right-of-way acquisition and pre-construction biological and archaeological surveys may delay the construction beyond the need of the proposed project. As the proposed project roadway can be constructed with a less than significant environmental impact, there is sufficient time to determine the impacts of the new north/south roadway.

⁴ Shasta County Southern Region Transportation Planning Study and Traffic Impact Fee Program Project Final Report, November, 2006, Page 56.

4.4 TRANSPORTATION AND CIRCULATION

Table 4.4-7A includes improvements to roadways in addition to the north-south alternative to Rhonda Road discussed above. These improvements are described as follows:

West Anderson Drive: Anderson Hills Parkway to Olinda Road will need to expand from two (2) lanes to four (4) lanes to accommodate buildout traffic. While there is sufficient area adjacent to the right-of-way, in places the roadway crosses minor drainages and Anderson Creek, which may affect adjacent wetlands or riparian areas. The expansion of the roadway will require additional grading and may require cuts and fills along the route to facilitate the new travel lanes. The biological analysis completed for the EIR assumed widening of the roadway and the wetland delineation included impacts associated with crossing of Anderson Creek. (See Impact 4.9.5 in the Biological Resources Chapter of this EIR.) As mitigated through the wetland permits and on-site mitigation included in the permitting process, this impact is considered **less than significant**.

South Street: West Anderson Drive to SR 273. This roadway will need to expand to four (4) lanes from its current two (2) lane configuration. Expansion of the roadway is constrained due to bluffs on the north side of the road, existing development as the roadway nears SR 273, an historic aqueduct owned and operated by ACID and Anderson Creek. Expansion to four (4) lanes could occur but would result in **significant and unavoidable** impacts to the historic aqueduct as well as to the riparian area along Anderson Creek. It is uncertain if there is sufficient area underneath the arches of the aqueduct and alongside Anderson Creek to enable two (2) additional travel lanes. Project engineers are uncertain as to the structural stability of the foundation of the aqueduct and whether additional construction could occur in the vicinity of the structure without modification. To address these uncertainties, Alternative 2 was developed and is discussed in Section 6 of this EIR. Under the alternative, South Street would form a westbound portion of a one-way couplet system. Bruce Street, approximately 1,100 feet south of South Street, would form the eastbound leg of the couplet. By forming a one-way couplet the need to widen South Street roadway would be avoided. While this alternative would impact adjacent wetland and riparian areas, particularly near the Bruce Street intersection with West Anderson Drive, there is sufficient area within the project to fully mitigate for the wetland impact. This alternative avoids needing to widen South Street between West Anderson Drive and SR 273 and therefore avoids impacting the historic aqueduct. Implementation of Alternative 2 would reduce these impacts to a level that is **less than significant**.

North Street: SR 273 to I-5. This section of roadway extends through the edge of the City of Anderson's downtown and provides primary access to northbound Interstate 5. The roadway currently has one travel lane in each direction with a continuous center turn lane. The City General Plan designates the route as an arterial which calls for widening to four (4) lanes. The widening will occur within a fully urban section of the roadway and might impact on-street parking in some areas. Since the City plans to widen North Street already, and the developer will contribute to the improvement, the impact would be **less than significant**.

North Street: I-5 to Riverside. A good portion of this roadway is already four (4) lanes, however, there are some two lane segments that will need to be expanded to accommodate new traffic. Much of the extension will occur with adjacent development and the City is currently planning on completing the improvements to the roadway prior to implementation of the proposed project. The City General Plan designates the route as an arterial, which calls for widening to four (4) lanes. There are no physical or biological impediments to expansion along the route and the expansion is expected to result in an impact that is **less than significant**.

Ox Yoke/Riverside Avenue: SR 273 to I-5. This roadway is currently a two (2) lane facility with sight-distance and topographic constraints to accommodating a significant increase in traffic. The City of Anderson is working with Shasta County RTPA on the *Ox Yoke Road/Riverside Avenue Corridor Study and Traffic Fee Program Project*. Working papers have been prepared and a number of design solutions considered. The recommended solution is Alternative B of the *Corridor Study*, which improves roadway widths and access to Interstate 5. The City and RTPA plan to create a fee program to fund improvements. The fee program would apply to the proposed project, reducing impacts to a less than significant level. However, as with other improvements requiring agreement by other public agencies, the City cannot guarantee that the improvement will be made and therefore this impact is considered **significant and unavoidable**.

Riverside Avenue: I-5 to North Street. This segment of Riverside is included in the *Ox Yoke Road/Riverside Avenue Corridor Study and Traffic Fee Program Project*, and would be widened from its current two (2) lane configuration to four (4) lanes. Widening of the roadway may occur with adjacent development as there is commercial and residential land along the route that is likely to develop in the near term. Except for the vacant land, the route is largely developed to urban standards. Along the vacant lands there may be roadside ditches and wetlands that would be affected as a result of widening. These impacts would be mitigated as part of the roadway widening project. This impact is considered **less than significant**. Some of the cost of widening of the roadway will be borne by the fee program developed as part of the *Corridor Study*.

Airport Road: Riverside to Dersch Road; and, Airport Road: Dersch to Knighton Road. Airport road connects to North Street once it crosses the Sacramento River. Airport Road provides a parallel route to I-5 east of I-5 and extends to SR 44 approximately 7.5 miles north of Anderson. Improvements to the route are planned by the City of Redding north of Dersch Road and by Shasta County from Dersch Road to Riverside Avenue. Shastec, an agency formed of Shasta County and the cities of Anderson and Redding, is also planning an expansion of Airport Road from the existing two (2) lane roadway to a four (4) lane expressway. This expansion has been planned for a number of years and will provide access to both the Airport and the industrial development planned at the Stillwater Industrial park. The route also provides east/west connectivity to I-5 and to SR 273 at a number of locations. Impacts associated with the roadway expansion may include loss of roadside wetland and increased noise (both during construction and with the addition of more traffic). These are normal impacts associated with road widening and there are numerous standard mitigation measures that would be applied to the project by the City of Redding. Overall this impact is considered **less than significant**.

Intersections

The new roadway (Anderson Hills Parkway) leading from the Specific Plan area to Rhonda Road will require a traffic signal at Rhonda Road. Alternatively, the new north/south roadway could intersect Anderson Hills Parkway at a roundabout. (See Alternative 3 in Section 6.0) This would provide for an efficient connection of the roadways and eliminate the need for a new traffic signal. This configuration is discussed in Section 6.0 Alternatives in this EIR. Most of the intersection and new roadway work will occur outside of the City of Anderson city limits, and will require an encroachment permit and long-term maintenance agreement with Shasta County. All of the other intersections analyzed in this EIR exist, and can easily be signalized with little adjacent development impact. Often the intersection improvements include adding turn lanes to enable free-travel lanes through the intersection. Expanding the roadway near the intersection often involves elimination of parking and occasionally moving the curb line and adding new pavement. In some instances, structures may need to be modified or removed to

4.4 TRANSPORTATION AND CIRCULATION

accommodate the expansion of the intersection. The exact geometry of the intersection improvement(s) will not be known until final design is prepared prior to expansion. With the exception of wetlands that might be associated with roadside ditches, it is unlikely that there will be any biological impacts associated with the intersection expansion. Impacts associated with intersection improvements are considered **less than significant**.

Freeway Improvements

As noted in Table 4.4-9A, modifications will be needed to mainline Interstate 5 in order to accommodate regional growth traffic, including traffic from the proposed project. The improvements anticipated under the Fix-5 partnership will involve widening of the interstate, adding new travel lanes and expanding right-of-way in some areas. There may also be a need to widen bridges over waterways resulting in impacts to biological resources and riparian habitat. Runoff from the new impervious surfaces may impact water quality to the extent that storm drainage systems may need to be improved to provide both capacity and treatment of the new runoff. All environmental impacts will need to be addressed by CALTRANS in the eventual CEQA/NEPA document prepared for the improvements. There is insufficient information at this time to know exactly what improvements will be constructed and, therefore, it is not possible to know what impacts will occur. It is likely that there will need to be an extensive mitigation plan addressing impacts associated with construction. While the City is participating in the Fix-5 program, the improvements are outside of its jurisdiction. As such, the EIR has evaluated the impacts of the proposed project as if the improvements were not constructed, resulting in a significant and unavoidable determination for reduction in the level of service. As the impacts of the improvements are not known at this time, the City must also conclude that any impacts will be **significant and unavoidable**.

Mitigation Measures

Implementation of the Specific Plan as proposed, and participation in the various funding mechanism for improvements throughout the region, will result in there being a less than significant traffic impact. However, as payment of fees alone cannot guarantee that the improvements will in fact be constructed, and since the City does not have jurisdiction over many of the improvements needed to ensure an adequate LOS, the City must assume that improvements to the infrastructure *may not* be made and that the resulting impacts will be **significant and unavoidable**.

REFERENCES

- California Department of Transportation. 2002. *Guide for the Preparation of Traffic Impact Studies*. State of California.
- City of Anderson. 2003. *City of Anderson Bikeway Plan*.
- City of Anderson. 2007. *City of Anderson General Plan – Circulation Element*.
- City of Redding. 2003. *City of Redding Bikeway Plan*.
- City of Redding. 2000. *City of Redding General Plan*.
- Dowling and Associates. 2007. Shasta County Travel Demand Forecasting Model.
- Institute of Transportation Engineers. 2004. *Parking Generation, 3rd ed.*
- Institute of Transportation Engineers. 2003. *Trip Generation, 7th ed.*
- Redding Area Bus Authority. 2001. *Master Transit Plan*.
- Shasta County. 2003. *Shasta County Bikeway Plan*.
- Shasta County. 2004. *Shasta County General Plan – Circulation Element*.
- Shasta County Regional Transportation Planning Agency. 2004. *Regional Transportation Plan*.
- Shasta County Regional Transportation Planning Agency. 2005. Shasta County Southern Region Transportation Planning Study and Traffic Impact Fee Program Project Final Report. <http://www.snowcrest.net/shasroad/S%20TOC.pdf>
- Shasta County Regional Transportation Planning Agency. 2007. *Ox Yoke Road/Riverside Avenue Corridor Study and Traffic Fee Program Project*. http://www.scrtpa.org/OXwp1_TOC.pdf
- SWA Group. 2007. *Vineyards at Anderson Draft Specific Plan*.
- Synchro software, Version 6.0
- Transportation Research Board National Research Council. 2000. *Highway Capacity Manual, Chapter 17I: Special Report 209*. Washington, D.C.
- Urban Land Institute. 2005. *Shared Parking, 2nd ed.*