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Dry Creek Valley and Sonoma Valley Capacity Threshold Study

Draft Background Conditions Report

Prepared for:

County of Sonoma

Prepared by:



**Dry Creek Valley and Sonoma Valley Capacity Threshold Study
Background Conditions Report**

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Introduction

The County of Sonoma has retained Omni-Means to conduct the *Dry Creek Valley and Sonoma Valley Capacity Threshold Study* (Study) for the areas of Dry Creek Valley and Sonoma Valley in Sonoma County, California. The Study is broken into phases. The first phase will include in-depth reviews of previous analyses, existing literature, applicable safety and capacity standards, and all other available transportation information for Dry Creek Valley and Sonoma Valley. The second and third phases will provide evaluation of roadway capacity and level of service analysis for Dry Creek Valley and Sonoma Valley, respectively. This report completed the first phases of the analysis, and provides background conditions and summarizes information relevant to the Study, including winery policies and permitting processes, special event coordination and event size, and winery locations along major roadways, with respect to local and tourist travel through the study areas. This report includes discussion of the following:

- Setting
- Winery Information
- Winery Policies
- Roadway Network
- Existing Traffic Conditions
- Bicycle Routes
- Collision Data

Setting

Sonoma County is located in Northern California and is adjacent to the counties of Mendocino, Lake, Napa, and Marin. Bordering over 50 miles of the Pacific Ocean coastline on its western front, Sonoma County is host to several coastal towns and cities, including Sea Ranch and Bodega Bay, located along the scenic California State Route 1 (SR 1). US Highway 101 (US 101) runs south to north through Central Sonoma County, providing access to the cities of Healdsburg, Santa Rosa, and Petaluma, and connecting south to the Bay Area and north to Mendocino County. State Route 128 (SR 128) runs on a northwest/southeast alignment from Yolo to Mendocino County, merging with US 101 for a brief segment just south of the City of Cloverdale, and continuing north to its terminus at SR 1 just south of the City of Mendocino.

Sonoma County's is connected by a network of two-lane rural highways (State Routes 1, 116, 12, 121, 128, and 37) and a major highway (US Highway 101). SR 116 extends east from SR 1 to its intersection with Highway 121 just south of the City of Sonoma, intersecting with Highway 12 in Sebastopol, and merging with US 101 from Rohnert Park to Petaluma. Sonoma's diverse terrain of coastal cliffs, rolling hills, and deep valleys make for steep and windy roadways throughout the County's extent. **Figure 1** presents the vicinity map with the County roadway network, and study areas of Dry Creek Valley and Sonoma Valley.

Sonoma County is divided into 17 wine-making regions, with some designated as American Viticulture Areas (AVAs, or appellations). Varying sources refer to these regions as AVAs, or wine regions. Each AVA holds its own unique geological, environmental and social environment, with complementary winery cultures. The 17 regions include:

- Alexander Valley
- Bennett Valley
- Carneros-Sonoma

- Chalk Hill
- Dry Creek Valley
- Fort Ross-Seaview
- Fountaingrove District
- Green Valley
- Knights Valley
- Moon Mountain
- Northern Sonoma
- Pine Mountain-Cloverdale Peak
- Rockpile
- Russian River Valley
- Sonoma Coast
- Sonoma Mountain
- Sonoma Valley

The Study focus areas of Dry Creek Valley and Sonoma Valley were selected for evaluation by the County based on the presence of significant winery activity along the Valleys' roadways, and accompanying traffic and safety concerns associated with increased winery visitorship and access. Residents of the Dry Creek Valley and Sonoma Valley have also expressed concerns with the perceived increase in traffic generated by larger industry-wide winery events that appear to promote day long vehicular activity between winery destinations. From a roadway safety and capacity perspective, many of the affected roadways are built below typical design standards. The preference for these scenic rural roads for recreational cycling creates additional conflicts between motorists, particularly on busy weekends.



Legend

- California Cities
- Sonoma County
- Napa County
- Dry Creek Valley

Dry Creek Valley Capacity Threshold Study

Dry Creek Valley - Vicinity Map

Figure 1



Sonoma County Wine Industry

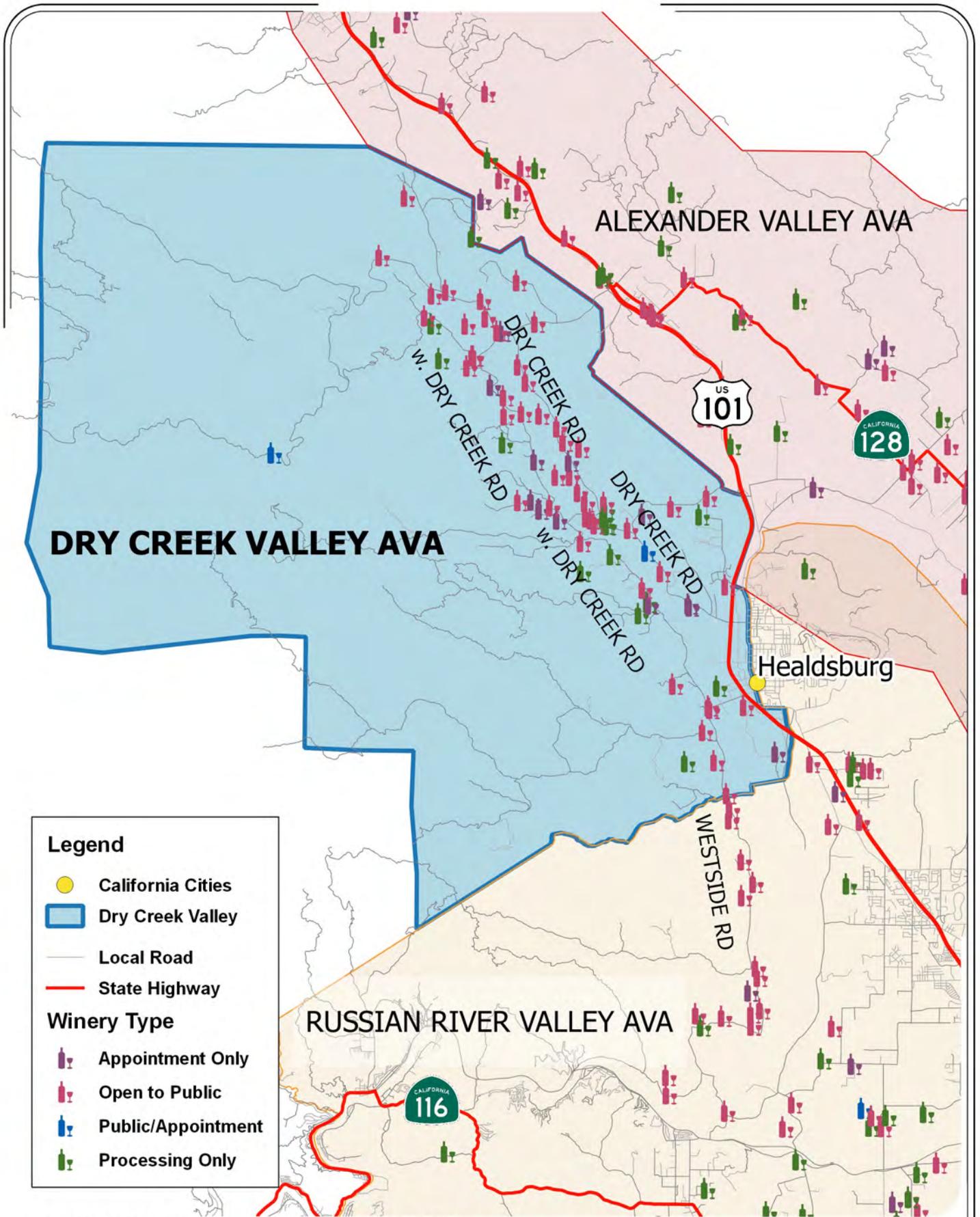
Located in California wine country, food and wine tourism are predominant industries in Sonoma County, which is second only to Napa County for the number of wineries per county in California. As of June 2016, Sonoma County has approved the operation of 473 wineries, approximately two-thirds (299) of which are approved to operate tasting rooms, and one-third (146) are approved to operate events. While not every approved winery has active operations today, approved Use Permits do not expire, and therefore a maximum of 473 wineries could theoretically be active within Sonoma County. According to US Census 2012, and documented in Sonoma County's Permit and Resource Management Department report, *Wineries and Spirits Manufacturing and Wholesaling in Sonoma County, 2014*, Sonoma County has over 250 active wineries. Sonoma County maintains a detailed Winery Database on the County website, which is available to public access at the following address: http://www.sonoma-county.org/prmd/docs/winery_database/.

Table 1 shows the varying types of wineries within Sonoma County. **Figures 2 and 3** present the winery concentration within Dry Creek Valley and Sonoma Valley, respectively.

**TABLE 1
TYPES OF PERMITTED WINERIES IN SONOMA COUNTY**

American Viticultural Area	Processing /Events	Events Only	Liquid Storage Only	Tasting Room /Events	Tasting Room Only	Processing /Tasting Room	Processing /Tasting Room /Events	Processing Only	Grand Total
Russian River Valley (115)		2	2	1	3	34	33	40	115
Sonoma Valley (86)				2	16	17	19	32	86
Dry Creek Valley (82)	1			1		30	34	17	83
Alexander Valley (68)	1	1			8	13	23	21	67
Los Carneros (40)		1	2	1	3	6	10	15	38
Green Valley (33)				2	4	7	4	15	32
Petaluma Gap (12)			1		1	6	1	3	12
Chalk Hill (8)				1		4	3		8
Bennett Valley (6)						1	1	4	6
Fort Ross Seaview (4)						1		3	4
Freestone-Occidental (4)					1		1	2	4
Sonoma Mountain (4)							1	3	4
Knight's Valley (1)						1			1
NA 0 Outside of AVA (13)				1	1	2	1	8	13
Total	2	4	5	9	37	122	131	163	473

Source: Sonoma County, June 2016.

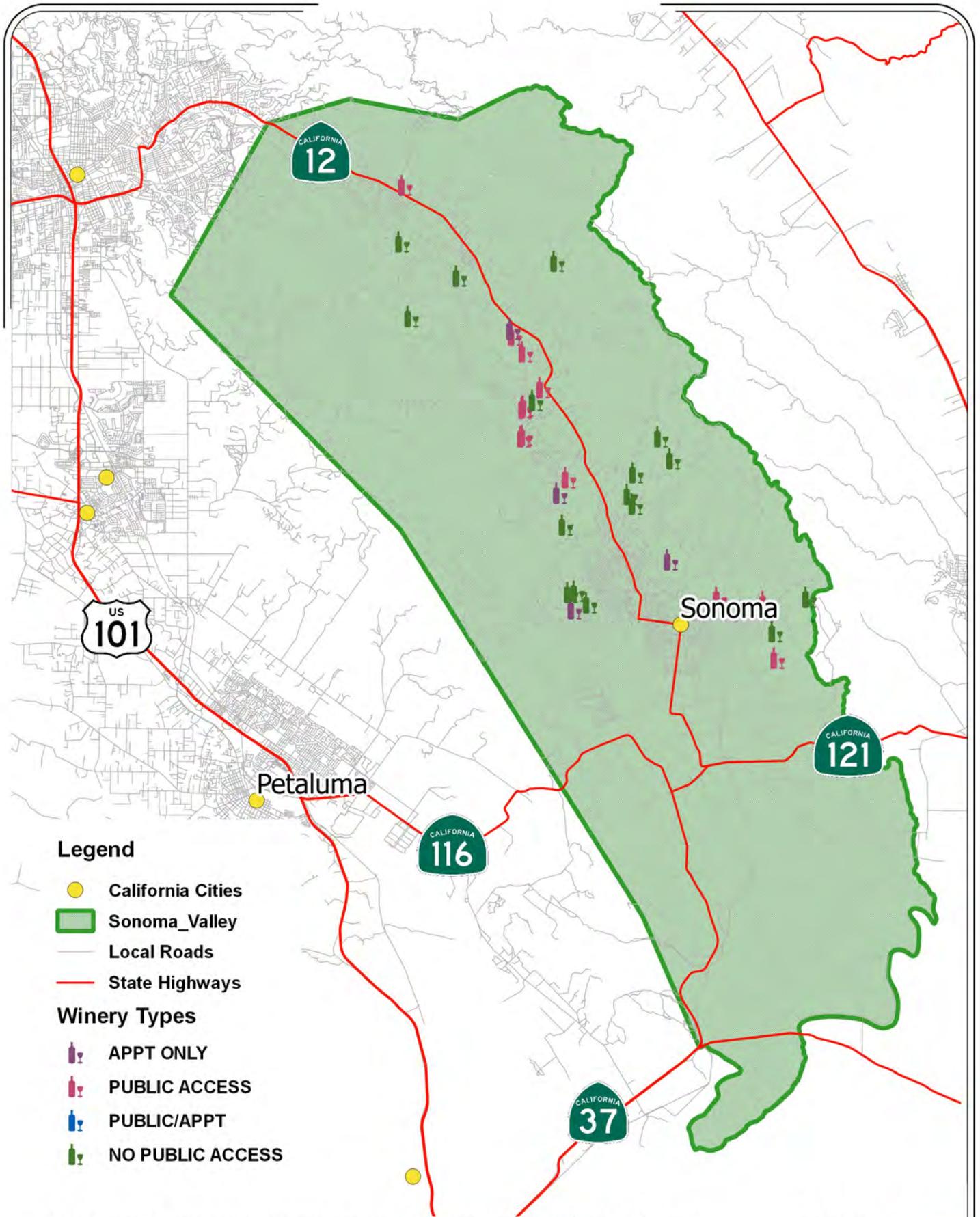


Dry Creek Valley Capacity Threshold Study

Dry Creek Valley - Winery Concentration

Figure 3





Dry Creek Valley and Sonoma Valley Background Conditions Report

Figure 3

Sonoma Valley - Roadway Network and Winery Concentration



Winery Permits

The production and sale of wine is regulated at the local, state, and federal levels. In Sonoma County, there are several types of permits required for varying winery activities. All winery activities, including wine processing, tasting rooms, and special events, in rural and agricultural zones require a Use Permit (also known as a conditional use permit) provided through Sonoma County. **Table 2** shows the type of County permits required for varying winery facilities.

**TABLE 2
SONOMA COUNTY WINERY TYPES AND REQUIRED PERMITS**

Winery Type	Federal TTB	State ABC	County	Notes
Wine Production/Winery	Wine Producer/Blender	02 (Winegrower/Winery)	Use Permit	Traditional bricks & mortar winery allowing full range of activities
Wine Blender	Wine Producer/Blender	22 (Wine Blender)	Design Review (Industrial zones) Use Permit (Ag zones)	Does not allow crush/fermentation. ABC Type 22 may be used with a TTB Bonded Wine Cellar permit for the storage of non-tax paid wine that may or may not involve blending
Public Warehouse	Wine Producer/Blender	14 (Public Warehouse)	Design Review	TTB Wine Producer/Blender permit required if warehouse is Bonded Wine Cellar, or Taxpaid Wine Bottling House
Wholesaler Warehouse	Wholesaler	17 (Beer & Wine Wholesaler)	Design Review	n/a
Virtual Winery Wholesaler Office ("Wine Broker")	Wine Wholesaler	17/20 (Wholesale/Offsale)	Zoning Permit Home Office	The virtual winery does not crush or ferment grapes or bottle wine, but may store up to 40 cases. The site where the wine is actually made (the custom crush winery) must have the appropriate ABC & TTB permits - typically a County Use Permit, an ABC Type 02, and a TTB Wine Producer/Blender and Wine Bond.

Source: *Wineries and Spirits Manufacturing and Wholesaling in Sonoma County, 2014*

Notes:

1. Federal TTB: Alcohol, Tobacco, Tax, and Trade Bureau
2. State ABC: California Alcoholic Beverage Control

Federal TTB and State ABC Permits

A majority of Federal Alcohol, Tobacco, Tax and Trade Bureau (FTTB, or TTB) Wine Producer/Blender Permits (565 of 726, or 80%) are given to wineries within unincorporated Sonoma County, when compared to cities and towns within the County. Within Unincorporated County, 92% of TTB Wine Producer/Blender Permits are in six AVAs, Dry Creek Valley with 101 and Sonoma Valley with 63. A majority of ABC Type 02-Winegrower Permits (754 of 1,079, or 70%) are given to wineries within unincorporated Sonoma County, when compared to cities and towns within the County. Within Unincorporated County, with approximately 125 in Dry Creek Valley and 105 in Sonoma Valley.

County Permits

County winery permits are granted through the Permit and Resource Management Department (PRMD). A majority of PRMD approved wineries (90%) are in rural areas, with a total approved production capacity of over 44 million cases/year. Dry Creek Valley and Sonoma Valley AVAs have 78 and 80 permitted wineries and produce 6,614,375 and 3,493,066 cases of wine per year, respectively. Only Alexander Valley, Russian River Valley, and Green Valley are approved to produce more. Dry Creek Valley has the highest percentage of wineries permitted to accommodate tasting rooms (62 of 78 wineries), and Sonoma Valley has the highest average event attendance in the County (211 persons/event).

County General Plan Winery Policies

Goals identified in the General Plan Agricultural Resources Element express the County's desire to limit the scale and location of visitor serving uses. The following guidelines refer to visitor serving uses in agricultural areas:

- (1) The use promotes and markets only agricultural products grown or processed in the local area.*
- (2) The use is compatible with and secondary and incidental to agricultural production activities in the area.*
- (3) The use will not require the extension of sewer and water.*
- (4) The use is compatible with existing uses in the area.*
- (5) Hotels, motels, resorts, and similar lodging are not allowed.*
- (6) Activities that promote and market agricultural products such as tasting rooms, sales and promotion of products grown or processed in the County, educational activities and tours, incidental sales or items related to local area agricultural products are allowed.*
- (7) Special events on agricultural lands or agricultural related events on other lands in the Sonoma Valley Planning Area will be subject to a pilot event coordination program which includes tracking and monitoring of visitor serving activities and schedule management, as necessary, to reduce cumulative impacts.*

Winery Tourism

With the approval of promotional and marketing events in 1989, and an amendment that allowed tasting rooms with a Use Permit, winery tourism has become a significant factor contributing to Sonoma County's economy and character, resulting in a \$13 billion wine business economy and 54,000 wine-related jobs in 2012 (Stonebridge Research Group, 2014, as cited in *Wineries and Spirits Manufacturing and Wholesaling in Sonoma County, 2014*). Winery events for the sale and promotion of agricultural products grown or processed in the County are allowed in agricultural zones with a Use Permit.

Tasting Rooms

According to the Sonoma County Winery Database (2016), Dry Creek Valley has the highest percentage of wineries permitted to accommodate tasting rooms (62 of 78 wineries). Sonoma Valley has 50 wineries permitted to operate tasting rooms. The most common hours of operation are between 10 am and 5 pm.

Winery Events

The County Planning Commission and Board of Supervisors considers applications for agricultural promotional event, or winery event, permits. In 2008, an amendment to the General Plan modified agriculture promotion (winery event) policies, restricting promotion of products to those that have been grown or processed in the local area. A promotional activity must be compatible with existing uses, and efforts to enforce "local concentration" were added. Use Permits specify the type and number of events allowed for each winery. The types of winery events include: industry wide events; agricultural promotion events ("special events"); weddings; Other: "wine-makers dinners"; and "wine release" events.

According to the Sonoma County Winery Database and Reports "County PRMD Winery Permits ranked by number of events and tasting rooms type" (June 2014), over 2,600 winery events per year have been approved by the County. Approximately 137 of the 439 permitted wineries in Sonoma County are approved to host events, however, the average number of events per winery varies by AVA.

While Dry Creek Valley, along with Russian River Valley, has the most wineries approved to host special events, the average number of permitted events per winery per year is 12 to 13 events per permitted tasting room, and Sonoma County hosts an average of 26 events per year per permitted tasting room. Sonoma County also has the highest average maximum event size of 211 persons/event, with Dry Creek hosting 85 to 115 persons/event. (Note: As documented in the *Wineries and Spirits Manufacturing and Wholesaling in Sonoma County, 2014*, these calculations exclude 16 events of 500 to 3000 persons, and 6 wineries permitted to host 60 or more annual events.)

Special and Industry-Wide Events

Special events include events that require an encroachment permit, such as winery events the correspond with a bicycle event. Due to the popularity of Dry Creek Valley and Sonoma Valley amongst bicyclists, special bicycle events are common and often overlap with winery activities.

Industry-wide events are not specified within a defined zoning ordinance or County policy. However, they tend to occur one to six times a year and are organized by industry group and

involve multiple wineries within close proximity to each other. Participation in industry-wide events is limited to wineries with use permits allowing public tasting rooms.

Issues and Concerns

According to the County of Sonoma PRMD, concerns regarding the impact of increased winery visitorship has prompted the need to address the following standards and practices:

1. Greater limitation on promotional events not explicitly related to agriculture (e.g., weddings).
2. Greater limitations on the number and size of events at wineries.
3. Increasing use of two year review periods for small/medium events, and limited term permits for larger events.

Winery Trip Generation

The Institute of Traffic Engineers (ITE) *Trip General Manual 9th Edition* does not contain trip generation rates or assumptions for winery land uses. Trip generation is utilized when conducting site impact studies, determining on-site circulation patterns, performing access management studies, determining traffic signal timing, and conducting environmental assessments. While similar land use assumptions have been employed to derive approximate trip generation, wineries comprise their own unique set of tourist and employee travel demand and should be treated according to winery-specific assumptions.

Sonoma County

A majority of wineries within Sonoma County accommodate some form of tourist visitation, including tasting rooms and events. Trip generation rates within Sonoma County should be reviewed to confirm their appropriateness, or to reflect on ways they could be improved. Winery trip generation also has implications for determining the appropriate number of parking spaces.

Trip Generation

In 1998, TJKM and Sonoma County established the *Winery Trip Generation Form* (form), which is used to complete traffic impact reports and winery permitting applications for winery developments, expansions, and event planning. The *Winery Trip Generation* form (see Appendix) was intended to replace *Land Division Procedure LD No. 9* issues in 1992, and has not been updated since. According to the winery trip generation form, winery trips are associated with the following categories:

- Winery Operations (Employee and Truck Trips)
- Vineyard Operations (Employee Trips)
- Tasting Room Operations (Employee and Visitor/Tasting Trips)
- Event Traffic (Employee and Visitor/Tasting Trips)
- Miscellaneous Trips

Project trips generation rates are therefore dependent on the type and scale of the winery, resulting in a positive correlation between the size of production (cases produced) and increased trip generation. Furthermore, wineries offering tasting rooms are projected to increase trip generation by almost double, due to the additional trips from visitors (referred to as visitor trips, or tasting trips). However, as observed by TJKM in 1998, tasting traffic no longer increases with increased production once the production volume reaches 500,000 cases.

In addition to calculating project trips, the form requires information on winery operation and event schedules. The event schedule section does not apply to wineries that are not permitted to host events.

The following assumptions are presented in the *Winery Trip Generation* form:

- Tasting Room Traffic: Visitors per year range from 40,000 to 100,000;
- Vehicle occupancy rate for tasting room visitors is 2.5 persons per vehicle.
- Employee Traffic: Employee growth decreases as production levels increase.
- Truck Traffic: Truck traffic increases as production levels increase.

Traffic Policies

Sonoma County currently has no adopted standards for parking and traffic control for winery events. According to *Managing Activities at Wineries: Building and Sustaining a Place-Based Brand*, prepared by Portland State University in February 2013, which provided analysis of several wine regions', including Sonoma County, issues of event parking location, design, or temporary traffic controls should be considered due to events' potential to cause backups on public roadways due to vehicle volumes and lack of appropriate parking. In addition, the report suggests enforcing restrictions to events that are only accessible via one-way roadways, as well as providing road width standards for large-scale events.

Level of Service (LOS) Policy

The County of Sonoma's *Guidelines for Traffic Studies* states the following regarding County roadway operations:

The County Level of Service Standard for County roadway operations is to maintain a Level of Service C [for specific roadway segments]. The project would have a significant traffic impact if the project's traffic would cause a road currently operating at an acceptable level of service to operate at an unacceptable level (i.e. LOS D, E or F).

The County of Sonoma's *Guidelines for Traffic Studies* states the following regarding County intersection operations:

The standard for intersections is to provide LOS D or better at build-out of the General Plan.

Napa County

Napa County borders Sonoma County to the east, and shares the characteristics of Northern California wine county that attracts tourists from the region, the state, and across the globe. As cited in *Wineries and Spirits Manufacturing and Wholesaling in Sonoma County, 2014*, US Census estimates that there are approximately 310 wineries in Napa County; however that number is constantly changing, as new wineries open and others close their doors. In 2005, Napa Valley Vintners' *Economic Impact of Winery and Vineyards in Napa County*, prepared by MKF Research¹, estimated that there were 391 "brick and mortar" winery locations in Napa County, and approximately 704 grape growers. The Napa Chamber of Commerce website² also cites 391 physical winery locations in Napa County (2016). The Wine Institute³ and the Napa Wine Project⁴ estimate that there are over 1,100 commercial wine producers and somewhere between 400 and 460 to 475 physical winery locations in Napa County, respectively.

Trip Generation

Napa County winery trip generation rates were established by the Napa County Conservation, Development, and Planning Department and published in its *Use Permit Application, 2011*.

¹ MKF Research, 2005: https://napavintners.com/downloads/napa_economic_impact_study.pdf

² Napa Chamber of Commerce, 2016: <http://www.napachamber.com/>

³ Wine Institute, 2015: <http://www.wineinstitute.org/resources/consumerfeaturedstories/article338>

⁴ The Napa Wine Project, 2016: <http://www.napawineproject.com/project-notes/>

Using these trip generation rates and assumptions, the County established a Winery Traffic Information/Trip Generation Sheet (see Appendix) that is used in permit applications and traffic impact analysis studies. **Table 3** presents the assumptions in Napa County's winery trip generation sheet.

**TABLE 3
NAPA COUNTY TRIP GENERATION ASSUMPTIONS**

Employees	
<i>Auto Occupancy</i>	<i>1.05 employees/auto</i>
Permanent Full-Time	3.2 trips/day
Permanent Part-Time	2 trips/day
Seasonal	2 trips/day (crush); see full time (bottling)
Visitors	
<i>Auto occupancy</i>	<i>Weekday = 2.6 visitors/auto</i> <i>Weekend = 2.8 visitors/auto</i>
Peaking Factors	
Peak Month	1.65 x average month
Average Weekend	0.22 x average month
Average Saturday	0.53 x average weekend
Peak Saturday	1.65 x average Saturday
Average Sunday	0.8 x average Saturday
Peak Sunday	2.0 x average Sunday
Peak Weekend Hour (3-4 PM)	0.57 x total for weekend day involved
Average 5-Day Week	1.3 x average weekend
Average Weekday	0.2 x average 5-day week
Peak Weekday Hour: Winery (3-4 PM); Roadway PM Peak (4-5 PM)	0.57 x total for weekday involved (Winery); 0.38 x total for weekday involved (Roadway PM Peak)
Service Vehicles	
Grapes (36 days (6 weeks)/season)	1.52 trips/1000 gals/season (4 ton loads assumed)
Materials/Supplies (250 days/yr)	1.47 trips/1000 gals/yr
Case Goods (250 days/yr)	0.8 trips/1000 gals/yr
<i>Source: Napa County Use Permit Application, 2015</i>	

There is a supplemental application for Winery Uses within the Use Permit Application, which requires applicants to provide information on operations, production capacity, visitation and hours of operation, grape origin, marketing program, and food service, in addition to the completion of the Winery Traffic Information/Trip Generation Sheet.

Traffic Policies

According to *Managing Activities at Wineries: Building and Sustaining a Place-Based Brand*, Napa holds the following traffic policies that aim to limit the amount of winery traffic during peak hours:

Reoccurring and scheduled vehicle trips to and from the site for employees, deliveries, and visitors shall not occur during peak (4-6 PM) travel times to the maximum extent possible.

All activity, including cleanup, shall cease by 10:00 PM. Start and finish time of activities shall be scheduled to minimize vehicles arriving or leaving between 4:00 and 6:00 PM.

The report also addressed the effectiveness of specific provisions adopted by Napa County, and determined that limiting the size of accessory uses in relation to production space was effective in preventing wineries from constructing large facilities to accommodate event halls and dining spaces. In Napa, the maximum ratio of accessory uses to production area is 40%. Napa also enforces the "75% Grape Source Rule", aimed at preserving local agricultural land, preventing industrial scale product import via trucks, and supporting the local economy.

Other provisions include limiting enforcing appointment only wine tours, and ensuring that marketing activities are "clearly incidental and subordinate to the primary operation of the winery as a production facility". However, these are difficult to enforce, and additional measures, such as limiting available parking spaces, could have a greater impact on the amount of traffic generated by these winery activities.

Additional Regional Winery Studies

Santa Barbara County

Santa Barbara County has proposed amendments to existing winery permitting regulations through the Winery Ordinance Update Project (project). According to Santa Barbara County's Department of Planning and Development, the project would define standards for (1) allowed tasting room and event activities; (2) food service; and (3) sale of wine related items. The project introduces a tiered permitting system to address permit review requirements based upon winery size and uses (such as tasting rooms, food service, and events) and development standards. The three tiers (A, B, and C) generally correspond to increasing minimum sizes for wineries, with A requiring 0 acres; B requiring 20-80 acres; and C requiring a minimum of 80 acres. Tier A wineries are not open to the public, and winery visitorship is allowed for Tier B and C wineries.

A traffic study was prepared by Linscott, Law & Greenspan, Engineers⁵ in May 2015 for the Draft Environmental Impact Report (DEIR), and accounts for anticipated impacts from future winery development based on changes to the Winery Ordinance. The study concludes that the number of "winery visitors" was the most appropriate independent variable to determine the site trip generation, and generates Average Daily Travel (ADT) rates for each of three tiers (A, B, and C), as follows:

- Tier A: Weekend Trip Generation (35 ADT); Weekday Trip Generation (23 ADT)
- Tier B: Weekend Trip Generation (138 ADT); Weekday Trip Generation (92 ADT)
- Tier C: Weekend Trip Generation (177 ADT); Weekday Trip Generation (118 ADT)

⁵ Traffic Analysis, Santa Barbara Winery Ordinance Update, Linscott, Law & Greenspan, Engineers 2015. http://longrange.sbcountyplanning.org/programs/winery_ord/Environmental%20Review/Appendices%20Complete.pdf

These values were applied to existing roadway operations based on the assumption that, on any given roadway, six wineries (two of each Tier type) could be developed. However, no reductions were taken for "winery-hopping", where one vehicle could visit more than one winery in a single trip.

Riverside County

The 2011 *Final Traffic Impact Study for the Wine County Community Plan*⁶, completed by Fehr & Peers for Riverside County, CA, established guidelines from winery trip generation rates. Trip generation rates were derived utilizing information specific to Riverside County, including the regional model, and local counts with applied production-to-attraction calculations. According to the report, "the major contributing factor for trip generation at a winery is the available number of parking spaces".

San Luis Obispo County

In 2014, Cal Poly San Luis Obispo prepared a study on trip generation for three wineries within San Luis Obispo Wine County. The wineries varied in size, employees, and production capability. However, there was consistency with trip generation per time of day, with the most frequented hours being between 11 AM and 4 PM. In addition, all three wineries, between the hours of 2 PM and 4 PM, max out their parking occupancy.

However, the resulting trip rates (which were derived by dividing the number of peak hour vehicle trips by the number of employees) varied greatly among the three wineries, ranging from 1.1 to 9.3 trips per employee. These rates (up to 9.3 trips per employee) are too high and do not reflect existing person per vehicle rates observed by the County.

⁶ Final Traffic Impact Study for the Wine County Community Plan, 2011:
<http://www.socalwinecountryplan.org/LinkClick.aspx?fileticket=nbxOTfnqnvA%3D&tabid=70>

Study Area and Vicinity Roadways

According to the *Sonoma County General Plan 2020*, the County owns and maintains 1,388 centerline miles of roadways, and the California State Department of Transportation (Caltrans) owns and maintains more than 237 centerline mile of highway, with more than three-quarters of it in the rural portions of the county. Sonoma County is within the Caltrans District 4 boundary, and applies the following roadway classifications:

- Primary Arterials
- Secondary Arterials
- Major Collectors
- Minor Collectors
- Local Roads

In 2000, the Sonoma County travel demand was established using the TRANPLAN travel model, modeling 372 traffic analysis zones (TAZs) within Sonoma County and 18 external zones.

Countywide Major Roadways

Sonoma's state highways provide a comprehensive and interconnected mobility system, and carry half or more of the daily vehicle miles traveled (VMT) in Sonoma County. They traverse from coastal cliffs to inland agricultural land, connecting urban and rural areas as they wind through the Sonoma County's mountainous terrain (ranging from sea level to an elevation high of 4,483 feet).

US Highway 101 (US 101), also referred to as Redwood Highway, is a north-south route beginning at Route 5 in the City of Los Angeles and extending approximately 807 miles north near the coast of the Oregon state line via Crescent City. Within Sonoma County, US 101 extends from the Sonoma/Marin County line to the Sonoma/Mendocino County line. Through Sonoma County, US 101 is a four-eight lane freeway, with a transition to a two-lane conventional highway approximately 21 miles north of the City of Santa Rosa to the Sonoma/Mendocino County line (just north of Dry Creek Valley). US 101 passes through the cities of Petaluma, Santa Rosa, Healdsburg, Rohnert Park, among others.

State Route 128 (SR 128) is a 120-mile rural, two-lane conventional highway that runs east-west from Mendocino County to Yolo County, passing through Sonoma and Napa counties and briefly through Solano County. SR 128 merges with US 101 for 10.18 miles (just north of Dry Creek Valley) from the City of Geyserville to the City of Cloverdale. Most of SR 128 passes through agricultural land, restricting expansion of development and lateral growth of urbanized areas along its alignment.

State Route 12 (SR 12), also referred to as Sonoma Highway, is an east-west route through Northern California, connecting the Bay Area to the San Joaquin Valley. Within Sonoma County, SR 12 links Sebastopol, Santa Rosa, the Sonoma Valley, and Napa County. SR 12 is an important corridor connecting Sonoma County commuter, tourist, and truck traffic to Interstate 80, which continues to the California/Nevada state line and beyond. SR 12 within Sonoma County is referred to as the SR 12 (West) corridor, and is defined as the 30 mile portion of SR 12 between the City of Sebastopol and SR 121 just south of the City of Sonoma, in Sonoma Valley. SR 12 (West) is divided into four segments:

- Segment A: Between Sebastopol and Santa Rosa west of US 101
- Segment B: Between Santa Rosa to US 101
- Segment C: Four-lane extension of 4th Street to/from downtown Santa Rosa
- Segment D: Two-lane rural road connecting Santa Rosa with the City of Sonoma

State Route 121 (SR 121) is a two-lane conventional highway traversing through southern Sonoma County and Napa County, in District 4. SR 121 goes from its junction with State Route 37 at Sears Point to SR 128, northeast of Napa. SR 121 runs north-south between SR 37 and SR 116, then east-west between SR 116 and Napa, and north-south between Napa and SR 128. There is a break in the route at Route 29 in Napa. SR 121 serves interregional traffic between Lake Berryessa, Napa, Sonoma and the Bay Area. It serves a portion of the wine country commercial truck traffic into Marin and San Francisco Counties. Traffic on SR 121 is recreational, commuter and commercial. SR 121 experiences additional traffic generated by attendees of special events at the nearby Sonoma Raceway located on SR 121. The existing facility through the study intersection is a two-lane highway with a posted speed limit of 50 mph. At the study intersection (at SR 116), SR 121 has a northbound free right turn lane that bypasses the intersection.

State Route 116 (SR 116) is a two-lane conventional highway traversing through Sonoma County. SR 116 goes from Route 1 near Jenner to the north, and ends at the study intersection at SR 121, south of Sonoma. There is a nine-mile break in the route at U.S. 101, from Cotati to Petaluma. SR 116 serves as a major transportation corridor between Sonoma and U.S. 101. Vehicular traffic on SR 116 is primarily commuter and commercial truck traffic, with some recreational traffic consisting of visitors to the Sonoma and Napa wine region. The existing facility through the study intersection is a two-lane highway with a posted speed limit of 50 mph.

Planned Roadway Improvements

According to the 2009 SCTA *Comprehensive Transportation Plan for Sonoma County* and the *Sonoma County General Plan 2020 Draft Environmental Impact Report (EIR)*, improvements related to the Study areas or the greater transportation network include:

- Old Redwood Highway - four lanes from the Town of Windsor to the City of Santa Rosa.
- Highway 12 - widening from the City of Santa Rosa to the City of Sebastopol
- Highway 116: three lanes from the City of Sebastopol to the City of Cotati
- Old Redwood Highway - four lanes from Railroad Ave. to the City of Petaluma
- Highway 37 - four lanes from County line to Highway 121
- Hwy 116/Hwy 121 - construct a roundabout at the intersection
- US 101/Old Redwood Highway interchange improvements
- US 101/Mill Street interchange in Healdsburg
- US 101/Dry Creek interchange in Healdsburg
- S. Healdsburg Avenue/Mill Street Improvements
- Dry Creek Road-Safety Improvements
- 5 way intersection at Healdsburg, Mill & Westside Roads
- Route 12 at 4th Street
- 8th Street East/Hwy 121 intersection
- 8th Street East widening Napa Road to Napa Street
- Hwy 12-center turn lane from SR to Sonoma
- Highway 121-116 Intersection and Arnold Drive improvements
- Arnold Drive-construct center turn lane County Club to Madrone

- Arnold Drive-center turn lane from Madrone to Petaluma Avenue
- Madrone Road-center turn lane from Arnold to Hwy 12

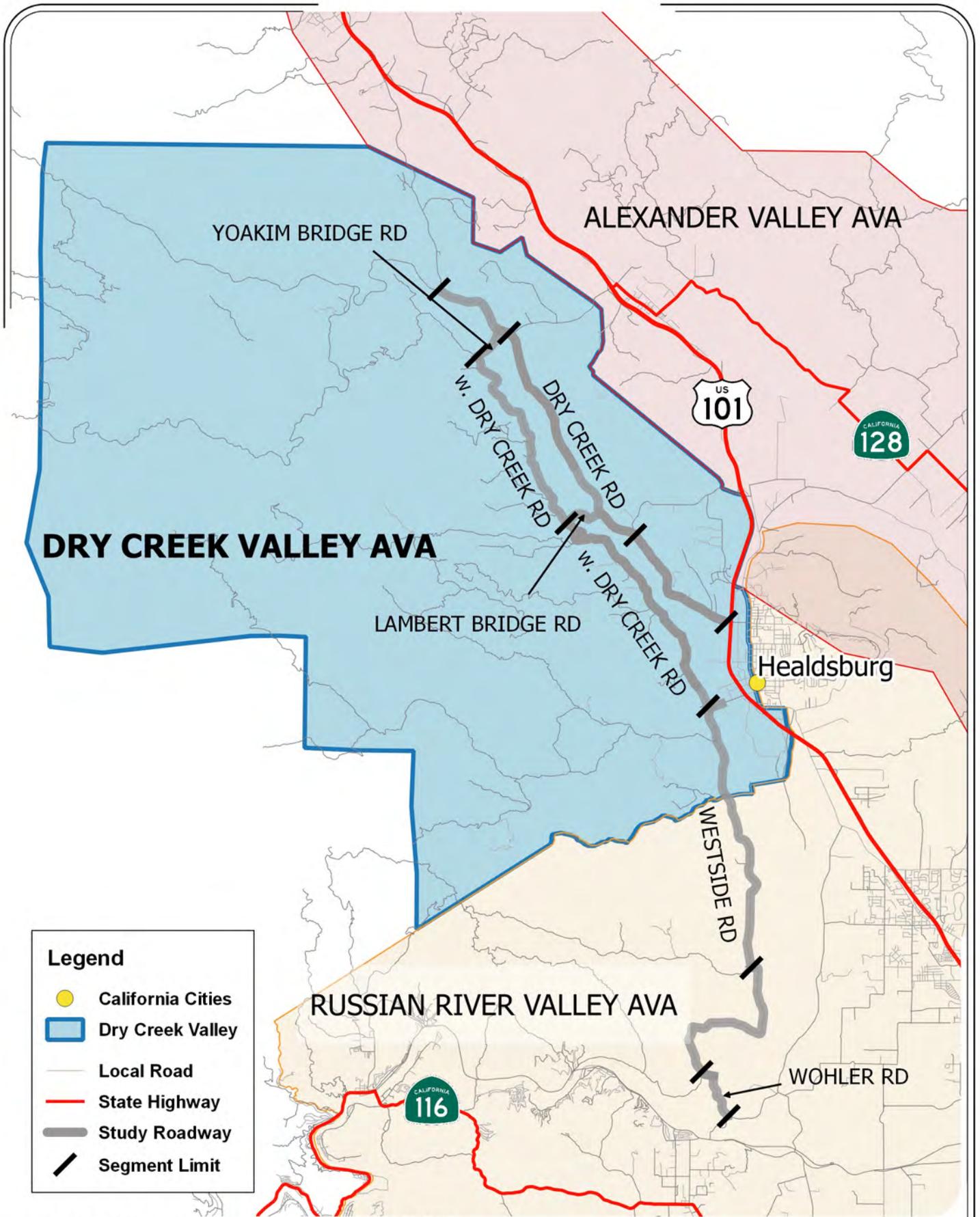
Other improvements include traffic calming measures of County Right of Way (ROW) throughout Sonoma County, the Port Sonoma Ferry Terminal, the SMART rail system, and improvements to transit routes.

Study Roadway Segments

Dry Creek Valley and Sonoma Valley are two of the most active wine-making regions in Sonoma County. As such, concentrated winery and accompanying tourist activity in these areas has resulted in significant increase in vehicular activity along certain roadways. The study roadway segments within Dry Creek Valley were chosen for their proximity to existing and proposed wineries, their relatively rural character, as well as for the conflicting presence of cyclist activity along the roadways. **Figure 4** shows the locations of study roadways within Dry Creek Valley and the concentration of wineries along these roadways. Study roadways for Sonoma Valley will be identified in Phase 3 of this study.

The Dry Creek Valley study roadways include:

- Dry Creek Road
- Lambert Bridge Road
- W. Dry Creek Road
- Westside Road
- Wohler Road
- Yoakim Bridge Road



Dry Creek Valley Capacity Threshold Study

Dry Creek Valley - Study Roadways

Figure 4



Dry Creek Valley Existing Roadway Conditions

Dry Creek Road

Dry Creek Road is a north-south two-lane major collector within Sonoma County and extends 10.02 miles south-north from Healdsburg to Sonoma Lake, west of Geyserville. Dry Creek Road is considered a minor arterial for a brief 0.10-mile segment within Healdsburg, where it intersects with US 101.

Dry Creek Road runs along the easterly side of Dry Creek through the valley of Dry Creek Valley, and covers generally flat, yet winding, terrain. The road runs parallel to Dry Creek. Dry Creek Valley Road provides direct access to approximately 52 of the 78 wineries within Dry Creek Valley AVA. The speed limit is 45 mph and there are designated shoulders through portions of the roadway.

A Class II bike lane is planned on Dry Creek Road. The image below shows a segment of Dry Creek Road with shoulders, used by cyclists.



Source: Google, 2016.

The image below shows a northbound segment of Dry Creek Road without shoulders or bike lanes.



Source: Google, 2016.



West Dry Creek Road

West Dry Creek Road is a north-south two-lane local road which runs along the westerly side of Dry Creek through the valley of Dry Creek Valley, along the same alignment as Dry Creek Road. W. Dry Creek Road extends 10.16 miles from Westside Road near Healdsburg to its terminus just south of Sonoma Lake.

West Dry Creek Road provides direct access to approximately 22 of the 78 wineries within the Dry Creek Valley AVA. W. Dry Creek Road intersects with Westside Road. The speed limit ranges from 30 mph on curves to 40 mph on straight-aways. For four miles south of Yoakim Bridge Road, the road is narrow and the speed limit is reduced to 25 mph.

There are no marked bike lanes and no designated shoulder along W. Dry Creek Road. However, there are 'share the road' signs to caution vehicle drivers on the possible presence of bicyclists.

The following image shows a frequently uses "Share the Road" sign on West Dry Creek Road, and a lack of bicycle lanes or shoulder.



Source: Google, 2016.



Westside Road

Westside Road is a north-south two-lane major collector for 12.36 miles of its length, and as a local road for its remainder. Westside Road begins at its intersection with River Road in the Community of Hacienda, and extends north to Healdsburg along the westerly side of Dry Creek, crossing over Dry Creek at the Dry Creek Bridge, and extending east to its terminus at US 101.

Westside Road intersections with Wohler Road at the Wohler Bridge and with W. Dry Creek Road just before the Dry Creek Bridge. The advisory speed limit along Westside Road ranges from 30 to 35 mph at curves, and 45 mph along straight-aways.

The following image shows a curve in the northbound direction along Westside Road, and a lack of shoulders or bike lanes.



Source: Google, 2016.



Yoakim Bridge Road

Yoakim Bridge Road is an east-west two-lane rural road that connects Dry Creek Road and W. Dry Creek Road, just southeast of Sonoma Lake, and crosses Dry Creek. Yoakim Bridge Road is approximately 0.6 miles.

There are no marked bike lanes or designated shoulders; however, the roadway is often used concurrently by motorists and cyclists.

The following image shows the bridge overcrossing above Dry Creek in the eastbound direction along Yoakim Bridge Road.



Source: Google, 2016.

The following image shows the road quality of Yoakim Bridge Road.



Source: Google, 2016.



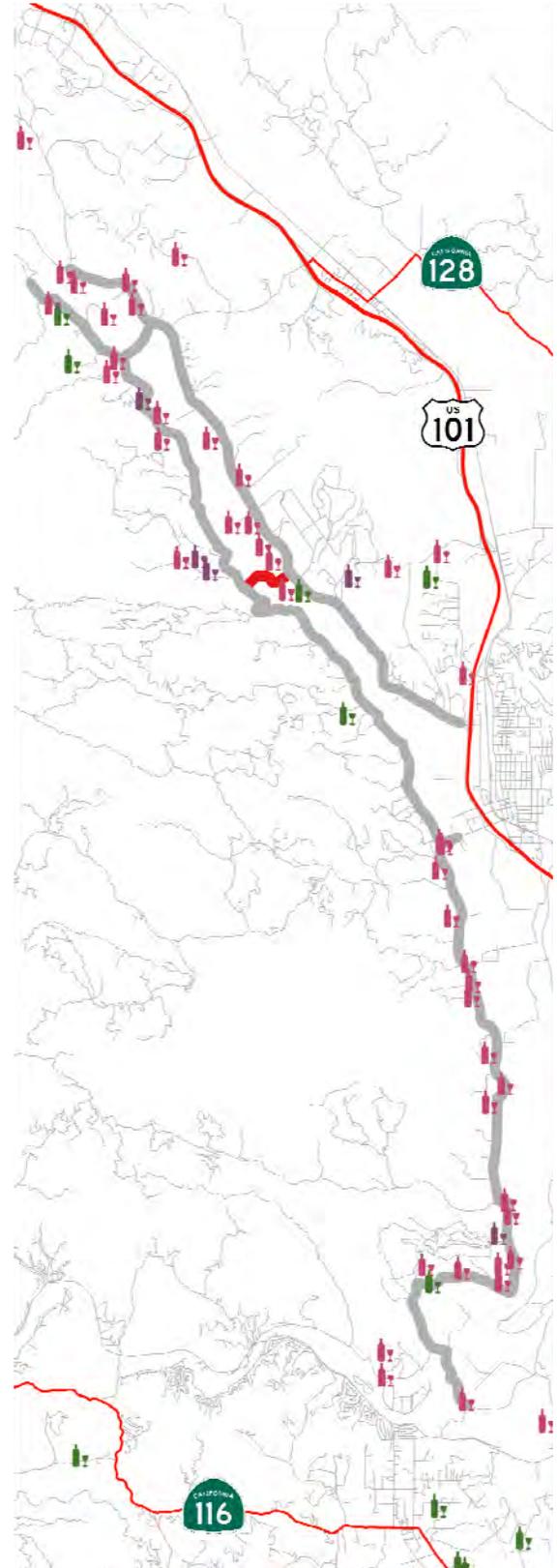
Lambert Bridge Road

Lambert Bridge Road is a east-west two-lane rural road that connects Dry Creek Road and West Dry Creek Road, just southeast of Sonoma Lake. There are no marked bike lanes or designated shoulders, however, it serves as a popular connection for motorists and cyclists to cross the valley.

The length of Lambert Bridge road is just under one mile, and crosses over Dry Creek. Dry Creek Vineyard and Passalacqua Winery are located along Lambert Bridge Road.



Source: Google, 2016.



Wohler Road

Yoakim Bridge Road is a north-south rural local road that connects Westside Road and River Road. Westside Road is considered a Class III bike route, with "Share the Road" signs, but there are no marked bike lanes or striping, or designated shoulders along Wohler Road.

Wohler Road crosses the Russian River at its northern terminus, where it intersects with Westside Road.

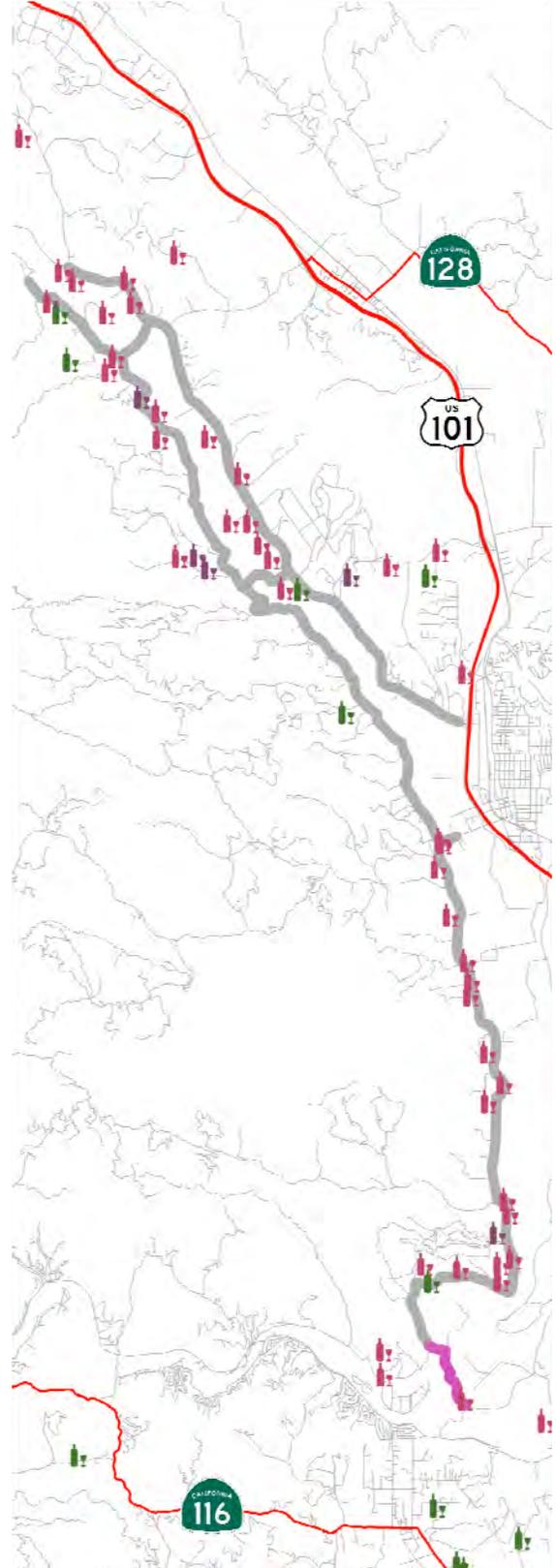
The following images show an example of narrow lane with and lack of shoulders along Wohler Road, and the one-car-lane Wholer Bridge seen from the westbound approach.



Source: Google, 2016.



Source: Google, 2016.



Existing Traffic Data Collection

Dry Creek Valley

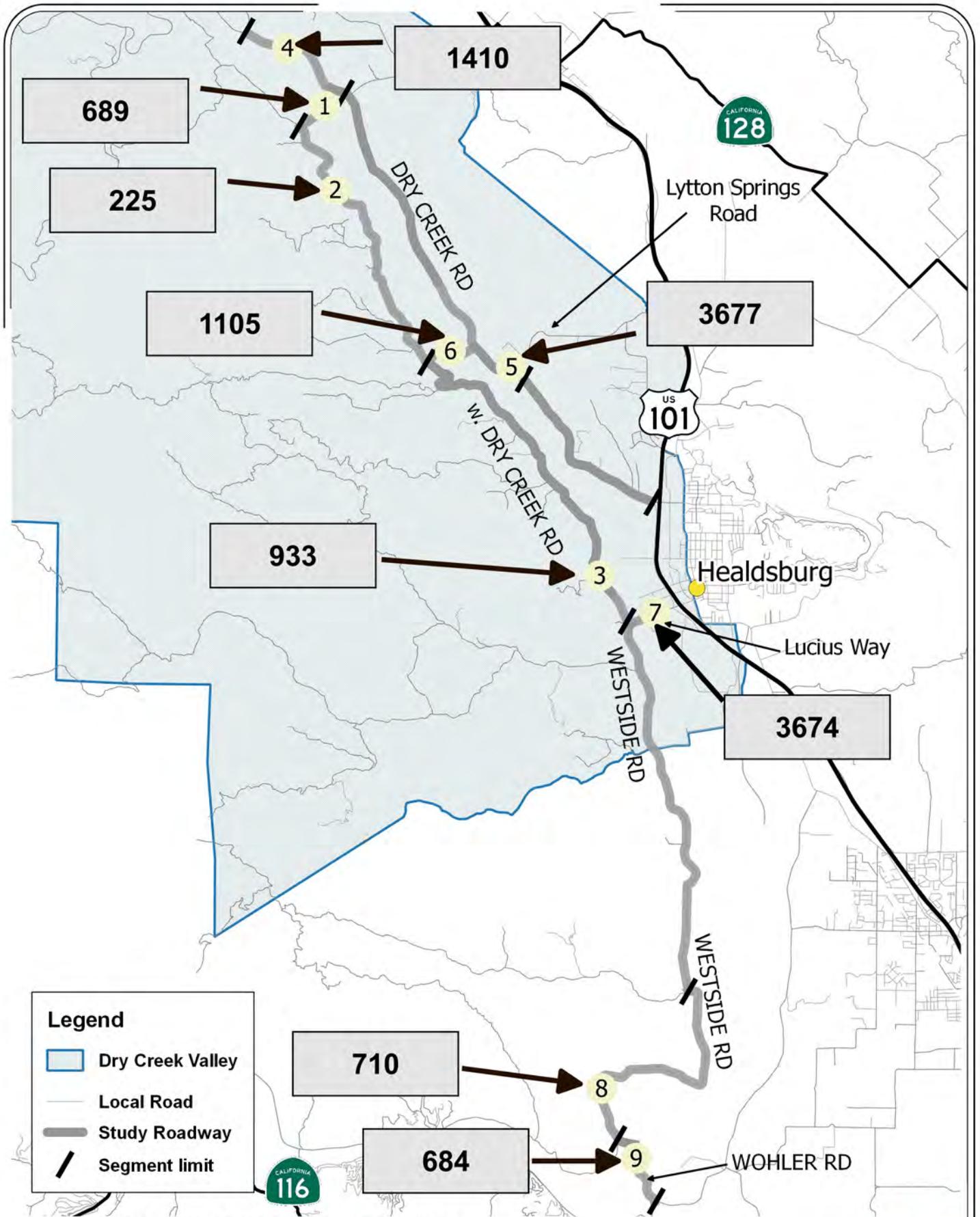
Average Daily Traffic (ADT) volumes were counted for the study roadways within Dry Creek Valley. The counts were conducted between January 15 and January 18, 2016, during the Winter Wineland event (Saturday January 16 and Sunday 17, 2016). **Figure 5** shows the existing ADT at the study roadway segments. **Table 4** shows the existing ADT volumes at the study roadway segments:

**TABLE 4
DRY CREEK VALLEY - STUDY ROADWAY ADT**

Roadway	Direction	ADT
Dry Creek Rd - North of Lytton Springs Rd	NB/SB	3677
Dry Creek Rd - South of Dutcher Creek Rd	NB/SB	1410
Lambert Bridge Rd	EB/WB	1105
W Dry Creek Rd - B/t Westside Rd and Everett Ranch Rd	NB/SB	933
W Dry Creek Rd - B/t Yoakim Brdige Rd and Brown Rd	NB/SB	255
Westside Rd - B/t Porter Creek and Wohler Rd	NB/SB	710
Westside Rd - B/t Dry Creek Bridge and Lucius Way	NB/SB	3674
Wohler Rd	NB/SB	342
Yoakim Brdige Rd	EB/WB	689

Sonoma Valley

Study roadways have not yet been identified for Sonoma Valley. However, according to the *Sonoma County Transportation Authority (SCTA) 2009 Comprehensive Transportation Plan for Sonoma County*, SR 12 within Sebastopol and in the Sonoma Valley are severely congested on both weekdays and weekends, especially during the summer months. This congestion is due in large part to tourist traffic associated with winery tasting rooms and special events.



Dry Creek Valley Capacity Threshold Study

Dry Creek Valley - Average Daily Traffic (ADT)

Figure 5



Bicycle Routes and Events

Bicycle routes within Sonoma County range from easy to expert, and from Class I to multi-use trails, and the County recognizes the following bicycle facility classifications:

Class I – Bicycle Path. Class I facilities are multi-use facilities that provide a completely separated right-of-way for the exclusive use of bicycles and pedestrians with cross flows of motorized traffic minimized.

Class II – Bicycle Lane. Class II facilities provide a striped and signed lane for one-way bicycle travel within the paved area of a roadway that shares the roadway with motor vehicles. The minimum width for bike lanes ranges between four and six feet depending upon the edge of roadway conditions (curbs). Bike lanes are demarcated by a six-inch white stripe, signage and pavement legends.

Class III – Bicycle Route. Class III facilities provide signs for shared use with motor vehicles within the same travel lane on a street or highway. Bike routes may be enhanced with warning or guide signs and shared lane marking pavement stencils. While Class III routes do not provide measure of separation, they have an important function in providing continuity to the bikeway network.

Dry Creek Valley Bicycle Facilities

Sonoma County is a destination spot for recreational rides and professional cycling events. According to SonomaCounty.com's *Popular Bike Itineraries: Cycling Through Wine Country* page, a 30-mile loop through Dry Creek Valley is one of the most famous and popular wine country bike routes in the world. This bike route requires bicycle travel on Yoakim Bridge Road and Dry Creek Road, travelling south into the town of Geyserville.

Additionally, according to the Sonoma County Transportation Authority *Countywide Bicycle and Pedestrian Master Plan, 2014 Update*, Healdsburg has the second highest percentage (2.4%) of its population commuting by bicycle, when compared to other cities and unincorporated towns in Sonoma County.

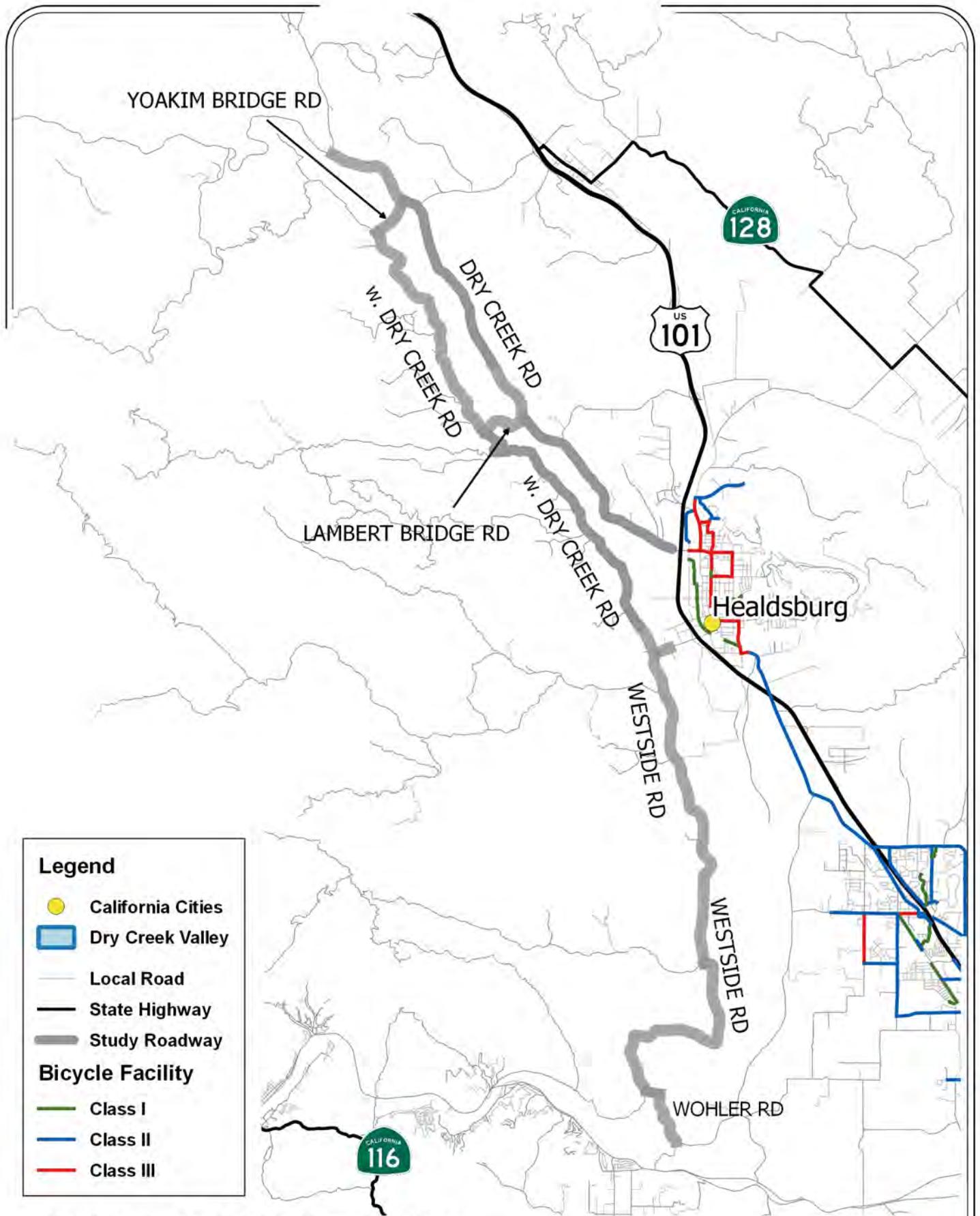
Dry Creek Valley is also the destination spot of organized bicycle rides, including the Giro Bello through Dry Creek Valley in July 2016, and the Tour de Fuzz through Healdsburg in September 2016. According to SonomaCounty.com, their recommended 'moderate' bike trips is through Dry Creek and Alexander Valleys, which included riding on segments of West Dry Creek Road, Yoakim Bridge Road, and Dry Creek Road. However, Yoakim Bridge Road and West Dry Creek Road have no bicycle facility designation as of today. Also, of the 13 collisions involving bicycles between 2011 and 2015, four of them have occurred on West Dry Creek Road.

Public and County concern over the potential for vehicle and bicycle collisions along the study roadways requires additional analysis, which will be included in Phase II of this Study. **Figures 6 and 7** presents the planned existing bicycle facilities in the Dry Creek Valley area.

Planned Bicycle Facility Improvements

According to the SCTA 2009 *Comprehensive Transportation Plan for Sonoma County*, the planned bicycle facility improvements include:

- Class 1 Segment 7-from Dry Creek Road to Skate Park
- Class I Segment 8-from Grove Street & Healdsburg Avenue to Dry Creek Road
- Dry Creek Road-Class III from Hw 101 to Grove Street
- River Road-Class II from Westside Road to Hwy 116
- River Road-Class II (S) from Scenic-Martinelli Road to Westside Road
- Wholer Road- Class III from River Road to Westside Road
- Westside Road-Class III from Healdsburg Cit Limits to River Road
- Arnold Drive-Class II from Gibson Street to Highway 12
- Madrone Road-Class II from Highway 12 to Arnold Drive
- Highway 116-South (SCBT)-Class II from Arnold Drive to Highway 121
- Agua Caliente Road (CSVT-V)-Class II (S) from Arnold Drive to Highway 12
- Warm Spring Road-Class II (S) from Bennett Valley Road to Arnold Drive

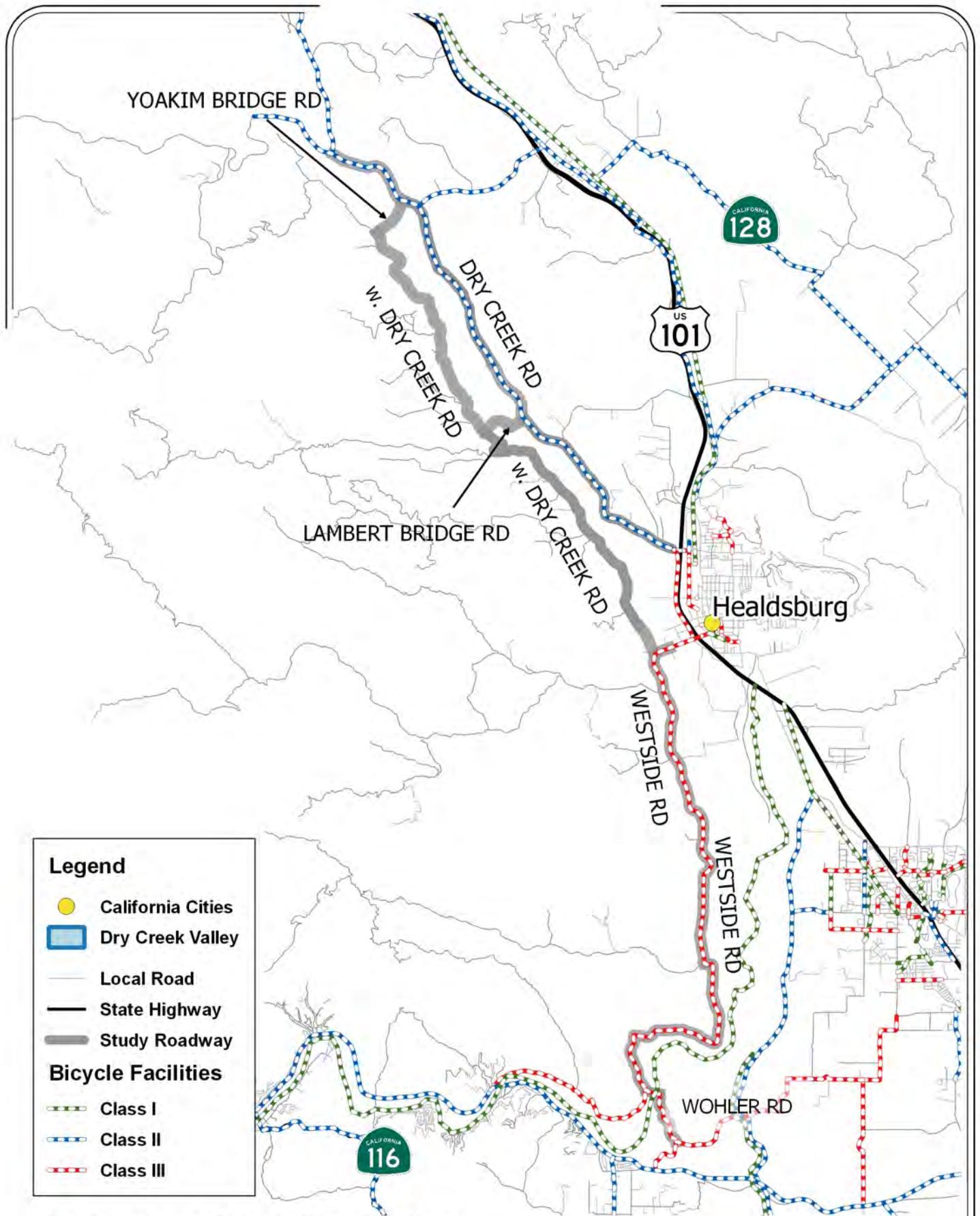


Dry Creek Valley Capacity Threshold Study

Dry Creek Valley - Existing Bicycle Facilities

Figure 6





Dry Creek Valley Capacity Threshold Study

Dry Creek Valley - Planned Bicycle Facilities

Figure 7

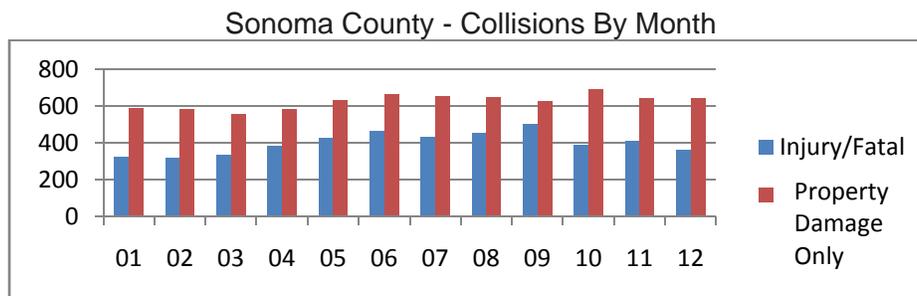
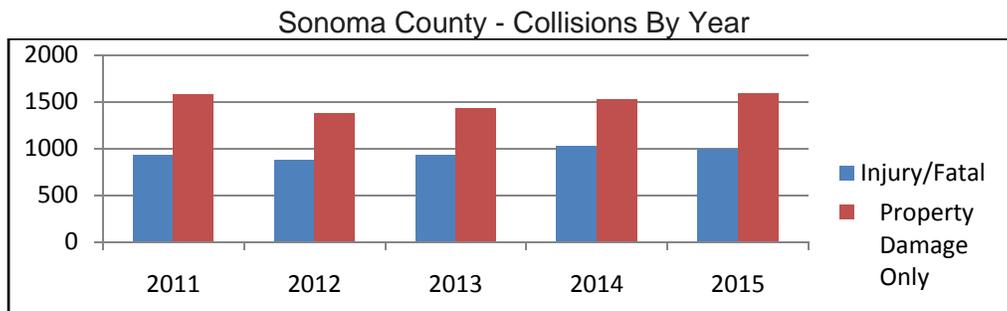


Collision Summary

Collision data from was derived from the Statewide Integrated Traffic Records System (SWITRS) and Transportation Injury Mapping System (TIMS) available data between January 1, 2011 and December 31, 2015. Caltrans' 2012 Collision Data on California State Highways collision rates were utilized to assume existing safety conditions for study roadways in Dry Creek Valley as compared to statewide average rates for consistent roadway types.

Sonoma County

During a five year period, from 2011 to 2015, Sonoma County has report 12,260 collisions, 118 of which were fatal, and 476 of which resulted in a serious injury. Approximately 324 (3%) of total vehicle accidents involved a bicycle, 28 of which resulted in some degree of injury. While accidents within Sonoma County are relatively consistent regardless of year and month, as shown in the graphs below, there appears to be a higher concentration of collisions resulting in either an injury or fatality, or property damage only.



Dry Creek Valley

The study roadways within Dry Creek Valley include Dry Creek Road, Lambert Bridge Road, W. Dry Creek Road, Westside Road, Wohler Road, and Yoakim Bridge Road. During a five year period, from 2011 to 2015, there were 121 reported collisions on the study roadways within the segment limits, with a majority of those collisions occurring on Dry Creek Road south of Dutcher Creek Road to Lytton Springs Road (55), W. Dry Creek Road south of Yoakim Bridge Road to Westside Road (22), and Westside Road south of Lucius Way to Wohler Road (39). Collisions occurring outside of the study limits were not included in this analysis, except when falling immediately outside of the limit boundary, for example, on Dry Creek Road just north of Dutcher Creek Road. (Note: On Dry Creek Road, from Lytton Springs Road to US 101, there were 35 additional collisions, bringing the total along Dry Creek Road to 86, and the total in the study

area to 151 collisions over five years; however, as no traffic volume counts were collected, collisions south of Lytton Springs Road are not analyzed in terms of collision rates per ADT.)

The number of collisions per year has remained consistent over the five year period, ranging from 20 to 28 collisions per year (2011: 28 collisions; 2012: 25 collisions; 2013: 20 collisions; 2014: 25 collisions; 2015: 23 collisions). **Table 5** presents the total number of collisions for all study roadway segments by collisions severity type or injury level.

**TABLE 5
STUDY ROADWAY SEGMENTS: COLLISION SEVERITY**

Study Roadway Segment	Fatal	Injury (Complaint of Pain)	Injury (Other Visible)	Injury (Severe)	Property Damage Only	Total
<u>Dry Creek Road:</u> Dutcher Creek Rd to Lytton Springs Rd		8	9	5	33	55
<u>W Dry Creek Road:</u> Yoakim Bridge Rd to Westside Rd		1	6	4	11	22
<u>Westside Road:</u> Lucius Way to Wohler Rd	2	4	13	3	17	39
Yoakim Bridge Road					1	1
Lambert Bridge Road					2	2
<u>Wohler Road:</u> Wohler Bridge to Eastside Rd		2				2
Grand Total	2	15	28	12	64	121

Data compiled from SWITRS, January 2011 to December 2015.

As shown in Table 5, almost half of all collisions on the study roadway segments resulting in some degree of injury, including 2 fatalities. One fatality occurred in 2012 on Westside Road near Wohler Road; the other occurred in 2014 on Westside Road south of Felta Road.

The following **Table 6** presents the collision types and those involving bicycles on the study roadway segments of Dry Creek Road, West Dry Creek Road, and Westside Road.

**TABLE 6
STUDY ROADWAY SEGMENTS: COLLISION TYPE AND BICYCLE ACCIDENTS**

5-year Collision Data	DRY CREEK RD Dutcher Creek Road to Lytton Springs Road				W DRY CREEK RD Yoakim Bridge Road to Westside Road				WESTSIDE RD Lucius Way to Wohler Road			
	Total Collisions	INVOLVING BICYCLE			Total Collisions	INVOLVING BICYCLE			Total Collisions	INVOLVING BICYCLE		
		Total	Injury	Severe Injury		Total	Injury	Severe Injury		Total	Injury	Severe Injury
Broadside	6								2	1	1	
Head-On	3				1				3			
Hit Object	21				13				24	1	1	
Other									1	1	1	
Overtuned	6	1	1		5	3	1	2	3	1	1	
Rear End	9	1		1	1				3	1		1
Sideswipe	10	2	2		2	1	1		2			
Vehicle/Ped									1			
Total	55	4	3	1	22	4	2	2	39	5	4	1
% of Total		7.3%	5.5%	1.8%		18.2%	9.1%	9.1%		12.8%	10.3%	2.6%
% of Total Involving Bicycle			75.0%	25.0%			50.0%	50.0%			80.0%	20.0%

Data compiled from SWITRS, January 2011 to December 2015.

Note: No fatalities were recorded along study roadway segments between January 2011 and December 2015.

As shown in Table 6, approximately 10 to 19 percent of all collisions along Dry Creek Road, West Dry Creek Road, and Westside Road in the study area involve a bicycle. According to SWITRS data, 13 collisions involving bicycles occurred within the study roadway segment; no bicycle collisions were recorded on Yoakim Bridge Road, Lambert Bridge Road, or Wohler Road, between January 2011 and December 2015. Of the recorded collisions, 12 of the 13 collisions occurred in the summer or fall months, with one occurring in late spring. 2011 and 2015 both had four (4) vehicle/bicycle collisions; 2012 and 2014 had two (2), and 2013 had one vehicle/bicycle collision.

Collision rates will be further analyzed in Phase 2 of this study.