Appendix I

Traffic Impact Study

Draft Traffic Impact Analysis Report

Shiloh Resort & Casino

Sonoma County, California

November 04, 2024

TJKM

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EXECUTIVE SUMMARY

This report summarizes the results of the Traffic Impact Study (TIS) conducted for the proposed Shiloh Resort & Casino development located at the southeast corner of Shiloh Road and Old Redwood Highway in unincorporated Sonoma County, immediately southeast of the Town of Windsor. Three proposed project alternatives referred to as Alternative A, Alternative B, and Alternative C in this report are analyzed. Alternative A represents a "full buildout" of the proposed project and would construct a casino with an approximately 122,600 square foot (sq. ft.) gaming floor, 3,380 gaming positions, a hotel with 400 rooms, approximately 74,190 sq. ft. of versatile meeting space, and a 2,800 seat event center. Alternative B would serve as a "reduced intensity" project and would construct a casino with an approximately 122,600 sq. ft. gaming floor, 3,380 gaming positions, a 200-room hotel (rather than a 400-room hotel), an approximately 33,140 sq. ft. conference space (down from 74,190 sq. ft.), and no event center. Alternative C represents a "non-gaming" option that incorporates a 20,000 sq. ft. winery and 5,000 sq. ft. tasting area, a 200-room hotel, a 14,000 sq. ft. spa, and a 4,700 sq. ft. dining area.

The purpose of this report is to provide summaries of changes in vehicle miles traveled (VMT) and traffic impacts on the surrounding transportation system with the proposed project. The VMT analysis is based on the methodology suggested by the *Technical Advisory on Evaluating Transportation Impacts in CEQA* published by the Governor's Office of Planning & Research (OPR) in December 2018. To evaluate the effects on the transportation infrastructure due to the addition of traffic from the proposed project, a level of service (LOS) analysis was conducted to determine consistency with the plans and standards of the Town of Windsor and the County of Sonoma.

The following study intersections were selected based on their proximity to the project site and major thoroughfares in the area, as well as the availability of existing traffic volume data:

1. Shiloh Road & Old Redwood Highway (Signal)
2. Shiloh Road & Hembree Lane (Signal)
3. Shiloh Road & US 101 Northbound Off-ramp (Signal)
4. Shiloh Road & US 101 Southbound Off-ramp (Signal)
5. Shiloh Road & Caletti Avenue (One-Way Stop)
6. Shiloh Road & Conde Lane (Signal)
7. Shiloh Road & Casino Entrance 1/Gridley Dr. (Two-Way Stop)
8. Old Redwood Highway & Casino Entrance 1 (Two-Way Stop)
9. Shiloh Road & Casino Entrance 2 (One–Way Stop)
10. Old Redwood Highway & US 101 Northbound Off-ramp/Lakewood Drive (Signal)
11. Old Redwood Highway & US 101 Northbound On-ramp (Free)
12. Old Redwood Highway & US 101 Southbound Ramps (Signal)

Vehicle Miles Traveled

Based on the OPR recommendations, VMT impacts attributable to the proposed project may be considered potentially significant if home-based work VMT per employee (VMT per job) exceeds 85 percent of the average rate for Sonoma County. The latest 2021 SCTA travel demand model run was used

to determine the VMT significance threshold for this project of 10.53 VMT per employee. The proposed project in its various forms under Alternative A, Alternative B, and Alternative C would generate 10.20 VMT per employee, 10.26 VMT per employee, and 10.25 VMT per employee, respectively, all of which are less than the significance threshold of 10.53 VMT per employee. Therefore, the project is expected to cause a **less-than-significant** impact.

Project Trip Generation

TJKM developed estimated project trip generation for the proposed project based on a combination of published trip generation rates from the Institute of Transportation Engineers (ITE) publication *Trip Generation* (11th Edition) and prior traffic studies for similar tribal casino resorts in Northern California. TJKM identified the 2015 traffic impact study for the Wilton Rancheria Casino Project, prepared by Kimley-Horn, as providing the most robust presentation of trip generation at such tribal gaming facilities. Alternative A of the proposed project is expected to generate 11,213 total daily weekday trips and 15,779 total daily Saturday trips, including 473 weekday a.m. peak hour trips (279 in, 194 out), 1,205 weekday p.m. peak hour trips (710 in, 495 out), and 1,340 midday Saturday peak hour trips (657 in, 683 out). Alternative B of the proposed project is expected to generate 8,763 total daily weekday trips and 13,319 total daily Saturday trips, including 473 weekday a.m. peak hour trips (279 in, 194 out), 863 weekday p.m. peak hour trips (448 in, 415 out), and 1,272 midday Saturday peak hour trips (607 in, 665 out). Finally, Alternative C of the proposed project is expected to generate 2,078 total daily weekday trips and 2,704 total daily Saturday trips, including 153 weekday a.m. peak hour trips (92 in, 61 out), 197 weekday p.m. peak hour trips (102 in, 95 out), and 361 midday Saturday peak hour trips (170 in, 191 out).

Existing Conditions

Under this scenario, all of the study intersections operate within applicable jurisdictional LOS standards during all three study peak hours.

Existing plus Alternative A Project Conditions

Under this scenario, the following intersections **would not be consistent** with level of service standards set by the Town of Windsor and Sonoma County:

- 1) Shiloh Rd. & Old Redwood Hwy. (Weekday PM and Saturday midday peak hours)
- 7) Shiloh Rd. & Casino Entrance 1/Gridley Dr. (Weekday PM and Saturday midday peak hours)
- 8) Old Redwood Hwy. & Casino Entrance 1 (Weekday PM and Saturday midday peak hours)

With the addition of intersection improvements, all project-related impacts at the above intersections would be mitigated to a level that **would be consistent** with level of service standards set by the Town of Windsor and Sonoma County. Mitigation measures that are mentioned in the document, would be feasible and based on reviewing the traffic and safety components.

Existing plus Alternative B Project Conditions

Under this scenario, the following intersections **would not be consistent** with level of service standards set by the Town of Windsor and Sonoma County:

- 1) Shiloh Rd. & Old Redwood Hwy. (Saturday midday peak hour)
- 7) Shiloh Rd. & Casino Entrance 1/Gridley Dr. (Saturday midday peak hour)

With the addition of intersection improvements, all project-related impacts at the above intersections would be mitigated to a level that **would be consistent** with level of service standards set by the Town of Windsor and Sonoma County. Mitigation measures that are mentioned in the document, would be feasible and based on reviewing the traffic and safety components.

Existing plus Alternative C Project Conditions

Under this scenario, all of the study intersections operate within applicable jurisdictional standards during all three peak periods.

Opening Year 2028 No Project Conditions

Under this scenario, all of the study intersections operate within applicable jurisdictional standards during all three peak periods.

Opening Year 2028 plus Alternative A Project Conditions

Under this scenario, the following intersections **would not be consistent** with level of service standards set by the Town of Windsor and Sonoma County:

- 1) Shiloh Rd. & Old Redwood Hwy. (Weekday PM and Saturday midday peak hours)
- 2) Shiloh Rd. & Hembree Ln. (Weekday PM and Saturday midday peak hours)
- 7) Shiloh Rd. & Casino Entrance 1/Gridley Dr. (Weekday PM and Saturday midday peak hours)
- 8) Old Redwood Hwy. & Casino Entrance 1 (Weekday PM peak hour)

With the addition of intersection improvements, all project-related impacts at the above intersections would be mitigated to a level that **would be consistent** with level of service standards set by the Town of Windsor and Sonoma County. Mitigation measures that are mentioned in the document, would be feasible and based on reviewing the traffic and safety components.

Opening Year 2028 plus Alternative B Project Conditions

Under this scenario, the following intersections **would not be consistent** with level of service standards set by the Town of Windsor and Sonoma County:

- 1) Shiloh Rd. & Old Redwood Hwy. (Saturday midday peak hour)
- 2) Shiloh Rd. & Hembree Ln. (Saturday midday peak hour)
- 7) Shiloh Rd. & Casino Entrance 1/Gridley Dr. (Saturday midday peak hour)

With the addition of intersection improvements, all project-related impacts at the above intersections would be mitigated to a level that **would be consistent** with level of service standards set by the Town of Windsor and Sonoma County. Mitigation measures that are mentioned in the document, would be feasible and based on reviewing the traffic and safety components.

Opening Year 2028 plus Alternative C Project Conditions

Under this scenario, all of the study intersections operate within applicable jurisdictional standards during all three peak periods.

General Plan 2040 No Project Conditions

Under this scenario, the following intersections **would not be consistent** with level of service standards set by the Town of Windsor and Sonoma County:

- 1) Shiloh Rd. & Old Redwood Hwy. (Weekday AM and PM peak hours)
- 2) Shiloh Rd. & Hembree Ln. (Weekday AM and PM, and Saturday midday peak hours)
- 3) Shiloh Rd. & US 101 NB Ramps (Weekday AM peak hour)
- 5) Shiloh Rd. & Caletti Ave. (Weekday AM and PM, and Saturday midday peak hours)
- 6) Shiloh Rd. & Conde Ln. (Weekday AM and PM peak hours)
- 8) Old Redwood Hwy. & Casino Entrance 1 (Weekday AM and PM peak hours)
- 12) Old Redwood Hwy. & US 101 SB Ramps (Weekday AM and Saturday midday peak hours)

General Plan 2040 plus Alternative A Project Conditions

Under this scenario, the following intersections **would not be consistent** with level of service standards set by the Town of Windsor and Sonoma County:

- 1) Shiloh Rd. & Old Redwood Hwy. (Weekday AM and PM, and Saturday midday peak hours)
- 2) Shiloh Rd. & Hembree Ln. (Weekday AM and PM, and Saturday midday peak hours)
- 3) Shiloh Rd. & US 101 NB Off Ramp (Weekday AM and PM, and Saturday midday peak hours)
- 5) Shiloh Rd. & Caletti Ave. (Weekday AM and PM, and Saturday midday peak hours)
- 6) Shiloh Rd. & Conde Ln. (Weekday AM and PM peak hours)
- 7) Shiloh Rd. & Casino Entrance 1/Gridley Dr. (Weekday PM and Saturday midday peak hours)
- 8) Old Redwood Hwy. & Casino Entrance 1 (Weekday AM and PM, and Saturday midday peak hours)
- 12) Old Redwood Hwy. & US 101 SB Ramps (Weekday AM and Saturday midday peak hours)

With the addition of intersection improvements, all project-related impacts at the above intersections would be mitigated to a level that **would be consistent** with level of service standards set by the Town of Windsor and Sonoma County. Mitigation measures that are mentioned in the document, would be feasible and based on reviewing the traffic and safety components.

General Plan 2040 plus Alternative B Project Conditions

Under this scenario, the following intersections **would not be consistent** with level of service standards set by the Town of Windsor and Sonoma County:

- 1) Shiloh Rd. & Old Redwood Hwy. (Weekday AM and PM, and Saturday midday peak hours)
- 2) Shiloh Rd. & Hembree Ln. (Weekday AM and PM, and Saturday midday peak hours)
- 3) Shiloh Rd. & US 101 NB Off-ramp (Weekday AM and PM, and Saturday midday peak hours)
- 5) Shiloh Rd. & Caletti Ave. (Weekday AM and PM, and Saturday midday peak hours)
- 6) Shiloh Rd & Conde Ln. (Weekday AM and PM peak hours)
- 7) Shiloh Rd. & Casino Entrance West/Gridley Dr. (Weekday PM and Saturday midday peak hours)
- 8) Old Redwood Hwy. & Casino Entrance (Weekday AM and PM, and Saturday midday peak hours)
- 12) Old Redwood Hwy & US 101 SB Ramps (Weekday AM and Saturday midday peak hours)

With the addition of intersection improvements, all project-related impacts at the above intersections would be mitigated to a level that **would be consistent** with level of service standards set by the Town of

Windsor and Sonoma County. Mitigation measures that are mentioned in the document, would be feasible and based on reviewing the traffic and safety components.

General Plan 2040 plus Alternative C Project Conditions

Under this scenario, the following intersections **would not be consistent** with level of service standards set by the Town of Windsor and Sonoma County:

- 1) Shiloh Rd. & Old Redwood Hwy. (Weekday AM and PM peak hours)
- 2) Shiloh Rd. & Hembree Ln. (Weekday AM and PM, and Saturday midday peak hours)
- 3) Shiloh Rd. & US 101 NB Off-ramp (Weekday AM and Saturday midday peak hours)
- 5) Shiloh Rd. & Caletti Ave. (Weekday AM and PM, and Saturday midday peak hours)
- 6) Shiloh Rd & Conde Ln. (Weekday AM and PM peak hours)
- 8) Old Redwood Hwy. & Project Entrance (Weekday AM and PM peak hours)
- 12) Old Redwood Hwy & US 101 SB Ramps (Weekday AM and Saturday midday peak hours)

With the addition of intersection improvements, all project-related impacts at the above intersections would be mitigated to a level that **would be consistent** with level of service standards set by the Town of Windsor and Sonoma County. Mitigation measures that are mentioned in the document, would be feasible and based on reviewing the traffic and safety components.

Roadway Segment Analysis

A roadway segment analysis concluded that all study segments along Shiloh Road experience the greatest degradations in operating conditions. The effects of the proposed project, as well as effects from additional future developments along Shiloh Road, **would be reduced to levels consistent** with the Town of Windsor and Sonoma County standards and plans by improvements listed in the intersection level of service analysis sections of this report.

Vehicle Access and On-Site Circulation

TJKM concluded that the site plan will operate acceptably and provide **adequate** connection to existing streets and circulation within the site.

Pedestrian and Bicycle Access and Circulation

The Town of Windsor plans to include improved pedestrian (concrete sidewalks) and bicycle facilities (Class II bike lanes) on both sides of Shiloh Road and Old Redwood Highway near the project site. The proposed project should provide adequate pedestrian and bicycle facilities on its site (particularly at its planned driveways) to facilitate pedestrian and bicycle traffic to and from the project site.

Transit Access

TJKM concluded that the proposed project would add ridership to bus route 60 operated by the Sonoma County Transit (SCT). Bus patrons would be served at an existing stop along the project frontage. The current headway is between one to two hours. The bus line has **adequate** capacity to accommodate the additional traffic from the proposed project.

Parking

TJKM concluded that all alternatives of the proposed project would provide a generous supply of parking to future patrons. Planned parking supplies are **adequate** for project needs.

Queuing Analysis

Queueing operations were calculated for all dedicated left-turn lane and right-turn lane groups at the study intersections. Under all plus project scenarios, project-related trips would be added to some dedicated left-turn lane and right-turn lane groups. While all scenarios experience 95th percentile queue lengths that are not consistent with Town of Windsor standards, the addition of project-related intersection improvements, restriping to increase storage length, and planned improvements by the Town of Windsor and County of Sonoma would mitigate project-related impacts to a level that **would be consistent** with standards of the Town of Windsor.

Recommendations

TJKM recommends the following:

- Implement the recommended intersection and segment improvements to mitigate project-related impacts on the surrounding transportation network.
- Provide concrete sidewalks, and marked crosswalks at the proposed project driveways to connect with existing and planned pedestrian facilities along Shiloh Road and Old Redwood Highway.
- Provide continuous, accessible pedestrian pathways between the nearby transit stops and project entrances.
- Provide pedestrian and bicycle facilities between the proposed project's driveways and the project's main facilities to improve on-site pedestrian and bicycle circulation

1.0 INTRODUCTION

This report summarizes the results of the TIS conducted for the proposed casino project located at the southeast corner of Shiloh Road and Old Redwood Highway in unincorporated Sonoma County. Three proposed project alternatives referred to as Alternative A, Alternative B, and Alternative C in this report are analyzed. Alternative A represents a "full buildout" of the proposed project and would construct a casino with an approximately 122,600 square foot (sq. ft.) gaming floor, 3,380 gaming positions, a hotel with 400 rooms, approximately 74,190 sq. ft. of versatile meeting space, and a 2,800 seat event center. The project would be accessed via two entrances on Shiloh Road and one entrance on Old Redwood Highway. Alternative B would construct a "reduced intensity" version of the project complete with a casino with an approximately 122,600 sq. ft. gaming floor, 3,380 gaming positions, a 200-room hotel (rather than a 400-room hotel), an approximately 33,140 sq. ft. conference space (down from 74,190 sq. ft.), and no event center. Alternative B includes the same two entrances on Shiloh Road and one entrance on Old Redwood Highway similar to Alternative A. Finally, Alternative C represents a "non-gaming" option that incorporates a 20,000 sq. ft. winery and 5,000 sq. ft. tasting area, a 200-room hotel, a 14,000 sq. ft. spa, and a 4,700 sq. ft. dining area. Alternative C includes only one public entrance on Shiloh Road and one public entrance on Old Redwood Highway; a service road entrance for on-site water and wastewater treatment facilities is located off of Shiloh Road but would be closed to general traffic.

This chapter discusses the TIS purpose, project study area, and analysis scenarios. **Figure 1** shows the study area, project site location, study intersections, and study segments that were analyzed. **Figure 2**, **Figure 3**, and **Figure 4** show the project site plans for Alternatives A, B, and C, respectively.

1.1 Study Purpose

The purpose of this report is to provide summaries of changes in VMT and traffic impacts on the surrounding transportation system with the proposed project. Since Sonoma County has not yet adopted criteria and impact thresholds for evaluating VMT impacts, TJKM followed advice contained in the *Technical Advisory on Evaluating Transportation Impacts in CEQA* published by OPR in December 2018. To evaluate the effects on the transportation infrastructure due to the addition of traffic from the proposed project, an LOS analysis was conducted to determine consistency with Town of Windsor and Sonoma County plans and standards.

1.2 Study Intersections

TJKM evaluated traffic conditions at twelve study intersections during the a.m. and p.m. peak hours for a typical weekday, as well as the Saturday midday peak period to account for the "recreational" nature of the project. The study intersections were selected based on their proximity to the project site and major thoroughfares in the area. Data collection efforts included measuring existing traffic counts and utilizing material in the *Town of Windsor General Plan 2040* and its Environmental Impact Report (2018).

The peak periods observed were between 7:00-9:00 a.m. and 4:00-6:00 p.m. on weekdays, and 10:00 a.m.-4:00 p.m. on Saturdays. The study intersections and associated traffic controls are as follows:

1. Shiloh Road & Old Redwood Highway (Signal)
2. Shiloh Road & Hembree Lane (Signal)
3. Shiloh Road & US 101 Northbound Off-ramp (Signal)
4. Shiloh Road & US 101 Southbound Off-ramp (Signal)
5. Shiloh Road & Caletti Avenue (One-Way Stop)
6. Shiloh Road & Conde Lane (Signal)
7. Shiloh Road & Casino Entrance 1/Gridley Dr. (Two-Way Stop)
8. Old Redwood Highway & Casino Entrance 1 (Two-Way Stop)
9. Shiloh Road & Casino Entrance 2 (One–Way Stop)
10. Old Redwood Highway & US 101 Northbound Off-ramp/Lakewood Drive (Signal)
11. Old Redwood Highway & US 101 Northbound On-ramp (Free)
12. Old Redwood Highway & US 101 Southbound Ramps (Signal)

1.3 Study Scenarios

The roadway operations analysis addresses the following 12 traffic scenarios:

- **Existing Conditions** – This scenario evaluates the study intersections based on existing traffic volumes, lane geometry and traffic controls.
- **Existing plus Alternative A Project Conditions** – This scenario includes Existing Conditions, along with the addition of traffic from the proposed project in its Alternative A configuration.
- **Existing plus Alternative B Project Conditions** – This includes Existing Conditions, along with the addition of traffic from the proposed project in its Alternative B configuration.
- **Existing plus Alternative C Project Conditions** – This includes Existing Conditions, along with the addition of traffic from the proposed project in its Alternative C configuration.
- **Opening Year 2028 No Project Conditions** – This scenario includes Existing Conditions, but with the addition of traffic from approved projects that are in the development pipeline in the Town of Windsor and Sonoma County, as well as effects from planned roadway improvements constructed by approved projects. A compounding annual growth rate of 2.189 percent was applied to existing traffic up to the opening year of 2028.
- **Opening Year 2028 plus Alternative A Project Conditions** – This scenario is identical to Opening Year 2028 Conditions, but with the addition of traffic from the proposed Alternative A project.
- **Opening Year 2028 plus Alternative B Project Conditions** – This scenario is identical to Opening Year 2028 Conditions, but with the addition of traffic from the proposed Alternative B project.
- **Opening Year 2028 plus Alternative C Project Conditions** – This scenario is identical to Opening Year 2028 Conditions, but with the addition of traffic from the proposed Alternative C project.
- **General Plan 2040 No Project Conditions** – This scenario expands Existing Conditions based on an annual growth rate derived from the Town of Windsor General Plan. Under this scenario, no

infrastructure improvements were assumed at the study intersections or the roadway segments except for those constructed by the approved developments included in Opening Year 2028 No Project Conditions. A compounding annual growth rate of 2.189 percent derived from the General Plan was applied to measured 2022 volumes.

- **General Plan 2040 plus Alternative A Project Conditions** – This scenario is identical to General Plan 2040 Conditions, but with the addition of traffic from the proposed Alternative A project.
- **General Plan 2040 plus Alternative B Project Conditions** – This scenario is identical to General Plan 2040 Conditions, but with the addition of traffic from the proposed Alternative B project.
- **General Plan 2040 plus Alternative C Project Conditions** – This scenario is identical to General Plan 2040 Conditions, but with the addition of traffic from the proposed Alternative C project.

Figure 1: Vicinity Map

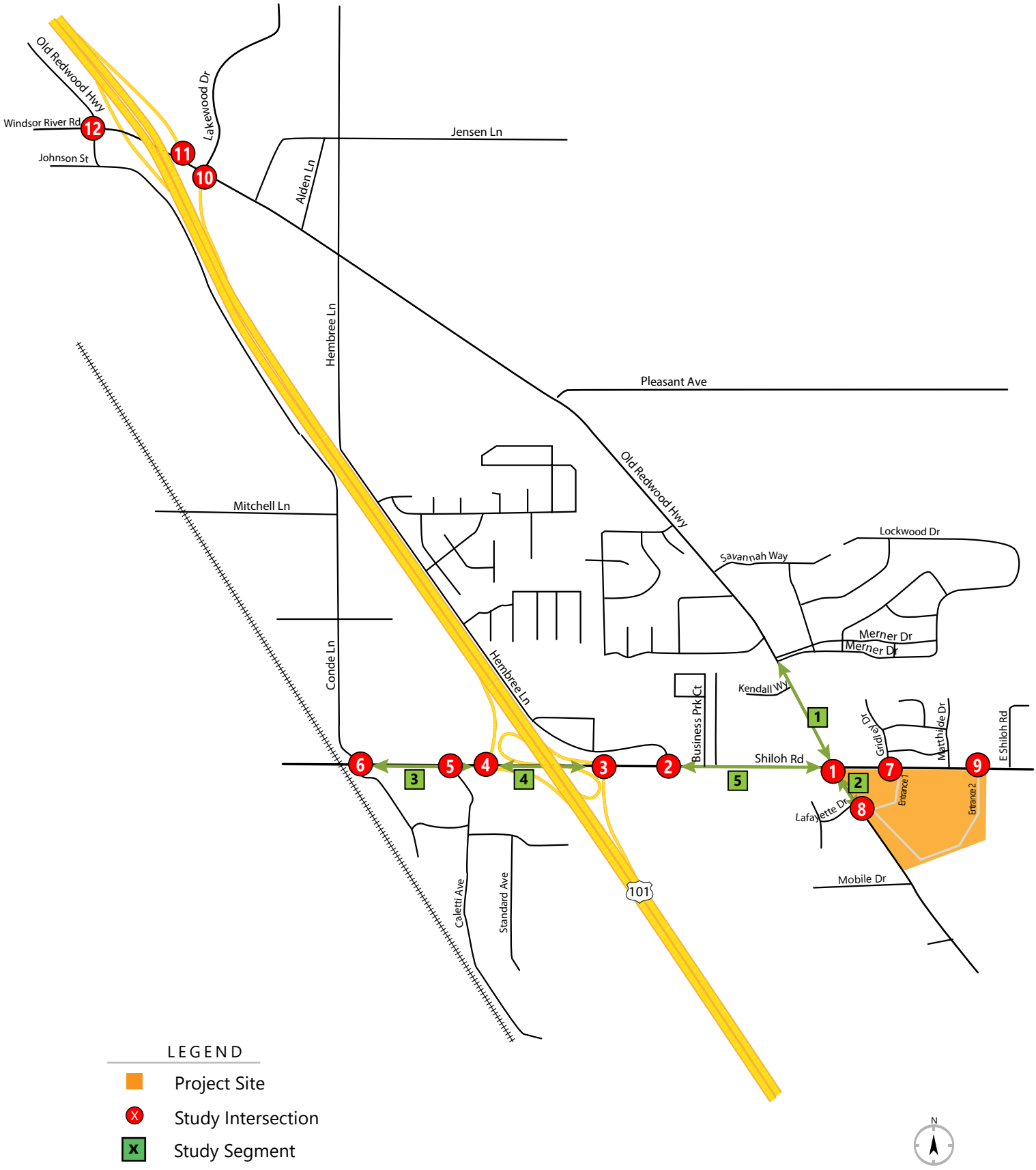


Figure 2: Site Plan - Alternative A

Figure 3: Site Plan - Alternative B

Figure 4: Site Plan - Alternative C

2.0 STUDY METHODOLOGY

Traffic impacts related to the proposed project were evaluated for compliance with applicable regulatory documents and environmental significance. An LOS analysis was conducted to determine consistency with the Town of Windsor and Sonoma County plans and standards.

2.1 Vehicle Miles Traveled

This section of the report provides a discussion of the methodology used to analyze potential impacts of VMT attributable to the project. As Sonoma County has not yet adopted criteria and impact thresholds for evaluating VMT impacts, for this VMT Analysis, TJKM followed advice contained in the *Technical Advisory on Evaluating Transportation Impacts in CEQA* published by the Governor's Office of Planning & Research (OPR) in December 2018.

SB 743, which was signed into law by Governor Brown in 2013 and codified in Public Resources Code 21099, tasked OPR with establishing new criteria for determining the significance of transportation impacts under CEQA. SB 743 requires the new criteria to "promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." SB 743 changes the way that public agencies evaluate the transportation impacts of projects under CEQA, recognizing that roadway congestion, while an inconvenience to drivers, is not itself an environmental impact (see Pub. Resource Code, § 21099, subd. (b)(2)). In December 2018, OPR circulated its most recent Technical Advisory on Evaluating Transportation Impacts in CEQA (OPR) that provides recommendations and describes various options for assessing VMT for transportation analysis purposes. The VMT analysis options described by OPR are primarily tailored towards single-use development residential, office or office projects, not mixed use projects and not hotel projects. OPR recommends the following methodology and criteria for specific land uses:

- For residential projects, OPR recommends that VMT impacts be considered potentially significant if a residential project is expected to generate VMT per Capita (i.e., VMT per resident) at a rate that exceeds 85 percent of a regional average. For office projects, OPR recommends that VMT impacts be considered potentially significant if a residential project is expected to generate VMT per Employee at a rate that exceeds 85 percent of a regional average.
- For retail projects, OPR recommends that VMT impacts be considered potentially significant if a project results in a net increase in total VMT. This approach takes into account the likelihood that retail developments may lead to increases or decreases in VMT, depending on previously existing retail travel patterns. This approach may also be used for other types of projects with customer components.
- OPR does not provide specific guidance on evaluating other land use types, such as hotels, except to say that other land uses could choose to use the method applicable to the land use with the most similarity to the proposed project.
- For mixed-use projects, OPR describes several options that include (1) evaluating each land use separately; or (2) evaluating mixed-use projects based on the method applicable to the dominant

land use. Evaluating each land use separately would potentially fail to measure the positive effects of mixed-use projects in reducing VMT.

OPR also recommends exempting some project types from VMT analysis based on the likelihood that such projects will generate low rates of VMT. OPR recommends that projects generating less than 110 trips per day generally may be assumed to cause a less than significant transportation impact.

Potentially relevant to the analysis of VMT attributable to employee VMT: OPR's Technical Advisory also notes that "low wage workers in particular would be more likely to choose a residential location close to their workplace if one is available."

Section 15064.3 of the State CEQA Guidelines describes the requirements for assessing transportation impacts based on vehicle miles traveled (VMT) that apply statewide beginning on July 1, 2020. As described in Section 15064.3:

- "Vehicle miles traveled" refers to the amount and distance of automobile travel "attributable to a project." Other relevant considerations may include the effects of the project on transit or non-motorized travel. As described separately in the Technical Advisory on Evaluating Transportation Impacts in CEQA (OPR, December 2018), VMT re-routed from other origins or destinations as the result of a project would not be attributable to a project except to the extent that the re-routing results in a net increase in VMT. For example, OPR guidelines note that retail projects typically re-route travel from other retail destinations, and therefore a retail project may lead to increases or decreases in VMT, depending on previously existing travel patterns. Similarly, a large share of retail trips are "pass-by trips" that would not be considered attributable to a retail project.
- Lead agencies have discretion to choose the most appropriate methodology to evaluate a project's vehicles miles traveled, including whether to express the change in absolute terms, per capita, per household or any other measure.
- If existing models or methods are not available to estimate the vehicle miles traveled for the particular project being considered: a lead agency may evaluate the project's vehicle miles travelled qualitatively.
- A lead agency may use models to estimate a project's vehicle miles traveled and may revise those estimates to reflect professional judgment based on substantial evidence.

Based on the OPR recommendations, VMT impacts attributable to the proposed casino may be considered potentially significant if home-based work VMT per employee (VMT per job) exceeds 85 percent the average rate for Sonoma County. The latest 2021 SCTA travel demand model run was used to determine VMT significance thresholds for this project.

2.2 Level of Service Analysis Methodology

LOS can be used to determine conformity with an adopted general plan or congestion management program. LOS is a qualitative measure that describes operational conditions as they relate to the traffic stream and perceptions by motorists and passengers. The LOS generally describes these conditions in terms of such factors as speed and travel time, delays, freedom to maneuver, traffic interruptions, comfort, convenience, and safety. The operational LOS are given letter designations from A to F, with A

representing the best operating conditions (free-flow) and F the worst (severely congested flow with high delays). Intersections generally are the capacity-controlling locations with respect to traffic operations on arterial and collector streets in urban areas. Level of service results from synchro were obtained using HCM 6th Edition for most of the intersections. For some intersections, HCM 2000 methodology was used for analysis purpose due to restrictions on non-NEMA phasing,

Signalized Intersections

The study intersections under traffic signal control were analyzed using the 6th Edition Highway Capacity Manual (HCM) Operations Methodology for signalized intersections described in Chapter 18 (HCM 6th Ed.). This methodology determines LOS based on average control delay per vehicle for the overall intersection during peak hour intersection operating conditions. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The average control delay for signalized intersections was calculated using Synchro 11 analysis software and was correlated to a LOS designation as shown in **Table 1**.

Unsignalized Intersections

The study intersections under stop control (unsignalized) were analyzed using the 6th Edition HCM Operations Methodology for unsignalized intersections described in Chapter 20 (HCM 6th Ed.). LOS ratings for stop-sign controlled intersections are based on the average control delay expressed in seconds per vehicle. At the side street, one-way or two-way stop controlled intersections, the control delay 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. The weighted average delay for the entire intersections is presented for all-way stop controlled intersections. The average control delay for unsignalized intersections was calculated using Synchro 11 analysis software and was correlated to a LOS designation as shown in **Table 2**.

Table 1: Signalized Intersection Delay and LOS Definitions

Level of Service	Description	Average Control Delay
A	Signal progression is extremely favorable. Most vehicles arrive during the green phase and do not stop at all. Short cycle lengths may also contribute to the very low vehicle delay.	10.0 or less
B	Operations characterized by good signal progression and/or short cycle lengths. More vehicles stop than with LOS A, causing higher levels of average vehicle delay.	10.1 to 20.0
C	Higher delays may result from fair signal progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, though may still pass through the intersection without stopping.	20.1 to 35.0
D	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable signal progression,	35.1 to 55.0

Level of Service	Description	Average Control Delay
	long cycle lengths, or high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable.	
E	This is considered to be the limit of acceptable delay. These high delay values generally indicate poor signal progression, long cycle lengths, and high volume-to-capacity (V/C) ratios. Individual cycle failures occur frequently.	55.1 to 80.0
F	This level of delay is considered unacceptable by most drivers. This condition often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection. Poor progression and long cycle lengths may also be major-contributing causes of such delay levels.	greater than 80.0

Source: Highway Capacity Manual 6th Ed., Chapter 18 (Transportation Research Board, 2010)
Average Control Delay per Vehicle in seconds

Table 2: Unsignalized Intersection Delay and LOS Definitions

Level of Service	Description	Average Control Delay
A	Little or no traffic delay	≤10
B	Short Traffic delays	>10 – 15
C	Average traffic delays	>15 – 25
D	Long traffic delays	>25 – 35
E	Very long traffic delays	>35 – 50
F	Extreme traffic delays	>50

Source: Highway Capacity Manual 6th Ed., Chapter 20 (Transportation Research Board, 2010)
Average Control Delay per Vehicle in seconds

2.3 Level of Service Standards

Level of service analysis is used for determining consistency with adopted agency plans and standards. Where standards refer to significant environmental impacts, this analysis instead identifies these as significant inconsistencies with adopted plans.

Town of Windsor

The Town of Windsor General Plan defines LOS D as the minimum acceptable level of congestion during the peak periods of weekday mornings and evenings for "high-volume facilities such as freeways, crosstown streets, and signalized or all-way stop-controlled intersections." An exception is made for the following intersections where an LOS E is tolerated by the Town as they are regional gateways to the Town's commercial and civic areas:

- Old Redwood Highway & US 101 Northbound Off-Ramp/Lakewood Drive
- Old Redwood Highway & US 101 Southbound Ramps
- Old Redwood Highway/Windsor River Road & Conde Lane

The Town has also established standards for "side-street stop-controlled unsignalized intersections." The standards apply to both controlled movements and overall intersections. Controlled movements operating at unacceptable LOS E or LOS F are allowed if:

- The intersection is projected to operate at LOS C or better overall, and
- The projected traffic volume on the controlled movement is 30 vehicles or less per hour on approaches with single lanes, or on multi-lane approaches, 30 vehicles or less per hour per lane.

A project's impact on a side-street stop-controlled unsignalized intersection with an overall intersection operating condition of LOS E or LOS F would be considered less-than-significant if it does not cause operating conditions to fall from LOS E to LOS F and it increases average delay for the intersection as a whole by 5 seconds or less.

LOS standards do not apply to minor intersections comprised of only local streets.

The Town of Windsor also requires intersection queuing to be evaluated in tandem with LOS. A project impact would be considered significant if:

- Project traffic added to the 95th percentile queue length causes the queue length to exceed the available stacking length, or
- Project traffic added to the 95th percentile queue length causes the queue length to increase by more than 10 feet or approximately one-half a car-length given that the 95th percentile queue length already exceeds the available stacking length.

The Town Engineer may make exception to these rules if physical restraints make mitigation of such impacts practicably infeasible.

As such, this study will use LOS D as a threshold for substantial impacts for study intersections located within the Town of Windsor.

Sonoma County

The Sonoma County General Plan establishes LOS C and LOS D as the minimum acceptable operating conditions on roadway segments and at roadway intersections, respectively. The Plan allows such levels of service to be exceeded if they are determined to be acceptable due to environmental or community values or if a project has an overriding public benefit that outweighs lower levels of service and increased congestion.

Thus, this study will consider LOS D as a threshold for substantial impacts for study intersections located outside the Town of Windsor and within the County of Sonoma.

3.0 EXISTING CONDITIONS

This section describes existing traffic volumes and operating conditions at the study intersections, including the results of LOS calculations.

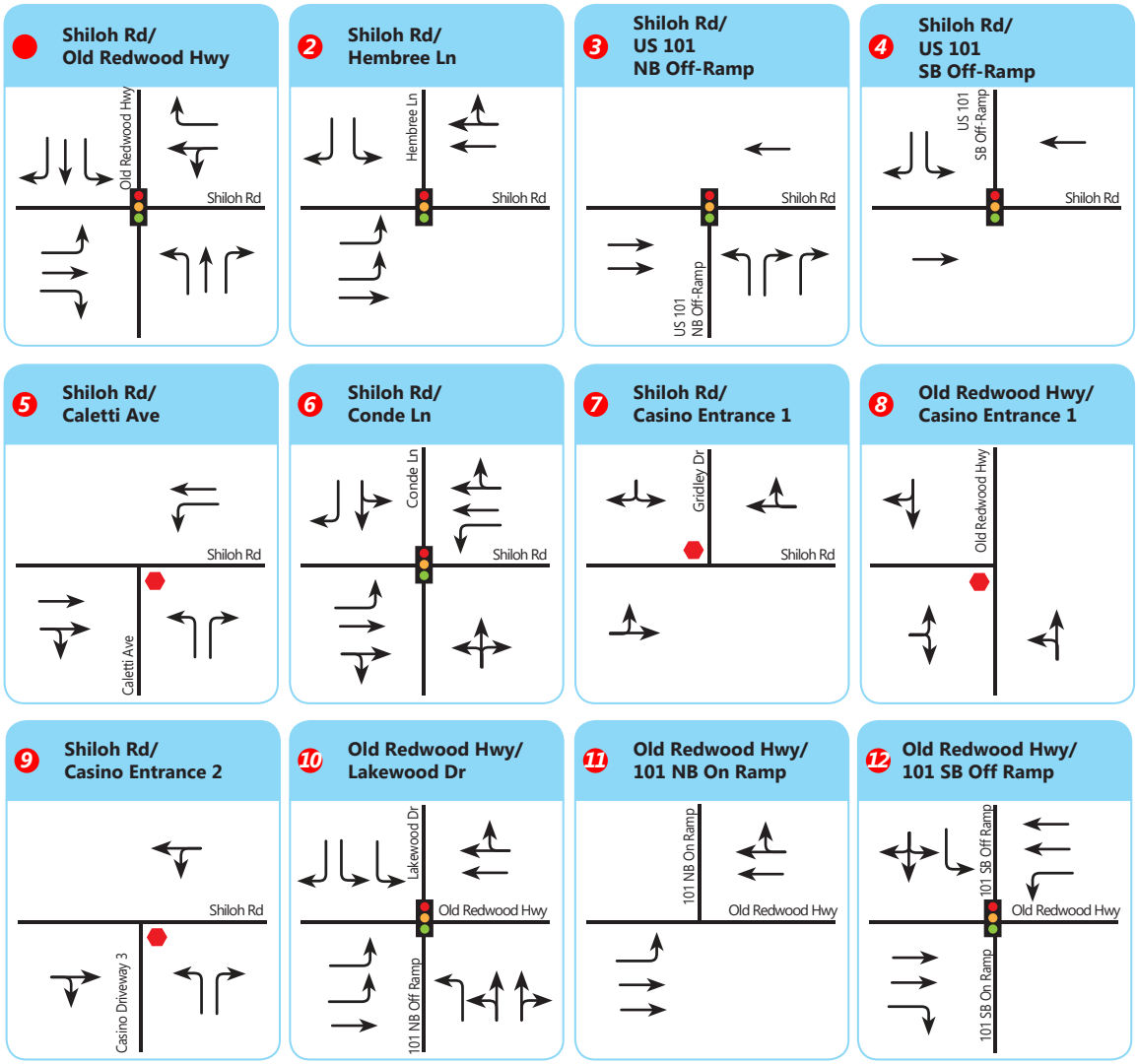
3.1 Existing Traffic Conditions

TJKM evaluated existing traffic conditions at selected study intersections and study segments during the a.m. and p.m. peak hours on a typical weekday, and during the midday peak hours on a typical Saturday. Intersection turning movement counts of vehicles, bicycles, and pedestrians were collected during the weekday a.m. peak period (7:00-9:00 a.m.) and the weekday p.m. peak period (4:00-6:00 p.m.) on July 28, 2022. Similar turning movement counts were collected during the Saturday midday peak hours (10:00 a.m.-4:00 p.m.) on July 30, 2022. The average daily traffic (ADT) volumes of vehicles were also collected for each study segment on July 28, 2022.

The traffic count data are included in **Appendix A**. The existing segment ADT volumes, existing intersection lane geometries, and existing intersection peak hour volumes are shown on **Figure 5**, **Figure 6**, and **Figure 7**, respectively.

Figure 5: ADT Counts

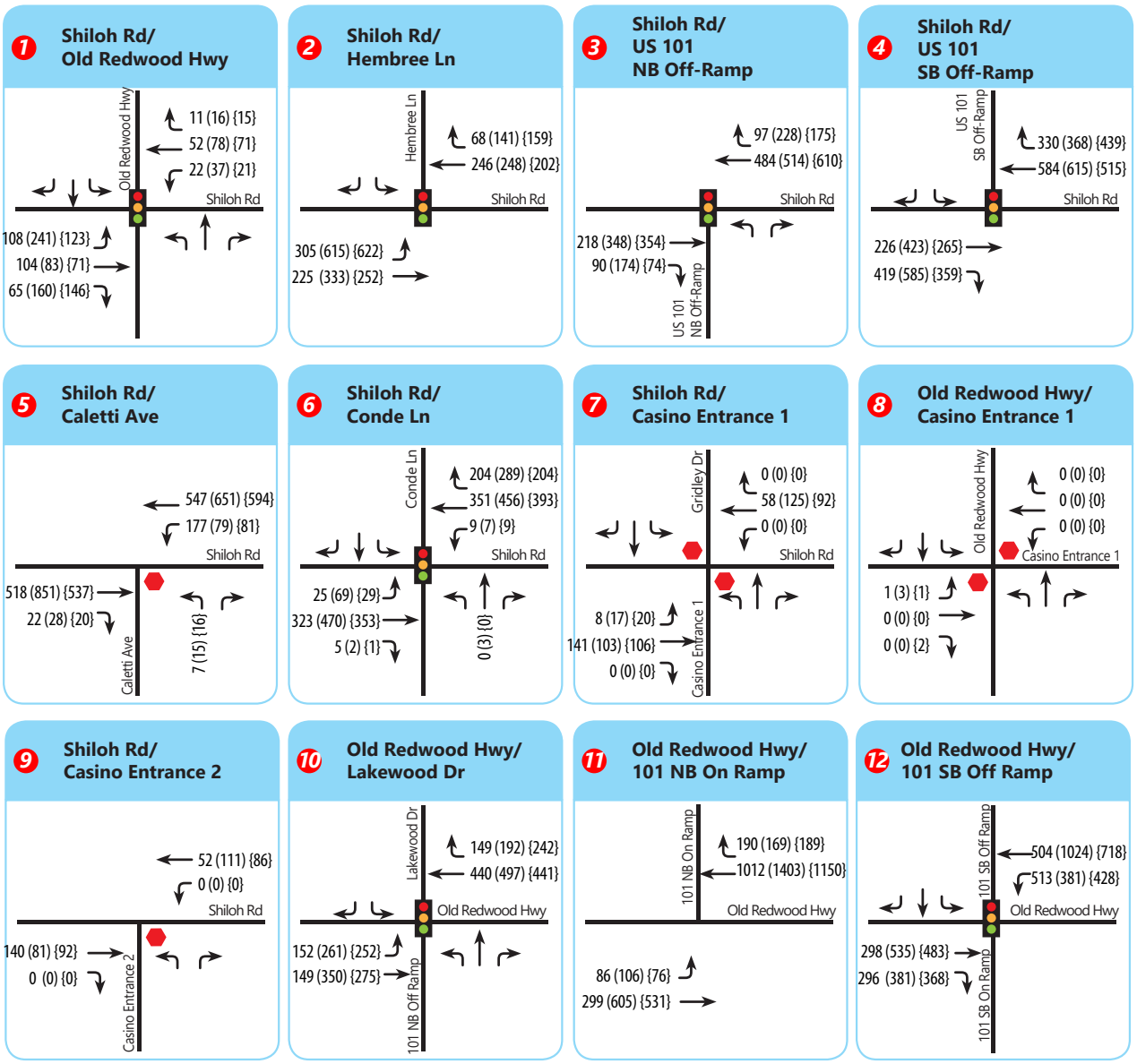
Figure 6: Project Lane Geometry Existing Conditions



LEGEND

- Study Intersection
- Study Segment
- Stop Sign
- Traffic Signal

Figure 7: Existing Conditions Peak Hour Traffic Volumes



LEGEND

- Study Intersection
- Study Segment
- Stop Sign
- Traffic Signal
- XX AM Peak Hour Volumes
- (XX) PM Peak Hour Volumes
- {XX} Saturday Midday Peak Hour Volumes

3.2 Intersection Level of Service Analysis – Existing Conditions

This scenario evaluates the study intersections based on adjusted existing traffic volumes, and existing lane geometry and traffic controls, as described above. The peak hour factors calculated from the existing turning movement counts were used for the study intersections for the Existing Conditions analysis. The results of the LOS analysis using the HCM 6th Ed. methodology and Synchro 11 software program for Existing Conditions are summarized in **Table 3**. LOS worksheets are provided in **Appendix B**.

Under this scenario, all of the study intersections operate within applicable jurisdictional standards during all three peak periods.

Table 3: Intersection Level of Service Analysis – Existing Conditions

#	Study Intersections	Control	Peak Hour	Existing Conditions	
				Delay	LOS
1	Shiloh Rd. & Old Redwood Hwy.	Signal	AM	16.0	B
			PM	20.4	C
			Saturday Midday	18.0	B
2	Shiloh Rd. & Hembree Ln.[5]	Signal	AM	8.4	A
			PM	11.9	B
			Saturday Midday	11.2	B
3	Shiloh Rd. & US-101 NB Ramps	Signal	AM	10.5	B
			PM	10.8	B
			Saturday Midday	10.2	B
4	Shiloh Rd. & US-101 SB Ramps[5]	Signal	AM	6.2	A
			PM	6.3	A
			Saturday Midday	8.4	A
5	Shiloh Rd. & Caletti Ave.	OWSC[3]	AM	13.5	B
			PM	21.1	C
			Saturday Midday	16.4	C
6	Shiloh Rd. & Conde Ln.[5]	Signal	AM	14.6	B
			PM	25.6	C
			Saturday Midday	15.4	B
7	Shiloh Rd. & Casino Entrance 1/Gridley Dr.	TWSC[4]	AM	8.8	A
			PM	9.3	A
			Saturday Midday	8.9	A
8	Old Redwood Hwy. & Casino Entrance	TWSC[4]	AM	13.4	B
			PM	22.1	C
			Saturday Midday	12.7	B
9	Shiloh Rd. & Casino Entrance 2[6]	OWSC[3]	AM	0.0	A
			PM	0.0	A
			Saturday Midday	0.0	A
10	Old Redwood Hwy. & US-101 NB Off Ramp/Lakewood Dr.	Signal	AM	17.4	B
			PM	24.6	C
			Saturday Midday	18.8	B
11	Old Redwood Hwy. & US-101 NB On Ramp[7]	Free	AM	-	-
			PM	-	-
			Saturday Midday	-	-
12	Old Redwood Hwy. & US-101 SB Ramps	Signal	AM	24.1	C
			PM	18.8	B
			Saturday Midday	20.4	C

Notes:
1. Delay – Whole intersection weighted average control delay expressed in seconds per vehicle for signalized and all-way stop controlled intersections. Total control delay for the worst movement is presented for side-street stop – controlled intersections.
2. LOS – Level of Service. **Bold** indicates unacceptable LOS and Delay.
3. OWSC - One Way Stop Control
4. TWSC - Two Way Stop Control
5. For Intersection 2, 4 & 6, LOS and Delay reported using HCM 2000 Methodology as HCM 6th edition does not support Non-NEMA phasing, but for Intersection 2 Cumulative conditions all scenarios are from HCM 6th Edition.
6. For Intersection 9, under Mitigations, LOS and Delay reported using HCM 2000 Methodology.
7. For Intersection 11, there is no delay or LOS as the control is free (there is no stop control or signal control).

3.3 Intersection Queuing Analysis – Existing Conditions

The 95th percentile queue lengths were calculated for each left-turn lane group and exclusive right-turn lane group on the approaches of each study intersection. **Table 4** details the results of the analysis. Under Existing Conditions, the following lane would experience 95th percentile queue lengths exceeding the available storage length:

- 10) Old Redwood Hwy. & US 101 NB Off-ramp/Lakewood Dr.

NBL during weekday PM peak hour

SBL during weekday PM and Saturday midday peak hours

Table 4: 95th Percentile Queue Lengths – Existing Conditions

#	Study Intersections	Lane Group	Storage Length (ft.)	Number of Lanes	Peak Hour	Existing Conditions Queue Length (ft.) [A]
1	Shiloh Rd. and Old Redwood Hwy.	EBL	375	1	AM	98
					PM	217
					Saturday Midday	113
		EBR	140	1	AM	16
					PM	49
					Saturday Midday	47
		WBR	50	1	AM	0
					PM	0
					Saturday Midday	0
		NBL	200	1	AM	71
					PM	161
					Saturday Midday	136
		NBR	100	1	AM	5
					PM	0
					Saturday Midday	0
		SBL	130	1	AM	24
					PM	44
					Saturday Midday	34
		SBR	95	1	AM	72
					PM	80
					Saturday Midday	65
2		EBL	-	Trap Lane	AM	63

#	Study Intersections	Lane Group	Storage Length (ft.)	Number of Lanes	Peak Hour	Existing Conditions Queue Length (ft.) [A]
					PM	143
					Saturday Midday	138
					AM	45
	Shiloh Rd. and Hembree Ln.	SBL	-	Trap Lane	PM	118
					Saturday Midday	44
					AM	24
		SBR	-	Trap Lane	PM	35
					Saturday Midday	4
					AM	245
		NBL	-	Trap Lane	PM	352
3	US 101 NB Off Ramp and Shiloh Rd.				Saturday Midday	189
					AM	11
		NBR	265	2	PM	30
					Saturday Midday	28
					AM	46
		SBL	-	Trap Lane	PM	68
4	Shiloh Rd. and US 101 SB Off Ramp				Saturday Midday	73
					AM	33
		SBR	275	1	PM	30
					Saturday Midday	14
					AM	30
		EBL	90	1	PM	76
					Saturday Midday	34
					AM	16
6	Conde Ln. and Shiloh Rd.	WBL	130	1	PM	16
					Saturday Midday	17
					AM	29
		SBR	40	1	PM	31
					Saturday Midday	24
10		EBL	155	1	AM	74

#	Study Intersections	Lane Group	Storage Length (ft.)	Number of Lanes	Peak Hour	Existing Conditions Queue Length (ft.) [A]
					PM	151
					Saturday Midday	142
					AM	161
		NBL	270	2	PM	**413**
					Saturday Midday	187
	US 101 NB Off Ramp/Lakewood Dr. & Old Redwood Hwy.				AM	62
		SBL	120	1	PM	**153**
					Saturday Midday	**134**
					AM	232
		SBR	-	Trap Lane	PM	239
					Saturday Midday	316
					AM	52
		EBR	-	Trap Lane	PM	49
					Saturday Midday	49
					AM	451
12	US 101 SB On Ramp/US 101 SB Off Ramp & Old Redwood Hwy.	WBL	-	Trap Lane	PM	340
					Saturday Midday	354
					AM	90
		SBL	420	2	PM	152
					Saturday Midday	96

Notes:

1. NBL – Northbound left
2. NBR – Northbound right
3. SBL – Southbound left
4. SBR – Southbound right
5. EBL – Eastbound left
6. EBR – Eastbound right
7. WBL – Westbound left
8. WBR – Westbound right
9. **Bold** indicates unacceptable 95th percentile queue length
10. 95th percentile queue lengths expressed in feet, rounded to the nearest five feet
11. *Average storage per lane, where dual turn lanes provide different storage lengths

4.0 EXISTING PLUS ALTERNATIVE A PROJECT CONDITIONS

This analysis scenario presents the impacts of the proposed project at the study intersections and surrounding roadway system. This scenario evaluates Existing Conditions with the addition of traffic from the proposed Alternative A project. The proposed Alternative A project would construct a casino with a 122,600 sq. ft. gaming floor, 3,380 gaming positions, a 400-room hotel, a 74,190 sq. ft. conference space, and a 2,800-seat event center on a site that is currently a vineyard.

4.1 Alternative A Vehicle Miles Traveled

As noted in section 2.1, TJKM followed guidance contained in the *Technical Advisory on Evaluating Transportation Impacts in CEQA* published by OPR in December 2018 since Sonoma County has not yet adopted criteria and impact thresholds for evaluating VMT impacts. Based on the OPR recommendations, VMT impacts attributable to the proposed casino may be considered potentially significant if home-based work VMT per employee (VMT per job) exceeds 85 percent the average rate for Sonoma County. The latest 2021 SCTA travel demand model run was used to determine VMT significance thresholds for this project. The average VMT rates for various project types in Sonoma County are shown in **Table 5**.

Table 5: Vehicle Miles Traveled Rates for Various Land Uses

Project Type	*VMT Performance Metric*	*Countywide Average*
Residential	Home-Based VMT per Capita	16.60
Office/Employment	Home-Based Commute VMT per Employee	12.39
Industrial	Home-Based Commute VMT per Employee	12.39

OPR guidelines set the significance threshold for VMT at 85% of the regional average. For Office/Employment based projects, the significance threshold will be set at 12.39 multiplied by 0.85, which is **10.53 VMT per employee.** This threshold applies to all scenarios with plus project conditions.

Since the SCTA travel demand model does not have a casino component in its land use designations, TJKM used the service square footage category to calculate VMT per employee for the project. The project is located in TAZ #88 of the SCTA model, and currently there are no employment type projects within the zone. **Table 6** shows the land use changes to the SCTM model to represent the Shiloh Road Casino Project.

Table 6: Land Use Changes for Base Year plus Alternative A Project

TAZ	Hotel Rooms	Service Square Footage	Total Employees
#88	+400	+405,882	+537*

*Total employees was derived from the SCAG employee density study, Table II-A for Hotel/Motel employer type.

The 122,600 square foot gaming floor contains 210 employees, the 74,190 square foot conference / meeting space employs 127 employees, while the hotel employs 200 people (1 employee per 2 rooms on average) for a total of 537 employees in the proposed project.

The land use changes were made into the base year land use of the SCTM model and a base year plus project model run was conducted to extract VMT statistics for the project. The results are summarized in **Table 7**.

Table 7: Home Based VMT per Employee Comparison under Alternative A Project Conditions

TAZ	Base Year Average Daily Home-Based VMT per Employee (per SCTA Model)	Regional Average (per SCTA Model)	15% Below Regional Average (per SCTA Model)	Base Year Plus Project Average Daily Home-Based VMT per Employee (per Model run)
#88	0*	12.39	10.53	10.20

*0 value since in the base year no employment land use type are found in TAZ #88.

The project's Home-Based VMT per employee value of **10.20** is lower than the 85% VMT threshold for the Sonoma County region (10.53 VMT per employee). Thus, the proposed project at full buildout is expected to have a **less-than-significant** impact on VMT.

4.2 Alternative A Project Trip Generation

TJKM developed estimated project trip generation for the proposed project based on a combination of published trip generation rates from the Institute of Transportation Engineers (ITE) publication *Trip Generation* (11th Edition) and prior traffic studies for similar tribal casino resorts in Northern California. TJKM identified the 2015 traffic impact study for the Wilton Rancheria Casino Project, prepared by Kimley-Horn, as providing the most robust presentation of trip generation at such tribal gaming facilities. The traffic study was incorporated into the certified final EIR in 2015, prepared for the U.S. Department of the Interior Bureau of Indian Affairs. The Wilton Rancheria study includes observed trip generation and facility data at Thunder Valley Casino and Cache Creek Casino, as well as a discussion of how those data were applied to the Wilton Rancheria project. In addition, that project consists of a similar mix of uses that mirror the proposed Shiloh Road casino project. The trip generation estimates provided below are closely based on the same assumptions and data as the Wilton Rancheria study. The only updated assumption is the use of rates from the newer 11th edition of *Trip Generation*.

As the Wilton Rancheria study omitted the a.m. peak hour in its analysis due to relatively low trip generation rates, TJKM utilized a.m. peak hour trip generation rates developed for the Siletz Tribe Casino Traffic Impact Study for estimating a.m. peak hour trips. The Siletz Tribe Casino Traffic Impact Study calculated casino trip rates using the size of the gaming use exclusively.

For the proposed project, TJKM used published trip rates for the ITE land use Hotel (ITE Code 310), observed trip generation rates from the Thunder Valley Casino and the Cache Creek Casino, and conservative estimates of occupancy at events taking place in the meeting space and event center. Hotel trips were reduced by 75 percent to represent the large proportion of hotel guests who would also be casino guests and captured under the Casino trip generation estimate.

Using the methodology outlined in the above mentioned study, the peak trip generation for the convention facility is based on an 85th percentile event, which translates to an attendance of about 2,380 out of a total of 2,800 seats. It is expected that some attendees will stay at the on-site hotel and walk to the convention facility. For this analysis, it is assumed that 25% of the hotel rooms will be occupied by

event attendees, while the remaining attendees will arrive by car. To calculate the expected vehicle trip generation rates for the convention facility, the majority of trips generated are anticipated to occur outside the PM peak hour, as events are likely to commence between 7:00 and 8:00 PM. The trip generation estimates presume that 15% of attendees at a full-capacity event will arrive during the peak hour, with an expected vehicle occupancy rate of 2.2 persons per vehicle. As a result, it is projected that approximately 1,023 vehicle trips will be generated by the event center during the weekday and Saturday PM peak hours.

Trip generation for the meeting space was similarly estimated. The proposed square footage was converted to seating based on the industry standard of 15 square feet per person. It was also assumed that 25% of the total attendees would be staying at the on-site hotel and walking to the facility. Each hotel room is expected to accommodate an average of 1.3 guests. Additionally, with an anticipated attendance rate of 85%, it is expected that there will be an average of 2.2 persons per vehicle. The trip rates and total number of trips are shown in **Table 8**.

The proposed project is expected to generate 11,213 net new daily weekday trips, including 473 a.m. peak hour trips (279 in, 194 out), 1,205 p.m. peak hour trips (710 in, 495 out), and 15,779 net new daily Saturday trips, including 1,340 p.m. peak hour trips (657 in, 683 out).

Table 8: Alternative A Project Trip Generation

Land Use (ITE Code)	*Size*		*Weekday Daily*		*A.M. Peak*						*P.M. Peak*			*Saturday Daily*		*Saturday P.M Peak*				
			Rate	*Trips*	*Rate*	*In:Out*	*In*	*Out*	*Total*	*Rate*	*In:Out*	*In*	*Out*	*Total*	*Rate*	*Trips*	*Rate*	*In:Out*	*In*	*Out*	*Total*
Casino - Gaming Positions	3,380	positions	0.45	7,540	0.14	59:41	279	194	473	0.21	47:53	336	379	715	0.28	12,086	0.36	47:53	565	638	1,203
Subtotal				*7,540*			*279*	*194*	*473*			*336*	*379*	*715*		*12,086*			*565*	*638*	*1,203*
Hotel (310)	400	rooms	7.99	3,196			0	0	0	0.59	51:49	120	116	236	8.19	3,276	0.72	56:44	161	127	288
Internal Capture (75% PM/Sat.)			*-75%*	*-2,397*			*0*	*0*	*0*	*-75%*		*-90*	*-87*	*-177*	*-75%*	*-2,457*	*-75%*		*-121*	*-95*	*-216*
Subtotal				*799*			*0*	*0*	*0*			*30*	*29*	*59*		*819*			*40*	*32*	*72*
Meeting/Conference Space	74.19	ksf	24.96	1,852			0	0	0	3.74	80:20	222	56	278	24.96	1,852	0.56	80:20	34	8	42
Subtotal				*1,852*			*0*	*0*	*0*			*222*	*56*	*278*		*1,852*			*34*	*8*	*42*
Event Center	2,800	seats	0.37	1,023			0	0	0	0.05	80:20	122	31	153	0.37	1,023	0.01	80:20	18	5	23
Subtotal				*1,023*			*0*	*0*	*0*			*122*	*31*	*153*		*1,023*			*18*	*5*	*23*
Net New Trips				**11,213**			**279**	**194**	**473**			**710**	**495**	**1,205**		**15,779**			**657**	**683**	**1,340**

Notes:

1. *Trip Generation, 11th Edition*, Institute of Transportation Engineers (ITE), 2021.
2. *Wilton Rancheria Fee-to-Trust Casino Project*, Kimley Horn, submitted on July 29, 2015.
3. The trip generation for the event center was based on the study conducted for the Wilton Rancheria Casino Project submitted on July 29, 2015. Following the methodology from that study, the peak trip generation for the convention facility is calculated for an 85th percentile event, which corresponds to an attendance of approximately 2,380 seats. It is anticipated that a portion of attendees will stay at the on-site hotel and walk to the convention facility. For this analysis, it is estimated that 25% of the hotel rooms will be occupied by event attendees, while the remaining attendees will drive to the venue. To determine the expected vehicle trip generation rates for the convention facility, auto occupancy rates and arrival patterns for various types of events were considered. Most of the trips generated are projected to occur outside the PM peak hour, as events are likely to start between 7:00 and 8:00 PM. The trip generation calculations assume that 15% of attendees at a capacity event will arrive during the peak hour, with an anticipated vehicle occupancy rate of 2.2 persons per vehicle. Consequently, it is estimated that approximately 1,023 total vehicle trips will be generated by the convention facility during the weekday and Saturday PM peak hours.
4. The trip generation for the meeting space was estimated using the proposed square footage, which was converted into seating based on an industry standard of 15 square feet per person. It was assumed that 25% of the total attendees would stay at the on-site hotel and walk to the facility. Each hotel room is projected to accommodate an average of 1.3 guests. Furthermore, with an anticipated attendance rate of 85%, it is expected that there will be an average of 2.2 persons per vehicle.

4.3 Alternative A Project Trip Distribution and Assignment

Trip distribution is a process that determines in what proportion vehicles would be expected to travel between the project site and various destinations outside the project study area. Assignment determines the various routes that vehicles would take from the project site to each destination using the calculated trip distribution. Trip distribution assumptions for the proposed development project were developed based on the existing travel patterns and the locations of regional destinations and complementary land uses. The distribution assumptions for the proposed project are as follows:

- 45 percent to/from US 101 to the south
- 25 percent to/from US 101 to the north
- 10 percent to/from Old Redwood Highway to the southeast
- 10 percent to/from Old Redwood Highway to the northwest
- 5 percent to/from Shiloh Road to the east
- 5 percent to/from Shiloh Road to the west

The same trip distribution is used for all plus project alternatives and scenarios.

Figure 8 and **Figure 9** illustrate the trip distribution and trip assignment at the study intersections, respectively. The project trips were then added to traffic volumes under Existing Conditions to generate Existing plus Project Conditions traffic volumes.

Figure 8: Trip Distribution

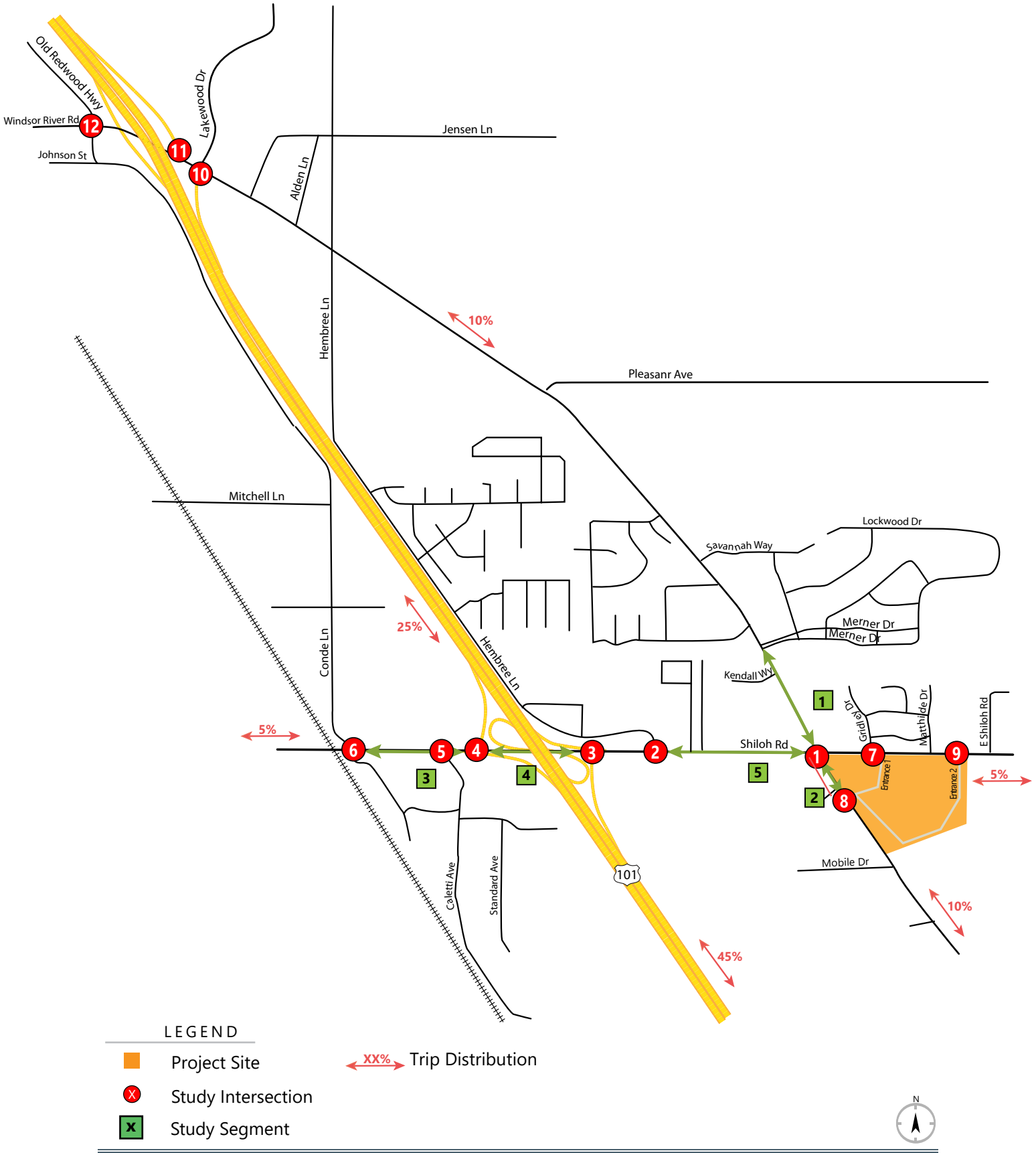
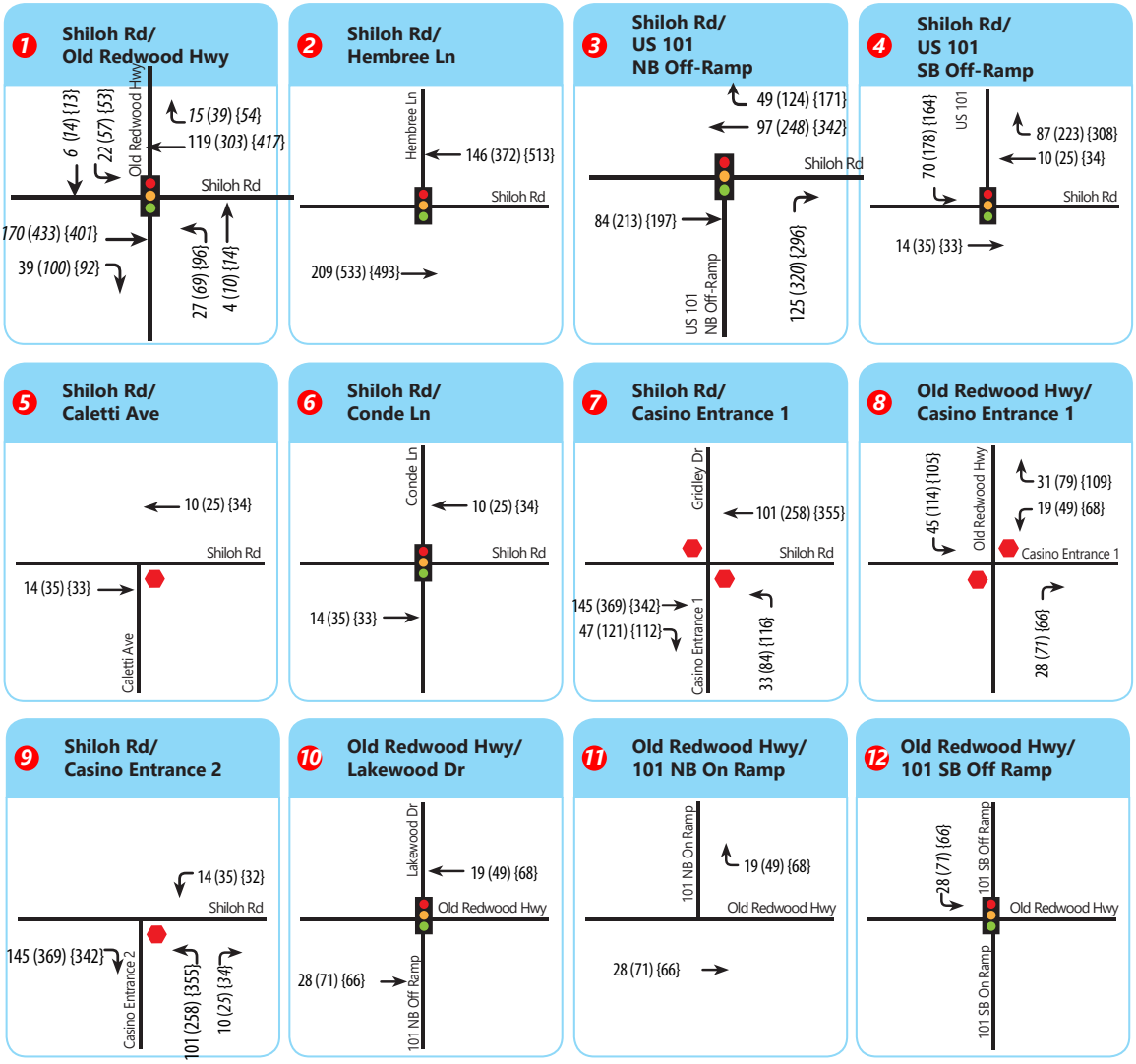


Figure 9: Trip Assignment Alternative A Volumes



4.4 Intersection Level of Service Analysis – Existing plus Alternative A Project Conditions

The intersection LOS analysis results for Existing plus Alternative A Project Conditions are summarized in **Table 9**.

Under this scenario, the following intersections **would not be consistent** with level of service standards set by the Town of Windsor and Sonoma County:

- 1) Shiloh Rd. & Old Redwood Hwy. (Weekday PM and Saturday midday peak hours)
- 7) Shiloh Rd. & Casino Entrance 1 (Weekday PM and Saturday midday peak hours)
- 8) Old Redwood Hwy. & Casino Entrance 1 (Weekday PM and Saturday midday peak hours)

Mitigation Measures

The required mitigation measures under this scenario are as follows. The numbers correspond to the intersections listed above:

- 1) Shiloh Rd. & Old Redwood Hwy.
    - Convert split phasing in EB/WB direction to protected phasing;
    - Convert existing westbound-through lane to an exclusive left-turn lane (storage length of 200 feet and taper length of 75 feet) and a shared through/right turn lane
    - Add one northbound left-turn lane
- 7) Shiloh Rd. & Casino Entrance 1
    - Signalize intersection;
    - Provide exclusive eastbound right-turn lane (Storage length of 150 feet and taper length of 75 feet)
- 8) Old Redwood Hwy. & Casino Entrance 1
    - Signalize intersection
    - Provide exclusive northbound right-turn lane (Storage length of 100 feet and taper length of 75 feet)
    - Provide exclusive southbound left-turn lane (Storage length of 50 feet and taper length of 25 feet)
- 9) Shiloh Road & Casino Entrance 3
    - Provide exclusive eastbound right-turn lane (Storage length of 200 feet and taper length of 75 feet)

With the addition of the above listed improvements, all project-related impacts at the impacted intersections would be mitigated to a level that **would be consistent** with level of service standards set by the Town of Windsor and Sonoma County.

Figures 10 and **11** show lane geometries and projected peak hour turning movement volumes at all the study intersections for Existing plus Alternative A Project Conditions, respectively. LOS worksheets are provided in **Appendix C**.

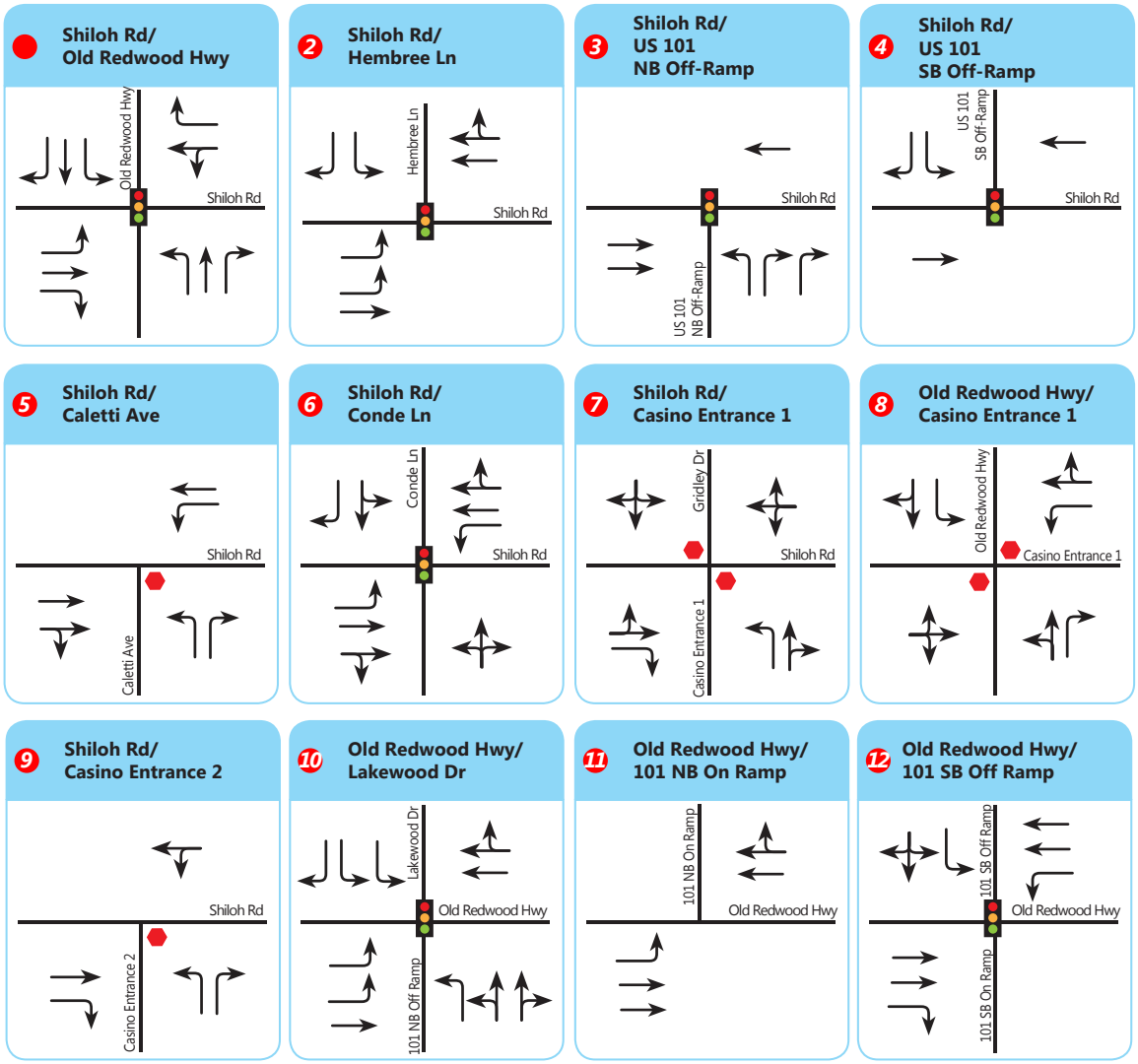
Table 9: Intersection Level of Service Analysis – Existing plus Alternative A Project Conditions

#	Study Intersections	Control	Peak Hour	Existing Conditions		Existing + Alternative A Project Conditions			Existing + Alternative A Project Conditions w/ Mitigations		
				Delay	LOS	Delay	LOS	Change in Delay	Delay	LOS	Change in Delay
1	Shiloh Rd. & Old Redwood Hwy.	Signal	AM	16.0	B	22.6	C	6.6	21.6	C	5.6
			PM	20.4	C	**61.6**	**E**	41.2	27.2	C	6.8
			Saturday Midday	18.0	B	**82.8**	**F**	64.8	25.1	C	7.1
2	Shiloh Rd. & Hembree Ln.[5]	Signal	AM	8.4	A	8.6	A	0.2	-	-	-
			PM	11.9	B	16.2	B	4.3	-	-	-
			Saturday Midday	11.2	B	17.3	B	6.1	-	-	-
3	Shiloh Rd. & US-101 NB Ramps	Signal	AM	10.5	B	12.5	B	2.0	-	-	-
			PM	10.8	B	22.6	C	11.8	-	-	-
			Saturday Midday	10.2	B	43.2	D	33.0	-	-	-
4	Shiloh Rd. & US-101 SB Ramps[5]	Signal	AM	6.2	A	8.0	A	1.8	-	-	-
			PM	6.3	A	11.8	B	5.5	-	-	-
			Saturday Midday	8.4	A	12.3	B	3.9	-	-	-
5	Shiloh Rd. & Caletti Ave.	OWSC[3]	AM	13.5	B	13.7	B	0.2	-	-	-
			PM	21.1	C	22.5	C	1.4	-	-	-
			Saturday Midday	16.4	C	17.5	C	1.1	-	-	-
6	Shiloh Rd. & Conde Ln.[5]	Signal	AM	14.6	B	14.7	B	0.1	-	-	-
			PM	25.6	C	27.0	C	1.4	-	-	-
			Saturday Midday	15.4	B	15.3	B	-0.1	-	-	-
7	Shiloh Rd. & Casino Entrance 1/Gridley Dr.	TWSC[4]	AM	8.8	A	13.8	B	5.0	-	-	-
			PM	9.3	A	**42.8**	**E**	33.5	9.6	A	0.3
			Saturday Midday	8.9	A	**50.3**	**F**	41.4	9.5	A	0.6
8	Old Redwood Hwy. & Casino Entrance	TWSC[4]	AM	13.4	B	16.0	C	2.6	-	-	-
			PM	22.1	C	**43.6**	**E**	21.5	8.0	A	-14.1
			Saturday Midday	12.7	B	20.5	C	7.8	-	-	-
9	Shiloh Rd. & Casino Entrance 2[6]	OWSC[3]	AM	0.0	A	10.7	B	10.7	-	-	-
			PM	0.0	A	14.5	B	14.5	-	-	-
			Saturday Midday	0.0	A	15.7	C	15.7	-	-	-
10	Old Redwood Hwy. & US-101 NB Off Ramp/Lakewood Dr.	Signal	AM	17.4	B	17.2	B	-0.2	-	-	-
			PM	24.6	C	24.6	C	0.0	-	-	-
			Saturday Midday	18.8	B	18.5	B	-0.3	-	-	-
11	Old Redwood Hwy. & US-101 NB On Ramp[7]	Free	AM	-	-	-	-	-	-	-	-
			PM	-	-	-	-	-	-	-	-
			Saturday Midday	-	-	-	-	-	-	-	-
12	Old Redwood Hwy. & US-101 SB Ramps	Signal	AM	24.1	C	24.6	C	0.5	-	-	-
			PM	18.8	B	20.8	C	2.0	-	-	-
			Saturday Midday	20.4	C	21.8	C	1.4	-	-	-

Notes:
1. Delay – Whole intersection weighted average control delay expressed in seconds per vehicle for signalized and all-way stop controlled intersections. Total control delay for the worst movement is presented for side-street stop – controlled intersections.
2. LOS – Level of Service. **Bold** indicates unacceptable LOS and Delay.
3. OWSC - One Way Stop Control

4. TWSC - Two Way Stop Control
5. For Intersection 2, 4 & 6, LOS and Delay reported using HCM 2000 Methodology as HCM 6th edition does not support Non-NEMA phasing, but for Intersection 2 Cumulative conditions all scenarios are from HCM 6th Edition.
6. For Intersection 9, under Mitigations, LOS and Delay reported using HCM 2000 Methodology.
7. For Intersection 11, there is no delay or LOS as the control is free (there is no stop control or signal control).

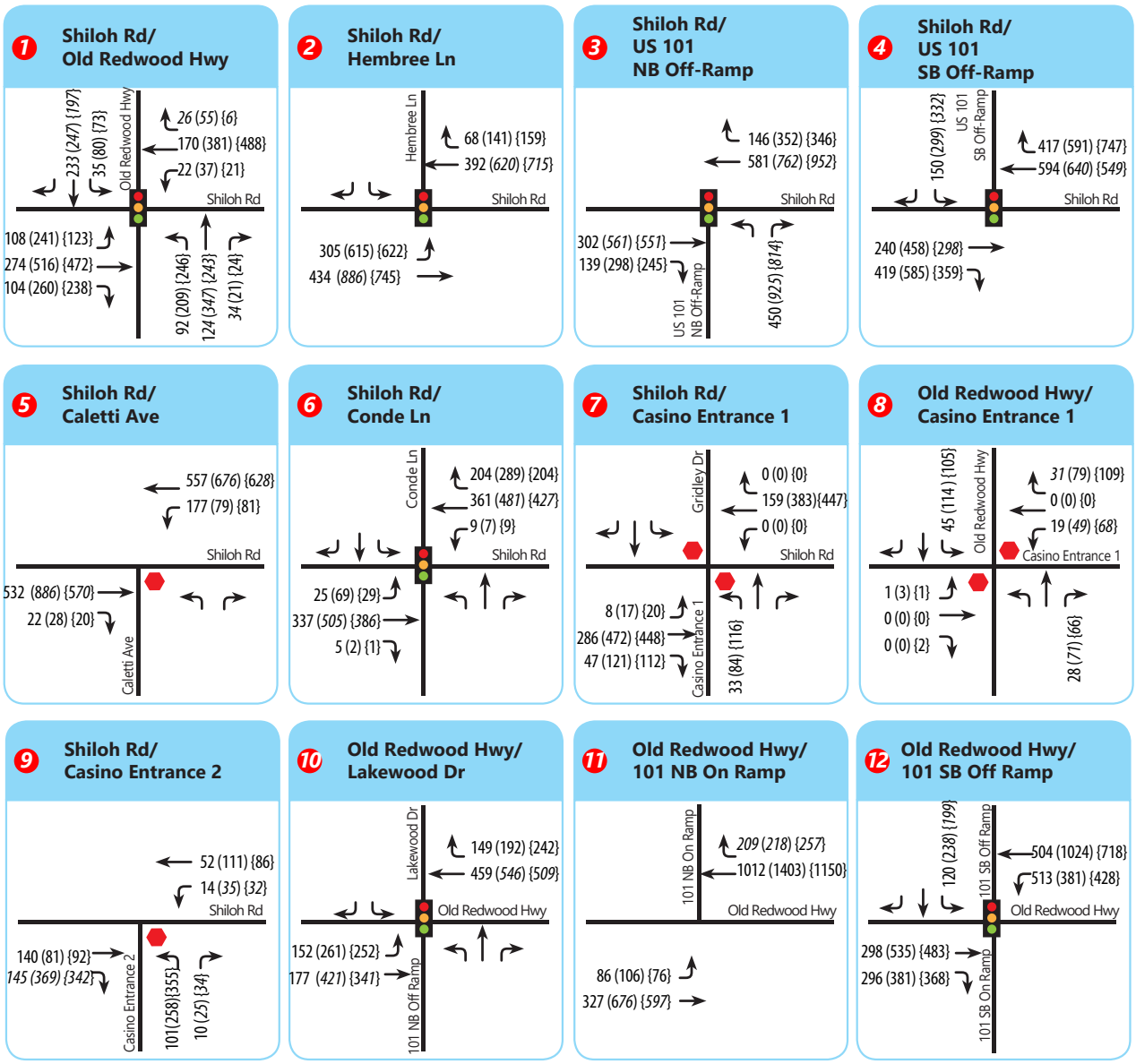
Figure 10: Project Lane Geometry Existing Plus Alternative A Project Conditions



LEGEND

- Study Intersection
- Study Segment
- Stop Sign
- Traffic Signal

Figure 11: Existing Plus Alternative A Project Conditions Peak Hour Traffic Volumes



LEGEND

- Study Intersection
- Study Segment
- Stop Sign
- Traffic Signal
- XX AM Peak Hour Volumes
- (XX) PM Peak Hour Volumes
- {XX} Saturday Midday Peak Hour Volumes

4.5 Intersection Queuing Analysis – Existing plus Alternative A Project Conditions

The 95th percentile queue lengths were calculated for each left-turn lane group and exclusive right-turn lane group on the approaches of each study intersection. **Table 10** details the results of the analysis. Under Existing plus Alternative A Project Conditions, the following lane groups would experience 95th percentile queue lengths exceeding the available storage length:

- 1) Shiloh Rd. & Old Redwood Hwy.

EBR during weekday PM and Saturday midday peak hours

NBL during weekday PM and Saturday midday peak hours

SBL during weekday PM and Saturday midday peak hours

SBR during weekday AM and PM, and Saturday midday peak hours

- 10) US 101 NB Off Ramp/Lakewood Dr. & Old Redwood Hwy.

NBL during weekday PM peak hour (no new impact)

SBL during weekday PM and Saturday midday peak hours (no new impact)

Mitigation Measures

At intersection #1, queue overflows can largely be mitigated by restriping to extend storage length as indicated in **Table 10**. At the northbound left turn lane, while the 95th percentile queue would overflow, the average queue length indicates that this would be rare and suggests the impact would be less than significant. It should also be noted that the Town of Windsor Traffic Impact Fee (TIF) program includes a project to restripe this intersection to provide two northbound left turn lanes. With this TIF project implemented, all queue impacts would be fully mitigated. At intersection 10, the project would not create any new queuing impacts. The detailed required mitigation measures under this scenario are as follows. The numbers correspond to the intersections listed above:

- 1) Restripe EBR to give 150 ft. storage length. Restripe SBL to 190 ft. Restripe SBR to 105 ft. Construct TIF project to add second NBL turn lane and second WB receiving lane.

With the addition of the above listed improvements, all project-related impacts at the impacted intersections would be mitigated to a level that **would be consistent** with queuing standards set by the Town of Windsor and Sonoma County.

Table 10: 95th Percentile Queue Lengths – Existing plus Alternative A Project Conditions

#	Study Intersections	Lane Group	Storage Length (ft.) (Mitigated)	Number of Lanes (Mitigated)	Peak Hour	Existing Conditions	Existing + Alternative A Project Conditions		Existing + Alternative A Project Conditions w/ Mitigations		Comments
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue Length (ft.) [B-A]	Queue Length (ft.) [B]	Change in Queue Length (ft.) [B-A]	
1	Shiloh Rd. and Old Redwood Hwy.	EBL	375	1	AM	98	122	24	111	13	
					PM	217	286	69	317	100	
					Saturday Midday	113	153	40	171	58	
		EBR	140 (150)	1	AM	16	48	32	45	29	Re-Stripe EBR Storage Length to 150 feet
					PM	49	**213**	**164**	147	98	
					Saturday Midday	47	**200**	**153**	129	82	
		WBL	(200)	(1)	AM				37	-	LOS mitigation requires providing 1 WBL lane at the intersection.
					PM				78	-	
					Saturday Midday				47	-	
		WBR	50	1	AM	0	0	0	0	0	
					PM	0	5	5	9	9	
					Saturday Midday	0	0	0	0	0	
		NBL	200	1 (2)	AM	71	127	56	60	-11	Add second NBL turn lane and WB receiving lane
					PM	161	**397**	**236**	150	-11	
					Saturday Midday	136	**455**	**319**	154	18	
		NBR	100	1	AM	5	3	-2	4	-1	
					PM	0	0	0	0	0	
					Saturday Midday	0	0	0	0	0	
		SBL	130 (190)	1	AM	24	64	40	61	37	Re-Stripe SBL Storage Length to 190 feet
					PM	44	**194**	**150**	190	146	
					Saturday Midday	34	**171**	**137**	141	107	
		SBR	95 (105)	1	AM	72	**101**	**29**	85	13	Re-Stripe SBR Storage Length to 105 feet
					PM	80	**97**	**17**	80	0	
					Saturday Midday	65	**99**	**34**	100	35	
2	Shiloh Rd. and Hembree Ln.	EBL	-	Trap Lane	AM	63	72	9			
					PM	143	209	66			

#	Study Intersections	Lane Group	Storage Length (ft.) (Mitigated)	Number of Lanes (Mitigated)	Peak Hour	Existing Conditions	Existing + Alternative A Project Conditions		Existing + Alternative A Project Conditions w/ Mitigations		Comments
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue Length (ft.) [B-A]	Queue Length (ft.) [B]	Change in Queue Length (ft.) [B-A]	
					Saturday Midday	138	220	82			
		SBL	-	Trap Lane	AM	45	51	6			
					PM	118	170	52			
					Saturday Midday	44	113	69			
		SBR	-	Trap Lane	AM	24	38	14			
					PM	35	235	200			
					Saturday Midday	4	34	30			
3	US 101 NB Off Ramp and Shiloh Rd.	NBL	-	Trap Lane	AM	245	245	0			
					PM	352	352	0			
					Saturday Midday	189	187	-2			
		NBR	265	2	AM	11	10	-1			
					PM	30	214	184			
					Saturday Midday	28	152	124			
4	Shiloh Rd. and US 101 SB Off Ramp	SBL	-	Trap Lane	AM	46	84	38			
					PM	68	165	97			
					Saturday Midday	73	154	81			
		SBR	275	1	AM	33	34	1			
					PM	30	30	0			
					Saturday Midday	14	14	0			
6	Conde Ln. and Shiloh Rd.	EBL	90	1	AM	30	31	1			
					PM	76	77	1			
					Saturday Midday	34	35	1			
		WBL	130	1	AM	16	16	0			
					PM	16	16	0			
					Saturday Midday	17	17	0			

#	Study Intersections	Lane Group	Storage Length (ft.) (Mitigated)	Number of Lanes (Mitigated)	Peak Hour	Existing Conditions	Existing + Alternative A Project Conditions		Existing + Alternative A Project Conditions w/ Mitigations		Comments
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue Length (ft.) [B-A]	Queue Length (ft.) [B]	Change in Queue Length (ft.) [B-A]	
10	US 101 NB Off Ramp/Lakewood Dr. & Old Redwood Hwy.	SBR	40	1	AM	29	29	0			
					PM	31	30	-1			
					Saturday Midday	24	24	0			
		EBL	155	1	AM	74	74	0			
					PM	151	151	0			
					Saturday Midday	142	142	0			
		NBL	270	2	AM	161	161	0			
					PM	**413**	**413**	**0**			
					Saturday Midday	187	187	0			
		SBL	120	1	AM	62	62	0			
					PM	**153**	**153**	**0**			
					Saturday Midday	**134**	**134**	**0**			
		SBR	-	Trap Lane	AM	232	238	6			
					PM	239	250	11			
					Saturday Midday	316	338	22			
12	US 101 SB On Ramp/US 101 SB Off Ramp & Old Redwood Hwy.	EBR	-	Trap Lane	AM	52	52	0			
					PM	49	49	0			
					Saturday Midday	49	49	0			
		WBL	-	Trap Lane	AM	451	451	0			
					PM	340	340	0			
					Saturday Midday	354	354	0			
		SBL	420	2	AM	90	103	13			
					PM	152	208	56			
					Saturday Midday	96	137	41			

Notes:
1. NBL – Northbound left

2. NBR – Northbound right
3. SBL – Southbound left
4. SBR – Southbound right
5. EBL – Eastbound left
6. EBR – Eastbound right
7. WBL – Westbound left
8. WBR – Westbound right
9. **Bold** indicates unacceptable 95th percentile queue length. **Red** indicates significant impact.
10. 95th percentile queue lengths expressed in feet, rounded to the nearest five feet
11. Average storage per lane, where dual turn lanes provide different storage lengths

5.0 EXISTING PLUS ALTERNATIVE B PROJECT CONDITIONS

This analysis scenario presents the impacts of the proposed project at the study intersections and surrounding roadway system. The proposed Alternative B project would construct a casino with a 122,600 sq. ft. gaming floor, a 200-room hotel (rather than a 400-room hotel), a 33,140 sq. ft. conference space (down from 74,190 sq. ft.), and no event center on a site that is currently a vineyard.

5.1 Alternative B Vehicle Miles Traveled

The VMT significance threshold for Alternative B project conditions is the same as that for Alternative A project conditions, which is **10.53 VMT per employee**.

Since the SCTA travel demand model does not have a casino component in its land use designations, TJKM used the service square footage category to calculate VMT per employee for the project. The project is located in TAZ #88 of the SCTA model, and currently there are no employment type project within the zone. **Table 11** shows the land use changes to the SCTM model to represent the Shiloh Road Casino Project.

Table 11: Land Use Changes for Base Year plus Alternative B Project

TAZ	Hotel Rooms	Service Square Footage	Total Employees
#88	+200	+405,882	+295*

*Total employees was derived from the SCAG employee density study, Table II-A for Hotel/Motel employer type.

The 114,345 square foot gaming floor contains 195 employees, while the hotel employs 100 people (1 employee per 2 room on average) for a total of 295 employees in the Shiloh Road Casino project.

The land use changes were made into the base year land use of the SCTM model and a base year plus project model run was conducted to extract VMT statistics for the project. The results are summarized in **Table 12**.

Table 12: Home Based VMT per Employee Comparison under Alternative B Project Conditions

TAZ	Base Year Average Daily Home-Based VMT per Employee (per SCTA Model)	Regional Average (per SCTA Model)	15% Below Regional Average (per SCTA Model)	Base Year Plus Project Average Daily Home-Based VMT per Employee (per Model run)
#88	0*	12.39	10.53	10.26

*0 value since in the base year no employment land use type are found in TAZ #88.

The project's Home-Based VMT per employee value of **10.26** is lower than the 85% VMT threshold for the Sonoma County region (10.53). Thus, the proposed Shiloh Road Casino project is expected to have a **less-than-significant** impact on VMT.

5.2 Alternative B Project Trip Generation

The methodology for trip generation under Alternative B "reduced intensity" project conditions is identical to that of Alternative A "full buildout" project conditions. The trips rates and total number of trips are shown in **Table 13**.

The proposed project is expected to generate 8,763 net new daily weekday trips, including 473 a.m. peak hour trips (279 in, 194 out), 863 p.m. peak hour trips (448 in, 415 out), and 13,319 net new daily Saturday trips, including 1,272 p.m. peak hour trips (607 in, 665 out).

Table 13: Alternative B Project Trip Generation

Land Use (ITE Code)	*Size*		*Weekday Daily*		*A.M. Peak*					*P.M. Peak*					*Saturday Daily*		*Saturday P.M Peak*			
			Rate	*Trips*	*Rate*	*In:Out*	*In*	*Out*	*Total*	*Rate*	*In:Out*	*In*	*Out*	*Total*	*Rate*	*Trips*	*Rate*	*In:Out*	*In*	*Out*	*Total*
Casino - Gaming Positions	3,380	positions	0.45	7,540	0.14	59:41	279	194	473	0.21	47:53	334	376	710	0.28	12,086	0.36	47:53	572	645	1,217
Subtotal				*7,540*			*279*	*194*	*473*			*334*	*376*	*710*		*12,086*			*572*	*645*	*1,217*
Hotel (310)	200	rooms	7.99	1,598			0	0	0	0.59	51:49	60	58	118	8.19	1,638	0.72	56:44	81	63	144
Internal Capture (75% PM/Sat.)			*-75%*	*-1,199*			*0*	*0*	*0*	*-75%*		*-45*	*-44*	*-89*	*-75%*	*-1,229*	*-75%*		*-61*	*-47*	*-108*
Subtotal				*400*			*0*	*0*	*0*			*15*	*14*	*29*		*410*			*20*	*16*	*36*
Meeting/Conference Space	33.14	ksf	24.87	824			0	0	0	3.73	80:20	99	25	124	24.87	824	0.56	80:20	15	4	19
Subtotal				*824*			*0*	*0*	*0*			*99*	*25*	*124*		*824*			*15*	*4*	*19*
Net New Trips				**8,763**			**279**	**194**	**473**			**448**	**415**	**863**		**13,319**			**607**	**665**	**1,272**

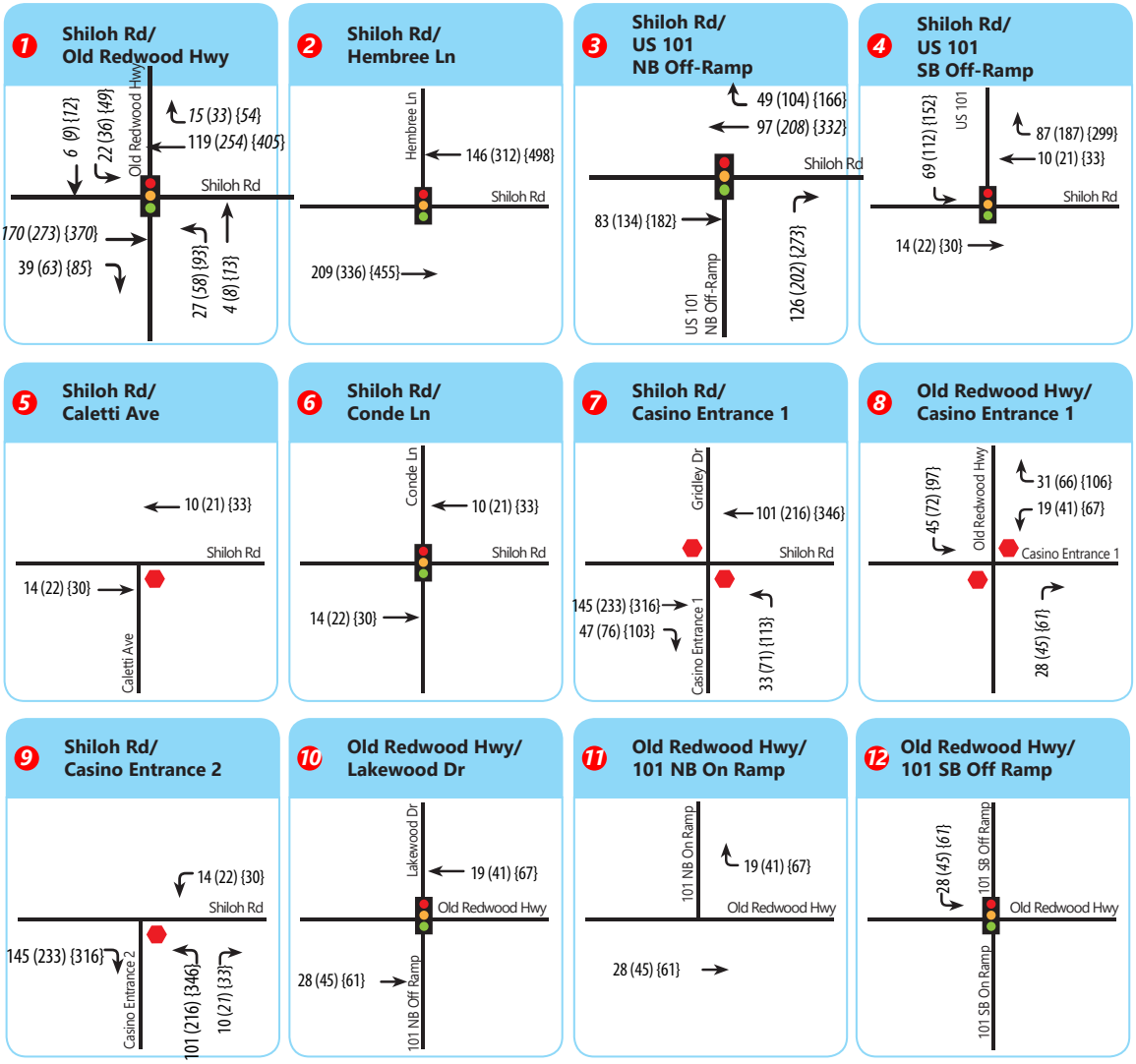
Notes:

1. *Trip Generation, 11th Edition*, Institute of Transportation Engineers (ITE), 2021

5.3 Alternative B Project Trip Assignment

The trip assignment for the proposed Alternative B project is shown on **Figure 12**. The trip distribution for Alternative B is identical to that of Alternative A.

Figure 12: Trip Assignment Alternative B Volumes



Project Site
Study Intersection
Study Segment
Stop Sign
Traffic Signal
XX AM Peak Hour Volumes
(XX) PM Peak Hour Volumes
{XX} Saturday Midday Peak Hour Volumes

5.4 Intersection Level of Service Analysis – Existing plus Alternative B Project Conditions

The intersection LOS analysis results for Existing plus Alternative B Project Conditions are summarized in **Table 14**.

Under this scenario, the following intersections **would not be consistent** with level of service standards set by the Town of Windsor and Sonoma County:

- 1) Shiloh Rd. & Old Redwood Hwy. (Saturday midday peak hour)
- 7) Shiloh Rd. & Casino Entrance 1/Gridley Dr. (Saturday midday peak hour)

Mitigation Measures

The required mitigation measures under this scenario are as follows. The numbers correspond to the intersections listed above:

- 1) Shiloh Rd. & Old Redwood Hwy.
    - Convert split phasing in EB/WB direction to protected phasing;
    - Convert existing westbound-through lane to an exclusive left-turn lane (storage length of 200 feet and taper length of 75 feet) and a shared through/right turn lane
    - Add one northbound left-turn lane
- 7) Shiloh Rd. & Casino Entrance 1
    - Signalize intersection
    - Provide exclusive eastbound right-turn lane (Storage length of 150 feet and taper length of 75 feet)
- 8) Old Redwood Hwy. & Casino Entrance 1
    - Provide exclusive northbound right-turn lane (Storage length of 100 feet and taper length of 75 feet)
    - Provide exclusive southbound left-turn lane (Storage length of 50 feet and taper length of 25 feet)
- 9) Shiloh Road & Casino Entrance 3
    - Provide exclusive eastbound right-turn lane (Storage length of 200 feet and taper length of 75 feet)

With the addition of the above listed improvements, all project-related impacts at the impacted intersections would be mitigated to a level that **would be consistent** with level of service standards set by the Town of Windsor and Sonoma County.

Figures 13 and **14** show lane geometries and projected peak hour turning movement volumes at all the study intersections for Existing plus Alternative B Project Conditions, respectively. LOS worksheets are provided in **Appendix D**.

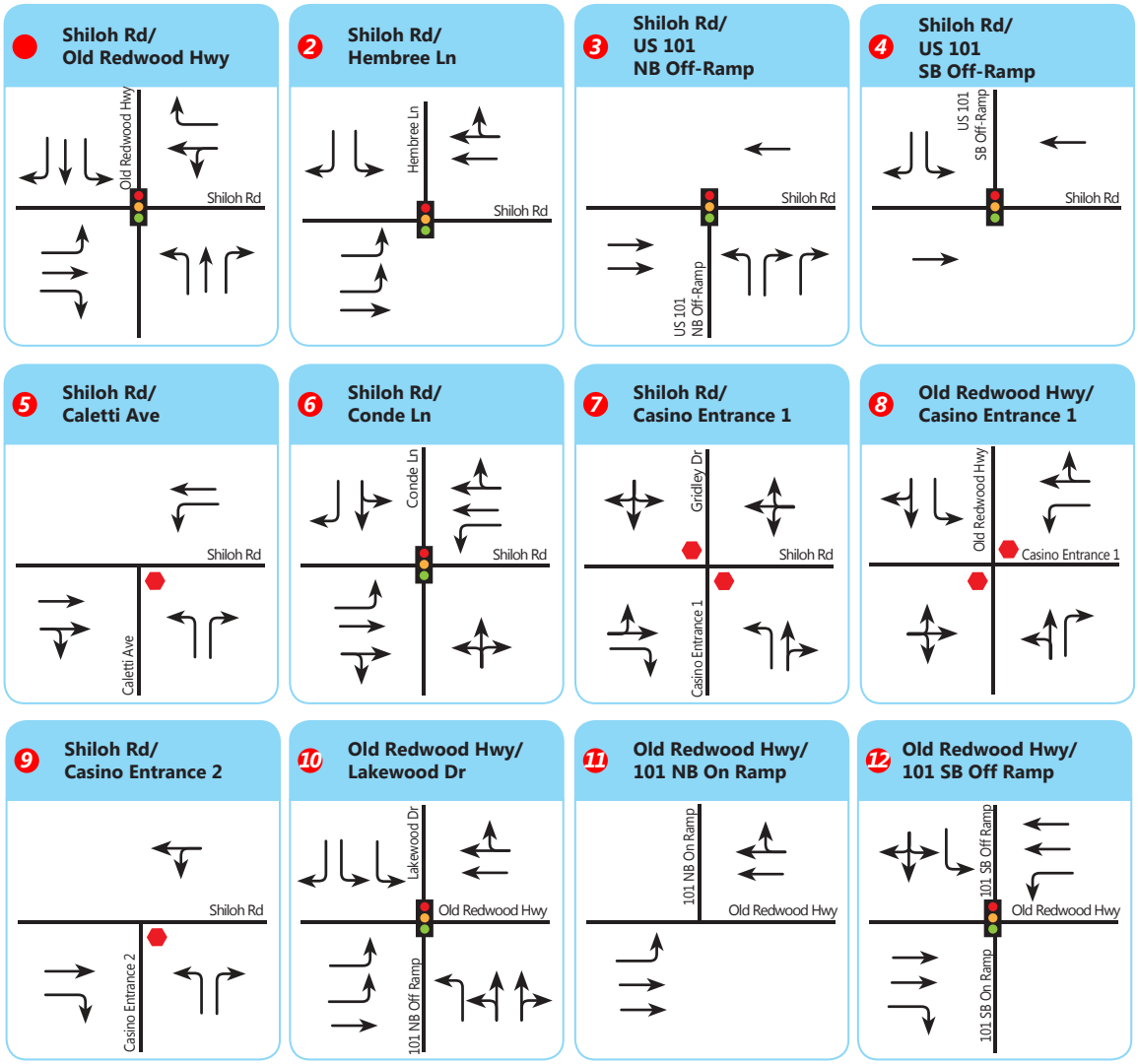
Table 14: Intersection Level of Service Analysis – Existing Conditions plus Alternative B Project Conditions

#	Study Intersections	Control	Peak Hour	Existing Conditions		Existing + Alternative B Project Conditions			Existing + Alternative B Project Conditions w/ Mitigations		
				Delay	LOS	Delay	LOS	Change in Delay	Delay	LOS	Change in Delay
1	Shiloh Rd. & Old Redwood Hwy.	Signal	AM	16.0	B	22.7	C	6.7	21.6	C	5.6
			PM	20.4	C	38.2	D	17.8	31.8	C	11.4
			Saturday Midday	18.0	B	**74.0**	**E**	56.0	24.4	C	6.4
2	Shiloh Rd. & Hembree Ln.[5]	Signal	AM	8.4	A	8.6	A	0.2	-	-	-
			PM	11.9	B	15.5	B	3.6	-	-	-
			Saturday Midday	11.2	B	17.2	B	6.0	-	-	-
3	Shiloh Rd. & US-101 NB Ramps	Signal	AM	10.5	B	12.5	B	2.0	-	-	-
			PM	10.8	B	17.5	B	6.7	-	-	-
			Saturday Midday	10.2	B	39.5	D	29.3	-	-	-
4	Shiloh Rd. & US-101 SB Ramps[5]	Signal	AM	6.2	A	8.0	A	1.8	-	-	-
			PM	6.3	A	9.3	A	3.0	-	-	-
			Saturday Midday	8.4	A	12.1	B	3.7	-	-	-
5	Shiloh Rd. & Caletti Ave.	OWSC[3]	AM	13.5	B	13.7	B	0.2	-	-	-
			PM	21.1	C	22.1	C	1.0	-	-	-
			Saturday Midday	16.4	C	17.4	C	1.0	-	-	-
6	Shiloh Rd. & Conde Ln.[5]	Signal	AM	14.6	B	14.7	B	0.1	-	-	-
			PM	25.6	C	26.9	C	1.3	-	-	-
			Saturday Midday	15.4	B	15.3	B	-0.1	-	-	-
7	Shiloh Rd. & Casino Entrance 1/Gridley Dr.	TWSC[4]	AM	8.8	A	13.8	B	5.0	-	-	-
			PM	9.3	A	25.6	D	16.3	-	-	-
			Saturday Midday	8.9	A	**43.7**	**E**	34.8	9.1	A	0.2
8	Old Redwood Hwy. & Casino Entrance	TWSC[4]	AM	13.4	B	16.0	C	2.6	-	-	-
			PM	22.1	C	34.7	D	12.6	-	-	-
			Saturday Midday	12.7	B	19.9	C	7.2	-	-	-
9	Shiloh Rd. & Casino Entrance 2[6]	OWSC[3]	AM	0.0	A	10.7	B	10.7	-	-	-
			PM	0.0	A	12.7	B	12.7	-	-	-
			Saturday Midday	0.0	A	15.2	C	15.2	-	-	-
10	Old Redwood Hwy. & US-101 NB Off Ramp/Lakewood Dr.	Signal	AM	17.4	B	17.2	B	-0.2	-	-	-
			PM	24.6	C	24.6	C	0.0	-	-	-
			Saturday Midday	18.8	B	18.5	B	-0.3	-	-	-
11	Old Redwood Hwy. & US-101 NB On Ramp[7]	Free	AM	-	-	-	-	-	-	-	-
			PM	-	-	-	-	-	-	-	-
			Saturday Midday	-	-	-	-	-	-	-	-
12	Old Redwood Hwy. & US-101 SB Ramps	Signal	AM	24.1	C	24.6	C	0.5	-	-	-
			PM	18.8	B	19.9	B	1.1	-	-	-
			Saturday Midday	20.4	C	21.6	C	1.2	-	-	-

Notes:
1. Delay – Whole intersection weighted average control delay expressed in seconds per vehicle for signalized and all-way stop controlled intersections. Total control delay for the worst movement is presented for side-street stop – controlled intersections.
2. LOS – Level of Service. **Bold** indicates unacceptable LOS and Delay.
3. OWSC - One Way Stop Control
4. TWSC - Two Way Stop Control

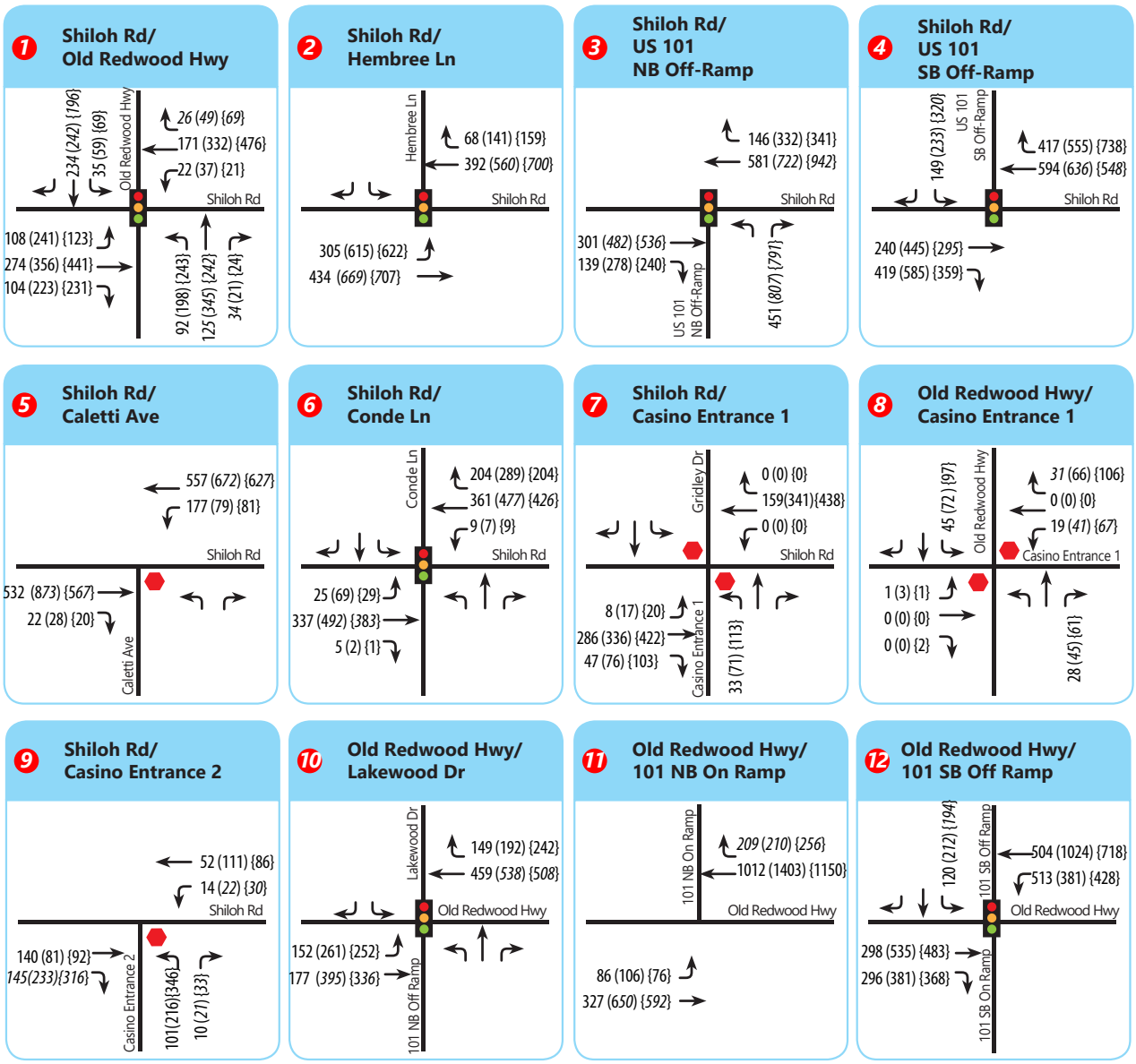
5. For Intersection 2, 4 & 6, LOS and Delay reported using HCM 2000 Methodology as HCM 6th edition does not support Non-NEMA phasing, but for Intersection 2 Cumulative conditions all scenarios are from HCM 6th Edition.
6. For Intersection 9, under Mitigations, LOS and Delay reported using HCM 2000 Methodology.
7. For Intersection 11, there is no delay or LOS as the control is free (there is no stop control or signal control).

Figure 13: Project Lane Geometry Existing Plus Alternative B Project Conditions



Project Site
Study Intersection
Study Segment
Stop Sign
Traffic Signal

Figure 14: Existing Plus Alternative B Project Conditions Peak Hour Traffic Volumes



LEGEND

- Project Site
- Study Intersection
- Study Segment
- Stop Sign
- Traffic Signal
- XX AM Peak Hour Volumes
- (XX) PM Peak Hour Volumes
- {XX} Saturday Midday Peak Hour Volumes

5.5 Intersection Queuing Analysis – Existing plus Alternative B Project Conditions

The 95th percentile queue lengths were calculated for each left-turn lane group and exclusive right-turn lane group on the approaches of each study intersection. **Table 15** details the results of the analysis. Under Existing plus Alternative B Project Conditions, the following lane groups would experience 95th percentile queue lengths exceeding the available storage length:

- 1) Shiloh Rd. & Old Redwood Hwy.

EBR during weekday PM and Saturday midday peak hours

NBL during weekday PM and Saturday midday peak hours

SBL during weekday PM and Saturday midday peak hours

SBR during weekday AM and PM, and Saturday midday peak hours

- 10) Old Redwood Hwy. & US 101 NB Off-ramp/Lakewood Dr.

NBL during weekday PM peak hour (no new impact)

SBL during weekday PM and Saturday midday peak hours (no new impact)

Mitigation Measures

At intersection #1, queue overflows can largely be mitigated by restriping to extend storage length as indicated in **Table 15**. At the northbound left turn lane, while the 95th percentile queue would overflow, the average queue length indicates that this would be rare and suggests the impact would be less than significant. It should also be noted that the Town of Windsor Traffic Impact Fee (TIF) program includes a project to restripe this intersection to provide two northbound left turn lanes. With this TIF project implemented, it is expected that all queue impacts would be fully mitigated. At intersection 10, the project would not create any new queuing impacts. The detailed required mitigation measures under this scenario are as follows. The numbers correspond to the intersections listed above:

- 1) Restripe EBR to give 150 ft. storage length. Restripe SBL to 190 ft. Restripe SBR to 105 ft. Construct TIF project to add second NBL turn lane and WB receiving lane.

With the addition of the above listed improvements, all project-related impacts at the impacted intersections would be mitigated to a level that **would be consistent** with queuing standards set by the Town of Windsor and Sonoma County.

Table 15: 95th Percentile Queue Lengths – Existing plus Alternative B Project Conditions

#	Study Intersections	Lane Group	Storage Length (ft.) (Mitigated)	Number of Lanes (Mitigated)	Peak Hour	Existing Conditions	Existing + Alternative B Project Conditions		Existing + Alternative B Project Conditions w/Mitigations		Comments
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	
1	Shiloh Rd. and Old Redwood Hwy.	EBL	375	1	AM	98	122	24	112	14	
					PM	217	285	68	285	68	
					Saturday Midday	113	153	40	171	58	
		EBR	140 (150)	1	AM	16	49	33	46	30	Re-Stripe EBR Storage Length to 150 feet
					PM	49	**145**	**96**	137	88	
					Saturday Midday	47	**188**	**141**	127	80	
		WBL	(200)	(1)	AM				37	-	LOS mitigation requires providing 1 WBL lane at the intersection.
					PM				55	-	
					Saturday Midday				47	-	
		WBR	50	1	AM	0	0	0	0	0	
					PM	0	0	0	0	0	
					Saturday Midday	0	18	18	21	21	
		NBL	200	1 (2)	AM	71	128	57	60	-11	Add second NBL turn lane and WB receiving lane
					PM	161	**369**	**208**	133	-28	
					Saturday Midday	136	**446**	**310**	149	13	
		NBR	100	1	AM	5	3	-2	4	-1	
					PM	0	0	0	0	0	
					Saturday Midday	0	0	0	0	0	
		SBL	130 (190)	1	AM	24	65	41	61	37	Re-Stripe SBL Storage Length to 190 feet
					PM	44	**139**	**95**	139	95	
					Saturday Midday	34	**163**	**129**	125	91	
		SBR	95 (105)	1	AM	72	**101**	**29**	86	14	Re-Stripe SBR Storage Length to 105 feet
					PM	80	**98**	**18**	92	12	

								Alternative B Project Conditions w/Mitigations	
					Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]
				Saturday Midday	65	**99**	**34**	99	34
2	Shiloh Rd. and Hembree Ln.	EBL	-	Trap Lane	AM	63	72	9	
					PM	143	200	57	
					Saturday Midday	138	218	80	
		SBL	-	Trap Lane	AM	45	51	6	
					PM	118	162	44	
					Saturday Midday	44	172	128	
		SBR	-	Trap Lane	AM	24	38	14	
					PM	35	205	170	
					Saturday Midday	4	362	358	
3	US 101 NB Off Ramp and Shiloh Rd.	NBL	-	Trap Lane	AM	245	245	0	
					PM	352	352	0	
					Saturday Midday	189	187	-2	
		NBR	265	2	AM	11	10	-1	
					PM	30	138	108	
					Saturday Midday	28	141	113	
4	Shiloh Rd. and US 101 SB Off Ramp	SBL	-	Trap Lane	AM	46	84	38	
					PM	68	126	58	
					Saturday Midday	73	148	75	
		SBR	275	1	AM	33	34	1	
					PM	30	30	0	
					Saturday Midday	14	14	0	
6	Conde Ln. and Shiloh Rd.	EBL	90	1	AM	30	31	1	
					PM	76	78	2	

#	Study Intersections	Lane Group	Storage Length (ft.) (Mitigated)	Number of Lanes (Mitigated)	Peak Hour	Existing Conditions	Existing + Alternative B Project Conditions		Existing + Alternative B Project Conditions w/Mitigations		Comments
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	
					Saturday Midday	34	35	1			
		WBL	130	1	AM	16	16	0			
					PM	16	16	0			
					Saturday Midday	17	17	0			
		SBR	40	1	AM	29	29	0			
					PM	31	31	0			
					Saturday Midday	24	24	0			
10	US 101 NB Off Ramp/Lakewood Dr. & Old Redwood Hwy.	EBL	155	1	AM	74	74	0			
					PM	151	151	0			
					Saturday Midday	142	142	0			
		NBL	270	2	AM	161	161	0			
					PM	**413**	**413**	**0**			
					Saturday Midday	187	187	0			
		SBL	120	1	AM	62	62	0			
					PM	**153**	**153**	**0**			
					Saturday Midday	**134**	**134**	**0**			
		SBR	-	Trap Lane	AM	232	238	6			
					PM	239	247	8			
					Saturday Midday	316	338	22			
12	US 101 SB On Ramp/US 101 SB Off Ramp & Old Redwood Hwy.	EBR	-	Trap Lane	AM	52	52	0			
					PM	49	49	0			
					Saturday Midday	49	49	0			
		WBL	-	Trap Lane	AM	451	451	0			
					PM	340	340	0			

#	Study Intersections	Lane Group	Storage Length (ft.) (Mitigated)	Number of Lanes (Mitigated)	Peak Hour	Existing Conditions	Existing + Alternative B Project Conditions		Existing + Alternative B Project Conditions w/Mitigations		Comments
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	
					Saturday Midday	354	354	0			
		SBL	420	2	AM	90	103	13			
					PM	152	190	38			
					Saturday Midday	96	133	37			

Notes:

1. NBL – Northbound left
2. NBR – Northbound right
3. SBL – Southbound left
4. SBR – Southbound right
5. EBL – Eastbound left
6. EBR – Eastbound right
7. WBL – Westbound left
8. WBR – Westbound right
9. **Bold** indicates unacceptable 95th percentile queue length. **Red** indicates significant impact.
10. 95th percentile queue lengths expressed in feet, rounded to the nearest five feet
11. *Average storage per lane, where dual turn lanes provide different storage lengths

6.0 EXISTING PLUS ALTERNATIVE C PROJECT CONDITIONS

This analysis scenario presents the impacts of the proposed project at the study intersections and surrounding roadway system. This scenario evaluates Existing Conditions with the addition of traffic from the proposed Alternative C project. The proposed Alternative C project would construct a 46,000 sq. ft. winery and 5,000 sq. ft. tasting area, a 200-room hotel, a 14,000 sq. ft. spa, and a 4,700 sq. ft. dining area. on a site that is currently a vineyard.

6.1 Alternative C Vehicle Miles Traveled

The VMT significance threshold for Alternative C project conditions is the same as that for Alternatives A and B project conditions, which is **10.53 VMT per employee**.

Since the SCTA travel demand model does not have a casino component in its land use designations, TJKM used the service square footage category to calculate VMT per employee for the project. The project is located in TAZ #88 of the SCTA model, and currently there are no employment type project within the zone. **Table 16** shows the land use changes to the SCTM model to represent the Shiloh Road Casino Project.

Table 16: Land Use Changes for Base Year plus Alternative C Project

TAZ	Hotel Rooms	Service Square Footage	Total Employees
#88	+200	+82,400	+241*

*Total employees was derived from the SCAG employee density study, Table II-A for Hotel/Motel employer type.

The 82,000 square foot winery and restaurants contains 141 employees, while the hotel employs 100 people (1 employee per 2 room on average) for a total of 241 employees in the Shiloh Road Casino project.

The land use changes were made into the base year land use of the SCTM model and a base year plus project model run was conducted to extract VMT statistics for the project. The results are summarized in **Table 17**.

Table 17: Home Based VMT per Employee Comparison under Alternative C Project Conditions

TAZ	Base Year Average Daily Home-Based VMT per Employee (per SCTA Model)	Regional Average (per SCTA Model)	15% Below Regional Average (per SCTA Model)	Base Year Plus Project Average Daily Home-Based VMT per Employee (per Model run)
#88	0*	12.39	10.53	10.25

*0 value since in the base year no employment land use type are found in TAZ #88.

The project's Home-Based VMT per employee value of **10.25** is lower than the 85% VMT threshold for the Sonoma County region (10.53). Thus, the proposed Shiloh Road Casino project Alternative C is expected to have a **less-than-significant** impact on VMT.

6.2 Alternative C Project Trip Generation

For Alternative C, a winery is proposed as the main attraction of the resort rather than a casino. The winery is composed of a visitor center where wine tasting would occur, and a warehouse facility where

wine production would take place. TJKM applied the published ITE trip rates for "winery" land uses (ITE Code 970) to the visitor center component of the winery. As for the warehouse facility component of the winery, TJKM projected trip generation based on the factors of number of full-time and part-time employees, gallons of wine production, and tons of grape haul. The number of employees was estimated using data from the United States Census Bureau[1], a winery study by Washington State University[2], and a Sonoma County Winery Trip Generation Form[3]. Trip generation rates, as well as the annual tons of grape haul based on estimated annual wine production, were obtained from a Napa County Winery Trip Generation Form[4]. Using the assumptions listed under **Table 18**, trip generation for the warehouse facility component of the winery was computed.

For the remaining land uses, TJKM used published ITE trip rates for the Hotel (ITE Code 310) and Dining (ITE Code 932). The spa was assumed to be a floor of the hotel that would not generate trips independently. Note also that the hotel is proposed to have 200 rooms rather than Alternative A's 400-room hotel.

Finally, internal capture rates of 50 percent for the dining land use and 30 percent for the visitor center were applied to account for patrons who were originally attracted to the resort by the hotel land use.

[1] United States Census Bureau. (2019). [Table CB1900CBP for NAICS 312130 Wineries in Sonoma County, CA]
[2] Fickle, L. A. A., Folwell, R. J., Ball, T., & Clary, C. (2005). Small Winery Investment and Operating Costs. Retrieved from http://ses.wsu.edu/wp-content/uploads/2015/02/eb1996_05.pdf
[3] Sonoma County. (1998). Winery Trip Generation. Retrieved from https://permitsonoma.org/Microsites/Permit%20Sonoma/Documents/Archive/Regulations/Cannabis%20Program/_Documents/_Documents/TJKM-Memo-Explanation-Form-dated-08-03-1998-20150812.pdf
[4] Napa County. (n.d.). Winery Trip Generation Worksheet. Available in Appendix N.

Table 18: Alternative C Project Trip Generation

Land Use (ITE Code)	*Size*		*Weekday Daily*		*A.M. Peak*					*P.M. Peak*					*Saturday Daily*		*Saturday P.M Peak*			
			Rate	*Trips*	*Rate*	*In:Out*	*In*	*Out*	*Total*	*Rate*	*In:Out*	*In*	*Out*	*Total*	*Rate*	*Trips*	*Rate*	*In:Out*	*In*	*Out*	*Total*
Hotel (310)[1]	200	rooms	7.99	1,598	0.46	56:44	52	40	92	0.59	51:49	60	58	118	8.19	1,638	0.72	56:44	81	63	144
Subtotal				*1,598*			*52*	*40*	*92*			*60*	*58*	*118*		*1,638*			*81*	*63*	*144*
Dining (932)[2]	4,700	sq. ft.	107.20	504	9.57	55:45	25	20	45	9.05	61:39	26	17	43	122.40	575	11.19	51:49	27	26	53
Internal Capture (50% all times)			*-50%*	*-252*	*-50%*		*-13*	*-10*	*-23*	*-50%*		*-13*	*-9*	*-22*	*-50%*	*-288*	*-50%*		*-14*	*-13*	*-27*
Subtotal				*252*			*12*	*10*	*22*			*13*	*8*	*21*		*287*			*13*	*13*	*26*
Winery	20	full-time employees	3.05	61	1.53	70:30	22	9	31	1.53	50:50	16	15	31	3.05	61	3.05	47:53	15	46	61
	1	part-time employees	1.90	2	0.95	70:30	1	0	1	0.95	50:50	0	1	1	1.90	2	1.90	47:53	1	1	2
	35,663	gal. wine production[4]	0.000018	1			0	0	0			0	0	0	0.000018	1	0.000018		0	0	0
	223	tons grape haul	0.013889	3			0	0	0			0	0	0	0.013889	3	0.013889		0	0	0
Subtotal				*67*			*23*	*9*	*32*			*16*	*16*	*32*		*67*			*16*	*47*	*63*
Visitor Center (970)[3]	5,000	sq. ft.	45.96	230	2.07	70:30	7	3	10	7.31	50:50	19	18	37	203.48	1,017	36.50	47:53	86	97	183
Internal Capture (30% all times)			*-30%*	*-69*	*-30%*		*-2*	*-1*	*-3*	*-30%*		*-6*	*-5*	*-11*	*-30%*	*-305*	*-30%*		*-26*	*-29*	*-55*
Subtotal				*161*			*5*	*2*	*7*			*13*	*13*	*26*		*712*			*60*	*68*	*128*
Net New Trips				**2,078**			**92**	**61**	**153**			**102**	**95**	**197**		**2,704**			**170**	**191**	**361**

Notes:

1, 2, 3. Trip Generation, 11th Edition, Institute of Transportation Engineers (ITE), 2021

4. Assumes annual wine production of 15,000 cases.

5. Peak hour employee rates were assumed to be half of daily employee rates for the winery (warehouse facility).

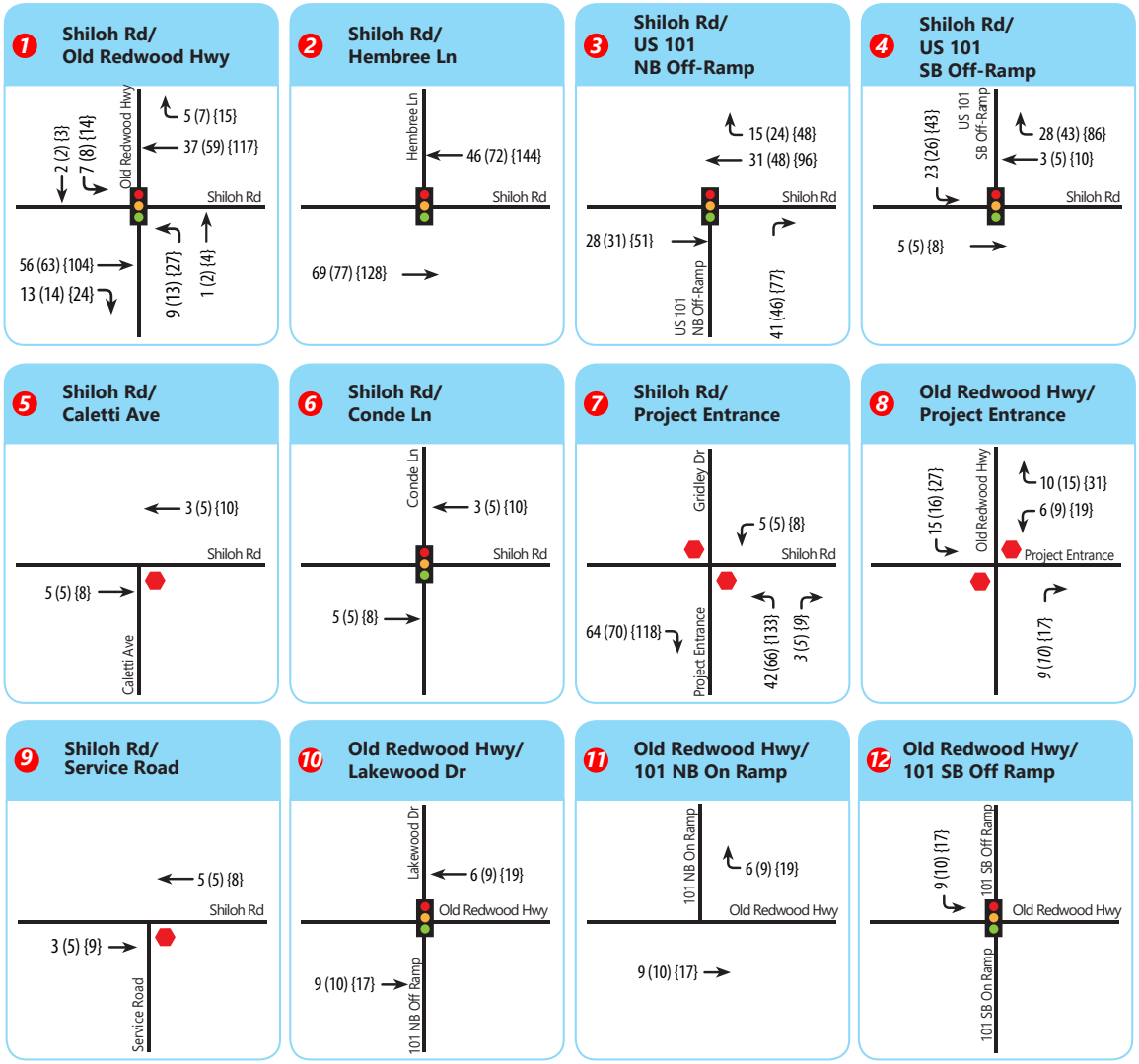
6. Directional distribution of trips during AM and PM peak hours for winery (warehouse facility) was assumed to be equal to that of visitor center (tasting room).

7. Trucks were assumed to make deliveries outside of peak hours.

6.3 Alternative C Project Trip Assignment

The trip assignment for the proposed Alternative C project is shown on **Figure 15**. The trip distribution for Alternative C is identical to that of Alternative A and Alternative B except that trips would not be distributed to intersection #9 (Shiloh Road & Casino Entrance 2) because a third entrance/exit would not be built. Under Alternative C, intersection #9 would connect to a service road instead.

Figure 15: Trip Assignment Alternative C Volumes



6.4 Intersection Level of Service Analysis – Existing plus Alternative C Project Conditions

The intersection LOS analysis results for Existing plus Alternative C Project Conditions are summarized in **Table 19**.

Under this scenario, all of the study intersections operate within applicable jurisdictional standards during all three peak periods with an assumption of exclusive southbound left-turn lane.

Mitigation measure

- 8) Old Redwood Hwy. & Casino Entrance 1
    - Provide exclusive southbound left-turn lane (Storage length of 50 feet and taper length of 25 feet)

Figures 16 and **17** show lane geometries and projected peak hour turning movement volumes at all the study intersections for Existing plus Alternative C Project Conditions, respectively. LOS worksheets are provided in **Appendix E**.

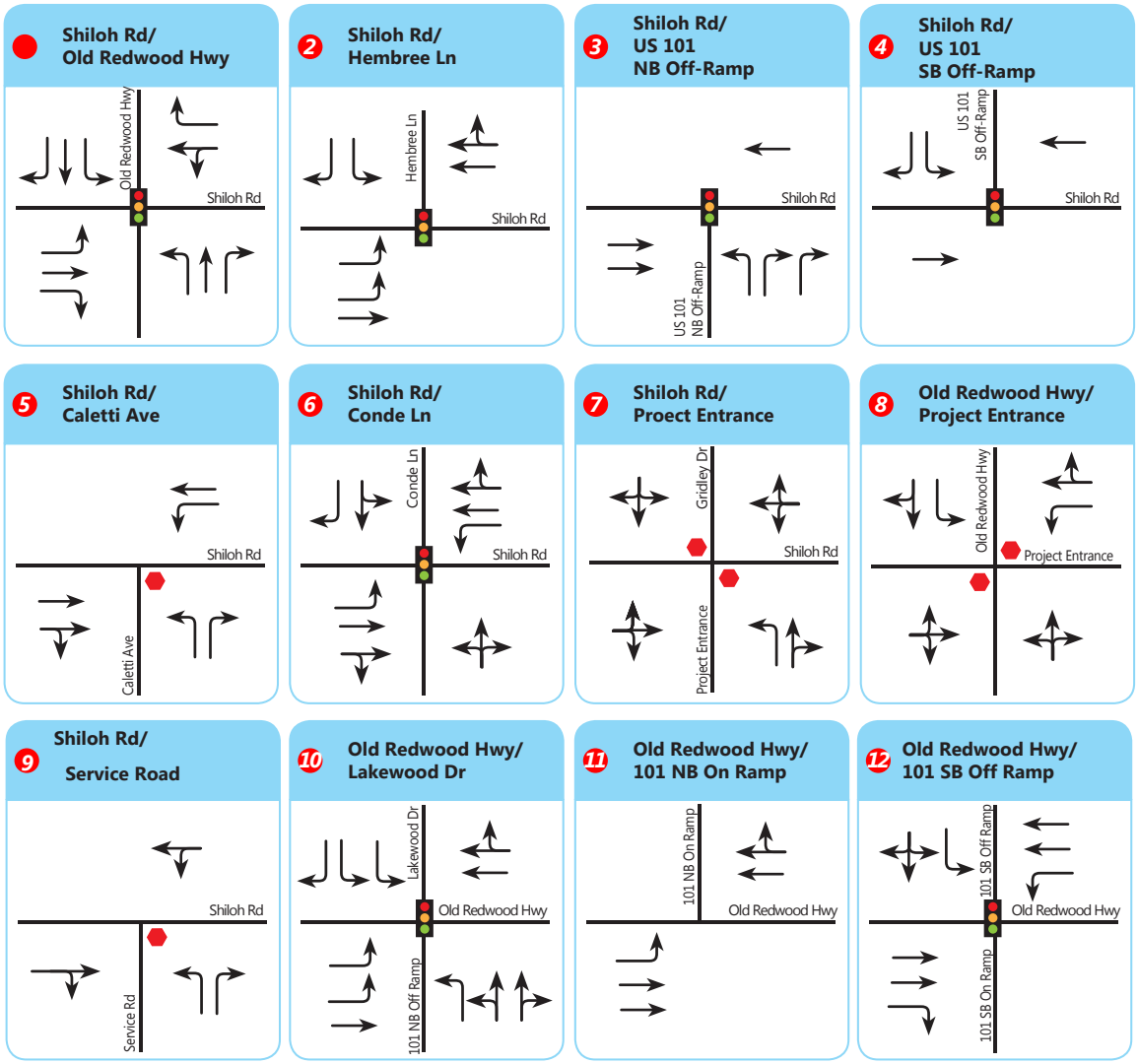
Table 19: Intersection Level of Service Analysis – Existing plus Alternative C Project Conditions

#	Study Intersections	Control	Peak Hour	Existing Conditions		Existing + Alternative C Project Conditions		
				Delay	LOS	Delay	LOS	Change in Delay
1	Shiloh Rd. & Old Redwood Hwy.	Signal	AM	16.0	B	17.7	B	1.7
			PM	20.4	C	22.7	C	2.3
			Saturday Midday	18.0	B	23.3	C	5.3
2	Shiloh Rd. & Hembree Ln.[5]	Signal	AM	8.4	A	8.4	A	0.0
			PM	11.9	B	12.9	B	1.0
			Saturday Midday	11.2	B	12.8	B	1.6
3	Shiloh Rd. & US-101 NB Ramps	Signal	AM	10.5	B	11.1	B	0.6
			PM	10.8	B	11.7	B	0.9
			Saturday Midday	10.2	B	12.6	B	2.4
4	Shiloh Rd. & US-101 SB Ramps[5]	Signal	AM	6.2	A	6.5	A	0.3
			PM	6.3	A	6.6	A	0.3
			Saturday Midday	8.4	A	9.8	A	1.4
5	Shiloh Rd. & Caletti Ave.	OWSC[3]	AM	13.5	B	13.5	B	0.0
			PM	21.1	C	21.3	C	0.2
			Saturday Midday	16.4	C	16.6	C	0.2
6	Shiloh Rd. & Conde Ln.[5]	Signal	AM	14.6	B	14.6	B	0.0
			PM	25.6	C	25.7	C	0.1
			Saturday Midday	15.4	B	15.4	B	0.0
7	Shiloh Rd. & Casino Entrance 1/Gridley Dr.	TWSC[4]	AM	8.8	A	11.3	B	2.5
			PM	9.3	A	12.8	B	3.5
			Saturday Midday	8.9	A	13.6	B	4.7
8	Old Redwood Hwy. & Casino Entrance	TWSC[4]	AM	13.4	B	14.2	B	0.8
			PM	22.1	C	24.2	C	2.1
			Saturday Midday	12.7	B	14.5	B	1.8
9	Shiloh Rd. & Casino Entrance 2[6]	OWSC[3]	AM	-	-	-	-	-
			PM	-	-	-	-	-
			Saturday Midday	-	-	-	-	-
10	Old Redwood Hwy. & US-101 NB Off Ramp/Lakewood Dr.	Signal	AM	17.4	B	17.3	B	-0.1
			PM	24.6	C	24.6	C	0.0
			Saturday Midday	18.8	B	18.7	B	-0.1
11	Old Redwood Hwy. & US-101 NB On Ramp[7]	Free	AM	-	-	-	-	-
			PM	-	-	-	-	-
			Saturday Midday	-	-	-	-	-
12	Old Redwood Hwy. & US-101 SB Ramps	Signal	AM	24.1	C	24.2	C	0.1
			PM	18.8	B	19.0	B	0.2
			Saturday Midday	20.4	C	20.7	C	0.3

Notes:
1. Delay – Whole intersection weighted average control delay expressed in seconds per vehicle for signalized and all-way stop controlled intersections. Total control delay for the worst movement is presented for side-street stop – controlled intersections.
2. LOS – Level of Service. **Bold** indicates unacceptable LOS and Delay.
3. OWSC - One Way Stop Control
4. TWSC - Two Way Stop Control

5. For Intersection 2, 4 & 6, LOS and Delay reported using HCM 2000 Methodology as HCM 6th edition does not support Non-NEMA phasing, but for Intersection 2 Cumulative conditions all scenarios are from HCM 6th Edition.
6. For Intersection 9, under Mitigations, LOS and Delay reported using HCM 2000 Methodology.
7. For Intersection 11, there is no delay or LOS as the control is free (there is no stop control or signal control).

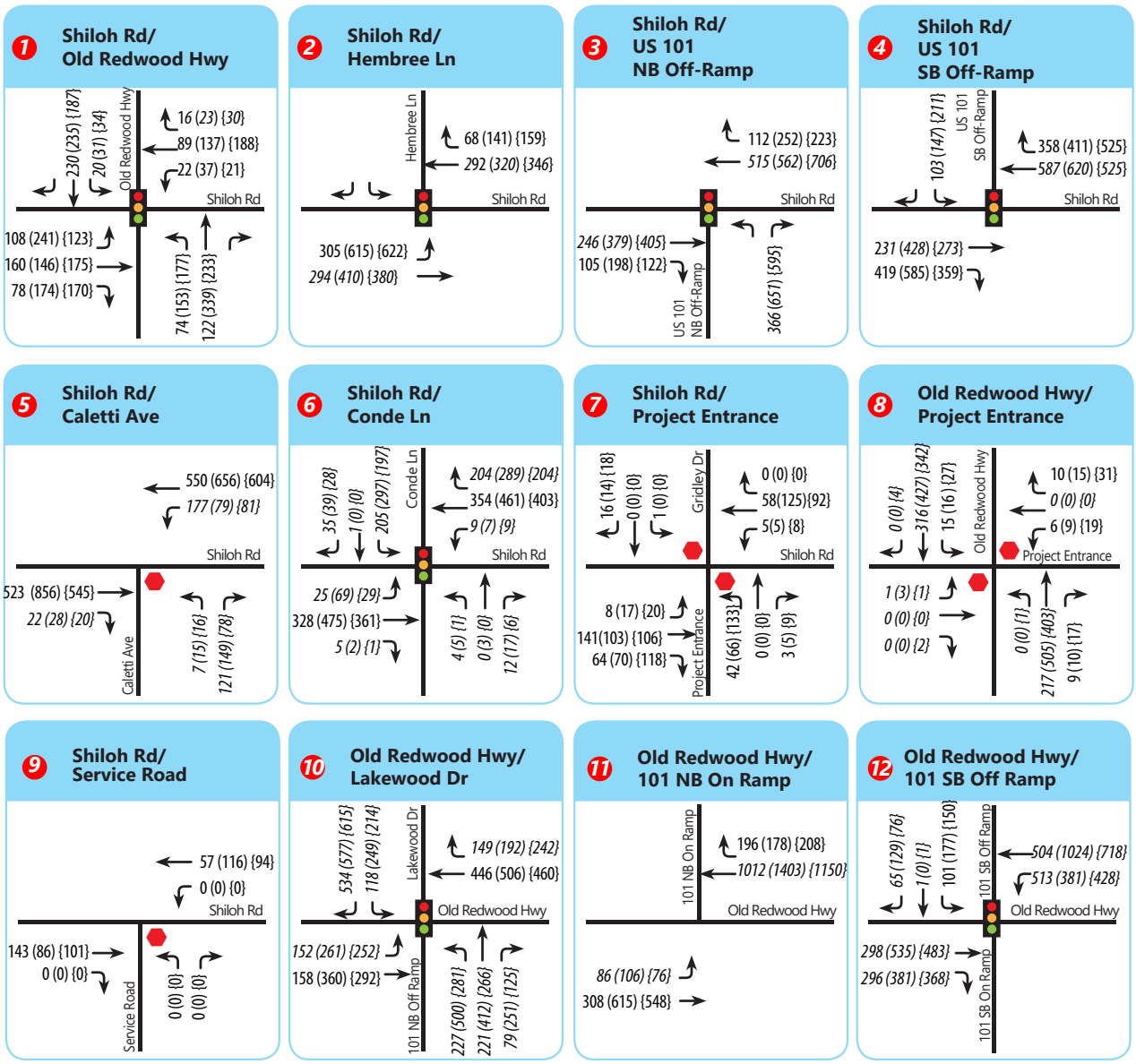
Figure 16: Project Lane Geometry Existing Plus Alternative C Project Conditions



Project Site
Study Intersection
Study Segment
Stop Sign
Traffic Signal

N

Figure 17: Existing Plus Alternative C Project Conditions Peak Hour Traffic Volumes



LEGEND

- Study Intersection
- Study Segment
- Stop Sign
- Traffic Signal
- XX AM Peak Hour Volumes
- (XX) PM Peak Hour Volumes
- {XX} Saturday Midday Peak Hour Volumes

6.5 Intersection Queuing Analysis – Existing plus Alternative C Project Conditions

The 95th percentile queue lengths were calculated for each left-turn lane group and exclusive right-turn lane group on the approaches of each study intersection. **Table 20** details the results of the analysis. Under Existing plus Alternative C Project Conditions, the following lane groups would experience 95th percentile queue lengths exceeding the available storage length:

- 1) Shiloh Rd. & Old Redwood Hwy.

NBL during weekday PM and Saturday midday peak hours

- 10) Old Redwood Hwy. & US 101 NB Off-ramp/Lakewood Dr.

NBL during weekday PM peak hour (no new impacts)

SBL during weekday PM and Saturday midday peak hours (no new impacts)

Mitigation Measures

At intersection #1, queue overflows can be mitigated by restriping to extend storage length as indicated in **Table 20**. At intersection 10, the project would not create any new queuing impacts. The detailed required mitigation measures under this scenario are as follows. The numbers correspond to the intersections listed above:

- 1) Restripe NBL to give 250 ft. storage length.

With the addition of the above listed improvements, all project-related impacts at the impacted intersections would be mitigated to a level that **would be consistent** with level of service standards set by the Town of Windsor and Sonoma County.

Table 20: 95th Percentile Queue Lengths – Existing plus Alternative C Project Conditions

						Existing +			
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	
1	Shiloh Rd. and Old Redwood Hwy.	EBL	375	1	AM	98	107	9	
					PM	217	234	17	
					Saturday Midday	113	133	20	
		EBR	140	1	AM	16	26	10	
					PM	49	53	4	
					Saturday Midday	47	54	7	
		WBR	50	1	AM	0	0	0	
					PM	0	0	0	
					Saturday Midday	0	0	0	
		NBL	200 (240)	1	AM	71	88	17	Restripe NBL Storage
					PM	161	**211**	**50**	

#	Study Intersections	Lane Group	Storage Length (ft.) (Mitigated)	Number of Lanes	Peak Hour	Existing Conditions	Existing + Alternative C Project Conditions		Comments
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	
					Saturday Midday	136	**234**	**98**	length to 250 feet
		NBR	100	1	AM	5	4	-1	
					PM	0	0	0	
					Saturday Midday	0	0	0	
		SBL	130	1	AM	24	37	13	
					PM	44	56	12	
					Saturday Midday	34	58	24	
		SBR	95	1	AM	72	83	11	
					PM	80	86	6	
					Saturday Midday	65	80	15	
2	Shiloh Rd. and Hembree Ln.	EBL	-	Trap Lane	AM	63	65	2	
					PM	143	155	12	
					Saturday Midday	138	156	18	
		SBL	-	Trap Lane	AM	45	46	1	
					PM	118	127	9	
					Saturday Midday	44	124	80	
		SBR	-	Trap Lane	AM	24	25	1	
					PM	35	62	27	
					Saturday Midday	4	107	103	
3	US 101 NB Off Ramp and Shiloh Rd.	NBL	-	Trap Lane	AM	245	245	0	
					PM	352	352	0	
					Saturday Midday	189	189	0	
		NBR	265	2	AM	11	11	0	
					PM	30	49	19	
					Saturday Midday	28	44	16	
4	Shiloh Rd. and US 101 SB Off Ramp	SBL	-	Trap Lane	AM	46	59	13	
					PM	68	82	14	
					Saturday Midday	73	91	18	
		SBR	275	1	AM	33	34	1	
					PM	30	30	0	
					Saturday Midday	14	14	0	
6	Conde Ln. and Shiloh Rd.	EBL	90	1	AM	30	30	0	
					PM	76	77	1	
					Saturday Midday	34	34	0	
		WBL	130	1	AM	16	16	0	
					PM	16	16	0	
					Saturday Midday	17	17	0	

#	Study Intersections	Lane Group	Storage Length (ft.) (Mitigated)	Number of Lanes	Peak Hour	Existing Conditions	Existing + Alternative C Project Conditions		Comments
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	
		SBR	40	1	AM	29	29	0	
					PM	31	31	0	
					Saturday Midday	24	24	0	
10	US 101 NB Off Ramp/Lakewood Dr. & Old Redwood Hwy.	EBL	155	1	AM	74	74	0	
					PM	151	151	0	
					Saturday Midday	142	142	0	
		NBL	270	2	AM	161	161	0	
					PM	**413**	**413**	**0**	
					Saturday Midday	187	187	0	
		SBL	120	1	AM	62	62	0	
					PM	**153**	**153**	**0**	
					Saturday Midday	**134**	**134**	**0**	
		SBR	-	Trap Lane	AM	232	233	1	
					PM	239	241	2	
					Saturday Midday	316	323	7	
12	US 101 SB On Ramp/US 101 SB Off Ramp & Old Redwood Hwy.	EBR	-	Trap Lane	AM	52	52	0	
					PM	49	49	0	
					Saturday Midday	49	49	0	
		WBL	-	Trap Lane	AM	451	451	0	
					PM	340	340	0	
					Saturday Midday	354	354	0	
		SBL	420	2	AM	90	93	3	
					PM	152	165	13	
					Saturday Midday	96	103	7	

Notes:

1. NBL – Northbound left
2. NBR – Northbound right
3. SBL – Southbound left
4. SBR – Southbound right
5. EBL – Eastbound left
6. EBR – Eastbound right
7. WBL – Westbound left
8. WBR – Westbound right
9. **Bold** indicates unacceptable 95th percentile queue length. **Red** indicates significant impact.
10. 95th percentile queue lengths expressed in feet, rounded to the nearest five feet
11. *Average storage per lane, where dual turn lanes provide different storage lengths

7.0 OPENING YEAR 2028 NO PROJECT CONDITIONS

The Opening Year 2028 No Project Conditions analysis forecasts how the study area's transportation system would operate with the growth and changes of the surrounding community by the year 2028 when the proposed project is planned to open. This scenario assumes that no project would be built. Corridor volumes on Shiloh Road and Old Redwood Highway in the immediate project vicinity were obtained from the SCTA traffic model. Traffic forecasts were developed by applying a growth increment of 2.189 percent to existing volumes to reflect growth through year 2028, accounting for projects not yet proposed as well as proposed projects that lacked final project descriptions or traffic studies at the time of analysis. Additionally, trips from the following approved projects were also added to the study intersections to estimate year 2028 traffic demands.

- Clearwater Traffic Impact Study – Senior living and care facility and commercial development

Senior Living Complex – 141 Units

Memory care Unit – 34-bed

Commercial development – 21,000 square feet

- Shiloh Crossing Project – Multi-Family residential development and commercial development

Multi-family – 173 affordable units

Commercial development – 8,000 square feet

- Shiloh Terrace Project – Affordable apartment complex

Apartments – 134 units

Under this scenario, no infrastructure improvements were assumed at the study intersections or the roadway segments except for the intersection of Shiloh Road and Hembree Lane (intersection #2) as per the approved developments.

- Northbound approach – 1 exclusive left-turn lane and 1 shared through right-turn lane
- Southbound approach – 1 shared left-through lane and 1 exclusive right-turn lane
- Eastbound approach – 2 exclusive left-turn lanes and 1 shared through right-turn lane
- Westbound approach – 1 exclusive left-turn lane and 1 through lane and 1 shared though-right turn lane

7.1 Intersection Level of Service Analysis – Opening Year 2028 No Project Conditions

The intersection LOS analysis results for Opening Year 2028 No Project Conditions are summarized in **Table 21**.

Under this scenario, all of the study intersections operate within applicable jurisdictional standards during all three peak periods.

Figures 18 and **19** shows lane geometries and projected peak hour turning movement volumes at the study intersections for Opening Year 2028 No Project Conditions for weekday a.m. and p.m., and Saturday midday peak hours, respectively. LOS worksheets are provided in the **Appendix F**.

Table 21: Intersection Level of Service Analysis – Opening Year 2028 No Project Conditions

#	Study Intersections	Control	Peak Hour	Opening Year 2028 Conditions	
				Delay	LOS
1	Shiloh Rd. & Old Redwood Hwy.	Signal	AM	17.3	B
			PM	23.7	C
			Saturday Midday	22.4	c
2	Shiloh Rd. & Hembree Ln.	Signal	AM	16.7	B
			PM	25.1	C
			Saturday Midday	35.6	D
3	Shiloh Rd. & US-101 NB Ramps	Signal	AM	16.2	B
			PM	17.6	B
			Saturday Midday	18.0	B
4	Shiloh Rd. & US-101 SB Ramps	Signal	AM	6.9	A
			PM	8.3	A
			Saturday Midday	11.7	B
5	Shiloh Rd. & Caletti Ave.	OWSC[3]	AM	15.6	C
			PM	29.7	D
			Saturday Midday	20.2	C
6	Shiloh Rd. & Conde Ln.	Signal	AM	15.1	B
			PM	38.1	D
			Saturday Midday	15.8	B
7	Shiloh Rd. & Casino Entrance 1/Gridley Dr.	TWSC[4]	AM	8.9	A
			PM	9.5	A
			Saturday Midday	9.0	A
8	Old Redwood Hwy. & Casino Entrance	TWSC[4]	AM	14.5	B
			PM	26.4	D
			Saturday Midday	13.7	B
9	Shiloh Rd. & Casino Entrance 2	OWSC[3]	AM	0.0	A
			PM	0.0	A
			Saturday Midday	0.0	A
10	Old Redwood Hwy. & US-101 NB Ramps/Lakewood Dr.	Signal	AM	18.3	B
			PM	28.7	C
			Saturday Midday	20.4	C
11	Old Redwood Hwy. & US-101 NB Ramps	Free	AM	-	-
			PM	-	-
			Saturday Midday	-	-
12	Old Redwood Hwy. & US-101 SB Ramps	Signal	AM	30.5	C
			PM	25.5	C
			Saturday Midday	28.7	C

Notes:
1. Delay – Whole intersection weighted average control delay expressed in seconds per vehicle for signalized and all-way stop controlled intersections. Total control delay for the worst movement is presented for side-street stop – controlled intersections.
2. LOS – Level of Service. **Bold** indicates unacceptable LOS and Delay.
3. OWSC - One Way Stop Control
4. TWSC - Two Way Stop Control
5. For Intersection 2, 4 & 6, LOS and Delay reported using HCM 2000 Methodology as HCM 6th edition does not support Non-NEMA phasing, but for Intersection 2 Cumulative conditions all scenarios are from HCM 6th Edition.
6. For Intersection 9, under Mitigations, LOS and Delay reported using HCM 2000 Methodology.
7. For Intersection 11, there is no delay or LOS as the control is free (there is no stop control or signal control).

Figure 18: Project Lane Geometry 2028 Opening Year No Project Conditions

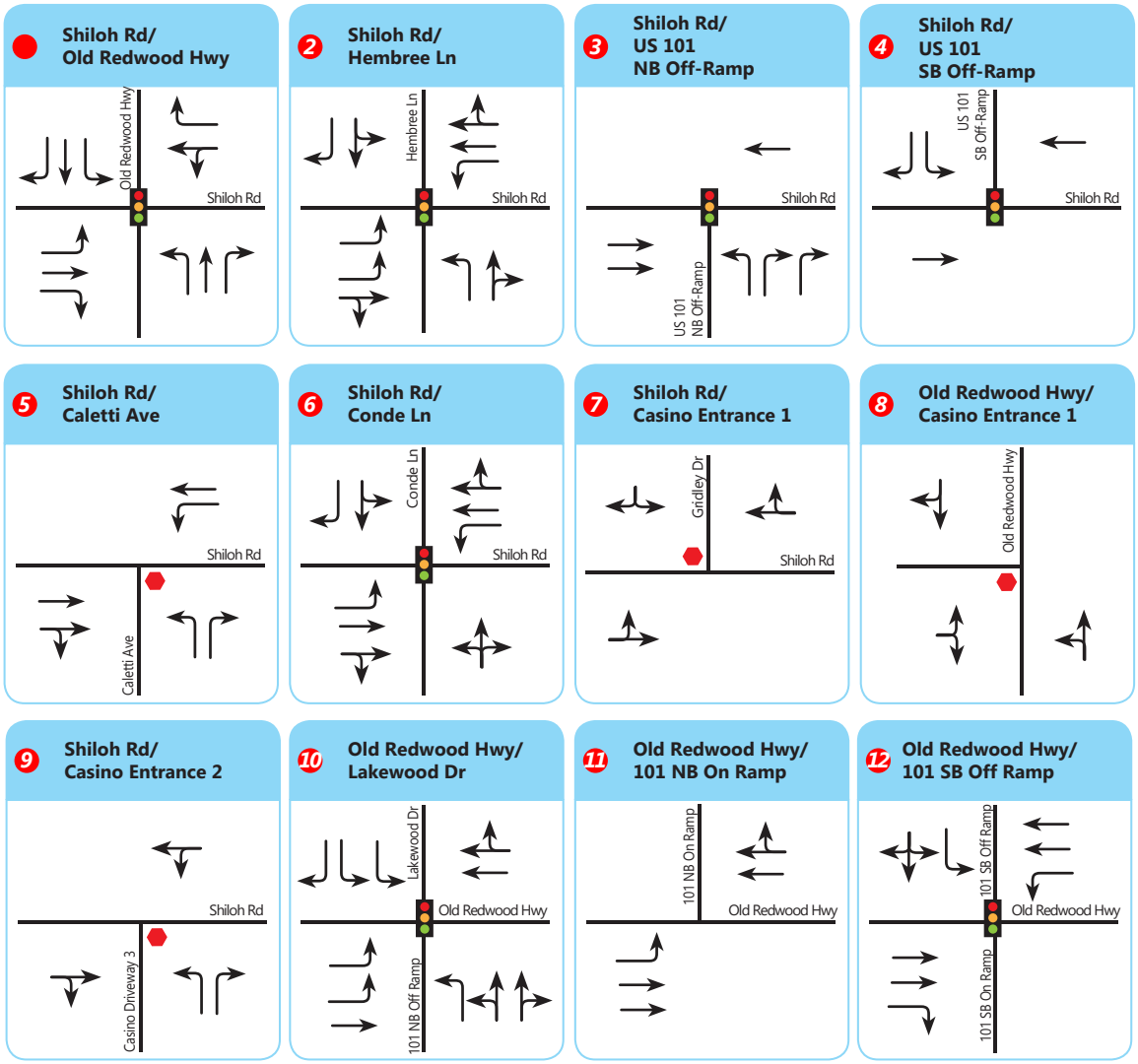
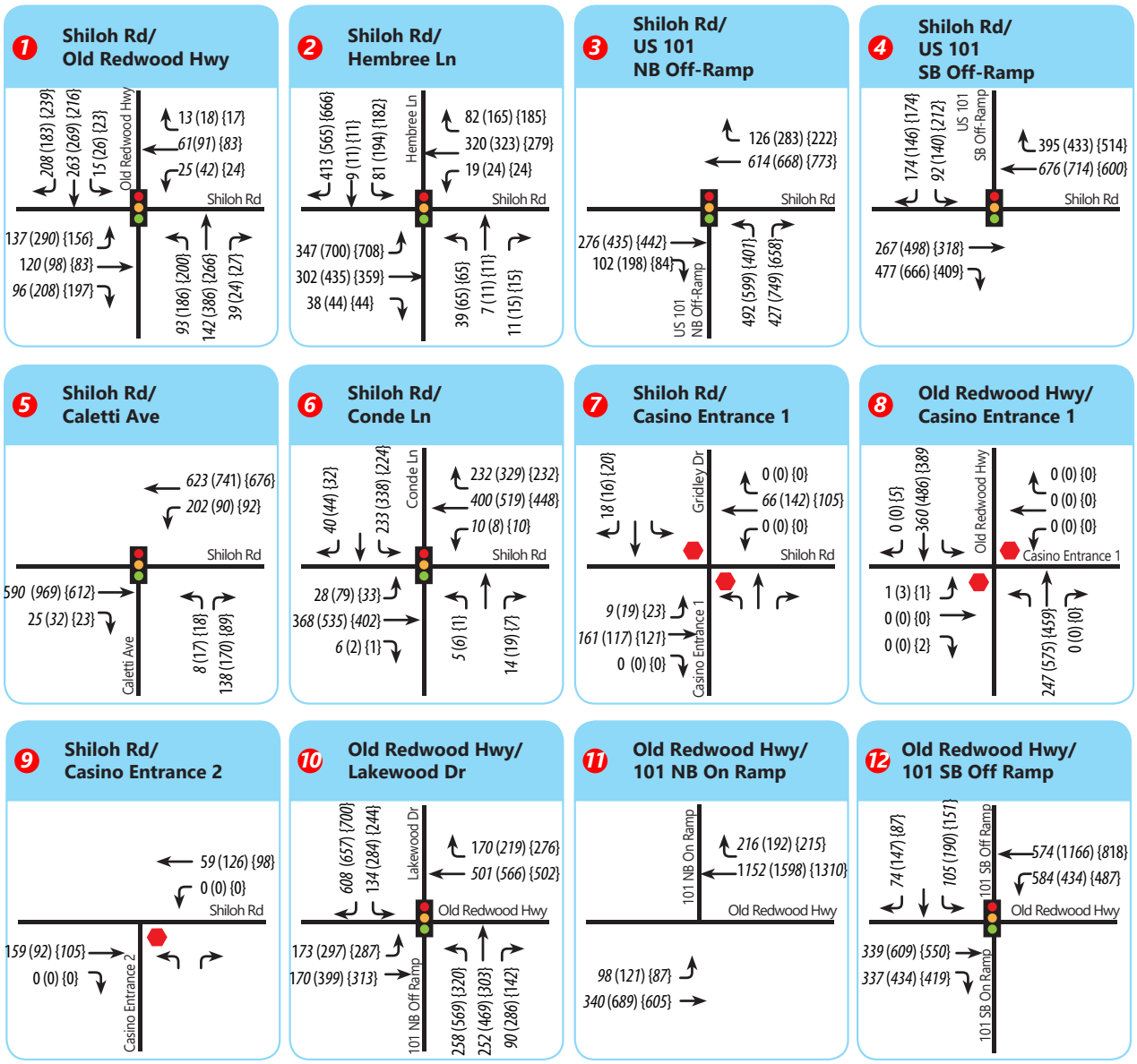


Figure 19: 2028 Opening Year No Project Conditions Peak Hour Traffic Volumes



LEGEND

- Project Site
- Study Intersection
- Study Segment
- Stop Sign
- Traffic Signal
- XX AM Peak Hour Volumes
- (XX) PM Peak Hour Volumes
- {XX} Saturday Midday Peak Hour Volumes

7.2 Intersection Queuing Analysis – Opening Year 2028 No Project Conditions

The 95th percentile queue lengths were calculated for each left-turn lane group and exclusive right-turn lane group on the approaches of each study intersection. **Table 22** details the results of the analysis. Under Opening Year 2028 No Project Conditions, the following lane groups would experience 95th percentile queue lengths exceeding the available storage length::

- 1) Shiloh Rd. & Old Redwood Hwy.

NBL during weekday PM and Saturday midday peak hours

SBR during weekday AM, PM, and Saturday midday peak hours

- 6) Conde Ln. & Shiloh Rd.

EBL during weekday PM peak hour

- 10) US 101 NB Off Ramp/Lakewood Dr. & Old Redwood Hwy.

EBL during weekday PM and Saturday midday peak hours

NBL during weekday PM peak hour

SBL during weekday PM and Saturday midday peak hours

Table 22: 95th Percentile Queue Lengths – Opening Year 2028 plus No Project Conditions

#	Study Intersections	Lane Group	Storage Length (ft.)	Number of Lanes	Peak Hour	Opening Year 2028 Conditions Queue Length (ft.) [A]
1	Shiloh Rd. and Old Redwood Hwy.	EBL	375	1	AM	135
					PM	280
					Saturday Midday	149
		EBR	140	1	AM	33
					PM	56
					Saturday Midday	54
		WBR	50	1	AM	0
					PM	0
					Saturday Midday	0
		NBL	200	1	AM	105
					PM	**274**
					Saturday Midday	**243**
		NBR	100	1	AM	7
					PM	0
					Saturday Midday	0
		SBL	130	1	AM	31
					PM	50
					Saturday Midday	40
		SBR	95	1	AM	**105**
					PM	**111**
					Saturday Midday	**105**
2	Shiloh Rd. and Hembree Ln.	EBL	-	Trap Lane	AM	144
					PM	356
					Saturday Midday	362
		WBL	-	Trap Lane	AM	32
					PM	37
					Saturday Midday	37
		NBL	-	Trap Lane	AM	53

#	Study Intersections	Lane Group	Storage Length (ft.)	Number of Lanes	Peak Hour	Opening Year 2028 Conditions Queue Length (ft.) [A]
					PM	92
					Saturday Midday	92
		SBR	-	Trap Lane	AM	49
					PM	218
					Saturday Midday	448
3	US 101 NB Off Ramp and Shiloh Rd.	NBL	-	Trap Lane	AM	293
					PM	461
					Saturday Midday	221
		NBR	265	2	AM	10
					PM	98
					Saturday Midday	71
4	Shiloh Rd. and US 101 SB Off Ramp	SBL	-	Trap Lane	AM	62
					PM	91
					Saturday Midday	107
		SBR	275	1	AM	42
					PM	39
					Saturday Midday	15
6	Conde Ln. and Shiloh Rd.	EBL	90	1	AM	35
					PM	**92**
					Saturday Midday	40
		WBL	130	1	AM	18
					PM	18
					Saturday Midday	19
		SBR	40	1	AM	32
					PM	33
					Saturday Midday	27
10	US 101 NB Off Ramp/Lakewood Dr. & Old Redwood Hwy.	EBL	155	1	AM	86
					PM	**179**
					Saturday Midday	**180**
		NBL	270	2	AM	181
					PM	**498**
					Saturday Midday	215
		SBL	120	1	AM	72
					PM	**181**
					Saturday Midday	**162**
		SBR	-	Trap Lane	AM	331
					PM	341
					Saturday Midday	521
12	US 101 SB On Ramp/US 101 SB Off Ramp & Old Redwood Hwy.	EBR	-	Trap Lane	AM	62
					PM	55
					Saturday Midday	50
		WBL	-	Trap Lane	AM	544
					PM	403
					Saturday Midday	424
		SBL	420	2	AM	101
					PM	181
					Saturday Midday	109

Notes:

1. NBL – Northbound left
2. NBR – Northbound right
3. SBL – Southbound left
4. SBR – Southbound right
5. EBL – Eastbound left
6. EBR – Eastbound right
7. WBL – Westbound left

8. WBR – Westbound right
9. **Bold** indicates unacceptable 95th percentile queue length
10. 95th percentile queue lengths expressed in feet, rounded to the nearest five feet
11. *Average storage per lane, where dual turn lanes provide different storage lengths

8.0 OPENING YEAR 2028 PLUS ALTERNATIVE A PROJECT CONDITIONS

This analysis scenario presents the impacts of the proposed project at the study intersections and surrounding roadway system. This scenario is identical to Opening Year 2028 No Project Conditions, but with the addition of traffic from the proposed Alternative A project. The project trip generation, trip distribution, and trip assignment are identical to those of Existing plus Alternative A Project Conditions.

8.1 Intersections Level of Service Analysis – Opening Year 2028 plus Alternative A Project Conditions

The intersection LOS analysis results for Opening Year 2028 plus Alternative A Project Conditions are summarized in **Table 23**.

Under this scenario, the following intersections **would not be consistent** with level of service standards set by the Town of Windsor and Sonoma County:

- 1) Shiloh Rd. & Old Redwood Hwy. (Weekday PM and Saturday midday peak hours)
- 2) Shiloh Rd. & Hembree Ln. (Weekday PM and Saturday midday peak hours)
- 7) Shiloh Rd. & Casino Entrance 1/Gridley Dr. (Weekday PM and Saturday midday peak hours)
- 8) Old Redwood Hwy. & Casino Entrance 1 (Weekday PM peak hour)

Mitigation Measures

The required mitigation measures under this scenario are as follows. The numbers correspond to the intersections listed above:

- 1) Shiloh Rd. & Old Redwood Hwy.
    - Convert split phasing in EB/WB direction to protected phasing;
    - Convert existing westbound-through lane to an exclusive left-turn lane (storage length of 200 feet and taper length of 75 feet) and a shared through/right turn lane
    - Add one northbound left-turn lane
- 2) Shiloh Rd. & Hembree Ln.
    - Optimize splits and cycle length
- 7) Shiloh Rd. & Casino Entrance 1/Gridley Dr.
    - Signalize intersection
    - Provide exclusive eastbound right-turn lane (Storage length of 150 feet and taper length of 75 feet)
- 8) Old Redwood Hwy. & Casino Entrance 1
    - Signalize intersection
    - Provide exclusive northbound right-turn lane (Storage length of 100 feet and taper length of 75 feet)
    - Provide exclusive southbound left-turn lane (Storage length of 50 feet and taper length of 25 feet)
- 9) Shiloh Road & Casino Entrance 3

- Provide exclusive eastbound right-turn lane (Storage length of 200 feet and taper length of 75 feet)

With the addition of intersection improvements, all project-related impacts at the above intersections would be mitigated to a level that **would be consistent** with level of service standards set by the Town of Windsor and Sonoma County.

Figures 20 and **21**show lane geometries and projected peak hour turning movement volumes at the study intersections for Opening Year 2028 plus Alternative A Project Conditions for weekday a.m. and p.m., and Saturday midday peak hours, respectively. LOS worksheets are provided in the **Appendix G**.

Table 23: Intersection Level of Service Analysis – Opening Year 2028 Plus Alternative A Project Conditions

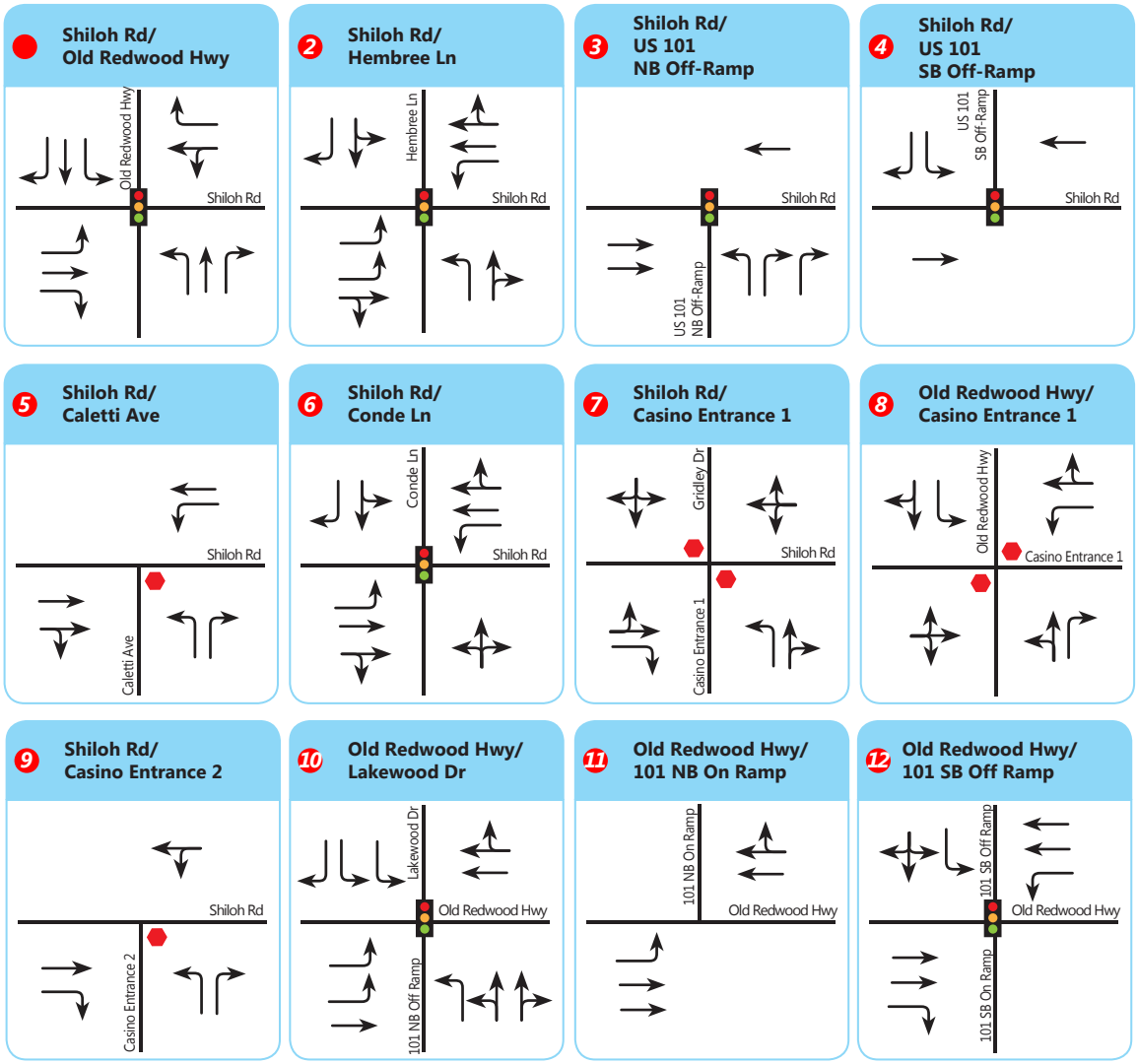
#	Study Intersections	Control	Peak Hour	Opening Year 2028 Conditions		Opening Year 2028 + Alternative A Project Conditions			Opening Year 2028 + Alternative A Project Conditions w/ Mitigations		
				Delay	LOS	Delay	LOS	Change in Delay	Delay	LOS	Change in Delay
1	Shiloh Rd. & Old Redwood Hwy.	Signal	AM	17.3	B	25.8	C	8.5	-	-	-
			PM	23.7	C	**79.9**	**E**	56.2	32.4	C	8.7
			Saturday Midday	22.4	C	**113.8**	**F**	91.4	31.9	C	9.5
2	Shiloh Rd. & Hembree Ln.	Signal	AM	16.7	B	18.6	B	1.9	-	-	-
			PM	25.1	C	**56.4**	**E**	31.3	42.4	D	17.3
			Saturday Midday	35.6	D	**58.7**	**E**	23.1	49.3	D	13.7
3	Shiloh Rd. & US-101 NB Ramps	Signal	AM	16.2	B	21.8	C	5.6	-	-	-
			PM	17.6	B	45.2	D	27.6	-	-	-
			Saturday Midday	18.0	B	53.1	D	35.1	-	-	-
4	Shiloh Rd. & US-101 SB Ramps	Signal	AM	6.9	A	9.0	A	2.1	-	-	-
			PM	8.3	A	13.6	B	5.3	-	-	-
			Saturday Midday	11.7	B	17.7	B	6.0	-	-	-
5	Shiloh Rd. & Caletti Ave.	OWSC[3]	AM	15.6	C	15.9	C	0.3	-	-	-
			PM	29.7	D	32.4	D	2.7	-	-	-
			Saturday Midday	20.2	C	22.0	C	1.8	-	-	-
6	Shiloh Rd. & Conde Ln.	Signal	AM	15.1	B	15.2	B	0.1	-	-	-
			PM	38.1	D	39.3	D	1.2	-	-	-
			Saturday Midday	15.8	B	15.9	B	0.1	-	-	-
7	Shiloh Rd. & Casino Entrance 1/Gridley Dr.	TWSC[4]	AM	8.9	A	14.3	B	5.4	-	-	-
			PM	9.5	A	**49.0**	**E**	39.5	9.1	A	-0.4
			Saturday Midday	9.0	A	**58.8**	**F**	49.8	13.7	B	4.7
8	Old Redwood Hwy. & Casino Entrance	TWSC[4]	AM	14.5	B	17.5	C	3.0	-	-	-
			PM	26.4	D	**55.6**	**F**	29.2	7.7	A	-18.7
			Saturday Midday	13.7	B	24.4	C	10.7	-	-	-
9	Shiloh Rd. & Casino Entrance 2	OWSC[3]	AM	0.0	A	10.9	B	10.9	-	-	-
			PM	0.0	A	15.4	C	15.4	-	-	-
			Saturday Midday	0.0	A	16.6	C	16.6	-	-	-
10		Signal	AM	18.3	B	18.2	B	-0.1	-	-	-
			PM	28.7	C	29.1	C	0.4	-	-	-

#	Study Intersections	Control	Peak Hour	Opening Year 2028 Conditions		Opening Year 2028 + Alternative A Project Conditions			Opening Year 2028 + Alternative A Project Conditions w/ Mitigations		
				Delay	LOS	Delay	LOS	Change in Delay	Delay	LOS	Change in Delay
	Old Redwood Hwy. & US-101 NB Ramps/Lakewood Dr.		Saturday Midday	20.4	C	20.3	C	-0.1	-	-	-
11	Old Redwood Hwy. & US-101 NB Ramps	Free	AM	-	-	-	-	-	-	-	-
			PM	-	-	-	-	-	-	-	-
			Saturday Midday	-	-	-	-	-	-	-	-
12	Old Redwood Hwy. & US-101 SB Ramps	Signal	AM	30.5	C	31.1	C	0.6	-	-	-
			PM	25.5	C	28.1	C	2.6	-	-	-
			Saturday Midday	28.7	C	30.2	C	1.5	-	-	-

Notes:

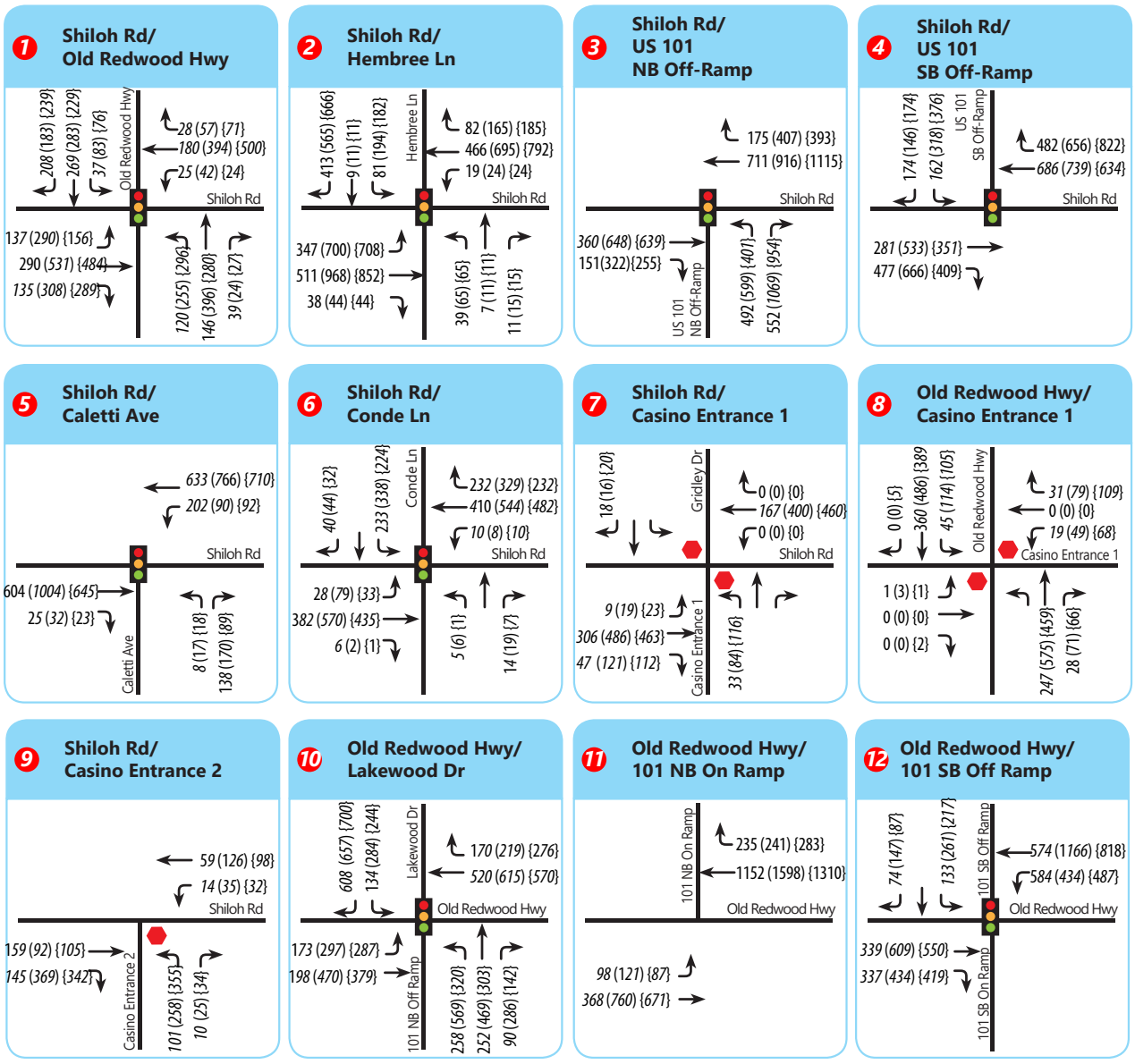
1. Delay – Whole intersection weighted average control delay expressed in seconds per vehicle for signalized and all-way stop controlled intersections. Total control delay for the worst movement is presented for side-street stop – controlled intersections.
2. LOS – Level of Service. **Bold** indicates unacceptable LOS and Delay.
3. OWSC - One Way Stop Control
4. TWSC - Two Way Stop Control
5. For Intersection 2, 4 & 6, LOS and Delay reported using HCM 2000 Methodology as HCM 6th edition does not support Non-NEMA phasing, but for Intersection 2 Cumulative conditions all scenarios are from HCM 6th Edition.
6. For Intersection 9, under Mitigations, LOS and Delay reported using HCM 2000 Methodology.
7. For Intersection 11, there is no delay or LOS as the control is free (there is no stop control or signal control).

Figure 20: Project Lane Geometry 2028 Opening Year Plus Alternative A Project Conditions



Project Site
Study Intersection
Study Segment
Stop Sign
Traffic Signal

Figure 21: 2028 Opening Year Plus Alternative A Project Conditions Peak Hour Traffic Volumes



LEGEND

Study Intersection	Stop Sign	XX	AM Peak Hour Volumes
Study Segment	Traffic Signal	(XX)	PM Peak Hour Volumes
		{XX}	Saturday Midday Peak Hour Volumes

8.2 Intersection Queuing Analysis – Opening Year 2028 plus Alternative A Project Conditions

The 95th percentile queue lengths were calculated for each left-turn lane group and exclusive right-turn lane group on the approaches of each study intersection. **Table 24** details the results of the analysis. Under Opening Year 2028 plus Alternative A Project Conditions, the following lane groups would experience 95th percentile queue lengths exceeding the available storage length:

- 1) Shiloh Rd. & Old Redwood Hwy.

EBR during weekday PM and Saturday midday peak hours

NBL during weekday PM and Saturday midday peak hours

SBL during weekday PM and Saturday midday peak hours

SBR during weekday AM and PM, and Saturday midday peak hours

- 3) US 101 NB Off Ramp & Shiloh Rd.

NBR during weekday PM peak hour

- 6) Conde Ln. & Shiloh Rd.

EBL during weekday PM peak hour (no new impact)

- 10) US 101 NB Off Ramp/Lakewood Dr. & Old Redwood Hwy.

EBL during weekday PM and Saturday midday peak hours (no new impact)

NBL during weekday PM peak hour (no new impact)

SBL during weekday PM and Saturday midday peak hours (no new impact)

Mitigation Measures

At intersection #1, queue overflows can largely be mitigated by restriping to extend storage length as indicated in **Table 24**. It should also be noted that the Town of Windsor Traffic Impact Fee (TIF) program includes a project to restripe this intersection to provide two northbound left turn lanes. With this TIF project implemented, all queue impacts would be fully mitigated. At intersection 3, there is adequate ramp length to accommodate the 95th percentile queue. At intersections 6 and 10, the project would not create any new queuing impacts. The detailed required mitigation measures under this scenario are as follows. The numbers correspond to the intersections listed above:

- 1) Restripe EBR to give 175 ft. storage length. Restripe SBL to 195 ft. Restripe SBR to 130 ft. Construct TIF project to add second NBL turn lane and second WB receiving lane.

With the addition of the above listed improvements, all project-related impacts at the impacted intersections would be mitigated to a level that **would be consistent** with queuing standards set by the Town of Windsor and Sonoma County.

Table 24: 95th Percentile Queue Lengths – Opening Year 2028 plus Alternative A Project Conditions

#	Study Intersections	Lane Group	Storage Length (ft.) (Mitigated)	Number of Lanes (Mitigated)	Peak Hour	Opening Year 2028 Conditions	Opening Year 2028 + Alternative A Project Conditions		Opening Year 2028 + Alternative A Project Conditions w/Mitigations		Comments
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	
1	Shiloh Rd. and Old Redwood Hwy.	EBL	375	1	AM	135	161	26	151	16	
					PM	280	356	76	370	90	
					Saturday Midday	149	199	50	221	72	
		EBR	140 (175)	1	AM	33	82	49	62	29	Re-Stripe EBR Storage Length to 175 feet
					PM	56	**263**	**207**	173	117	
					Saturday Midday	54	**258**	**204**	168	114	
		WBL	(200)	(1)	AM				43	-	LOS mitigation requires providing 1 WBL lane at the intersection.
					PM				85	-	
					Saturday Midday				54	-	
		WBR	50	1	AM	0	0	0	0	0	
					PM	0	8	8	12	12	
					Saturday Midday	0	16	16	20	20	
		NBL	200 (215)	1 (2)	AM	105	169	64	79	-26	Add second NBL turn lane and WB receiving lane.
					PM	**274**	**508**	**234**	184	-90	
					Saturday Midday	**243**	**585**	**342**	212	-31	
		NBR	100	1	AM	7	6	-1	7	0	
					PM	0	0	0	0	0	
					Saturday Midday	0	0	0	0	0	
		SBL	130	1	AM	31	75	44	68	37	

#	Study Intersections	Lane Group	Storage Length (ft.) (Mitigated)	Number of Lanes (Mitigated)	Peak Hour	Opening Year 2028 Conditions	Opening Year 2028 + Alternative A Project Conditions		Opening Year 2028 + Alternative A Project Conditions w/Mitigations		Comments
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	
			(195)		PM	50	**205**	**155**	193	143	
					Saturday Midday	40	**195**	**155**	174	134	Re-Stripe SBL Storage Length to 195 feet
		SBR	95 (130)	1	AM	**105**	**135**	**30**	98	-7	
					PM	**111**	**134**	**23**	126	15	Re-Stripe SBR Storage Length to 130 feet
					Saturday Midday	**105**	**148**	**43**	120	15	
2	Shiloh Rd. and Hembree Ln.	EBL	-	Trap Lane	AM	144	144	0	144	0	
					PM	356	370	14	368	12	
					Saturday Midday	362	375	13	406	44	
		WBL	-	Trap Lane	AM	32	32	0	32	0	
					PM	37	39	2	41	4	
					Saturday Midday	37	39	2	45	8	
		NBL	-	Trap Lane	AM	53	53	0	53	0	
					PM	92	96	4	110	18	
					Saturday Midday	92	96	4	122	30	
		SBR	-	Trap Lane	AM	49	112	63	112	63	
					PM	218	537	319	499	281	
					Saturday Midday	448	724	276	477	29	
3	US 101 NB Off Ramp and Shiloh Rd.	NBL	-	Trap Lane	AM	293	293	0			
					PM	461	461	0			

#	Study Intersections	Lane Group	Storage Length (ft.) (Mitigated)	Number of Lanes (Mitigated)	Peak Hour	Opening Year 2028 Conditions	Opening Year 2028 + Alternative A Project Conditions		Opening Year 2028 + Alternative A Project Conditions w/Mitigations		Comments
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	
					Saturday Midday	221	248	27			
		NBR	265	2	AM	10	23	13			There is adequate ramp length for the queue without affecting mainline traffic
					PM	98	**363**	**265**			
					Saturday Midday	71	221	150			
4	Shiloh Rd. and US 101 SB Off Ramp	SBL	-	Trap Lane	AM	62	106	44			
					PM	91	237	146			
					Saturday Midday	107	245	138			
		SBR	275	1	AM	42	43	1			
					PM	39	39	0			
					Saturday Midday	15	15	0			
6	Conde Ln. and Shiloh Rd.	EBL	90	1	AM	35	35	0			
					PM	**92**	**92**	**0**			
					Saturday Midday	40	41	1			
		WBL	130	1	AM	18	18	0			
					PM	18	18	0			
					Saturday Midday	19	20	1			
		SBR	40	1	AM	32	32	0			
					PM	33	33	0			

#	Study Intersections	Lane Group	Storage Length (ft.) (Mitigated)	Number of Lanes (Mitigated)	Peak Hour	Opening Year 2028 Conditions	Opening Year 2028 + Alternative A Project Conditions		Opening Year 2028 + Alternative A Project Conditions w/Mitigations		Comments
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	
					Saturday Midday	27	27	0			
10	US 101 NB Off Ramp/Lakewood Dr. & Old Redwood Hwy.	EBL	155	1	AM	86	86	0			
					PM	**179**	**179**	**0**			
					Saturday Midday	**180**	**180**	**0**			
		NBL	270	2	AM	181	181	0			
					PM	**498**	**498**	**0**			
					Saturday Midday	215	215	0			
		SBL	120	1	AM	72	72	0			
					PM	**181**	**181**	**0**			
					Saturday Midday	**162**	**162**	**0**			
		SBR	-	Trap Lane	AM	331	335	4			
					PM	341	350	9			
					Saturday Midday	521	537	16			
12	US 101 SB On Ramp/US 101 SB Off Ramp & Old Redwood Hwy.	EBR	-	Trap Lane	AM	62	62	0			
					PM	55	55	0			
					Saturday Midday	50	50	0			
		WBL	-	Trap Lane	AM	544	544	0			
					PM	403	403	0			

#	Study Intersections	Lane Group	Storage Length (ft.) (Mitigated)	Number of Lanes (Mitigated)	Peak Hour	Opening Year 2028 Conditions	Opening Year 2028 + Alternative A Project Conditions		Opening Year 2028 + Alternative A Project Conditions w/Mitigations		Comments
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	
					Saturday Midday	424	424	0			
		SBL	420	2	AM	101	113	12			
					PM	181	237	56			
					Saturday Midday	109	155	46			

Notes:

1. NBL – Northbound left
2. NBR – Northbound right
3. SBL – Southbound left
4. SBR – Southbound right
5. EBL – Eastbound left
6. EBR – Eastbound right
7. WBL – Westbound left
8. WBR – Westbound right
9. **Bold** indicates unacceptable 95th percentile queue length. **Red** indicates significant impact.
10. 95th percentile queue lengths expressed in feet, rounded to the nearest five feet
11. *Average storage per lane, where dual turn lanes provide different storage lengths

9.0 OPENING YEAR 2028 PLUS ALTERNATIVE B PROJECT CONDITIONS

This analysis scenario presents the impacts of the proposed project at the study intersections and surrounding roadway system. This scenario is identical to Opening Year 2028 No Project Conditions, but with the addition of traffic from the Alternative B project. The project trip generation, trip distribution, and trip assignment is identical to that of Existing plus Alternative B Project Conditions.

9.1 Intersections Level of Service Analysis – Opening Year 2028 plus Alternative B Project Conditions

The intersection LOS analysis results for Opening Year 2028 plus Alternative B Project Conditions are summarized in **Table 25**.

Under this scenario, the following intersections **would not be consistent** with level of service standards set by the Town of Windsor and Sonoma County:

- 1) Shiloh Rd. & Old Redwood Hwy. (Saturday midday peak hour)
- 2) Shiloh Rd. & Hembree Ln. (Saturday midday peak hour)
- 7) Shiloh Rd. & Casino Entrance 1/Gridley Dr. (Saturday midday peak hour)

Mitigation Measures

The required mitigation measures under this scenario are as follows. The numbers correspond to the intersections listed above:

- 1) Shiloh Rd. & Old Redwood Hwy.
  - Convert split phasing in EB/WB direction to protected phasing;
  - Convert existing westbound-through lane to an exclusive left-turn lane (storage length of 200 feet and taper length of 75 feet) and a shared through/right turn lane
  - Add one northbound left-turn lane
- 2) Shiloh Rd. & Hembree Ln.
  - Optimize splits and cycle length
- 7) Shiloh Rd. & Casino Entrance 1/Gridley Dr.
  - Signalize intersection
  - Provide exclusive eastbound right-turn lane (Storage length of 150 feet and taper length of 75 feet)
- 8) Old Redwood Hwy. & Casino Entrance 1
  - Provide exclusive northbound right-turn lane (Storage length of 100 feet and taper length of 75 feet)
  - Provide exclusive southbound left-turn lane (Storage length of 50 feet and taper length of 25 feet)
- 9) Shiloh Road & Casino Entrance 3
  - Provide exclusive eastbound right-turn lane (Storage length of 200 feet and taper length of 75 feet)

With the addition of intersection improvements, all project-related impacts at the above intersections would be mitigated to a level that **would be consistent** with level of service standards set by the Town of Windsor and Sonoma County.

Figures 22 and **23** show lane geometries and projected peak hour turning movement volumes at the study intersections for Opening Year 2028 plus Alternative B Conditions for weekday a.m. and p.m., and Saturday midday peak hours, respectively. LOS worksheets are provided in the **Appendix H**.

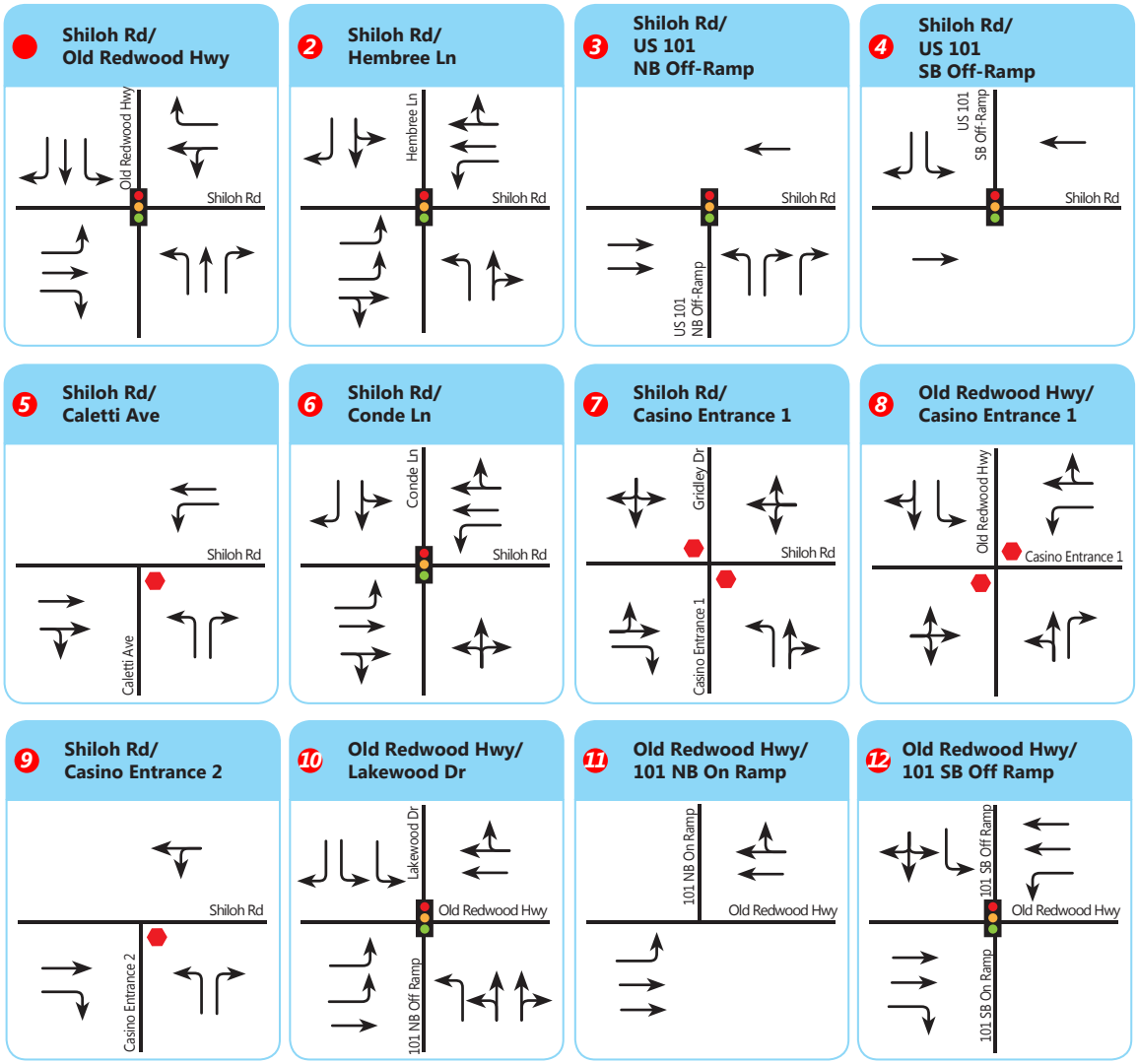
Table 25: Intersection Level of Service Analysis – Opening Year 2028 plus Alternative B Project Conditions

#	Study Intersections	Control	Peak Hour	Opening Year 2028 Conditions		Opening Year 2028 + Alternative B Project Conditions			Opening Year 2028 + Alternative B Project Conditions w/ Mitigations		
				Delay	LOS	Delay	LOS	Change in Delay	Delay	LOS	Change in Delay
1	Shiloh Rd. & Old Redwood Hwy.	Signal	AM	17.3	B	25.8	C	8.5	-	-	-
			PM	23.7	C	41.8	D	18.1	-	-	-
			Saturday Midday	22.4	C	**105.1**	**F**	82.7	31.3	C	8.9
2	Shiloh Rd. & Hembree Ln.	Signal	AM	16.7	B	18.6	B	1.9	-	-	-
			PM	25.1	C	26.4	C	1.3	-	-	-
			Saturday Midday	35.6	D	**57.3**	**E**	21.7	47.0	D	11.4
3	Shiloh Rd. & US-101 NB Ramps	Signal	AM	16.2	B	21.8	C	5.6	-	-	-
			PM	17.6	B	23.4	C	5.8	-	-	-
			Saturday Midday	18.0	B	50.0	D	-	-	-	-
4	Shiloh Rd. & US-101 SB Ramps	Signal	AM	6.9	A	9.0	A	2.1	-	-	-
			PM	8.3	A	9.5	A	1.2	-	-	-
			Saturday Midday	11.7	B	16.6	B	4.9	-	-	-
5	Shiloh Rd. & Caletti Ave.	OWSC[3]	AM	15.6	C	15.9	C	0.3	-	-	-
			PM	29.7	D	22.1	C	-7.6	-	-	-
			Saturday Midday	20.2	C	22.0	C	1.8	-	-	-
6	Shiloh Rd. & Conde Ln.	Signal	AM	15.1	B	15.2	B	0.1	-	-	-
			PM	38.1	D	26.9	C	-11.2	-	-	-
			Saturday Midday	15.8	B	15.9	B	0.1	-	-	-
7	Shiloh Rd. & Casino Entrance 1/Gridley Dr.	TWSC[4]	AM	8.9	A	14.3	B	5.4	-	-	-
			PM	9.5	A	25.6	D	16.1	-	-	-
			Saturday Midday	9.0	A	**49.4**	**E**	40.4	9.1	A	0.1
8	Old Redwood Hwy. & Casino Entrance	TWSC[4]	AM	14.5	B	17.5	C	3.0	-	-	-
			PM	26.4	D	34.7	D	8.3	-	-	-
			Saturday Midday	13.7	B	23.7	C	10.0	-	-	-
9	Shiloh Rd. & Casino Entrance 2	OWSC[3]	AM	0.0	A	10.9	B	10.9	-	-	-
			PM	0.0	A	12.7	B	12.7	-	-	-
			Saturday Midday	0.0	A	16.0	C	16.0	-	-	-
10	Old Redwood Hwy. & US-101 NB Ramps/Lakewood Dr.	Signal	AM	18.3	B	18.2	B	-0.1	-	-	-
			PM	28.7	C	24.6	C	-4.1	-	-	-
			Saturday Midday	20.4	C	20.3	C	-0.1	-	-	-
11	Old Redwood Hwy. & US-101 NB Ramps	Free	AM	-	-	-	-	-	-	-	-
			PM	-	-	-	-	-	-	-	-
			Saturday Midday	-	-	-	-	-	-	-	-
12	Old Redwood Hwy. & US-101 SB Ramps	Signal	AM	30.5	C	31.1	C	0.6	-	-	-
			PM	25.5	C	19.9	B	-5.6	-	-	-
			Saturday Midday	28.7	C	29.9	C	1.2	-	-	-

Notes:
1. Delay – Whole intersection weighted average control delay expressed in seconds per vehicle for signalized and all-way stop controlled intersections. Total control delay for the worst movement is presented for side-street stop – controlled intersections.

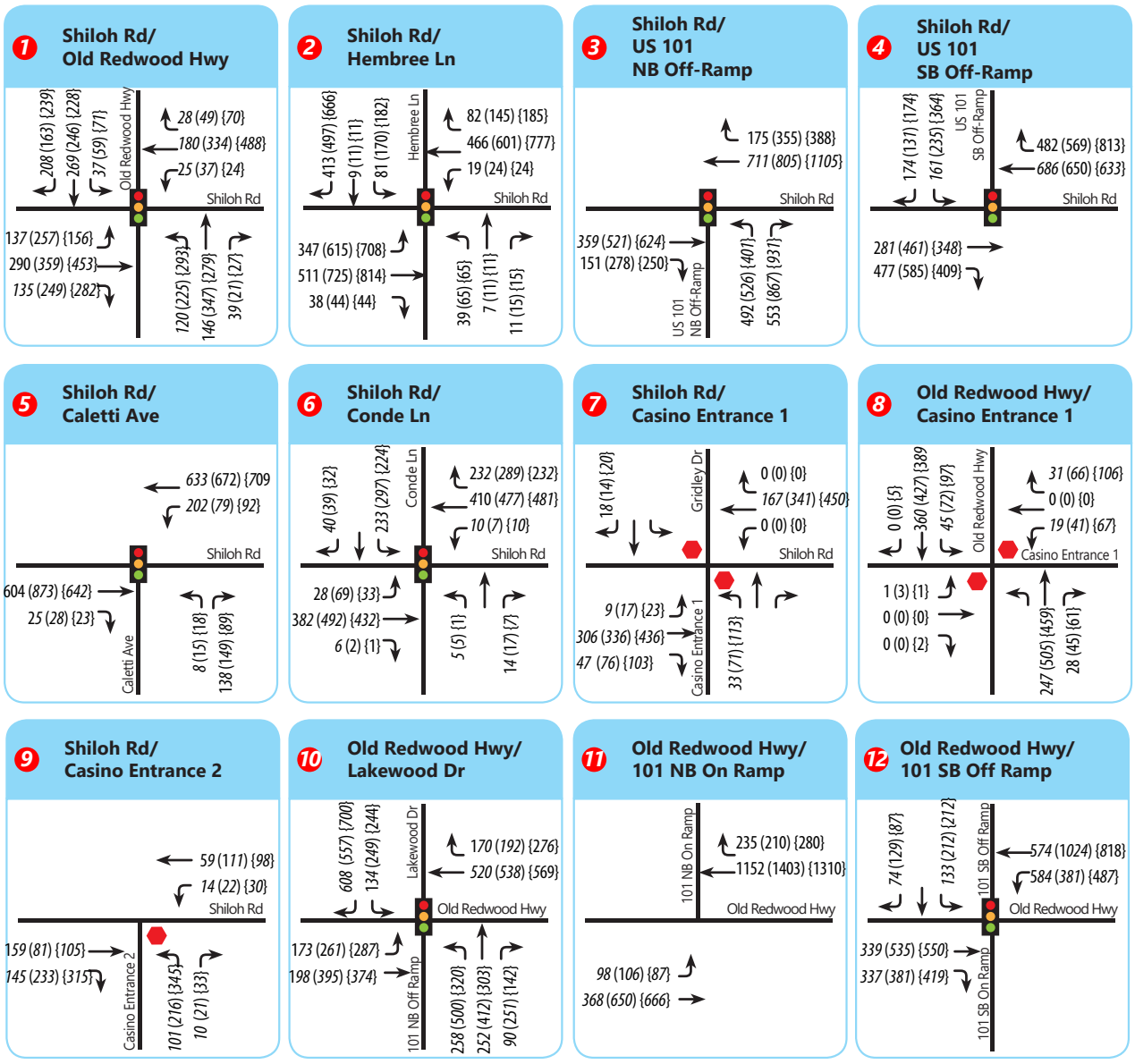
2. LOS – Level of Service. **Bold** indicates unacceptable LOS and Delay.
3. OWSC - One Way Stop Control
4. TWSC - Two Way Stop Control
5. For Intersection 2, 4 & 6, LOS and Delay reported using HCM 2000 Methodology as HCM 6th edition does not support Non-NEMA phasing, but for Intersection 2 Cumulative conditions all scenarios are from HCM 6th Edition.
6. For Intersection 9, under Mitigations, LOS and Delay reported using HCM 2000 Methodology.
7. For Intersection 11, there is no delay or LOS as the control is free (there is no stop control or signal control).

Figure 22: Project Lane Geometry 2028 Opening Year Plus Alternative B Project Conditions



Project Site
Study Intersection
Study Segment
Stop Sign
Traffic Signal

Figure 23: 2028 Opening Year Plus Alternative B Project Conditions Peak Hour Traffic Volumes



LEGEND

X Study Intersection	Stop Sign	XX	AM Peak Hour Volumes
X Study Segment	Traffic Signal	(XX)	PM Peak Hour Volumes
		{XX}	Saturday Midday Peak Hour Volumes

N

TJKM

9.2 Intersection Queuing Analysis – Opening Year 2028 plus Alternative B Project Conditions

The 95th percentile queue lengths were calculated for each left-turn lane group and exclusive right-turn lane group on the approaches of each study intersection. **Table 26** details the results of the analysis. Under Opening Year 2028 plus Alternative B Project Conditions, the following lane groups would experience 95th percentile queue lengths exceeding the available storage length:

- 1) Shiloh Rd. & Old Redwood Hwy.

EBR during weekday PM and Saturday midday peak hours

NBL during weekday PM and Saturday midday peak hours

SBL during weekday PM and Saturday midday peak hours

SBR during weekday AM and PM, and Saturday midday peak hours

- 10) US 101 NB Off Ramp/Lakewood Dr. & Old Redwood Hwy.

EBL during Saturday midday peak hour

NBL during weekday PM peak hour

SBL during weekday PM and Saturday midday peak hours

Mitigation Measures

At intersection #1, queue overflows can largely be mitigated by restriping to extend storage length as indicated in **Table 26**. It should also be noted that the Town of Windsor Traffic Impact Fee (TIF) program includes a project to restripe this intersection to provide two northbound left turn lanes. With this TIF project implemented, all queue impacts would be fully mitigated. At intersection 10, the project would not create any new queuing impacts. The detailed required mitigation measures under this scenario are as follows. The numbers correspond to the intersections listed above:

- 1) Restripe EBR to give 175 ft. storage length. Restripe SBL to 190 ft. Restripe SBR to 130 ft. Construct TIF project to add second NBL turn lane.

With the addition of the above listed improvements, all project-related impacts at the impacted intersections would be mitigated to a level that **would be consistent** with queuing standards set by the Town of Windsor and Sonoma County.

Table 26: 95th Percentile Queue Lengths – Opening Year 2028 plus Alternative B Project Conditions

#	Study Intersections	Lane Group	Storage Length (ft.) (Mitigated)	Number of Lanes (Mitigated)	Peak Hour	Opening Year 2028 Conditions	Opening Year 2028 + Alternative B Project Conditions		Opening Year 2028 + Alternative B Project Conditions w/Mitigations		Comments
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	
1	Shiloh Rd. and Old Redwood Hwy.	EBL	375	1	AM	135	161	26	131	-4	
					PM	280	307	27	307	27	
					Saturday Midday	149	199	50	214	65	
		EBR	140 (175)	1	AM	33	82	49	62	29	Re-Stripe EBR Storage Length to 175 feet
					PM	56	**161**	**105**	131	75	
					Saturday Midday	54	**242**	**188**	164	110	
		WBL	(200)	(1)	AM				43	-	LOS mitigation requires providing 1 WBL lane at the intersection.
					PM				56	-	
					Saturday Midday				53	-	
		WBR	50	1	AM	0	0	0	0	0	
					PM	0	0	0	0	0	
					Saturday Midday	0	14	14	19	19	
		NBL	200	1 (2)	AM	105	169	64	79	-26	Add second NBL turn lane and WB receiving lane
					PM	**274**	**431**	**157**	150	-124	
					Saturday Midday	**243**	**580**	**337**	187	-56	
		NBR	100	1	AM	7	6	-1	7	0	
					PM	0	0	0	0	0	
					Saturday Midday	0	0	0	0	0	
		SBL	130 (190)	1	AM	31	75	44	68	37	Re-Stripe SBL Storage Length to 190 feet
					PM	50	**139**	**89**	139	89	
					Saturday Midday	40	**181**	**141**	130	90	
		SBR	95 (130)	1	AM	**105**	**135**	**30**	98	-7	Re-Stripe SBR Storage Length to 130 feet
					PM	**111**	**110**	**-1**	80	-31	
					Saturday Midday	**105**	**148**	**43**	115	10	
2		EBL	-	Trap Lane	AM	144	144	0			

#	Study Intersections	Lane Group	Storage Length (ft.) (Mitigated)	Number of Lanes (Mitigated)	Peak Hour	Opening Year 2028 Conditions	Opening Year 2028 + Alternative B Project Conditions		Opening Year 2028 + Alternative B Project Conditions w/Mitigations		Comments
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	
	Shiloh Rd. and Hembree Ln.				PM	356	310	-46			
					Saturday Midday	362	375	13			
		WBL	-	Trap Lane	AM	32	32	0			
					PM	37	39	2			
					Saturday Midday	37	39	2			
		NBL	-	Trap Lane	AM	53	53	0			
					PM	92	96	4			
					Saturday Midday	92	96	4			
		SBR	-	Trap Lane	AM	49	112	63			
					PM	218	369	151			
					Saturday Midday	448	720	272			
3	US 101 NB Off Ramp and Shiloh Rd.	NBL	-	Trap Lane	AM	293	293	0			
					PM	461	352	-109			
					Saturday Midday	221	248	27			
		NBR	265	2	AM	10	23	13			
					PM	98	176	78			
					Saturday Midday	71	205	134			
4	Shiloh Rd. and US 101 SB Off Ramp	SBL	-	Trap Lane	AM	62	105	43			
					PM	91	132	41			
					Saturday Midday	107	233	126			
		SBR	275	1	AM	42	43	1			
					PM	39	33	-6			
					Saturday Midday	15	15	0			
6	Conde Ln. and Shiloh Rd.	EBL	90	1	AM	35	35	0			
					PM	**92**	78	-14			

#	Study Intersections	Lane Group	Storage Length (ft.) (Mitigated)	Number of Lanes (Mitigated)	Peak Hour	Opening Year 2028 Conditions	Opening Year 2028 + Alternative B Project Conditions		Opening Year 2028 + Alternative B Project Conditions w/Mitigations		Comments
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	
					Saturday Midday	40	41	1			
		WBL	130	1	AM	18	18	0			
					PM	18	16	-2			
					Saturday Midday	19	20	1			
		SBR	40	1	AM	32	32	0			
					PM	33	31	-2			
					Saturday Midday	27	27	0			
10	US 101 NB Off Ramp/Lakewood Dr. & Old Redwood Hwy.	EBL	155	1	AM	86	86	0			
					PM	**179**	151	-28			
					Saturday Midday	**180**	**180**	**0**			
		NBL	270	2	AM	181	181	0			
					PM	**498**	**413**	**-85**			
					Saturday Midday	215	215	0			
		SBL	120	1	AM	72	72	0			
					PM	**181**	**153**	**-28**			
					Saturday Midday	**162**	**162**	**0**			
		SBR	-	Trap Lane	AM	331	335	4			
					PM	341	247	-94			
					Saturday Midday	521	537	16			
12	US 101 SB On Ramp/US 101 SB Off Ramp & Old Redwood Hwy.	EBR	-	Trap Lane	AM	62	62	0			
					PM	55	49	-6			
					Saturday Midday	50	50	0			
		WBL	-	Trap Lane	AM	544	544	0			
					PM	403	340	-63			

#	Study Intersections	Lane Group	Storage Length (ft.) (Mitigated)	Number of Lanes (Mitigated)	Peak Hour	Opening Year 2028 Conditions	Opening Year 2028 + Alternative B Project Conditions		Opening Year 2028 + Alternative B Project Conditions w/Mitigations		Comments
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	
					Saturday Midday	424	424	0			
		SBL	420	2	AM	101	113	12			
					PM	181	190	9			
					Saturday Midday	109	151	42			

Notes:

1. NBL – Northbound left
2. NBR – Northbound right
3. SBL – Southbound left
4. SBR – Southbound right
5. EBL – Eastbound left
6. EBR – Eastbound right
7. WBL – Westbound left
8. WBR – Westbound right
9. **Bold** indicates unacceptable 95th percentile queue length. **Red** indicates significant impact.
10. 95th percentile queue lengths expressed in feet, rounded to the nearest five feet
11. *Average storage per lane, where dual turn lanes provide different storage lengths

10.0 OPENING YEAR 2028 PLUS ALTERNATIVE C PROJECT CONDITIONS

This analysis scenario presents the impacts of the proposed project at the study intersections and surrounding roadway system. This scenario is identical to Opening Year 2028 No Project Conditions, but with the addition of traffic from the Alternative C project. The project trip generation, trip distribution, and trip assignment is identical to that of Existing plus Alternative C Project Conditions.

10.1 Intersections Level of Service Analysis – Opening Year 2028 plus Alternative C Project Conditions

The intersection LOS analysis results for Opening Year 2028 plus Alternative C Project Conditions are summarized in **Table 27.**

Under this scenario, all of the study intersections operate within applicable jurisdictional standards during all three peak periods with an assumption of exclusive southbound left-turn lane.

Mitigation measure

- 8) Old Redwood Hwy. & Casino Entrance 1
    - Provide exclusive southbound left-turn lane (Storage length of 50 feet and taper length of 25 feet)

Figures 24 and **25** show lane geometries and projected peak hour turning movement volumes at the study intersections for Opening Year 2028 plus Alternative C Conditions for weekday a.m. and p.m., and Saturday midday peak hours, respectively. LOS worksheets are provided in the **Appendix I**.

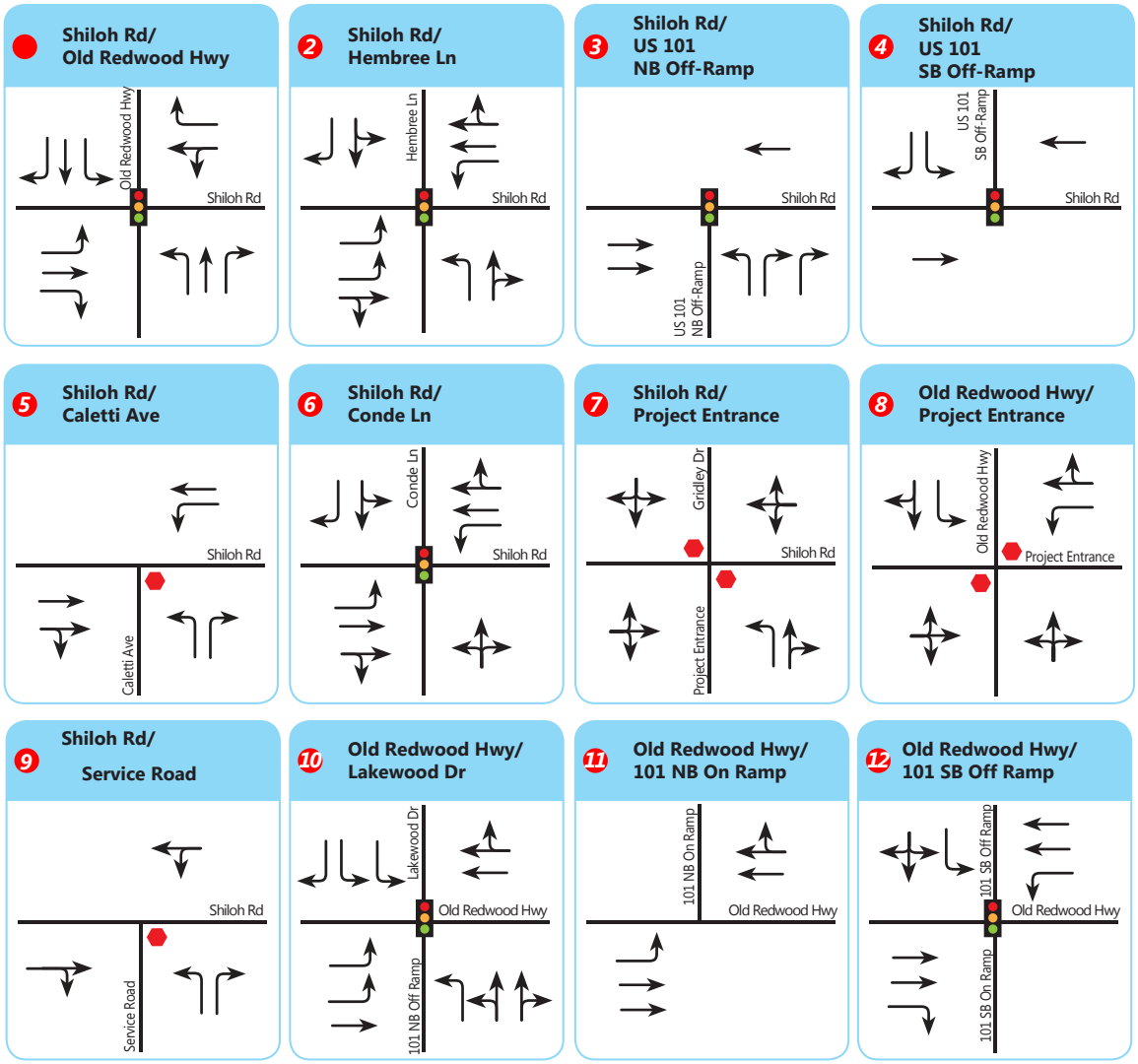
Table 27: Intersection Level of Service Analysis – Opening Year 2028 plus Alternative C Project Conditions

#	Study Intersections	Control	Peak Hour	Opening Year 2028 Conditions		Opening Year 2028 + Alternative C Project Conditions		
				Delay	LOS	Delay	LOS	Change in Delay
1	Shiloh Rd. & Old Redwood Hwy.	Signal	AM	17.3	B	19.2	B	1.9
			PM	23.7	C	26.9	C	3.2
			Saturday Midday	22.4	c	31.4	C	9.0
2	Shiloh Rd. & Hembree Ln.	Signal	AM	16.7	B	17.1	B	0.4
			PM	25.1	C	26.8	C	1.7
			Saturday Midday	35.6	D	40.6	D	5.0
3	Shiloh Rd. & US-101 NB Ramps	Signal	AM	16.2	B	17.8	B	1.6
			PM	17.6	B	20.2	C	2.6
			Saturday Midday	18.0	B	28.8	C	10.8
4	Shiloh Rd. & US-101 SB Ramps	Signal	AM	6.9	A	8.2	A	1.3
			PM	8.3	A	8.8	A	0.5
			Saturday Midday	11.7	B	12.5	B	0.8
5	Shiloh Rd. & Caletti Ave.	OWSC[3]	AM	15.6	C	15.8	C	0.2
			PM	29.7	D	30.3	D	0.6
			Saturday Midday	20.2	C	20.8	C	0.6

#	Study Intersections	Control	Peak Hour	Opening Year 2028 Conditions		Opening Year 2028 + Alternative C Project Conditions		
				Delay	LOS	Delay	LOS	Change in Delay
6	Shiloh Rd. & Conde Ln.	Signal	AM	15.1	B	15.1	B	0.0
			PM	38.1	D	38.3	D	0.2
			Saturday Midday	15.8	B	15.9	B	0.1
7	Shiloh Rd. & Casino Entrance 1/Gridley Dr.	TWSC[4]	AM	8.9	A	11.6	B	2.7
			PM	9.5	A	13.5	B	4.0
			Saturday Midday	9.0	A	14.2	B	5.2
8	Old Redwood Hwy. & Casino Entrance	TWSC[4]	AM	14.5	B	15.4	C	0.9
			PM	26.4	D	29.3	D	2.9
			Saturday Midday	13.7	B	14.8	B	1.1
9	Shiloh Rd. & Casino Entrance 2	OWSC[3]	AM	0.0	A	10.4	B	10.4
			PM	0.0	A	10.7	B	10.7
			Saturday Midday	0.0	A	11.1	B	11.1
10	Old Redwood Hwy. & US 101 NB Off Ramp/Lakewood Dr.	Signal	AM	18.3	B	18.3	B	0.0
			PM	28.7	C	28.8	C	0.1
			Saturday Midday	20.4	C	20.3	C	-0.1
11	Old Redwood Hwy. & US 101 NB On Ramp	Free	AM	-	-	-	-	-
			PM	-	-	-	-	-
			Saturday Midday	-	-	-	-	-
12	Old Redwood Hwy. & US 101 SB Ramps	Signal	AM	30.5	C	30.7	C	0.2
			PM	25.5	C	25.7	C	0.2
			Saturday Midday	28.7	C	28.9	C	0.2

Notes:
1. Delay – Whole intersection weighted average control delay expressed in seconds per vehicle for signalized and all-way stop controlled intersections. Total control delay for the worst movement is presented for side-street stop – controlled intersections.
2. LOS – Level of Service. **Bold** indicates unacceptable LOS and Delay.
3. OWSC - One Way Stop Control
4. TWSC - Two Way Stop Control
5. For Intersection 2, 4 & 6, LOS and Delay reported using HCM 2000 Methodology as HCM 6th edition does not support Non-NEMA phasing, but for Intersection 2 Cumulative conditions all scenarios are from HCM 6th Edition.
6. For Intersection 9, under Mitigations, LOS and Delay reported using HCM 2000 Methodology.
7. For Intersection 11, there is no delay or LOS as the control is free (there is no stop control or signal control).

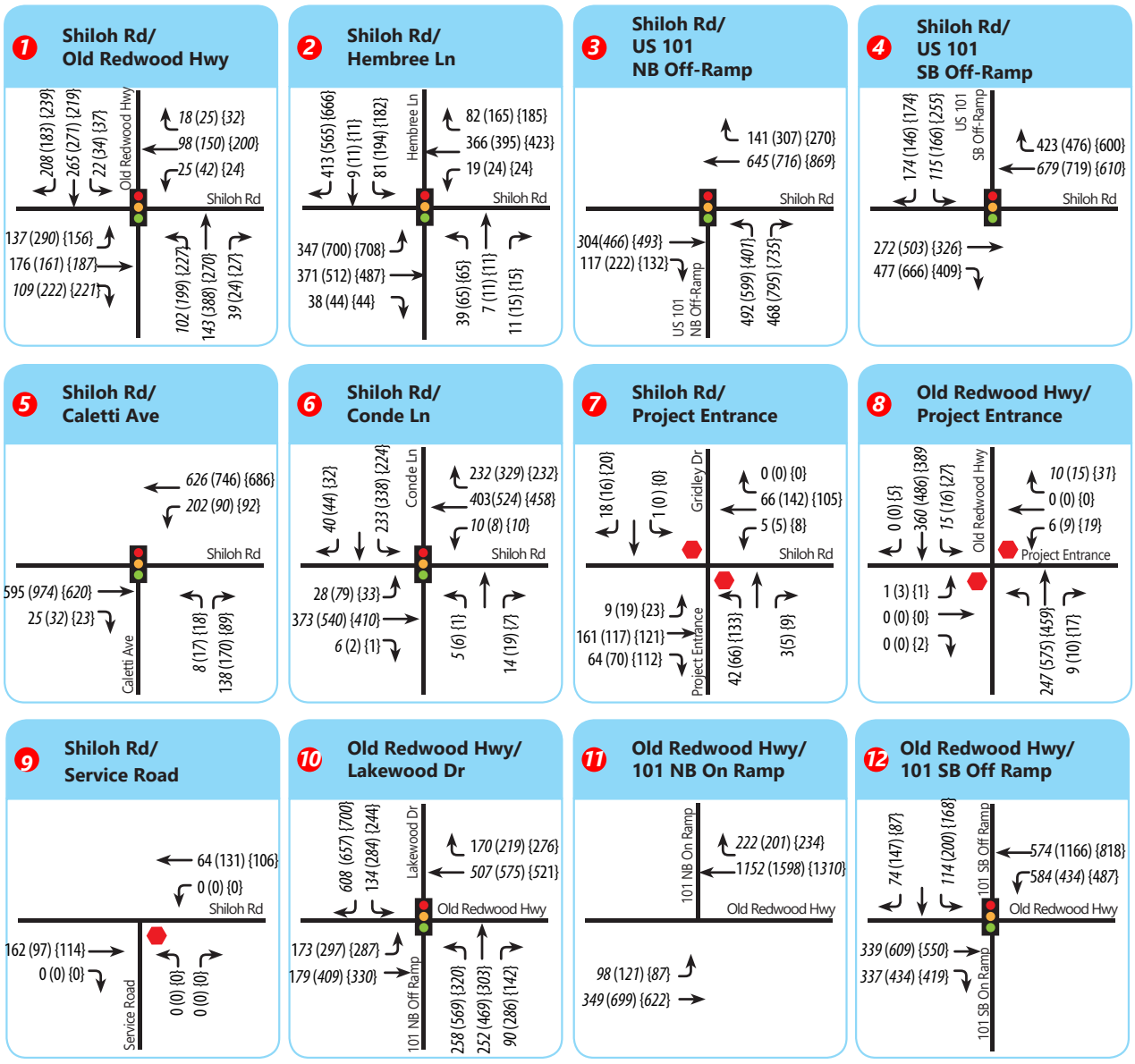
Figure 24: Project Lane Geometry 2028 Opening Year Plus Alternative C Project Conditions



Project Site
Study Intersection
Study Segment
Stop Sign
Traffic Signal

N

Figure 25: 2028 Opening Year Plus Alternative C Project Conditions Peak Hour Traffic Volumes



LEGEND

Study Intersection	Stop Sign	XX	AM Peak Hour Volumes
Study Segment	Traffic Signal	(XX)	PM Peak Hour Volumes
		{XX}	Saturday Midday Peak Hour Volumes

10.2 Intersection Queuing Analysis – Opening Year 2028 plus Alternative C Project Conditions

The 95th percentile queue lengths were calculated for each left-turn lane group and exclusive right-turn lane group on the approaches of each study intersection. **Table 28** details the results of the analysis. Under Opening Year 2028 plus Alternative C Project Conditions, the following lane groups would experience 95th percentile queue lengths exceeding the available storage length:

- 1) Shiloh Rd. & Old Redwood Hwy.

NBL during weekday PM and Saturday midday peak hours

SBR during weekday AM and PM, and Saturday midday peak hours

- 6) Conde Ln. and Shiloh Rd.

EBL during weekday PM peak hour

- 10) US 101 NB Off Ramp/Lakewood Dr. & Old Redwood Hwy.

EBL during weekday PM and Saturday midday peak hours

NBL during weekday PM peak hour

SBL during weekday PM and Saturday midday peak hours

With mitigation, the project **would be consistent** with the Town of Windsor General Plan standards.

Mitigation Measures

At intersection #1, queue overflows can largely be mitigated by restriping to extend storage length as indicated in **Table 28**. At the northbound left turn lane, while the 95th percentile queue would overflow, the average queue length indicates that this would be rare and suggests the impact would be less than significant. It should also be noted that the Town of Windsor Traffic Impact Fee (TIF) program includes a project to restripe this intersection to provide two northbound left turn lanes. With this TIF project implemented, all queue impacts would be fully mitigated. At intersections #6 and #10, the project would not create any new queuing impacts. The detailed required mitigation measures under this scenario are as follows. The numbers correspond to the intersections listed above:

- 1) Restripe SBR to give 130 ft. storage length. Construct TIF project to add second NBL turn lane and WB receiving lane.

With the addition of the above listed improvements, all project-related impacts at the impacted intersections would be mitigated to a level that **would be consistent** with level of service standards set by the Town of Windsor and Sonoma County.

Table 28: 95th Percentile Queue Lengths – Opening Year 2028 plus Alternative C Project Conditions

#	Study Intersections	Lane Group	Storage Length (ft.) (Mitigated)	Number of Lanes (Mitigated)	Peak Hour	Opening Year 2028 Conditions	Opening Year 2028 + Alternative C Project Conditions		Opening Year 2028 + Alternative C Project Conditions w/Mitigations		Comments
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	
1	Shiloh Rd. and Old Redwood Hwy.	EBL	375	1	AM	135	144	9	138	3	
					PM	280	308	28	308	28	
					Saturday Midday	149	176	27	176	27	
		EBR	140	1	AM	33	35	2	34	1	
					PM	56	62	6	62	6	
					Saturday Midday	54	62	8	62	8	
		WBR	50	1	AM	0	0	0	0	0	
					PM	0	0	0	0	0	
					Saturday Midday	0	0	0	0	0	
		NBL	200	1 (2)	AM	105	128	23	61	-44	Add second NBL turn lane and WB receiving lane
					PM	**274**	**327**	**53**	121	-153	
					Saturday Midday	**243**	**370**	**127**	131	-112	
		NBR	100	1	AM	7	7	0	8	1	
					PM	0	0	0	0	0	
					Saturday Midday	0	0	0	0	0	
		SBL	130	1	AM	31	44	13	42	11	
					PM	50	65	15	65	15	
					Saturday Midday	40	73	33	73	33	
		SBR	95 (130)	1	AM	**105**	**117**	**12**	111	6	Re-Stripe SBR Storage Length to 130 feet
					PM	**111**	**117**	**6**	117	6	
					Saturday Midday	**105**	**129**	**24**	128	23	
2	Shiloh Rd. and Hembree Ln.	EBL	-	Trap Lane	AM	144	144	0			
					PM	356	356	0			
					Saturday Midday	362	362	0			
		WBL	-	Trap Lane	AM	32	32	0			

#	Study Intersections	Lane Group	Storage Length (ft.) (Mitigated)	Number of Lanes (Mitigated)	Peak Hour	Opening Year 2028 Conditions	Opening Year 2028 + Alternative C Project Conditions		Opening Year 2028 + Alternative C Project Conditions w/Mitigations		Comments
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	
					PM	37	37	0			
					Saturday Midday	37	37	0			
		NBL	-	Trap Lane	AM	53	53	0			
					PM	92	92	0			
					Saturday Midday	92	92	0			
		SBR	-	Trap Lane	AM	49	66	17			
					PM	218	322	104			
					Saturday Midday	448	559	111			
3	US 101 NB Off Ramp and Shiloh Rd.	NBL	-	Trap Lane	AM	293	293	0			
					PM	461	461	0			
					Saturday Midday	221	221	0			
		NBR	265	2	AM	10	10	0			
					PM	98	127	29			
					Saturday Midday	71	113	42			
4	Shiloh Rd. and US 101 SB Off Ramp	SBL	-	Trap Lane	AM	62	77	15			
					PM	91	106	15			
					Saturday Midday	107	132	25			
		SBR	275	1	AM	42	42	0			
					PM	39	39	0			
					Saturday Midday	15	15	0			
6	Conde Ln. and Shiloh Rd.	EBL	90	1	AM	35	35	0			
					PM	**92**	**92**	**0**			
					Saturday Midday	40	40	0			
		WBL	130	1	AM	18	18	0			
					PM	18	18	0			

#	Study Intersections	Lane Group	Storage Length (ft.) (Mitigated)	Number of Lanes (Mitigated)	Peak Hour	Opening Year 2028 Conditions	Opening Year 2028 + Alternative C Project Conditions		Opening Year 2028 + Alternative C Project Conditions w/Mitigations		Comments
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	
					Saturday Midday	19	19	0			
		SBR	40	1	AM	32	32	0			
					PM	33	33	0			
					Saturday Midday	27	27	0			
10	US 101 NB Off Ramp/Lakewood Dr. & Old Redwood Hwy.	EBL	155	1	AM	86	86	0			
					PM	**179**	**179**	**0**			
					Saturday Midday	**180**	**180**	**0**			
		NBL	270	2	AM	181	181	0			
					PM	**498**	**498**	**0**			
					Saturday Midday	215	215	0			
		SBL	120	1	AM	72	72	0			
					PM	**181**	**181**	**0**			
					Saturday Midday	**162**	**162**	**0**			
		SBR	-	Trap Lane	AM	331	332	1			
					PM	341	342	1			
					Saturday Midday	521	526	5			
12	US 101 SB On Ramp/US 101 SB Off Ramp & Old Redwood Hwy.	EBR	-	Trap Lane	AM	62	62	0			
					PM	55	55	0			
					Saturday Midday	50	50	0			
		WBL	-	Trap Lane	AM	544	544	0			
					PM	403	403	0			
					Saturday Midday	424	424	0			
		SBL	420	2	AM	101	104	3			
					PM	181	194	13			
					Saturday Midday	109	116	7			

Notes:

1. NBL – Northbound left
2. NBR – Northbound right
3. SBL – Southbound left
4. SBR – Southbound right
5. EBL – Eastbound left
6. EBR – Eastbound right
7. WBL – Westbound left
8. WBR – Westbound right
9. **Bold** indicates unacceptable 95th percentile queue length. **Red** indicates significant impact.
10. 95th percentile queue lengths expressed in feet, rounded to the nearest five feet
11. *Average storage per lane, where dual turn lanes provide different storage lengths

11.0 GENERAL PLAN 2040 NO PROJECT CONDITIONS

The General Plan 2040 No Project Conditions analysis forecasts how the study area's transportation system would operate with the growth and changes of the surrounding community by the year 2040. This scenario assumes that no project would be built. Corridor volumes on Shiloh Road and Old Redwood Highway in the immediate project vicinity were obtained from the SCTA traffic model. Based on the growth in these corridor volumes, an annual compounding growth rate of 2.189 percent was applied to project future 2040 traffic volumes. Under this scenario, no infrastructure improvements were assumed at the study intersections or the roadway segments except for the intersection of Shiloh Road and Hembree Lane (intersection #2) as per the approved developments included in Opening Year 2028 No Project Conditions.

11.1 Intersections Level of Service Analysis – General Plan 2040 No Project Conditions

The intersection LOS analysis results for General Plan 2040 No Project Conditions are summarized in **Table 29**.

Under this scenario, the following intersections **would not be consistent** with level of service standards set by the Town of Windsor and Sonoma County:

- 1) Shiloh Rd. & Old Redwood Hwy. (Weekday AM and PM peak hours)
- 2) Shiloh Rd. & Hembree Ln. (Weekday AM and PM, and Saturday midday peak hours)
- 3) Shiloh Rd. & US 101 NB Ramps (Weekday AM peak hour)
- 5) Shiloh Rd. & Caletti Ave. (Weekday AM and PM, and Saturday midday peak hours)
- 6) Shiloh Rd. & Conde Ln. (Weekday AM and PM peak hours)
- 8) Old Redwood Hwy. & Casino Entrance 1 (Weekday AM and PM peak hours)
- 12) Old Redwood Hwy. & US 101 SB Ramps (Weekday AM and Saturday midday peak hours)

Figures 26 and **27** show lane geometries and projected peak hour turning movement volumes at the study intersections for General Plan 2040 No Project Conditions for weekday a.m. and p.m., and Saturday midday peak hours, respectively. LOS worksheets are provided in the **Appendix J**.

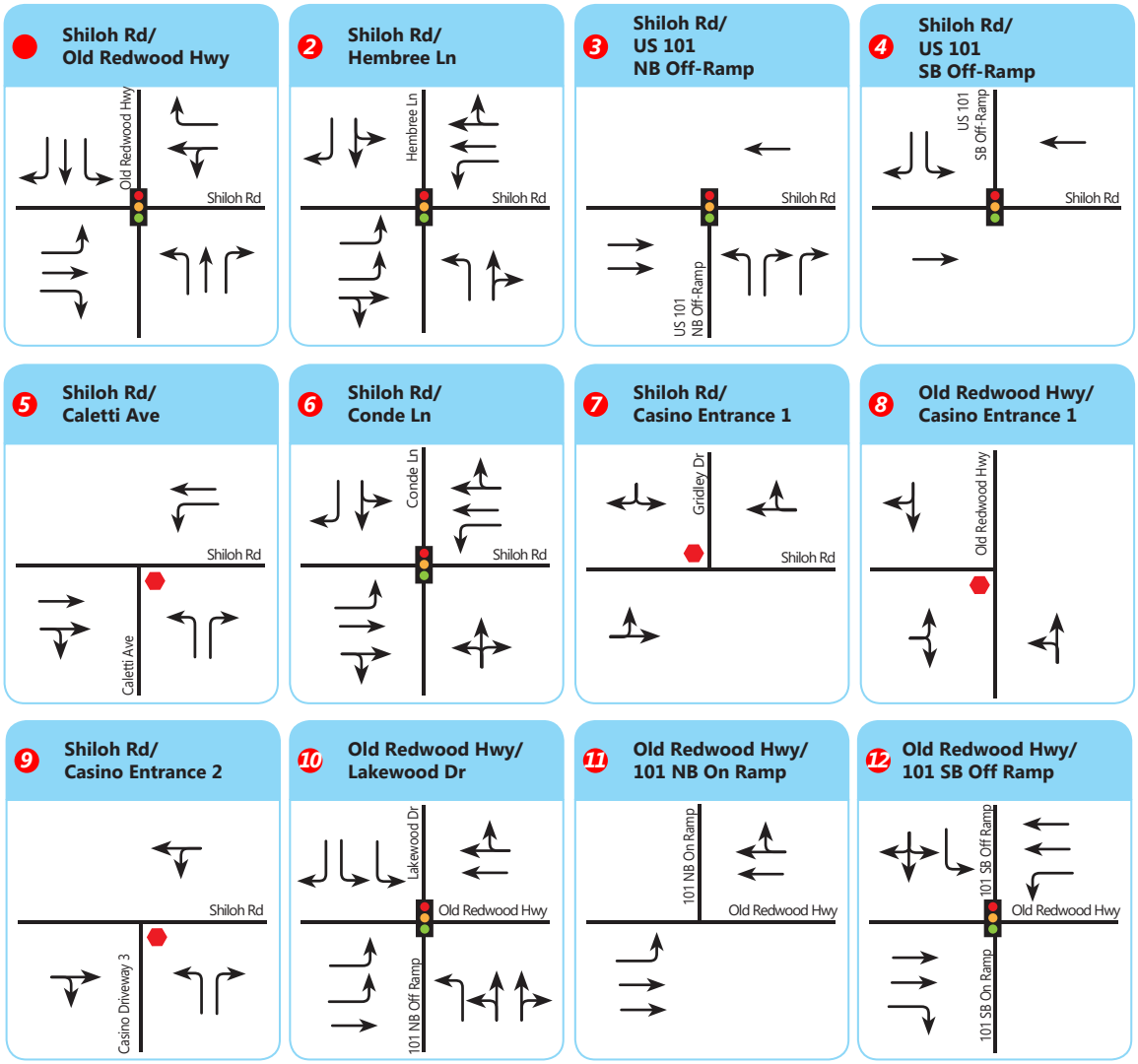
Table 29: Intersection Level of Service Analysis – General Plan 2040 No Project Conditions

#	Study Intersections	Control	Peak Hour	General Plan 2040 Conditions	
				Delay[1]	LOS[2]
1	Shiloh Rd. & Old Redwood Hwy.	Signal	AM	**93.8**	**F**
			PM	**229.3**	**F**
			Saturday Midday	26.7	C
2	Shiloh Rd. & Hembree Ln.	Signal	AM	**64.3**	**E**
			PM	**56.3**	**E**
			Saturday Midday	**94.6**	**F**
3	Shiloh Rd. & US-101 NB Ramps	Signal	AM	**120.3**	**F**
			PM	37.9	D
			Saturday Midday	39.0	D
4	Shiloh Rd. & US-101 SB Ramps	Signal	AM	22.6	C

#	Study Intersections	Control	Peak Hour	General Plan 2040 Conditions	
				Delay[1]	LOS[2]
			PM	19.4	B
			Saturday Midday	14.6	B
5	Shiloh Rd. & Caletti Ave.	OWSC[3]	AM	**79.9**	**F**
			PM	**98.6**	**F**
			Saturday Midday	**54.1**	**F**
6	Shiloh Rd. & Conde Ln.	Signal	AM	**72.0**	**E**
			PM	**83.1**	**F**
			Saturday Midday	29.9	C
7	Shiloh Rd. & Casino Entrance 1/Gridley Dr.	TWSC[4]	AM	9.0	A
			PM	9.9	A
			Saturday Midday	9.3	A
8	Old Redwood Hwy. & Casino Entrance	TWSC[4]	AM	**55.7**	**F**
			PM	**359.3**	**F**
			Saturday Midday	15.8	C
9	Shiloh Rd. & Casino Entrance 2	OWSC[3]	AM	0.0	A
			PM	0.0	A
			Saturday Midday	0.0	A
10	Old Redwood Hwy. & US 101 NB Off Ramp/Lakewood Dr.	Signal	AM	17.9	B
			PM	33.6	C
			Saturday Midday	31.6	C
11	Old Redwood Hwy. & US 101 NB On Ramp	Free	AM	-	-
			PM	-	-
			Saturday Midday	-	-
12	Old Redwood Hwy. & US 101 SB Ramps	Signal	AM	**110.0**	**F**
			PM	39.6	D
			Saturday Midday	**58.1**	**E**

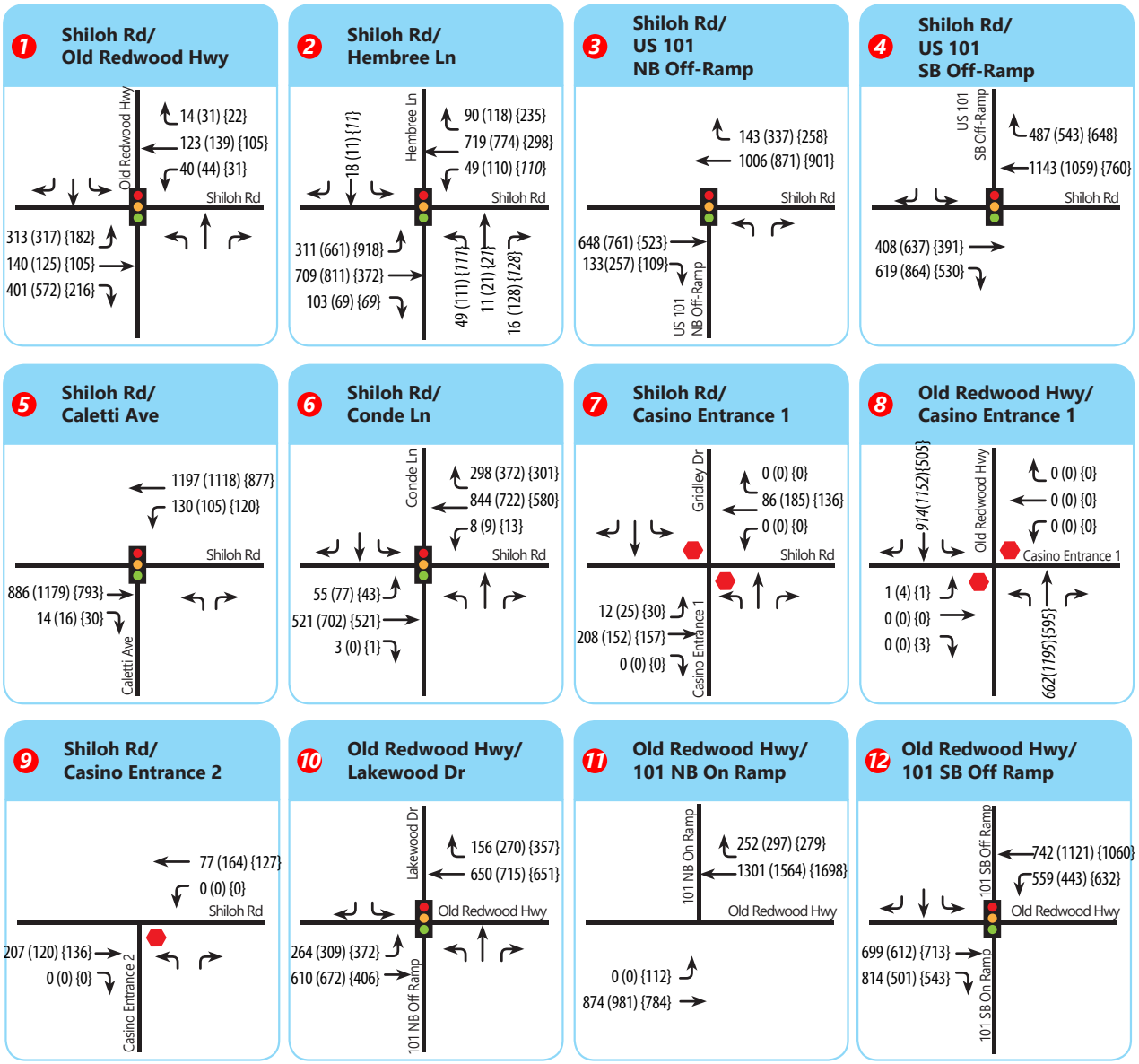
Notes:
1. Delay – Whole intersection weighted average control delay expressed in seconds per vehicle for signalized and all-way stop controlled intersections. Total control delay for the worst movement is presented for side-street stop – controlled intersections.
2. LOS – Level of Service. **Bold** indicates unacceptable LOS and Delay.
3. OWSC - One Way Stop Control
4. TWSC - Two Way Stop Control
5. For Intersection 2, 4 & 6, LOS and Delay reported using HCM 2000 Methodology as HCM 6th edition does not support Non-NEMA phasing, but for Intersection 2 Cumulative conditions all scenarios are from HCM 6th Edition.
6. For Intersection 9, under Mitigations, LOS and Delay reported using HCM 2000 Methodology.
7. For Intersection 11, there is no delay or LOS as the control is free (there is no stop control or signal control).

Figure 26: Project Lane Geometry General Plan 2040 No Project Conditions



Project Site
Study Intersection
Study Segment
Stop Sign
Traffic Signal

Figure 27: General Plan 2040 No Project Conditions Peak Hour Traffic Volumes



LEGEND

X Study Intersection	Stop Sign	XX	AM Peak Hour Volumes
X Study Segment	Traffic Signal	(XX)	PM Peak Hour Volumes
		{XX}	Saturday Midday Peak Hour Volumes

11.2 Intersection Queuing Analysis – General Plan 2040 No Project Conditions

The 95th percentile queue lengths were calculated for each left-turn lane group and exclusive right-turn lane group on the approaches of each study intersection. **Table 30** details the results of the analysis. Under General Plan 2040 No Project Conditions, the following lane groups would experience 95th percentile queue lengths exceeding the available storage length:

- 1) Shiloh Rd. & Old Redwood Hwy.

EBR during weekday PM peak hour

NBL during weekday AM and PM, and Saturday midday peak hours

SBR during weekday AM and PM, and Saturday midday peak hours

- 10) Old Redwood Hwy. & US 101 NB Off-ramp/Lakewood Dr.

EBL during weekday PM and Saturday midday peak hours

NBL during weekday PM and Saturday midday peak hours

SBL during weekday AM and PM, and Saturday midday peak hours

Table 30: 95th Percentile Queue Lengths – General Plan 2040 No Project Conditions

#	Study Intersections	Lane Group	Storage Length (ft.)	Number of Lanes	Peak Hour	General Plan 2040 Conditions Queue Length (ft.) [A]
1	Shiloh Rd. & Old Redwood Hwy.	EBL	375	1	AM	361
					PM	345
					Saturday Midday	195
		EBR	140	1	AM	42
					PM	**136**
					Saturday Midday	60
		WBR	50	1	AM	0
					PM	0
					Saturday Midday	0
		NBL	200	1	AM	**602**
					PM	**1105**
					Saturday Midday	**337**
		NBR	100	1	AM	0
					PM	10
					Saturday Midday	2
		SBL	130	1	AM	60
					PM	85
					Saturday Midday	55
		SBR	95	1	AM	**378**
					PM	**209**
					Saturday Midday	**155**

#	Study Intersections	Lane Group	Storage Length (ft.)	Number of Lanes	Peak Hour	General Plan 2040 Conditions Queue Length (ft.) [A]
2	Shiloh Rd. & Hembree Ln.	EBL	-	Trap Lane	AM	134
					PM	342
					Saturday Midday	504
		WBL	-	Trap Lane	AM	65
					PM	171
					Saturday Midday	166
		NBL	-	Trap Lane	AM	65
					PM	173
					Saturday Midday	168
		SBR	-	Trap Lane	AM	526
					PM	516
					Saturday Midday	747
3	US 101 NB Off Ramp & Shiloh Rd.	NBL	-	Trap Lane	AM	681
					PM	571
					Saturday Midday	312
		NBR	265	2	AM	75
					PM	180
					Saturday Midday	132
4	Shiloh Rd. & US 101 SB Off Ramp	SBL	-	Trap Lane	AM	262
					PM	381
					Saturday Midday	168
		SBR	275	1	AM	112
					PM	41
					Saturday Midday	38
6	Conde Ln. and Shiloh Rd.	EBL	90	1	AM	67
					PM	91
					Saturday Midday	54
		WBL	130	1	AM	18
					PM	19
					Saturday Midday	25
		SBR	40	1	AM	22
					PM	44
					Saturday Midday	31
10	US 101 NB Off Ramp/Lakewood Dr. & Old Redwood Hwy.	EBL	155	1	AM	145
					PM	**189**
					Saturday Midday	**244**
		NBL	270	2	AM	173
					PM	**523**
					Saturday Midday	**285**
		SBL	120	1	AM	**163**

#	Study Intersections	Lane Group	Storage Length (ft.)	Number of Lanes	Peak Hour	General Plan 2040 Conditions Queue Length (ft.) [A]
					PM	**256**
					Saturday Midday	**220**
		SBR	-	Trap Lane	AM	510
					PM	317
					Saturday Midday	851
12	US 101 SB On Ramp/US 101 SB Off Ramp & Old Redwood Hwy.	EBR	-	Trap Lane	AM	624
					PM	98
					Saturday Midday	136
		WBL	-	Trap Lane	AM	511
					PM	412
					Saturday Midday	579
		SBL	420	2	AM	172
					PM	313
					Saturday Midday	158

Notes:

1. NBL – Northbound left
2. NBR – Northbound right
3. SBL – Southbound left
4. SBR – Southbound right
5. EBL – Eastbound left
6. EBR – Eastbound right
7. WBL – Westbound left
8. WBR – Westbound right
9. **Bold** indicates unacceptable 95th percentile queue length
10. 95th percentile queue lengths expressed in feet, rounded to the nearest five feet
11. *Average storage per lane, where dual turn lanes provide different storage lengths

12.0 GENERAL PLAN 2040 PLUS ALTERNATIVE A PROJECT CONDITIONS

This analysis scenario presents the impacts of the proposed project at the study intersections and surrounding roadway system. This scenario is identical to General Plan 2040 No Project Conditions, but with the addition of traffic from the proposed Alternative A project. The project trip generation, trip distribution, and trip assignment are identical to those of Existing plus Alternative A Project Conditions and Opening Year 2028 plus Alternative A Project Conditions.

12.1 Intersection Level of Service Analysis – General Plan 2040 plus Alternative A Project Conditions

The intersection LOS analysis results for General Plan 2040 plus Alternative A Project Conditions are summarized in **Table 31**.

Under this scenario, the following intersections **would not be consistent** with level of service standards set by the Town of Windsor and Sonoma County:

- 1) Shiloh Rd. & Old Redwood Hwy. (Weekday AM and PM, and Saturday midday peak hours)
- 2) Shiloh Rd. & Hembree Ln. (Weekday AM and PM, and Saturday midday peak hours)
- 3) Shiloh Rd. & US 101 NB Off Ramp (Weekday AM and PM, and Saturday midday peak hours)
- 5) Shiloh Rd. & Caletti Ave. (Weekday AM and PM, and Saturday midday peak hours)
- 6) Shiloh Rd. & Conde Ln. (Weekday AM and PM peak hours)
- 7) Shiloh Rd. & Casino Entrance 1/Gridley Dr. (Weekday PM and Saturday midday peak hours)
- 8) Old Redwood Hwy. & Casino Entrance 1 (Weekday AM and PM, and Saturday midday peak hours)
- 12) Old Redwood Hwy. & US 101 SB Ramps (Weekday AM and Saturday midday peak hours)

Mitigation Measures

The required mitigation measures under this scenario are as follows. The numbers correspond to the intersections listed above:

- 1) Shiloh Rd. & Old Redwood Hwy

Widen Shiloh Rd. between Caletti Ave. and Gridley Dr. from two lanes to four lanes

Convert split phasing in EB/WB direction to protected phasing

Restripe NB approach to include two exclusive left turn lanes, two through lanes, and one exclusive right turn lane

Restripe SB approach to include one exclusive left turn lane, two through lanes, and one exclusive right turn lane

Restripe EB approach to include one exclusive left turn lane, two through lanes, and one exclusive right turn lane

Restripe WB approach to include one exclusive left turn lane, two through lanes, and one exclusive right turn lane

- 2) Shiloh Rd. & Hembree Ln.

Widen Shiloh Rd. between Caletti Ave. and Gridley Dr. from two lanes to four lanes

Convert split phasing in NB/SB direction to protected phasing

Restripe NB approach to include one exclusive left turn lane and one shared through-right turn lane

Restripe SB approach to include one exclusive left turn lane, one through lane, and two exclusive right turn lanes

Restripe EB approach to include two exclusive left turn lanes, one through lane, and one shared through-right turn lane

Restripe WB approach to include one exclusive left turn lane, one through lane, and one shared through-right turn lane

- 3) Shiloh Rd. & US 101 NB Off Ramp

Widen Shiloh Rd. between Caletti Ave. and Gridley Dr. from two lanes to four lanes

Restripe EB approach to include two through lanes

Restripe WB approach to include two through lanes

- 5) Shiloh Rd. & Caletti Ave.

Widen Shiloh Rd. between Caletti Ave. and Gridley Dr. from two lanes to four lanes

Restripe WB approach to include one exclusive left turn lane and two through lanes

- 6) Shiloh Rd. & Conde Ln.

Optimize signal timing parameters

- 7) Shiloh Rd. & Casino Entrance 1/Gridley Dr.
  - Signalize intersection
  - Provide exclusive eastbound right-turn lane (Storage length of 150 feet and taper length of 75 feet)
- 8) Old Redwood Hwy. & Casino Entrance 1
  - Signalize intersection
  - Provide exclusive northbound right-turn lane (Storage length of 100 feet and taper length of 75 feet)
  - Provide exclusive southbound left-turn lane (Storage length of 50 feet and taper length of 25 feet)
- 9) Shiloh Road & Casino Entrance 3

- Provide exclusive eastbound right-turn lane (Storage length of 200 feet and taper length of 75 feet)

- 12) Old Redwood Hwy. & US 101 SB Ramps
  - Optimize signal timing parameters

With the addition of intersection improvements, all project-related impacts at the above intersections would be mitigated to a level that **would be consistent** with level of service standards set by the Town of Windsor and Sonoma County.

Figures 28 and **29** show lane geometries and projected peak hour turning movement volumes at the study intersections for General Plan 2040 plus Alternative A Project Conditions for weekday a.m. and p.m., and Saturday midday peak hours, respectively. LOS worksheets are provided in the **Appendix K**.

Table 31: Intersection Level of Service Analysis – General Plan 2040 plus Alternative A Project Conditions

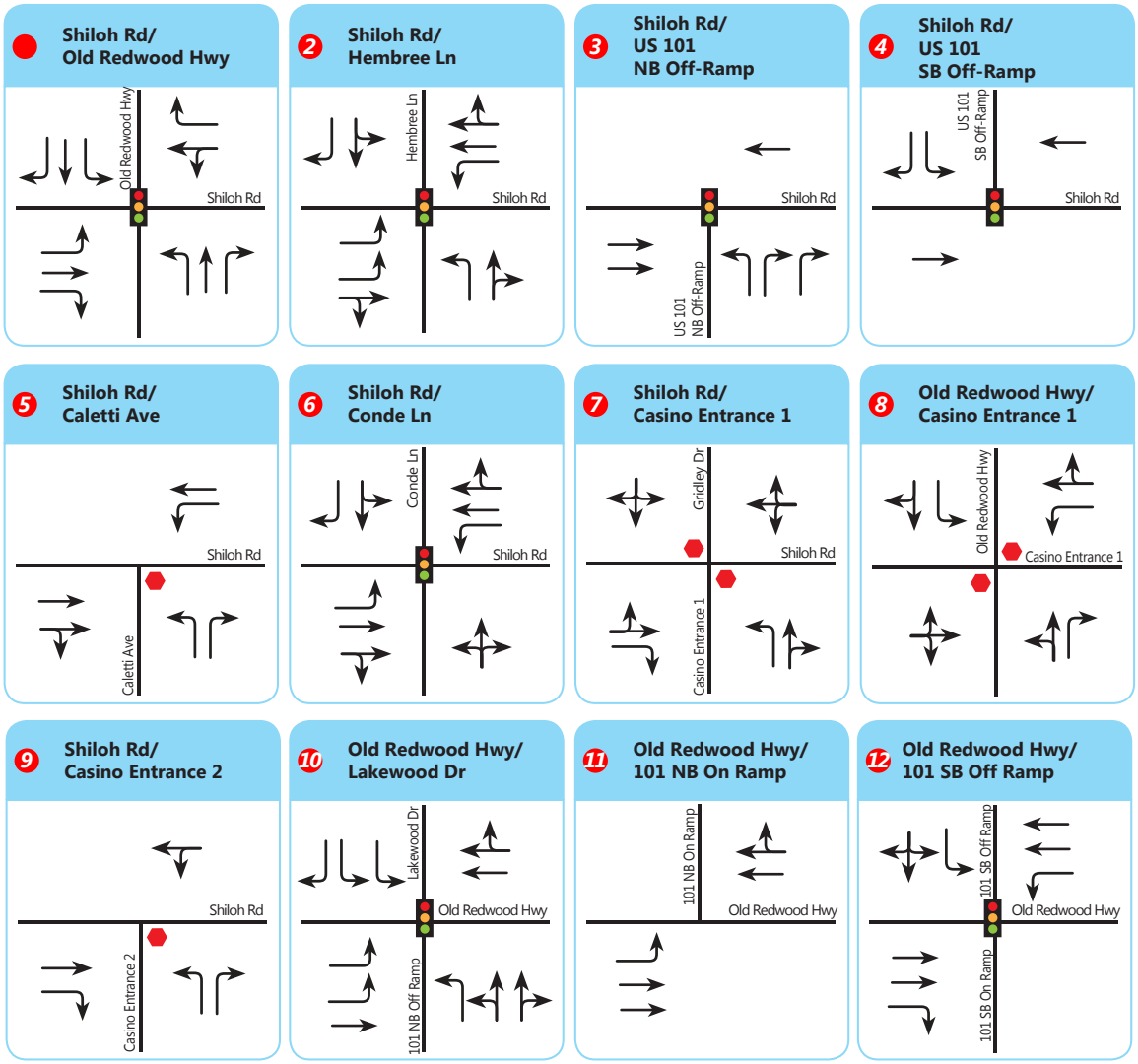
#	Study Intersections	Control	Peak Hour	General Plan 2040 Conditions		General Plan 2040 + Alternative A Project Conditions			General Plan 2040 + Alternative A Project Conditions w/ Mitigations		
				Delay[1]	LOS[2]	Delay[1]	LOS[2]	Change in Delay[6]	Delay	LOS	Change in Delay
1	Shiloh Rd. & Old Redwood Hwy.	Signal	AM	**93.8**	**F**	**133.1**	**F**	39.3	33.0	C	-60.8
			PM	**229.3**	**F**	**367.4**	**F**	138.1	54.9	D	-174.4
			Saturday Midday	26.7	C	**134.7**	**F**	108.0	26.2	C	-0.5
2	Shiloh Rd. & Hembree Ln.	Signal	AM	**64.3**	**E**	**82.2**	**F**	17.9	19.8	B	-44.5
			PM	**56.3**	**E**	**118.7**	**F**	62.4	45.4	D	-10.9
			Saturday Midday	**94.6**	**F**	**177.4**	**F**	82.8	53.6	D	-41.0
3	Shiloh Rd. & US-101 NB Ramps	Signal	AM	**120.3**	**F**	**132.4**	**F**	12.1	43.7	D	-76.6
			PM	37.9	D	**76.7**	**E**	38.8	20.7	C	-17.2
			Saturday Midday	39.0	D	**131.3**	**F**	92.3	25.4	C	-13.6
4	Shiloh Rd. & US-101 SB Ramps	Signal	AM	22.6	C	29.8	C	7.2	-	-	-
			PM	19.4	B	53.8	D	34.4	-	-	-
			Saturday Midday	14.6	B	39.5	D	24.9	-	-	-
5	Shiloh Rd. & Caletti Ave.	OWSC[3]	AM	**79.9**	**F**	**85.7**	**F**	5.8	29.4	D	-50.5
			PM	**98.6**	**F**	**117.4**	**F**	18.8	30.8	D	-67.8
			Saturday Midday	**54.1**	**F**	**65.8**	**F**	11.7	29.0	D	-25.1
6	Shiloh Rd. & Conde Ln.	Signal	AM	**72.0**	**E**	**71.4**	**E**	-0.6	29.3	C	-42.7
			PM	**83.1**	**F**	**81.7**	**F**	-1.4	34.8	C	-48.3
			Saturday Midday	29.9	C	30.6	C	0.7	-	-	-
7	Shiloh Rd. & Casino Entrance 1/Gridley Dr.	TWSC[4]	AM	9.0	A	15.9	C	6.9	-	-	-
			PM	9.9	A	**74.2**	**F**	64.3	9.2	A	-0.7
			Saturday Midday	9.3	A	**89.5**	**F**	80.2	9.1	A	-0.2
8	Old Redwood Hwy. & Casino Entrance	TWSC[4]	AM	**55.7**	**F**	**76.9**	**F**	21.2	6.7	A	-49.0
			PM	**359.3**	**F**	**1836.2**	**F**	1476.9	11.5	B	-347.8
			Saturday Midday	15.8	C	**44.7**	**E**	28.9	8.4	A	-7.4
9	Shiloh Rd. & Casino Entrance 2	OWSC[3]	AM	0.0	A	11.8	B	11.8	-	-	-
			PM	0.0	A	17.8	C	17.8	-	-	-

#	Study Intersections	Control	Peak Hour	General Plan 2040 Conditions		General Plan 2040 + Alternative A Project Conditions			General Plan 2040 + Alternative A Project Conditions w/ Mitigations		
				Delay[1]	LOS[2]	Delay[1]	LOS[2]	Change in Delay[6]	Delay	LOS	Change in Delay
			Saturday Midday	0.0	A	19.3	C	19.3	-	-	-
10	Old Redwood Hwy. & US 101 NB Off Ramp/Lakewood Dr.	Signal	AM	17.9	B	18.0	B	0.1	-	-	-
			PM	33.6	C	36.3	D	2.7	-	-	-
			Saturday Midday	31.6	C	32.5	C	0.9	-	-	-
11	Old Redwood Hwy. & US 101 NB On Ramp	Free	AM	-	-	-	-	-	-	-	-
			PM	-	-	-	-	-	-	-	-
			Saturday Midday	-	-	-	-	-	-	-	-
12	Old Redwood Hwy. & US 101 SB Ramps	Signal	AM	**110.0**	**F**	**110.0**	**F**	0.0	54.7	D	-55.3
			PM	39.6	D	47.6	D	8.0	-	-	-
			Saturday Midday	**58.1**	**E**	**60.4**	**E**	2.3	45.1	D	-13.0

Notes:

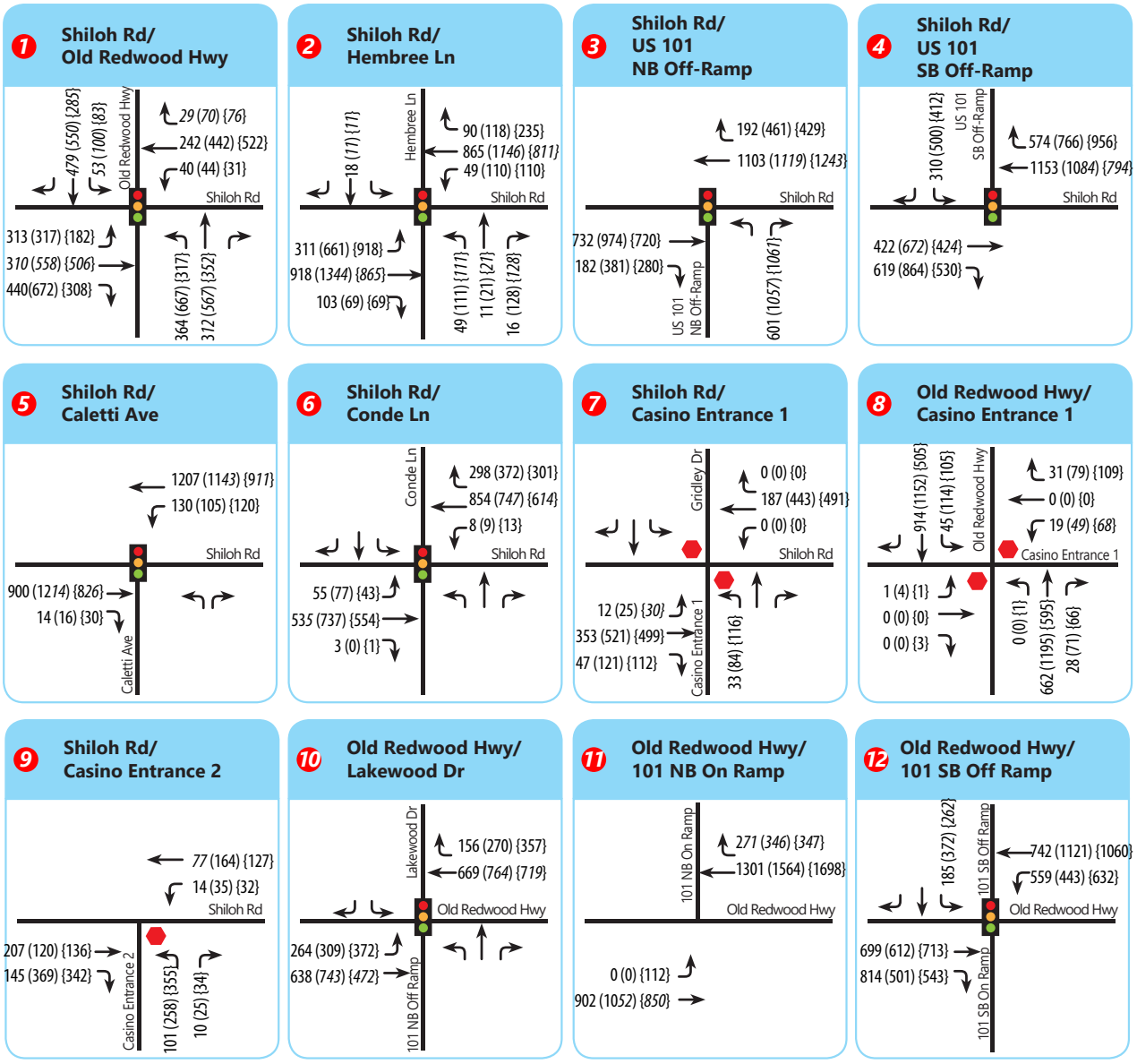
1. Delay – Whole intersection weighted average control delay expressed in seconds per vehicle for signalized and all-way stop controlled intersections. Total control delay for the worst movement is presented for side-street stop – controlled intersections.
2. LOS – Level of Service. **Bold** indicates unacceptable LOS and Delay.
3. OWSC - One Way Stop Control
4. TWSC - Two Way Stop Control
5. For Intersection 2, 4 & 6, LOS and Delay reported using HCM 2000 Methodology as HCM 6th edition does not support Non-NEMA phasing, but for Intersection 2 Cumulative conditions all scenarios are from HCM 6th Edition.
6. For Intersection 9, under Mitigations, LOS and Delay reported using HCM 2000 Methodology.
7. For Intersection 11, there is no delay or LOS as the control is free (there is no stop control or signal control).

Figure 28: Project Lane Geometry General Plan 2040 Plus Alternative A Project Conditions



Project Site
Study Intersection
Study Segment
Stop Sign
Traffic Signal

Figure 29: General Plan 2040 Plus Alternative A Project Conditions Peak Hour Traffic Volumes



LEGEND

Study Intersection	Stop Sign	XX	AM Peak Hour Volumes
Study Segment	Traffic Signal	(XX)	PM Peak Hour Volumes
		{XX}	Saturday Midday Peak Hour Volumes

12.2 Intersection Queuing Analysis – General Plan 2040 plus Alternative A Project Conditions

The 95th percentile queue lengths were calculated for each left-turn lane group and exclusive right-turn lane group on the approaches of each study intersection. **Table 32** details the results of the analysis. Under General Plan 2040 plus Alternative A Project Conditions, the following lane groups would experience 95th percentile queue lengths exceeding the available storage length:

- 1) Shiloh Rd. & Old Redwood Hwy.

EBL during weekday AM and PM peak hours

EBR during weekday AM and PM, and Saturday midday peak hours

NBL during weekday AM and PM, and Saturday midday peak hours

SBL during weekday PM and Saturday midday peak hours

SBR during weekday AM and PM, and Saturday midday peak hours

- 3) Shiloh Rd. & US 101 NB Off-ramp

NBR during weekday PM and Saturday midday peak hours

- 10) Old Redwood Hwy. & US 101 NB Off-ramp/Lakewood Dr.

EBL during weekday PM and Saturday midday peak hours

NBL during weekday PM and Saturday midday peak hours

SBL during weekday AM and PM, and Saturday midday peak hours

Mitigation Measures

At intersection #1, queue overflows can largely be mitigated by restriping to extend storage length as indicated in **Table 32**. The mitigations for LOS described above also include restriping to provide two northbound left turn lanes. At intersection #3, restriping can mitigate the queue overflow. At intersection #10, the project would not create any new queuing impacts. Although intersection #6 would not experience queue overflows under General Plan 2040 plus Project Conditions, the signal retiming associated with LOS mitigations would create new overflows. This can be partially mitigated with restriping, and there is adequate upstream block length to accommodate the queue overflow from the eastbound left turn lane. The detailed required mitigation measures under this scenario are as follows. The numbers correspond to the intersections listed above:

- 1) Restripe EBL to give 425 ft. storage length. Restripe EBR to 200 ft. Restripe SBL to 190 ft. Restripe SBR to 160 ft. Construct TIF project to add second NBL turn lane and WB receiving lane.
- 3) Restripe NBR to give 340 ft. Storage Length.
- 6) Restripe SBR to give 65 ft. storage length.

With the addition of the above listed improvements, all project-related impacts at the impacted intersections would be mitigated to a level that **would be consistent** with queuing standards set by the Town of Windsor and Sonoma County.

Table 32. 95th Percentile Queue Lengths– General Plan 2040 plus Alternative A Project Conditions

#	Study Intersections	Lane Group	Storage Length (ft.) (Mitigated)	Number of Lanes (Mitigated)	Peak Hour	General Plan 2040 Conditions	General Plan 2040 + Alternative A Project Conditions		General Plan 2040 + Alternative A Project Conditions w/Mitigations		Comments
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	
1	Shiloh Rd. & Old Redwood Hwy.	EBL	375 (425)	1	AM	361	**441**	**80**	277	-84	Re-Stripe EBL Storage Length to 425 feet.
					PM	345	**424**	**79**	423	78	
					Saturday Midday	195	236	41	198	3	
		EBR	140 (200)	1	AM	42	**280**	**238**	67	25	Re-Stripe EBR Storage Length to 200 feet.
					PM	**136**	**791**	**655**	189	53	
					Saturday Midday	60	**292**	**232**	51	-9	
		WBL	(200)	(1)	AM				59	-	LOS mitigation requires providing 1 WBL lane at the intersection.
					PM				84	-	
					Saturday Midday				53	-	
		WBR	50	1	AM	0	0	0	0	0	
					PM	0	21	21	28	28	
					Saturday Midday	0	20	20	20	20	
		NBL	200 (430)	1 (2)	AM	**602**	**730**	**128**	184	-418	Add second NBL turn lane and WB receiving lane
					PM	**1105**	**1374**	**269**	426	-679	
					Saturday Midday	**337**	**648**	**311**	179	-158	
		NBR	100	1	AM	0	0	0	0	0	
					PM	10	11	1	15	5	
					Saturday Midday	2	0	-2	0	-2	
		SBL	130 (190)	1	AM	60	126	66	76	16	Re-Stripe SBL Storage Length to 190 feet
					PM	85	**249**	**164**	157	72	
					Saturday Midday	55	**217**	**162**	154	99	
		SBR	95 (160)	1	AM	**378**	**442**	**64**	75	-303	Re-stripe SBR Storage Length to 160 feet
					PM	**209**	**238**	**29**	146	-63	
					Saturday Midday	**155**	**197**	**42**	73	-82	
2		EBL	-	Trap Lane	AM	134	134	0	147	13	

#	Study Intersections	Lane Group	Storage Length (ft.) (Mitigated)	Number of Lanes (Mitigated)	Peak Hour	General Plan 2040 Conditions	General Plan 2040 + Alternative A Project Conditions		General Plan 2040 + Alternative A Project Conditions w/Mitigations		Comments
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	
	Shiloh Rd. & Hembree Ln.				PM	342	342	0	325	-17	
					Saturday Midday	504	522	18	501	-3	
		WBL	-	Trap Lane	AM	65	65	0	56	-9	
					PM	171	171	0	130	-41	
					Saturday Midday	166	171	5	132	-34	
		NBL	-	Trap Lane	AM	65	65	0	56	-9	
					PM	173	173	0	136	-37	
					Saturday Midday	168	173	5	133	-35	
		SBL	(350)	(Trap Lane)					155	-	LOS mitigation requires providing 1 SBL lane at the intersection. Storage length required is 350 feet
									232	-	
									350	-	
		SBR	- ()	Trap Lane (2)	AM	526	559	33	135	-391	
					PM	516	535	19	175	-341	
					Saturday Midday	747	1015	268	345	-402	
3	US 101 NB Off Ramp & Shiloh Rd.	NBL	-	Trap Lane	AM	681	681	0	623	-58	
					PM	571	571	0	456	-115	
					Saturday Midday	312	312	0	342	30	
		NBR	265 (340)	2	AM	75	125	50	121	46	Re-Stripe NBR Storage Length to 340 feet
					PM	180	**411**	**231**	332	152	
					Saturday Midday	132	**351**	**219**	338	206	
4	Shiloh Rd. & US 101 SB Off Ramp	SBL	-	Trap Lane	AM	262	368	106			
					PM	381	638	257			
					Saturday Midday	168	381	213			
		SBR	275	1	AM	112	113	1			
					PM	41	41	0			

#	Study Intersections	Lane Group	Storage Length (ft.) (Mitigated)	Number of Lanes (Mitigated)	Peak Hour	General Plan 2040 Conditions	General Plan 2040 + Alternative A Project Conditions		General Plan 2040 + Alternative A Project Conditions w/Mitigations		Comments
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	
					Saturday Midday	38	47	9			
6	Conde Ln. and Shiloh Rd.	EBL	90	1	AM	67	67	0	87	20	Overflow due to railroad crossing. EBL storage lane cannot be extended, but block length is adequate.
					PM	91	91	0	**161**	**70**	
					Saturday Midday	54	56	2	56	2	
		WBL	130	1	AM	18	18	0	23	5	
					PM	19	19	0	26	7	
					Saturday Midday	25	26	1	26	1	
		SBR	40 (65)	1	AM	22	22	0	30	8	Re-Stripe SBR Storage Length to 65 feet
					PM	44	44	0	64	20	
					Saturday Midday	31	31	0	31	0	
10	US 101 NB Off Ramp/Lakewood Dr. & Old Redwood Hwy.	EBL	155	1	AM	145	145	0			
					PM	**189**	**189**	**0**			
					Saturday Midday	**244**	**244**	**0**			
		NBL	270	2	AM	173	173	0			
					PM	**523**	**523**	**0**			
					Saturday Midday	**285**	**285**	**0**			
		SBL	120	1	AM	**163**	**163**	**0**			
					PM	**256**	**256**	**0**			
					Saturday Midday	**220**	**220**	**0**			
		SBR	-	Trap Lane	AM	510	511	1			
					PM	317	320	3			
					Saturday Midday	851	859	8			
12	US 101 SB On Ramp/US 101 SB	EBR	-	Trap Lane	AM	624	624	0	697	73	
					PM	98	98	0	98	0	

#	Study Intersections	Lane Group	Storage Length (ft.) (Mitigated)	Number of Lanes (Mitigated)	Peak Hour	General Plan 2040 Conditions	General Plan 2040 + Alternative A Project Conditions		General Plan 2040 + Alternative A Project Conditions w/Mitigations		Comments
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	
	Off Ramp & Old Redwood Hwy.				Saturday Midday	136	136	0	203	67	
		WBL	-	Trap Lane	AM	511	511	0	434	-77	
					PM	412	412	0	412	0	
					Saturday Midday	579	579	0	602	23	
		SBL	420	2	AM	172	210	38	282	110	
					PM	313	361	48	361	48	
					Saturday Midday	158	203	45	226	68	

Notes:

1. NBL – Northbound left
2. NBR – Northbound right
3. SBL – Southbound left
4. SBR – Southbound right
5. EBL – Eastbound left
6. EBR – Eastbound right
7. WBL – Westbound left
8. WBR – Westbound right
9. **Bold** indicates unacceptable 95th percentile queue length. **Red** indicates significant impact.
10. 95th percentile queue lengths expressed in feet, rounded to the nearest five feet
11. *Average storage per lane, where dual turn lanes provide different storage lengths

12.3 Fair Share Analysis – General Plan plus Alternative A Project Conditions

Study intersections requiring mitigation under this scenario were evaluated to determine the Project's fair share contribution. For intersections that required mitigation through physical improvements under Existing plus Project Alternative A conditions or Opening Year 2028 plus Alternative A Project Conditions, it is assumed that the project would be fully responsible for the cost of mitigations. **Table 33** shows fair share percentages for each impacted intersection. It should be noted that intersections 2, 3, 4, and 5 would be separately affected by the planned reconstruction of the US-101/Shiloh Road interchange. For the overpass between northbound and southbound ramps on Shiloh Road, the project fair share is 27.4 percent.

Table 33. Fair Share Analysis – Alternative A

#	Study Intersections	Peak Hour	Existing Volume	Project Trips	Cumulative + Project	Total Growth	Project Share	Fair Share Contribution
1	Shiloh Rd. & Old Redwood Hwy.	AM	992	402	2998	2006	20%	**39.4%**
		PM	1515	1025	4296	2781	37%	
		Saturday Midday	1234	1140	2963	1729	66%	
		Total	**3741**	**2567**	**10257**	**6516**	**39.4%**	
2	Shiloh Rd. & Hembree Ln.	AM	1276	355	3129	1853	19%	**36.4%**
		PM	1998	905	4416	2418	37%	
		Saturday Midday	1975	1006	3921	1946	52%	
		Total	**5249**	**2266**	**11466**	**6217**	**36.4%**	
3	Shiloh Rd. & US-101 NB Ramps	AM	1646	355	3574	1928	18%	**37.2%**
		PM	2395	905	4562	2167	42%	
		Saturday Midday	2083	1006	4082	1999	50%	
		Total	**6124**	**2266**	**12218**	**6094**	**37.2%**	
5	Shiloh Rd. & Caletti Ave.	AM	1392	24	2390	998	2%	**5.9%**
		PM	1773	60	2655	882	7%	
		Saturday Midday	1326	67	2026	700	10%	
		Total	**4491**	**151**	**7071**	**2580**	**5.9%**	
6	Shiloh Rd. & Conde Ln.	AM	1174	24	2155	981	2%	**6.3%**
		PM	1654	60	2420	766	8%	
		Saturday Midday	1221	67	1868	647	10%	
		Total	**4049**	**151**	**6443**	**2394**	**6.3%**	
7	Shiloh Rd. & Casino Entrance 1/Gridley Dr.	AM	224	326.4	657.4	433	75%	**Mitigated under Existing and 2028 Conditions**
		PM	259	832	1215	956	87%	
		Saturday Midday	236	925.4	1275.4	1039	89%	
		Total	**719**	**2084**	**3148**	**2429**	**85.8%**	
8	Old Redwood Hwy. & Casino Entrance	AM	534	122.6	910.6	377	33%	**Mitigated under Existing and 2028 Conditions**
		PM	935	313	1694	759	41%	
		Saturday Midday	753	348.6	1459.6	707	49%	
		Total	**2222**	**784**	**4064**	**1842**	**42.6%**	
12	Old Redwood Hwy. & US 101 SB Ramps	AM	1769	28	3143	1374	2%	**5.2%**
		PM	2617	71	3272	655	11%	
		Saturday Midday	2207	66	3323	1116	6%	
		Total	**6593**	**165**	**9738**	**3145**	**5.2%**	

13.0 GENERAL PLAN 2040 PLUS ALTERNATIVE B PROJECT CONDITIONS

This analysis scenario presents the impacts of the proposed project at the study intersections and surrounding roadway system. This scenario is identical to General Plan 2040 No Project Conditions, but with the addition of traffic from the Alternative B project. The project trip generation, trip distribution, and trip assignment are identical to those of Existing plus Alternative B Project Conditions and Opening Year 2028 plus Alternative B Project Conditions.

13.1 Intersection Level of Service Analysis – General Plan 2040 plus Alternative B Project Conditions

The intersection LOS analysis results for General Plan 2040 plus Alternative B Project Conditions are summarized in **Table 34**.

Under this scenario, the following intersections **would not be consistent** with level of service standards set by the Town of Windsor and Sonoma County:

- 1) Shiloh Rd. & Old Redwood Hwy. (Weekday AM and PM, and Saturday midday peak hours)
- 2) Shiloh Rd. & Hembree Ln. (Weekday AM and PM, and Saturday midday peak hours)
- 3) Shiloh Rd. & US 101 NB Off-ramp (Weekday AM and PM, and Saturday midday peak hours)
- 5) Shiloh Rd. & Caletti Ave. (Weekday AM and PM, and Saturday midday peak hours)
- 6) Shiloh Rd & Conde Ln. (Weekday AM and PM peak hours)
- 7) Shiloh Rd. & Casino Entrance West/Gridley Dr. (Weekday PM and Saturday midday peak hours)
- 8) Old Redwood Hwy. & Casino Entrance (Weekday AM and PM, and Saturday midday peak hours)
- 12) Old Redwood Hwy & US 101 SB Ramps (Weekday AM and Saturday midday peak hours)

Mitigation Measures

The required mitigation measures under this scenario are as follows. The numbers correspond to the intersections listed above:

- 1) Shiloh Rd. & Old Redwood Hwy
    - Widen Shiloh Rd. between Caletti Ave. and Gridley Dr. from two lanes to four lanes
    - Convert split phasing in EB/WB direction to protected phasing
    - Restripe NB approach to include two exclusive left turn lanes, two through lanes, and one exclusive right turn lane
    - Restripe SB approach to include one exclusive left turn lane, two through lanes, and one exclusive right turn lane
    - Restripe EB approach to include one exclusive left turn lane, two through lanes, and one exclusive right turn lane

    - Restripe WB approach to include one exclusive left turn lane, two through lanes, and one exclusive right turn lane

- 2) Shiloh Rd. & Hembree Ln.
    - Widen Shiloh Rd. between Caletti Ave. and Gridley Dr. from two lanes to four lanes
    - Convert split phasing in NB/SB direction to protected phasing
    - Restripe NB approach to include one exclusive left turn lane and one shared through-right turn lane
    - Restripe SB approach to include one exclusive left turn lane, one through lane, and two exclusive right turn lanes
    - Restripe EB approach to include two exclusive left turn lanes, one through lane, and one shared through-right turn lane
    - Restripe WB approach to include one exclusive left turn lane, one through lane, and one shared through-right turn lane
- 3) Shiloh Rd. & US 101 NB Off Ramp
    - Widen Shiloh Rd. between Caletti Ave. and Gridley Dr. from two lanes to four lanes
    - Restripe EB approach to include two through lanes
    - Restripe WB approach to include two through lanes
- 5) Shiloh Rd. & Caletti Ave.
    - Widen Shiloh Rd. between Caletti Ave. and Gridley Dr. from two lanes to four lanes
    - Restripe WB approach to include one exclusive left turn lane and two through lanes
- 6) Shiloh Rd. & Conde Ln.
    - Optimize signal timing parameters
- 7) Shiloh Rd. & Casino Entrance 1/Gridley Dr.
    - Signalize intersection
    - Provide exclusive eastbound right-turn lane (Storage length of 150 feet and taper length of 75 feet)
- 8) Old Redwood Hwy. & Casino Entrance 1
    - Signalize intersection
    - Provide exclusive northbound right-turn lane (Storage length of 100 feet and taper length of 75 feet)
    - Provide exclusive southbound left-turn lane (Storage length of 50 feet and taper length of 25 feet)
- 9) Shiloh Road & Casino Entrance 3
    - Provide exclusive eastbound right-turn lane (Storage length of 200 feet and taper length of 75 feet)
- 12) Old Redwood Hwy. & US 101 SB Ramps
    - Optimize signal timing parameters

With the addition of intersection improvements, all project-related impacts at the above intersections would be mitigated to a level that **would be consistent** with level of service standards set by the Town of Windsor and Sonoma County.

Figures 30 and **31** show lane geometries and projected peak hour turning movement volumes at the study intersections for General Plan 2040 plus Alternative B Project Conditions for weekday a.m. and p.m., and Saturday midday peak hours, respectively. LOS worksheets are provided in the **Appendix L**.

Table 34: Intersection Level of Service Analysis – General Plan 2040 plus Alternative B Conditions

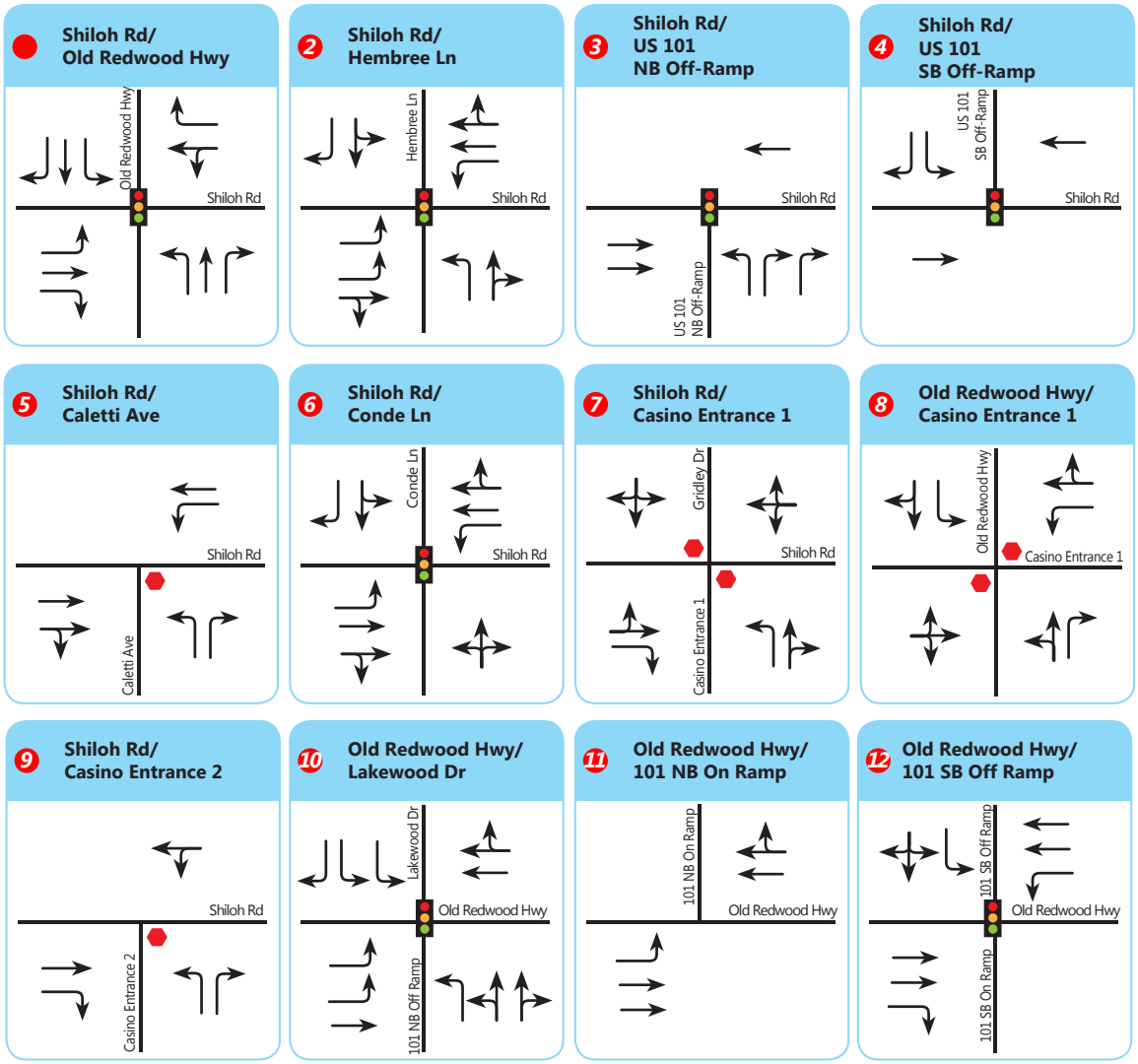
#	Study Intersections	Control	Peak Hour	General Plan 2040 Conditions		General Plan 2040 + Alternative B Project Conditions			General Plan 2040 + Alternative B Project Conditions w/ Mitigations		
				Delay[1]	LOS[2]	Delay[1]	LOS[2]	Change in Delay[6]	Delay	LOS	Change in Delay
1	Shiloh Rd. & Old Redwood Hwy.	Signal	AM	**93.8**	**F**	**133.1**	**F**	39.3	33.0	C	-60.8
			PM	**229.3**	**F**	**336.4**	**F**	107.1	53.5	D	-175.8
			Saturday Midday	26.7	C	**125.3**	**F**	98.6	25.8	C	-0.9
2	Shiloh Rd. & Hembree Ln.	Signal	AM	**64.3**	**E**	**82.2**	**F**	17.9	18.2	B	-46.1
			PM	**56.3**	**E**	**91.9**	**F**	35.6	43.4	D	-12.9
			Saturday Midday	**94.6**	**F**	**166.7**	**F**	72.1	47.4	D	-47.2
3	Shiloh Rd. & US-101 NB Ramps	Signal	AM	**120.3**	**F**	**132.4**	**F**	12.1	43.7	D	-76.6
			PM	37.9	D	**67.8**	**E**	29.9	18.5	B	-19.4
			Saturday Midday	39.0	D	**127.5**	**F**	88.5	23.8	C	-15.2
4	Shiloh Rd. & US-101 SB Ramps	Signal	AM	22.6	C	29.6	C	7.0	-	-	-
			PM	19.4	B	36.2	D	16.8	-	-	-
			Saturday Midday	14.6	B	35.4	D	20.8	-	-	-
5	Shiloh Rd. & Caletti Ave.	OWSC[3]	AM	**79.9**	**F**	**85.7**	**F**	5.8	29.4	D	-50.5
			PM	**98.6**	**F**	**107.3**	**F**	8.7	30.1	D	-68.5
			Saturday Midday	**54.1**	**F**	**65.7**	**F**	11.6	28.9	D	-25.2
6	Shiloh Rd. & Conde Ln.	Signal	AM	**72.0**	**E**	**71.4**	**E**	-0.6	29.3	C	-42.7
			PM	**83.1**	**F**	**82.1**	**F**	-1.0	34.8	C	-48.3
			Saturday Midday	29.9	C	30.6	C	0.7	-	-	-
7	Shiloh Rd. & Casino Entrance 1/Gridley Dr.	TWSC[4]	AM	9.0	A	15.9	C	6.9	-	-	-
			PM	9.9	A	**37.2**	**E**	27.3	9.0	A	-
			Saturday Midday	9.3	A	**73.7**	**F**	64.4	9.1	A	-
8	Old Redwood Hwy. & Casino Entrance	TWSC[4]	AM	**55.7**	**F**	**76.9**	**F**	21.2	6.7	A	-
			PM	**359.3**	**F**	**1047.1**	**F**	687.8	12.2	B	-
			Saturday Midday	15.8	C	**42.4**	**E**	26.6	8.4	A	-
9	Shiloh Rd. & Casino Entrance 2	OWSC[3]	AM	0.0	A	11.8	B	11.8	-	-	-
			PM	0.0	A	14.8	B	14.8	-	-	-
			Saturday Midday	0.0	A	18.6	C	18.6	-	-	-
10	Old Redwood Hwy. & US 101 NB Off Ramp/Lakewood Dr.	Signal	AM	17.9	B	18.0	B	0.1	-	-	-
			PM	33.6	C	35.5	D	1.9	-	-	-
			Saturday Midday	31.6	C	32.5	C	0.9	-	-	-
11	Old Redwood Hwy. & US 101 NB On Ramp	Free	AM	-	-	-	-	-	-	-	-
			PM	-	-	-	-	-	-	-	-
			Saturday Midday	-	-	-	-	-	-	-	-

#	Study Intersections	Control	Peak Hour	General Plan 2040 Conditions		General Plan 2040 + Alternative B Project Conditions			General Plan 2040 + Alternative B Project Conditions w/ Mitigations		
				Delay[1]	LOS[2]	Delay[1]	LOS[2]	Change in Delay[6]	Delay	LOS	Change in Delay
12	Old Redwood Hwy. & US 101 SB Ramps	Signal	AM	**110.0**	**F**	**110.0**	**F**	0.0	54.7	D	-55.3
			PM	39.6	D	44.4	D	4.8	-	-	-
			Saturday Midday	**58.1**	**E**	**60.2**	**E**	2.1	32.2	C	-25.9

Notes:

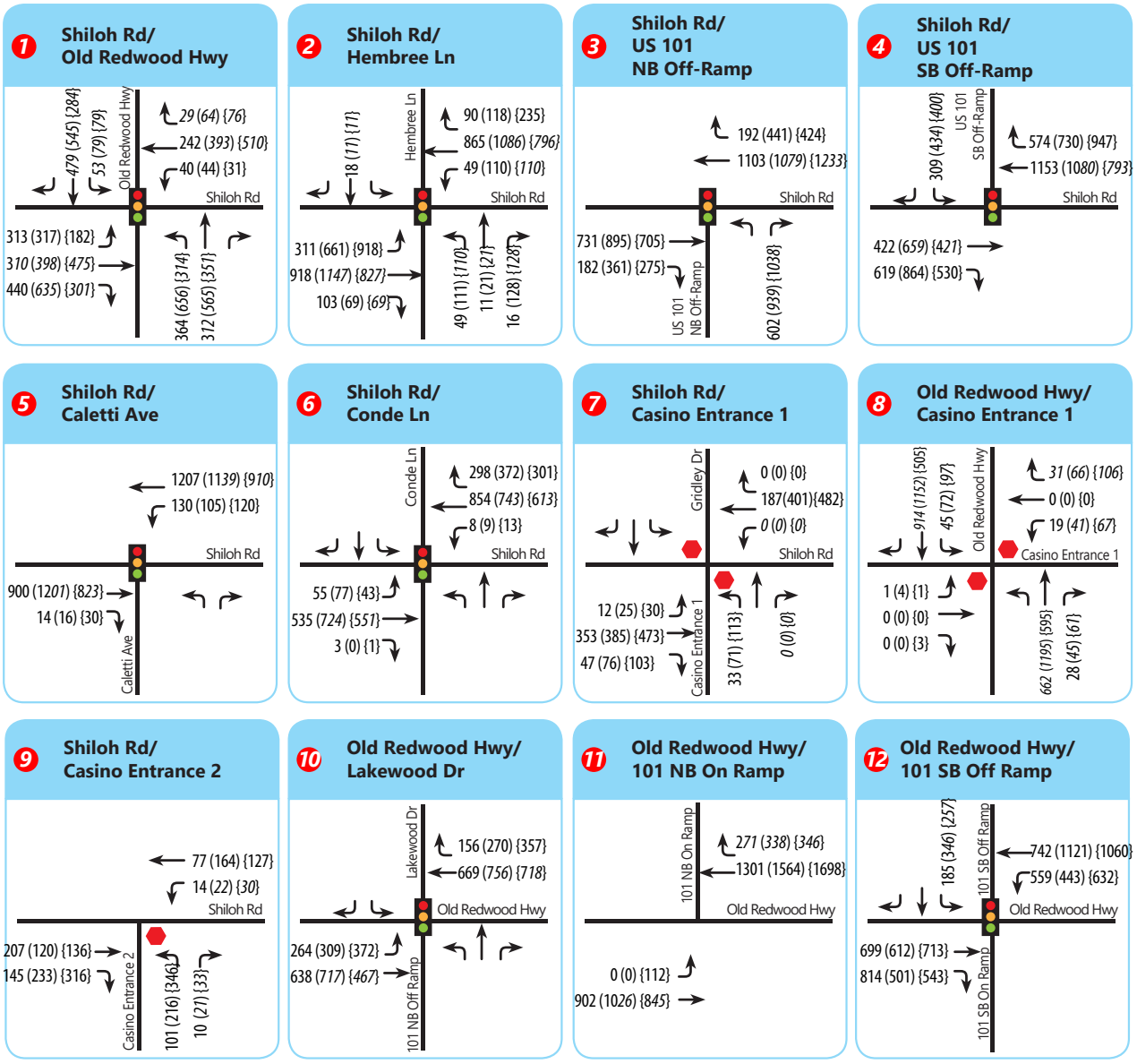
1. Delay – Whole intersection weighted average control delay expressed in seconds per vehicle for signalized and all-way stop controlled intersections. Total control delay for the worst movement is presented for side-street stop – controlled intersections.
2. LOS – Level of Service. **Bold** indicates unacceptable LOS and Delay.
3. OWSC - One Way Stop Control
4. TWSC - Two Way Stop Control
5. For Intersection 2, 4 & 6, LOS and Delay reported using HCM 2000 Methodology as HCM 6th edition does not support Non-NEMA phasing, but for Intersection 2 Cumulative conditions all scenarios are from HCM 6th Edition.
6. For Intersection 9, under Mitigations, LOS and Delay reported using HCM 2000 Methodology.
7. For Intersection 11, there is no delay or LOS as the control is free (there is no stop control or signal control).

Figure 30: Project Lane Geometry General Plan 2040 Plus Alternative B Project Conditions



Project Site
Study Intersection
Study Segment
Stop Sign
Traffic Signal

Figure 31: General Plan 2040 Plus Alternative B Project Conditions Peak Hour Traffic Volumes



LEGEND

- X — Study Intersection
- X — Study Segment
- Stop Sign
- Traffic Signal
- XX — AM Peak Hour Volumes
- (XX) — PM Peak Hour Volumes
- {XX} — Saturday Midday Peak Hour Volumes

N

TJKM

13.2 Intersection Queuing Analysis – General Plan 2040 plus Alternative B Project Conditions

The 95th percentile queue lengths were calculated for each left-turn lane group and exclusive right-turn lane group on the approaches of each study intersection. **Table 35** details the results of the analysis. Under General Plan 2040 plus Alternative B Project Conditions, the following lane groups would experience 95th percentile queue lengths exceeding the available storage length:

- 1) Shiloh Rd. & Old Redwood Hwy.

EBL during weekday AM and PM peak hours

EBR during weekday AM and PM, and Saturday midday peak hours

NBL during weekday AM and PM, and Saturday midday peak hours

SBL during weekday PM and Saturday midday peak hours

SBR during weekday AM and PM, and Saturday midday peak hours

- 3) Shiloh Rd. & US 101 NB Off-ramp

NBR during weekday PM and Saturday midday peak hours

- 10) Old Redwood Hwy. & US 101 NB Off-ramp/Lakewood Dr.

EBL during weekday PM and Saturday midday peak hours

NBL during weekday PM and Saturday midday peak hours

SBL during weekday AM, PM, and Saturday midday peak hours

Mitigation Measures

At intersection #1, queue overflows can largely be mitigated by restriping to extend storage length as indicated in **Table 35**. The mitigations for LOS described above also include restriping to provide two northbound left turn lanes. At intersection #3, restriping can mitigate the queue overflow. At intersection #10, the project would not create any new queuing impacts. Although intersection #6 would not experience queue overflows under General Plan 2040 plus Project Conditions, the signal retiming associated with LOS mitigations would create new overflows. This can be partially mitigated with restriping, and there is adequate upstream block length to accommodate the queue overflow from the eastbound left turn lane. The detailed required mitigation measures under this scenario are as follows. The numbers correspond to the intersections listed above:

- 1) Restripe EBL to give 385 ft. storage length. Restripe SBL to 145 ft. Restripe SBR to 105 ft. Construct TIF project to add second NBL turn lane and WB receiving lane.
- 6) Restripe SBR to give 65 ft. storage length.

With the addition of the above listed improvements, all project-related impacts at the impacted intersections would be mitigated to a level that **would be consistent** with queuing standards set by the Town of Windsor and Sonoma County.

Table 35. 95th Percentile Queue Lengths– General Plan 2040 plus Alternative B Project Conditions

#	Study Intersections	Lane Group	Storage Length (ft.) (Mitigated)	Number of Lanes (Mitigated)	Peak Hour	General Plan 2040 Conditions	General Plan 2040 + Alternative B Project Conditions		General Plan 2040 + Alternative B Project Conditions		Comments
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	
1	Shiloh Rd. & Old Redwood Hwy.	EBL	375 (385)	1	AM	361	**441**	**80**	278	-83	Re-Stripe EBL Storage Length to 385 feet
					PM	345	**424**	**79**	381	36	
					Saturday Midday	195	236	41	196	1	
		EBR	140	1	AM	42	**280**	**238**	68	26	
					PM	**136**	**588**	**452**	132	-4	
					Saturday Midday	60	**274**	**214**	51	-9	
		WBL							59	59	LOS mitigation requires providing 1 WBL lane at the intersection.
									75	75	
									53	53	
		WBR	50	1	AM	0	0	0	0	0	
					PM	0	14	14	16	16	
					Saturday Midday	0	20	20	20	20	
		NBL	200 (430)	1 (2)	AM	**602**	**730**	**128**	182	-420	Add second NBL turn lane and WB receiving lane
					PM	**1105**	**1352**	**247**	428	-677	
					Saturday Midday	**337**	**643**	**306**	175	-162	
		NBR	100	1	AM	0	0	0	0	0	
					PM	10	11	1	0	-10	
					Saturday Midday	2	0	-2	0	-2	
		SBL	130 (145)	1	AM	60	126	66	76	16	Re-Stripe SBL Storage Length to 145 feet
					PM	85	**196**	**111**	116	31	
					Saturday Midday	55	**206**	**151**	143	88	
		SBR	95 (105)	1	AM	**378**	**442**	**64**	75	-303	Re-stripe SBR Storage Length to 105 feet
					PM	**209**	**238**	**29**	102	-107	
					Saturday Midday	**155**	**197**	**42**	73	-82	
2	Shiloh Rd. & Hembree Ln.	EBL	-	Trap Lane	AM	134	134	0	147	13	
					PM	342	342	0	325	-17	

#	Study Intersections	Lane Group	Storage Length (ft.) (Mitigated)	Number of Lanes (Mitigated)	Peak Hour	General Plan 2040 Conditions	General Plan 2040 + Alternative B Project Conditions		General Plan 2040 + Alternative B Project Conditions		Comments
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	
					Saturday Midday	504	522	18	455	-49	
		WBL	-	Trap Lane	AM	65	65	0	56	-9	
					PM	171	171	0	111	-60	
					Saturday Midday	166	171	5	180	14	
		NBL	-	Trap Lane	AM	65	65	0	56	-9	
					PM	173	173	0	136	-37	
					Saturday Midday	168	171	3	132	-36	
		SBL	(1)	(350)					155	155	LOS mitigation requires providing 1 SBL lane at the intersection. Storage length required is 350 feet
									232	232	
									312	312	
		SBR	-	Trap Lane (2)	AM	526	559	33	135	-391	
					PM	516	535	19	173	-343	
					Saturday Midday	747	1012	265	288	-459	
3	US 101 NB Off Ramp & Shiloh Rd.	NBL	-	Trap Lane	AM	681	681	0	623	-58	
					PM	571	571	0	420	-151	
					Saturday Midday	312	312	0	323	11	
		NBR	265 (310)	2	AM	75	125	50	122	47	LOS mitigation requires providing 2 NBR lanes at the intersection. Storage length required is 310 feet
					PM	180	**294**	**114**	207	27	
					Saturday Midday	132	**314**	**182**	306	174	
4	Shiloh Rd. & US 101 SB Off Ramp	SBL	-	Trap Lane	AM	262	367	105			
					PM	381	545	164			
					Saturday Midday	168	366	198			
		SBR	275	1	AM	112	113	1			
					PM	41	41	0			
					Saturday Midday	38	46	8			

#	Study Intersections	Lane Group	Storage Length (ft.) (Mitigated)	Number of Lanes (Mitigated)	Peak Hour	General Plan 2040 Conditions	General Plan 2040 + Alternative B Project Conditions		General Plan 2040 + Alternative B Project Conditions		Comments
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	
6	Conde Ln. and Shiloh Rd.	EBL	90	1	AM	67	67	0	87	20	Overflow due to railroad crossing. EBL storage lane cannot be extended, but block length is adequate.
					PM	91	91	0	**161**	**70**	
					Saturday Midday	54	56	2	56	2	
		WBL	130	1	AM	18	18	0	23	5	
					PM	19	19	0	26	7	
					Saturday Midday	25	26	1	26	1	
		SBR	40 (65)	1	AM	22	22	0	30	8	Re-Stripe SBR Storage Length to 65 feet
					PM	44	44	0	64	20	
					Saturday Midday	31	31	0	31	0	
10	US 101 NB Off Ramp/Lakewood Dr. & Old Redwood Hwy.	EBL	155	1	AM	145	145	0			
					PM	**189**	**189**	**0**			
					Saturday Midday	**244**	**244**	**0**			
		NBL	270	2	AM	173	173	0			
					PM	**523**	**523**	**0**			
					Saturday Midday	**285**	**285**	**0**			
		SBL	120	1	AM	**163**	**163**	**0**			
					PM	**256**	**256**	**0**			
					Saturday Midday	**220**	**220**	**0**			
		SBR	-	Trap Lane	AM	510	511	1			
					PM	317	319	2			
					Saturday Midday	851	859	8			
12	US 101 SB On Ramp/US 101 SB Off Ramp & Old Redwood Hwy.	EBR	-	Trap Lane	AM	624	624	0	697	73	
					PM	98	98	0	75	-23	
					Saturday Midday	136	136	0	204	68	
		WBL	-	Trap Lane	AM	511	511	0	434	-77	
					PM	412	412	0	460	48	

#	Study Intersections	Lane Group	Storage Length (ft.) (Mitigated)	Number of Lanes (Mitigated)	Peak Hour	General Plan 2040 Conditions	General Plan 2040 + Alternative B Project Conditions		General Plan 2040 + Alternative B Project Conditions		Comments
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	
					Saturday Midday	579	579	0	545	-34	
		SBL	420	2	AM	172	210	38	282	110	
					PM	313	348	35	329	16	
					Saturday Midday	158	202	44	235	77	

Notes:

1. NBL – Northbound left
2. NBR – Northbound right
3. SBL – Southbound left
4. SBR – Southbound right
5. EBL – Eastbound left
6. EBR – Eastbound right
7. WBL – Westbound left
8. WBR – Westbound right
9. **Bold** indicates unacceptable 95th percentile queue length. **Red** indicates significant impact.
10. 95th percentile queue lengths expressed in feet, rounded to the nearest five feet
11. *Average storage per lane, where dual turn lanes provide different storage lengths

13.3 Fair Share Analysis – General Plan 2040 plus Alternative B Project Conditions

Study intersections requiring mitigation under this scenario were evaluated to determine the Project's fair share contribution. For intersections that required mitigation through physical improvements under Existing plus Project Alternative B conditions or Opening Year 2028 plus Alternative B Project Conditions, it is assumed that the project would be fully responsible for the cost of mitigations. **Table 36** shows fair share percentages for each impacted intersection. It should be noted that intersections 2, 3, 4, and 5 would be separately affected by the planned reconstruction of the US-101/Shiloh Road interchange. For the overpass between northbound and southbound ramps on Shiloh Road, the project fair share is 26.7 percent.

Table 36. Fair Share Analysis – Alternative B

#	Study Intersections	Peak Hour	Existing Volume	Project Trips	Cumulative + Project	Total Growth	Project Share	Fair Share Contribution
1	Shiloh Rd. & Old Redwood Hwy.	AM	992	402	2998	2006	20%	**36.0%**
		PM	1515	734	4005	2490	29%	
		Saturday Midday	1234	1081	2904	1670	65%	
		Total	**3741**	**2217**	**9907**	**6166**	**36.0%**	
2	Shiloh Rd. & Hembree Ln.	AM	1276	355	3129	1853	19%	**33.1%**
		PM	1998	648	4159	2161	30%	
		Saturday Midday	1975	953	3868	1893	50%	
		Total	**5249**	**1956**	**11156**	**5907**	**33.1%**	
3	Shiloh Rd. & US-101 NB Ramps	AM	1646	355	3574	1928	18%	**33.8%**
		PM	2395	648	4305	1910	34%	
		Saturday Midday	2083	953	4029	1946	49%	
		Total	**6124**	**1956**	**11908**	**5784**	**33.8%**	
5	Shiloh Rd. & Caletti Ave.	AM	1392	24	2390	998	2%	**5.1%**
		PM	1773	43	2638	865	5%	
		Saturday Midday	1326	63	2022	696	9%	
		Total	**4491**	**130**	**7050**	**2559**	**5.1%**	
6	Shiloh Rd. & Conde Ln.	AM	1174	24	2155	981	2%	**5.5%**
		PM	1654	43	2403	749	6%	
		Saturday Midday	1221	63	1864	643	10%	
		Total	**4049**	**130**	**6422**	**2373**	**5.5%**	
7	Shiloh Rd. & Casino Entrance 1/Gridley Dr.	AM	224	326.4	657.4	433	75%	**Mitigated under Existing and 2028 Conditions**
		PM	259	596	979	720	83%	
		Saturday Midday	236	877	1227.4	991	89%	
		Total	**719**	**1800**	**2864**	**2145**	**83.9%**	
8	Old Redwood Hwy. & Casino Entrance	AM	534	123	910.6	377	33%	**39.1%**
		PM	935	224	1605	670	33%	
		Saturday Midday	753	332	1442.6	690	48%	
		Total	**2222**	**678**	**3958**	**1736**	**39.1%**	
12	Old Redwood Hwy. & US 101 SB Ramps	AM	1769	28	3143	1374	2%	**4.3%**
		PM	2617	45	3246	629	7%	
		Saturday Midday	2207	61	3318	1111	5%	
		Total	**6593**	**134**	**9707**	**3114**	**4.3%**	

14.0 GENERAL PLAN 2040 PLUS ALTERNATIVE C PROJECT CONDITIONS

This analysis scenario presents the impacts of the proposed project at the study intersections and surrounding roadway system. This scenario is identical to General Plan 2040 No Project Conditions, but with the addition of traffic from the Alternative C project. The project trip generation, trip distribution, and trip assignment are identical to those of Existing plus Alternative C Project Conditions and Opening Year 2028 plus Alternative C Project Conditions.

14.1 Intersection Level of Service Analysis – General Plan 2040 plus Alternative C Project Conditions

The intersection LOS analysis results for General Plan 2040 plus Alternative C Project Conditions are summarized in **Table 37**.

Under this scenario, the following intersections **would not be consistent** with level of service standards set by the Town of Windsor and Sonoma County:

- 1) Shiloh Rd. & Old Redwood Hwy. (Weekday AM and PM peak hours)
- 2) Shiloh Rd. & Hembree Ln. (Weekday AM and PM, and Saturday midday peak hours)
- 3) Shiloh Rd. & US 101 NB Off-ramp (Weekday AM and Saturday midday peak hours)
- 5) Shiloh Rd. & Caletti Ave. (Weekday AM and PM, and Saturday midday peak hours)
- 6) Shiloh Rd & Conde Ln. (Weekday AM and PM peak hours)
- 8) Old Redwood Hwy. & Project Entrance (Weekday AM and PM peak hours)
- 12) Old Redwood Hwy & US 101 SB Ramps (Weekday AM and Saturday midday peak hours)

Mitigation Measures

The required mitigation measures under this scenario are as follows. The numbers correspond to the intersections listed above:

- 1) Shiloh Rd. & Old Redwood Hwy
    - Widen Shiloh Rd. between Caletti Ave. and Old Redwood Hwy. from two lanes to four lanes
    - Convert split phasing in EB/WB direction to protected phasing
    - Restripe NB approach to include two exclusive left turn lanes, one through lane, and one exclusive right turn lane
    - Restripe SB approach to include one exclusive left turn lane, one through lane, and one exclusive right turn lane
    - Restripe EB approach to include one exclusive left turn lane, one through lane, and one exclusive right turn lane with overlap phasing
    - Restripe WB approach to include one exclusive left turn lane, one through lane, and one exclusive right turn lane

- 2) Shiloh Rd. & Hembree Ln.

    - Widen Shiloh Rd. between Caletti Ave. and Old Redwood Hwy. from two lanes to four lanes
    - Convert split phasing in NB/SB direction to protected phasing
    - Restripe NB approach to include one exclusive left turn lane and one shared through-right turn lane
    - Restripe SB approach to include one exclusive left turn lane, one through lane, and two exclusive right turn lanes
    - Restripe EB approach to include two exclusive left turn lanes, one through lane, and one shared through-right turn lane
    - Restripe WB approach to include one exclusive left turn lane, one through lane, and one shared through-right turn lane
- 3) Shiloh Rd. & US 101 NB Off Ramp
    - Widen Shiloh Rd. between Caletti Ave. and Old Redwood Hwy. from two lanes to four lanes
    - Restripe EB approach to include two through lanes
    - Restripe WB approach to include two through lanes
- 5) Shiloh Rd. & Caletti Ave.
    - Widen Shiloh Rd. between Caletti Ave. and Old Redwood Hwy. from two lanes to four lanes
    - Restripe WB approach to include one exclusive left turn lane and two through lanes
- 6) Shiloh Rd. & Conde Ln.
    - Optimize signal timing parameters
- 8) Old Redwood Hwy. & Project Entrance 1
    - Signalize intersection
    - Provide exclusive southbound left-turn lane (Storage length of 50 feet and taper length of 25 feet)
- 12) Old Redwood Hwy. & US 101 SB Ramps
    - Optimize signal timing parameters

With the addition of intersection improvements, all project-related impacts at the above intersections would be mitigated to a level that **would be consistent** with level of service standards set by the Town of Windsor and Sonoma County.

Figures 32 and **33** show lane geometries and projected peak hour turning movement volumes at the study intersections for General Plan 2040 plus Alternative C Project Conditions for weekday a.m. and p.m., and Saturday midday peak hours, respectively. LOS worksheets are provided in the **Appendix M**.

Table 37: Intersection Level of Service Analysis – General Plan 2040 plus Alternative C Conditions

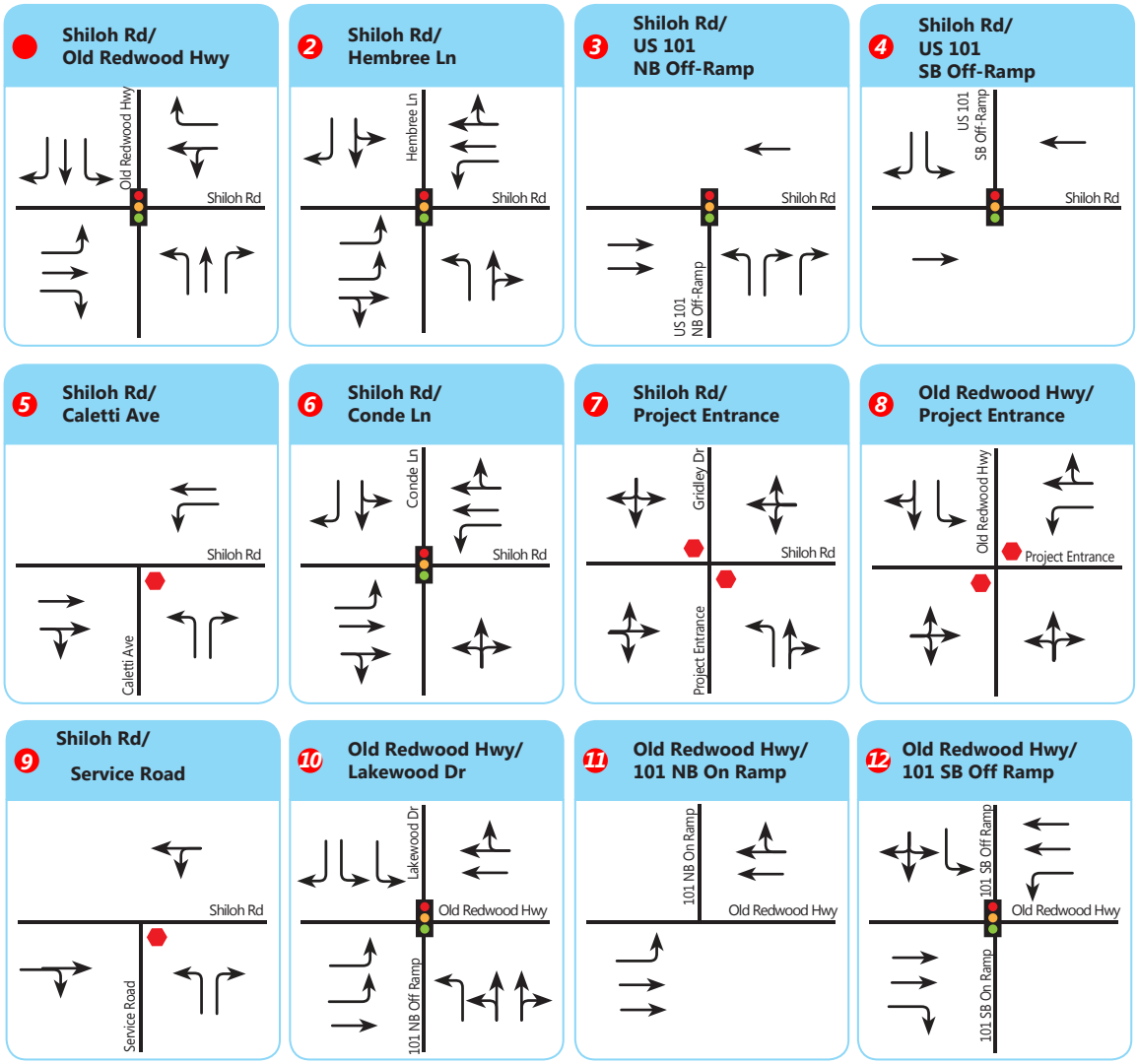
#	Study Intersections	Control	Peak Hour	General Plan 2040 Conditions		General Plan 2040 + Alternative C Project Conditions			General Plan 2040 + Alternative C Project Conditions w/ Mitigation		
				Delay[1]	LOS[2]	Delay[1]	LOS[2]	Change in Delay[6]	Delay[1]	LOS[2]	Change in Delay[6]
1	Shiloh Rd. & Old Redwood Hwy.	Signal	AM	**93.8**	**F**	**105.5**	**F**	11.7	30.8	C	-63.0
			PM	**229.3**	**F**	**250.6**	**F**	21.3	43.1	D	-186.2
			Saturday Midday	26.7	C	38.5	D	11.8	-	-	-
2	Shiloh Rd. & Hembree Ln.	Signal	AM	**64.3**	**E**	**71.0**	**E**	6.7	19.0	B	-45.3
			PM	**56.3**	**E**	**67.7**	**E**	11.4	33.6	C	-22.7
			Saturday Midday	**94.6**	**F**	**108.3**	**F**	13.7	35.2	D	-59.4
3	Shiloh Rd. & US-101 NB Ramps	Signal	AM	**120.3**	**F**	**123.8**	**F**	3.5	40.3	D	-80.0
			PM	37.9	D	43.5	D	5.6	-	-	-
			Saturday Midday	39.0	D	**59.3**	**E**	20.3	13.8	B	-25.2
4	Shiloh Rd. & US-101 SB Ramps	Signal	AM	22.6	C	24.4	C	1.8	-	-	-
			PM	19.4	B	21.3	C	1.9	-	-	-
			Saturday Midday	14.6	B	16.1	B	1.5	-	-	-
5	Shiloh Rd. & Caletti Ave.	OWSC[3]	AM	**79.9**	**F**	**79.9**	**F**	0.0	28.3	D	-51.6
			PM	**98.6**	**F**	**98.7**	**F**	0.1	29.1	D	-69.5
			Saturday Midday	**54.1**	**F**	**58.2**	**F**	4.1	27.3	D	-26.8
6	Shiloh Rd. & Conde Ln.	Signal	AM	**72.0**	**E**	**71.8**	**E**	-0.2	21.6	C	-50.4
			PM	**83.1**	**F**	**82.9**	**F**	-0.2	23.2	C	-59.9
			Saturday Midday	29.9	C	30.1	C	0.2	-	-	-
7	Shiloh Rd. & Casino Entrance 1/Gridley Dr.	TWSC[4]	AM	9.0	A	12.4	B	3.4	-	-	-
			PM	9.9	A	15.0	C	5.1	-	-	-
			Saturday Midday	9.3	A	16.0	C	6.7	-	-	-
8	Old Redwood Hwy. & Casino Entrance	TWSC[4]	AM	**55.7**	**F**	**62.1**	**F**	6.4	5.0	A	-50.7
			PM	**359.3**	**F**	**461.3**	**F**	102.0	10.0	B	-349.3
			Saturday Midday	15.8	C	21.3	C	5.5	-	-	-
9	Shiloh Rd. & Casino Entrance 2	OWSC[3]	AM	0.0	A	-	-	-	-	-	-
			PM	0.0	A						
			Saturday Midday	0.0	A						
10	Old Redwood Hwy. & US-101 NB Ramps/Lakewood Dr.	Signal	AM	17.9	B	17.9	B	0.0	-	-	-
			PM	33.6	C	34.0	C	0.4	-	-	-
			Saturday Midday	31.6	C	31.8	C	0.2	-	-	-
11	Old Redwood Hwy. & US-101 NB Ramps	Free	AM	-	-	-	-	-	-	-	-
			PM	-	-	-	-	-	-	-	-
			Saturday Midday	-	-	-	-	-	-	-	-
12	Old Redwood Hwy. & US-101 SB Ramps	Signal	AM	**110.0**	**F**	**109.9**	**F**	-0.1	53.6	D	-56.4
			PM	39.6	D	40.7	D	1.1	-	-	-
			Saturday Midday	**58.1**	**E**	**58.5**	**E**	0.4	41.5	D	-16.6

Notes:

1. Delay – Whole intersection weighted average control delay expressed in seconds per vehicle for signalized and all-way stop controlled intersections. Total control delay for the worst movement is presented for side-street stop – controlled intersections.
2. LOS – Level of Service. **Bold** indicates unacceptable LOS and Delay.
3. OWSC - One Way Stop Control

4. TWSC - Two Way Stop Control
5. For Intersection 2, 4 & 6, LOS and Delay reported using HCM 2000 Methodology as HCM 6th edition does not support Non-NEMA phasing, but for Intersection 2 Cumulative conditions all scenarios are from HCM 6th Edition.
6. For Intersection 9, under Mitigations, LOS and Delay reported using HCM 2000 Methodology.
7. For Intersection 11, there is no delay or LOS as the control is free (there is no stop control or signal control).

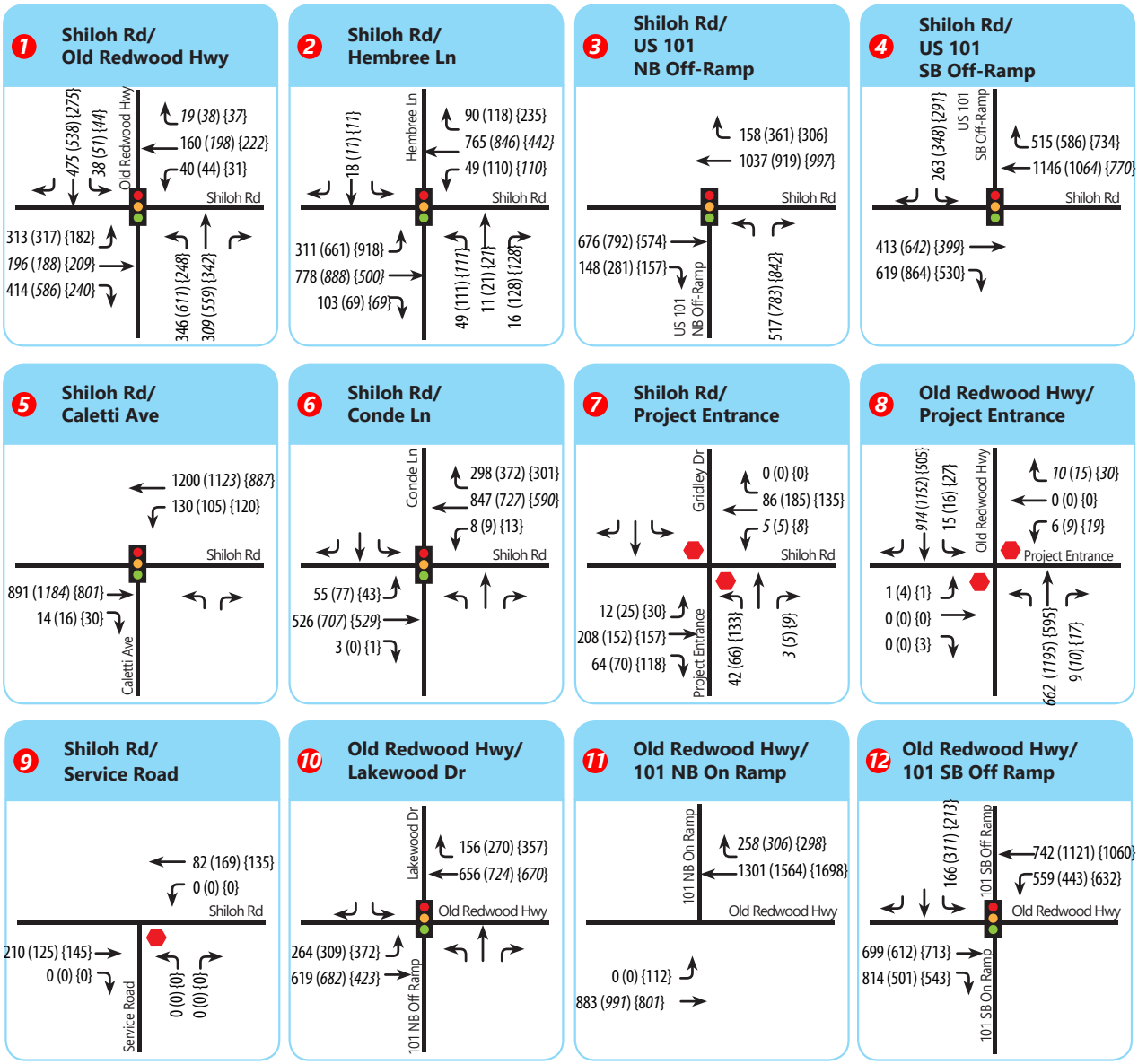
Figure 32: Project Lane Geometry General Plan 2040 Plus Alternative C Project Conditions



Project Site
Study Intersection
Study Segment
Stop Sign
Traffic Signal

N

Figure 33: General Plan 2040 Plus Alternative C Project Conditions Peak Hour Traffic Volumes



LEGEND

- X — Study Intersection
- X — Study Segment
- Stop Sign
- Traffic Signal
- XX — AM Peak Hour Volumes
- (XX) — PM Peak Hour Volumes
- {XX} — Saturday Midday Peak Hour Volumes

14.2 Intersection Queuing Analysis – General Plan 2040 plus Alternative C Project Conditions

The 95th percentile queue lengths were calculated for each left-turn lane group and exclusive right-turn lane group on the approaches of each study intersection. **Table 38** details the results of the analysis. Under General Plan 2040 plus Alternative C Project Conditions, the following lane groups would experience 95th percentile queue lengths exceeding the available storage length:

- 1) Shiloh Rd. & Old Redwood Hwy.

EBL during weekday AM and PM peak hours

EBR during weekday PM peak hours

NBL during weekday AM and PM, and Saturday midday peak hours

SBR during weekday AM and PM, and Saturday midday peak hours

- 10) Old Redwood Hwy. & US 101 NB Off-ramp/Lakewood Dr.

EBL during weekday PM and Saturday midday peak hours

NBL during weekday PM and Saturday midday peak hours

SBL during weekday AM and PM, and Saturday midday peak hours

With mitigation, the project **would be consistent** with the Town of Windsor General Plan standards.

Mitigation Measures

At intersection #1, queue overflows can largely be mitigated by restriping to extend storage length as indicated in **Table 38**. The mitigations for LOS described above also include restriping to provide two northbound left turn lanes. At intersection #10, the project would not create any new queuing impacts. The detailed required mitigation measures under this scenario are as follows. Although intersection #6 would not experience queue overflows under General Plan 2040 plus Project Conditions, the signal retiming associated with LOS mitigations would create new overflows. The numbers correspond to the intersections listed above:

- 1) Restripe EBL to give 405 ft. storage length. Restripe EBR to 180 ft. Restripe SBL to 190 ft. Restripe SBR to 200 ft. Construct TIF project to add second NBL turn lane and WB receiving lane.
- 6) Restripe SBR to give 50 ft. storage length.

With the addition of the above listed improvements, all project-related impacts at the impacted intersections would be mitigated to a level that **would be consistent** with queuing standards set by the Town of Windsor and Sonoma County.

Table 38. 95th Percentile Queue Lengths– General Plan 2040 plus Alternative C Project Conditions

#	Study Intersections	Lane Group	Storage Length (ft.) (Mitigated)	Number of Lanes (Mitigated)	Peak Hour	General Plan 2040 Conditions	General Plan 2040 + Alternative C Project Conditions		General Plan 2040 + Alternative C Project Conditions w/Mitigations		Comments
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	
1	Shiloh Rd. & Old Redwood Hwy.	EBL	375 (405)	1	AM	361	**392**	**31**	382	21	Re-Stripe EBL Storage Length to 405 feet
					PM	345	**388**	**43**	401	56	
					Saturday Midday	195	227	32	206	11	
		EBR	140 (180)	1	AM	42	63	21	179	137	Re-Stripe EBR Storage Length to 180 feet
					PM	**136**	**162**	**26**	144	8	
					Saturday Midday	60	77	17	51	-9	
		WBL		(1)					57	-	
									82	-	
									55	-	
		WBR	50	1	AM	0	0	0	0	0	
					PM	0	0	0	0	0	
					Saturday Midday	0	0	0	0	0	
		NBL	200 (430)	1	AM	**602**	**641**	**39**	186	-416	LOS Mitigation requires providing 2NBL lanes at the intersection. Storage length required is 360 feet per lane.
					PM	**1105**	**1190**	**85**	359	-746	
					Saturday Midday	**337**	**479**	**142**	175	-162	
		NBR	100	1	AM	0	0	0	0	0	
					PM	10	11	1	12	2	
					Saturday Midday	2	1	-1	0	-2	
		SBL	130	1	AM	60	77	17	56	-4	Re-Stripe SBL Storage Length to 190 feet
					PM	85	114	29	91	6	
					Saturday Midday	55	105	50	93	38	
		SBR	95 (200)	1	AM	**378**	**397**	**19**	80	-298	Re-stripe SBR Storage Length to 200 feet
					PM	**209**	**223**	**14**	200	-9	
					Saturday Midday	**155**	**185**	**30**	64	-91	
2		EBL	-	Trap Lane	AM	134	134	0	147	13	

#	Study Intersections	Lane Group	Storage Length (ft.) (Mitigated)	Number of Lanes (Mitigated)	Peak Hour	General Plan 2040 Conditions	General Plan 2040 + Alternative C Project Conditions		General Plan 2040 + Alternative C Project Conditions w/Mitigations		Comments
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	
	Shiloh Rd. & Hembree Ln.	WBL	-	Trap Lane	PM	342	342	0	326	-16	
					Saturday Midday	504	504	0	447	-57	
					AM	65	65	0	56	-9	
					PM	171	171	0	122	-49	
					Saturday Midday	166	166	0	120	-46	
		NBL	-	Trap Lane	AM	65	65	0	56	-9	
					PM	173	173	0	123	-50	
					Saturday Midday	168	168	0	121	-47	
		SBL	(310)	(1)			539	-	155	-	LOS mitigation requires providing 1 SBL lane at the intersection. Storage length required is 310 feet
							529	-	227	-	
							852	-	307	-	
		SBR	-	Trap Lane (2)	AM	526	539	13	119	-407	
					PM	516	529	13	151	-365	
					Saturday Midday	747	852	105	174	-573	
3	US 101 NB Off Ramp & Shiloh Rd.	NBL	-	Trap Lane	AM	681	681	0	612	-69	
					PM	571	571	0	359	-212	
					Saturday Midday	312	312	0	271	-41	
		NBR	265	2	AM	75	90	15	94	19	
					PM	180	203	23	126	-54	
					Saturday Midday	132	175	43	136	4	
4	Shiloh Rd. & US 101 SB Off Ramp	SBL	-	Trap Lane	AM	262	297	35			
					PM	381	419	38			
					Saturday Midday	168	227	59			

#	Study Intersections	Lane Group	Storage Length (ft.) (Mitigated)	Number of Lanes (Mitigated)	Peak Hour	General Plan 2040 Conditions	General Plan 2040 + Alternative C Project Conditions		General Plan 2040 + Alternative C Project Conditions w/Mitigations		Comments
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	
		SBR	275	1	AM	112	113	1			
					PM	41	41	0			
					Saturday Midday	38	41	3			
6	Conde Ln. and Shiloh Rd.	EBL	90	1	AM	67	67	0	72	5	Overflow due to railroad crossing. EBL storage lane cannot be extended, but block length is adequate.
					PM	91	91	0	**96**	5	
					Saturday Midday	54	55	1	65	11	
		WBL	130	1	AM	18	18	0	19	1	
					PM	19	19	0	21	2	
					Saturday Midday	25	25	0	29	4	
		SBR	40 (50)	1	AM	22	22	0	25	3	Re-Stripe SBR Storage Length to 50 feet
					PM	44	44	0	**49**	5	
					Saturday Midday	31	31	0	38	7	
10	US 101 NB Off Ramp/Lakewood Dr. & Old Redwood Hwy.	EBL	155	1	AM	145	145	0			
					PM	**189**	**189**	**0**			
					Saturday Midday	**244**	**244**	**0**			
		NBL	270	2	AM	173	173	0			
					PM	**523**	**523**	**0**			
					Saturday Midday	**285**	**285**	**0**			
		SBL	120	1	AM	**163**	**163**	**0**			
					PM	**256**	**256**	**0**			
					Saturday Midday	**220**	**220**	**0**			
		SBR	-	Trap Lane	AM	510	510	0			
					PM	317	317	0			
					Saturday Midday	851	853	2			

#	Study Intersections	Lane Group	Storage Length (ft.) (Mitigated)	Number of Lanes (Mitigated)	Peak Hour	General Plan 2040 Conditions	General Plan 2040 + Alternative C Project Conditions		General Plan 2040 + Alternative C Project Conditions w/Mitigations		Comments
						Queue Length (ft.) [A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	Queue Length (ft.) [B]	Change in Queue (ft.) [B-A]	
12	US 101 SB On Ramp/US 101 SB Off Ramp & Old Redwood Hwy.	EBR	-	Trap Lane	AM	624	624	0	697	73	
					PM	98	98	0	98	0	
					Saturday Midday	136	136	0	203	67	
		WBL	-	Trap Lane	AM	511	511	0	434	-77	
					PM	412	412	0	412	0	
					Saturday Midday	579	579	0	602	23	
		SBL	420	2	AM	172	184	12	250	78	
					PM	313	325	12	325	12	
					Saturday Midday	158	173	15	187	29	

Notes:

1. NBL – Northbound left
2. NBR – Northbound right
3. SBL – Southbound left
4. SBR – Southbound right
5. EBL – Eastbound left
6. EBR – Eastbound right
7. WBL – Westbound left
8. WBR – Westbound right
9. **Bold** indicates unacceptable 95th percentile queue length. **Red** indicates significant impact.
10. 95th percentile queue lengths expressed in feet, rounded to the nearest five feet
11. *Average storage per lane, where dual turn lanes provide different storage lengths

14.3 Fair Share Analysis – General Plan 2040 plus Alternative C Project Conditions

Study intersections requiring mitigation under this scenario were evaluated to determine the Project's fair share contribution. For intersections that required mitigation through physical improvements under Existing plus Project Alternative C conditions or Opening Year 2028 plus Alternative C Project Conditions, it is assumed that the project would be fully responsible for the cost of mitigations. **Table 39** shows fair share percentages for each impacted intersection. It should be noted that intersections 2, 3, 4, and 5 would be separately affected by the planned reconstruction of the US-101/Shiloh Road interchange. For the overpass between northbound and southbound ramps on Shiloh Road, the project fair share is 9.1 percent.

Table 39. Fair Share Analysis – Alternative C

#	Study Intersections	Peak Hour	Existing Volume	Project Trips	Cumulative + Project	Total Growth	Project Share	Fair Share Contribution
1	Shiloh Rd. & Old Redwood Hwy.	AM	992	130	2726	1734	7%	**13.3%**
		PM	1515	168	3439	1924	9%	
		Saturday Midday	1234	308	2131	897	34%	
		Total	**3741**	**606**	**8296**	**4555**	**13.3%**	
2	Shiloh Rd. & Hembree Ln.	AM	1276	115	2889	1613	7%	**22.7%**
		PM	1998	905	4416	2418	37%	
		Saturday Midday	1975	272	3637	1662	16%	
		Total	**5249**	**1292**	**10942**	**5693**	**22.7%**	
3	Shiloh Rd. & US-101 NB Ramps	AM	1646	115	3334	1688	7%	**25.2%**
		PM	2395	905	4562	2167	42%	
		Saturday Midday	2083	272	3348	1265	22%	
		Total	**6124**	**1292**	**11244**	**5120**	**25.2%**	
5	Shiloh Rd. & Caletti Ave.	AM	1392	8	2374	982	1%	**3.4%**
		PM	1773	60	2655	882	7%	
		Saturday Midday	1326	18	1977	651	3%	
		Total	**4491**	**86**	**7006**	**2515**	**3.4%**	
6	Shiloh Rd. & Conde Ln.	AM	1174	8	2139	965	1%	**3.7%**
		PM	1654	60	2420	766	8%	
		Saturday Midday	1221	18	1819	598	3%	
		Total	**4049**	**86**	**6378**	**2329**	**3.7%**	
7	Shiloh Rd. & Casino Entrance 1/Gridley Dr.	AM	224	106	436.6	213	50%	**77.5%**
		PM	259	832	1215	956	87%	
		Saturday Midday	236	250	600	364	69%	
		Total	**719**	**1188**	**2252**	**1533**	**77.5%**	
8	Old Redwood Hwy. & Casino Entrance	AM	534	39	827.4	293	13%	**29.7%**
		PM	935	313	1694	759	41%	
		Saturday Midday	753	94	1205	452	21%	
		Total	**2222**	**446**	**3726**	**1504**	**29.7%**	
12	Old Redwood Hwy. & US 101 SB Ramps	AM	1769	9	3124	1355	1%	**3.2%**
		PM	2617	71	3272	655	11%	
		Saturday Midday	2207	17	3274	1067	2%	
		Total	**6593**	**97**	**9670**	**3077**	**3.2%**	

15.0 ADDITIONAL ANALYSIS

The following sections provide additional analyses of other transportation issues associated with the project site, including:

- Fair share analysis
- Roadway segment analysis
- Vehicle access and circulation
- Pedestrian and bicycle access and circulation
- Transit access
- Parking analysis
- Recommendations

The analyses in these sections are based on professional judgment in accordance with the standards and methods employed by traffic engineers.

15.1 Roadway Segment Analysis

All study segments were evaluated for changes in weekday average daily traffic (ADT) due to the project. Study segments are shown in **Figure 1 and 5**, existing ADT counts are shown in **Figure 5**. For General Plan 2040 conditions, growth factors for each segment were derived by comparing the growth in adjacent intersection volumes between Existing and 2040 conditions.

The methodology used for estimating daily segment capacity is based on the generalized daily service volumes for signalized highways, published by the Federal Highway Administration ("Simplified Highway Capacity Calculation Method for the Highway Performance Monitoring System", 2017). This simplified methodology is based on the number of lanes, speed limit, percent green time, and daily traffic volumes. As LOS E is typically defined as a maximum volume-to-capacity ratio (V/C) of 1.0, the generalized maximum service volumes for LOS E were used to determine roadway capacity. The V/C criteria used in the analysis are shown in **Table 40**.

Table 40. V/C Criteria

Level of Service	V/C Ratio
LOS A	0.0 -0.60
LOS B	0.61 - 0.70
LOS C	0.71 - 0.80
LOS D	0.81 - 0.90
LOS E	0.91 - 1.00
LOS F	Above 1.00

The results of the analysis, utilizing existing lane geometry, are shown in **Tables 41, 42, and 43**. **Tables 44, 45, and 46** show the effects of proposed intersection mitigations under Existing and Opening Year 2028 Conditions, and widening of Shiloh Road to two lanes in each direction under General Plan 2040 Conditions.

Under Existing Conditions, the portion of Shiloh Road between the US 101 NB ramps and SB ramps operates at an unacceptable LOS E. All other study segments operate at an acceptable LOS. With the addition of project traffic under Alternative A, the portion of Shiloh Road between the US 101 NB ramps and SB ramps degrades to LOS F. Additionally, the section of Shiloh Road between Hembree Lane and Old Redwood Highway degrades from LOS A to unacceptable LOS E. Under Alternative B, the section of Shiloh Road between the US 101 NB ramps and SB ramps degrades to LOS F, while the section of Shiloh Road between Hembree Lane and Old Redwood Highway drops to a still acceptable LOS D. For Alternative C, the section of Shiloh Road between the US 101 NB ramps and SB ramps is also an unacceptable LOS E.

Under Opening Year 2028 Conditions, all study segments operate at an acceptable LOS except the portion of Shiloh Road between the US 101 NB ramps and SB ramps which has an LOS of F. With the addition of Alternative A project traffic, all three Shiloh Road segments degrade to unacceptable levels of service. Under Alternative B, the segment of Shiloh Road between Hembree Lane and Old Redwood Highway operates at an acceptable LOS D while the remaining Shiloh Road segments operate an unacceptable LOS's. For Alternative C, one segment of Shiloh Road between the US 101 SB ramps and the US 101 NB ramps operates at an unacceptable LOS F. All other study segments operate at acceptable LOS's.

For General Plan 2040 Conditions, the segments of Shiloh Road between Conde Lane and the US 101 SB ramps, and between the US 101 SB ramps and the US 101 NB ramps operate at unacceptable LOS F with no project built. All other study segments operate at acceptable LOS's. An additional segment of Shiloh Road between Hembree Lane and Old Redwood Highway degrades to unacceptable LOS F with the addition of traffic from the Alternative A project. The same study segment has an unacceptable LOS E under Alternative B project conditions. The other study segments operates at acceptable LOS's. Finally, under Alternative C project conditions, the segments of Shiloh Road between Conde Lane and the US 101 SB ramps, and between the US 101 SB ramps and the US 101 NB ramps operate at unacceptable LOS F. The remaining study segments operate at acceptable LOS's.

In general, all study segments along Shiloh Road experience the greatest degradations in operating conditions. Although mitigation measures proposed along Shiloh Road would generally not widen the roadway, they would collectively increase the amount of green time allocated to through movements and thus increase lane capacities. Increased green time is taken into account for lane capacities under Existing Conditions with mitigations and Opening Year 2028 Conditions with mitigations, while General Plan 2040 capacity is increased via physical widening without additional changes to assumed capacity per lane. This widening is planned under the Town of Windsor General Plan and Traffic Impact Fee program and assumed to be implemented under mitigated General Plan 2040 Conditions. With these capacity increasing measures taken into account, the project would consistently improve v/c ratios and segment LOS compared to No Project conditions for Existing, Opening Year 2028, and General Plan 2040 Conditions, consistent with the Town of Windsor and Sonoma County standards and plans.

Table 41: Roadway Segment Analysis – Existing Conditions

ID	Roadway Segment	HCM Capacity	Speed Limit	Existing Condition			Existing Plus Alternative A Project Conditions						Existing Plus Alternative B Project Conditions						Existing Plus Alternative C Project Conditions					
				ADT	V/C	LOS	Project Daily Trips	ADT	V/C	LOS	Change in V/C	Percentage Increase in Trips	Project Daily Trips	ADT	V/C	LOS	Change in V/C	Percentage Increase in Trips	Project Daily Trips	ADT	V/C	LOS	Change in V/C	Percentage Increase in Trips
1	Old Redwood Highway, Between Shiloh Road & Kendall Way	22,200	40	10,710	0.48	A	1,121	11,831	0.53	A	0.05	10%	876	11,586	0.52	A	0.04	8%	208	10,918	0.49	A	0.01	2%
2	Old Redwood Highway, Between Shiloh Road & Lafayette Drive	21,700	45	9,931	0.46	A	1,121	11,052	0.51	A	0.05	11%	876	10,807	0.50	A	0.04	9%	208	10,139	0.47	A	0.01	2%
3	Shiloh Road, Between Conde Lane & US-101 SB Ramps	22,200	40	17,535	0.79	C	561	18,096	0.82	D	0.03	3%	438	17,973	0.81	D	0.02	2%	104	17,639	0.79	C	0.00	1%
4	Shiloh Road, Between US-101 SB Ramps & US-101 NB Ramps	22,200	40	21,207	**0.96**	**E**	3,364	24,571	**1.11**	**F**	**0.15**	16%	2,629	23,836	**1.07**	**F**	**0.12**	12%	623	21,830	**0.98**	**E**	**0.03**	3%
5	Shiloh Road, Between Hembree Lane & Old Redwood Highway	22,200	40	10,569	0.48	A	8,410	18,979	0.85	D	0.38	80%	6,572	17,141	0.77	C	0.30	62%	1,559	12,128	0.55	A	0.07	**15%**

Table 42: Roadway Segment Analysis – 2028 Opening Year Conditions

ID	Roadway Segment	HCM Capacity	Speed Limit	2028 Opening Year No Project			2028 Opening Year Plus Alternative A Conditions						2028 Opening Year Plus Alternative B Project Conditions						2028 Opening Year Plus Alternative C Project Conditions					
				ADT	V/C	LOS	Project Daily Trips	ADT	V/C	LOS	Change in V/C	Percentage Increase in Trips	Project Daily Trips	ADT	V/C	LOS	Change in V/C	Percentage Increase in Trips	Project Daily Trips	ADT	V/C	LOS	Change in V/C	Percentage Increase in Trips
1	Old Redwood Highway, Between Shiloh Road & Kendall Way	22,200	40	12,061	0.54	A	1,121	13,182	0.59	A	0.05	9%	876	12,937	0.58	A	0.04	7%	208	12,269	0.55	A	0.01	2%
2	Old Redwood Highway, Between Shiloh Road & Lafayette Drive	21,700	45	11,184	0.52	A	1,121	12,305	0.57	A	0.05	10%	876	12,060	0.56	A	0.04	8%	208	11,392	0.52	A	0.01	2%
3	Shiloh Road, Between Conde Lane & US-101 SB Ramps	22,200	40	19,747	0.89	D	561	20,308	**0.91**	**E**	**0.03**	3%	438	20,185	**0.91**	**E**	**0.02**	2%	104	19,851	0.89	D	0.00	1%
4	Shiloh Road, Between US-101 SB Ramps & US-101 NB Ramps	22,200	40	23,883	**1.08**	**F**	3,364	27,246	**1.23**	**F**	**0.15**	14%	2,629	26,511	**1.19**	**F**	**0.12**	11%	623	24,506	**1.10**	**F**	**0.03**	3%
5	Shiloh Road, Between Hembree Lane & Old Redwood Highway	22,200	40	11,902	0.54	A	8,410	20,312	**0.91**	**E**	**0.38**	**71%**	6,572	18,475	0.83	D	0.30	**55%**	1,559	13,461	0.61	B	0.07	**13%**

Table 43: Roadway Segment Analysis – General Plan 2040 Conditions

ID	Roadway Segment	HCM Capacity	Speed Limit	General Plan 2040 No Project Conditions			General Plan 2040 Plus Alternative A Conditions						General Plan 2040 Alternative B Project Conditions						General Plan 2040 Alternative C Project Conditions					
				ADT	V/C	LOS	Project Daily Trips	ADT	V/C	LOS	Change in V/C	Percentage Increase in Trips	Project Daily Trips	ADT	V/C	LOS	Change in V/C	Percentage Increase in Trips	Project Daily Trips	ADT	V/C	LOS	Change in V/C	Percentage Increase in Trips
1	Old Redwood Highway, Between Shiloh Road & Kendall Way	22,200	40	15,297	0.69	B	1,121	16,418	0.74	C	0.05	7%	876	16,173	0.73	C	0.04	6%	208	15,504	0.70	B	0.01	1%
2	Old Redwood Highway, Between Shiloh Road & Lafayette Drive	21,700	45	14,184	0.65	A	1,121	15,305	0.71	C	0.05	8%	876	15,060	0.69	B	0.04	6%	208	14,392	0.66	B	0.01	1%
3	Shiloh Road, Between Conde Lane & US-101 SB Ramps	22,200	40	25,044	**1.13**	**F**	561	25,605	**1.15**	**F**	**0.03**	2%	438	25,482	**1.15**	**F**	**0.02**	2%	104	25,148	**1.13**	**F**	**0.00**	0%
4	Shiloh Road, Between US-101 SB Ramps & US-101 NB Ramps	22,200	40	30,289	**1.36**	**F**	3,364	33,653	**1.52**	**F**	**0.15**	11%	2,629	32,918	**1.48**	**F**	**0.12**	9%	623	30,912	**1.39**	**F**	**0.03**	2%
5	Shiloh Road, Between Hembree Lane & Old Redwood Highway	22,200	40	15,095	0.68	A	8,410	23,505	**1.06**	**F**	**0.38**	**56%**	6,572	21,667	**0.98**	**E**	**0.30**	**44%**	1,559	16,654	0.75	C	0.07	**10%**

Table 44: Roadway Segment Analysis **– Existing Conditions with Mitigations**

ID	Roadway Segment	HCM Capacity with Proposed Mitigations	Speed Limit	Existing Condition			Existing Plus Alternative A Project Conditions_Mitigation						Existing Plus Alternative B Project Conditions_Mitigation						Existing Plus Alternative C Project Conditions_Mitigation					
				ADT	V/C	LOS	Project Daily Trips	ADT	V/C	LOS	Change in V/C	Percentage Increase in Trips	Project Daily Trips	ADT	V/C	LOS	Change in V/C	Percentage Increase in Trips	Project Daily Trips	ADT	V/C	LOS	Change in V/C	Percentage Increase in Trips
4	Shiloh Road, Between US-101 SB Ramps & US-101 NB Ramps	30,800	40	21,207	0.69	B	3,364	24,571	0.80	C	0.11	16%	2,629	23,836	0.77	C	0.09	12%	623	21,830	0.71	C	0.02	3%

Table 45: Roadway Segment Analysis – 2028 Opening Year Conditions with Mitigations

ID	Roadway Segment	HCM Capacity with Proposed Mitigations	Speed Limit	2028 Opening Year No Project			2028 Opening Year Plus Alternative A Conditions_Mitigation						2028 Opening Year Plus Alternative B Project Conditions_Mitigation						2028 Opening Year Plus Alternative C Project Conditions_Mitigation					
				ADT	V/C	LOS	Project Daily Trips	ADT	V/C	LOS	Change in V/C	Percentage Increase in Trips	Project Daily Trips	ADT	V/C	LOS	Change in V/C	Percentage Increase in Trips	Project Daily Trips	ADT	V/C	LOS	Change in V/C	Percentage Increase in Trips
3	Shiloh Road, Between Conde Lane & US-101 SB Ramps	30,800	40	19,747	0.64	B	561	20,308	0.66	B	0.02	3%	438	20,185	0.66	B	0.01	2%	-	-	-	-	-	-
4	Shiloh Road, Between US-101 SB Ramps & US-101 NB Ramps	30,800	40	23,883	0.78	C	3,364	27,246	0.88	D	**0.11**	14%	2,629	26,511	0.86	D	0.09	11%	623	24,506	0.80	C	0.02	3%
5	Shiloh Road, Between Hembree Lane & Old Redwood Highway	30,800	40	11,902	0.39	A	8,410	20,312	0.66	B	0.27	**71%**	-	-	-	-	-	**-**	-	-	-	-	-	**-**

Table 46: Roadway Segment Analysis – General Plan 2040 Conditions with Mitigations

ID	Roadway Segment	HCM Capacity with Proposed Mitigations	Speed Limit	General Plan 2040 No Project Conditions			General Plan 2040 Plus Alternative A Conditions_Mitigation						General Plan 2040 Alternative B Project Conditions_Mitigation						General Plan 2040 Alternative C Project Conditions_Mitigation					
				ADT	V/C	LOS	Project Daily Trips	ADT	V/C	LOS	Change in V/C	Percentage Increase in Trips	Project Daily Trips	ADT	V/C	LOS	Change in V/C	Percentage Increase in Trips	Project Daily Trips	ADT	V/C	LOS	Change in V/C	Percentage Increase in Trips
3	Shiloh Road, Between Conde Lane & US-101 SB Ramps	49,300	40	25,044	0.51	A	561	25,605	0.52	A	0.01	2%	438	25,482	0.52	A	0.01	2%	104	25,148	0.51	A	0.00	0%
4	Shiloh Road, Between US-101 SB Ramps & US-101 NB Ramps	49,300	40	30,289	0.61	B	3,364	33,653	0.68	B	0.07	11%	2,629	32,918	0.67	B	0.05	9%	623	30,912	0.63	B	0.01	2%
5	Shiloh Road, Between Hembree Lane & Old Redwood Highway	49,300	40	15,095	0.31	A	8,410	23,505	0.48	A	0.17	**56%**	6,572	21,667	0.44	A	0.13	**44%**	1,559	-	-	-	-	**-**

15.2 Site Access, Circulation, and Parking

This section analyzes site access and internal circulation based on the site plans presented in **Figures 2, 3** and **4**. Access and circulation are similar for all alternatives as they have a similar basic footprint within the overall site.

Vehicle Access and Circulation

As shown in the site plans, Alternatives A and B of the proposed project would construct full access driveways at three locations: one driveway on Old Redwood Highway approximately 650 feet (ft.) south of Shiloh Road, and two driveways on Shiloh Road, approximately 500 ft. and 2,600 ft. east of Old Redwood Highway. Alternative C would construct only two driveways by excluding the second driveway on Shiloh Road approximately 2,600 ft. east of Old Redwood Highway. The proposed driveway on Old Redwood Highway (Study intersection 8) would be aligned with an existing (entrance-only) driveway at Shiloh Neighborhood Church (5901 Old Redwood Highway). The western driveway on Shiloh Road (Study intersection 7) would be aligned with Gridley Drive. The eastern driveway on Shiloh Road (Study intersection 9) would expand an existing driveway into the project site, located at 222 E. Shiloh Road.

The Old Redwood Road entrance is expected to require signalization. This location would serve arrivals and departures from Old Redwood Road both south and north of the driveway and also could be used by visitors arriving from the Shiloh Road/US 101 interchange to the west. Once on-site, visitors could drive to the main entrance drop off area, or drive to the rear of the site to reach the main parking areas, including a garage. Those that choose to drive initially to the drop off area at the main entrance, will likely proceed to the parking area at the rear of the site by using the loop road, which connects the Old Redwood Highway access point, provides access to the parking area, and proceeds to the eastern access point. Some patrons will arrive by bus. Buses also have a drop off area at the main entrance where all passengers will be discharged. Parking for buses is located along the loop road.

The western access point on Shiloh Road is aligned with Gridley Drive located about 500 feet east of the Old Redwood Road intersection. That intersection is expected to be signalized. The portion of Shiloh Road between the two signalized intersections is expected to require two through lanes in each direction. The new signal would require two through lanes and one left turn lane on the westbound approach. The eastbound approach should have two through lanes, one left turn lane and one right turn lane. The northbound approach leaving the casino should have two left turn lanes and one combination through right lane. The existing single lane southbound approach will suffice.

The entrance to the site from this entrance leads directly to a large traffic circle. The traffic circle provides a direct connection to the main casino entrance where motorists may drop off their passengers before proceeding to the parking areas behind the main casino. The hotel lobby and event center are also served by the passenger drop off area.

The third access point is located at the far eastern edge of the site. It provides direct access to the loop road which serves the surface and garage parking located to the east of the casino. There is a direct bridged pedestrian connection to the casino floor and to the hotel rooms from the parking areas. It is expected that many of the patrons will use the bridge access to the parking areas to exit the site, either by using the east access to Shiloh Road or to exit via the loop road to the west, using the Old Redwood Highway exit. The loop road intersection with Shiloh Road will be controlled by a single stop sign stopping the northbound loop road traffic. The exit lane should have one left turn lane and one right turn lane. The eastbound approach should be equipped with one right turn lane in addition to the existing single lanes in each direction on Shiloh Road.

Pedestrian and Bicycle Access and Circulation

With some exceptions, the areas near the proposed casino are generally lacking sidewalks. The exceptions are the residential area on the north side of Shiloh Road opposite the proposed site, sections of the east side of Old Redwood Highway north of Shiloh Road, and areas on the north side of Shiloh Road near Hembree Lane. Generally the area is semi-rural with no sidewalks and in some cases very poor pedestrian conditions. The site is not proposing sidewalks along its frontages. However, pedestrian facilities should be provided at the two new traffic signals to provide a connection with the sidewalks on the north side of Shiloh and the urban features on the west side of Old Redwood Highway near the future signals at the church. TJKM also recommends constructing continuous, accessible pedestrian paths between the nearest bus stops, the project access points closest to Shiloh Road & Old Redwood Highway, and the nearest project entrances. The Town of Windsor Traffic Impact Fee proposes sidewalks, curbs and gutters and bicycle lanes on the future 5-lane widening of Shiloh Road. The Town General Plan also proposes Class II Bicycle lanes on both sides of Shiloh Road and Old Redwood Highway near the project. Both streets already have long sections of existing Class II Bicycle Lanes west and north of the project.

Transit Access

Sonoma County Transit (SCT) serves the project area. Route 60 mostly travels along Old Redwood Highway between Cloverdale and Santa Rosa on headways varying between one to two hours. There is an existing pair of stops adjacent to the corner of Shiloh Road and Old Redwood Highway. With the addition of accessible pedestrian pathways between the stops and the project entrances, this route has the potential to serve employees and patrons in the Old Redwood Highway corridor. The bus line has **adequate** capacity to accommodate the additional traffic from the proposed project.

15.3 Parking

The project proposes to supply significant parking for customers and employees. Parking calculations are based on combining the requirements for hotel, dining, event center and casino uses. The proposed breakdowns of parking requirements for Alternative A are as follows:

- Hotel – One space per room and one space per manager. Total = 400 + 40 or 440 stalls.
- Dining – One space/ 60 feet of dining area. 51,440 square feet requires 857 stalls

- Event Center – One space/ 4 seats or one per 75 square feet, whichever is greater. 53,380 square feet/75 requires 712 stalls.
- Casino – One space per table game. 3,110 games require 3,110 stalls.

Total stalls required are 440+857+712+3,110 = 5,119. This is the number proposed to be provided. This would seem to be a generous supply considering the overlap of users and the low likelihood of simultaneous capacity utilization of all four components.

The Alternative B site has fewer hotel rooms and no event center. Its total parking requirement is 4,461 parking stalls.

15.4 Recommendations

TJKM recommends the following:

- Implement the recommended intersection and segment improvements to mitigate project-related impacts on the surrounding transportation network.
- Provide concrete sidewalks, marked crosswalks at the proposed project driveways to connect with existing and planned pedestrian facilities along Shiloh Road and Old Redwood Highway.
- Provide continuous, accessible pedestrian pathways between the nearby transit stops and project entrances.
- Provide pedestrian and bicycle facilities between the proposed project's driveways and the project's main facilities to improve on-site pedestrian and bicycle circulation.