

Appendix I

**US 50/South Shore Community
Revitalization (Stateline) Project –
Caltrans Project Report Traffic
Operations Analysis Update**

Technical Memorandum



Draft

Project Development Team

To: Caltrans District 3 – John Holder, Damion Farley
Nevada Department of Transportation (NDOT) – Bill Glaser
Tahoe Transportation District (TTD) – Russ Nygaard
Tahoe Regional Planning Agency (TRPA) – Keith Norberg

Cc: Wood Rodgers, Inc. – Mark Rayback, Steven Robinson

From: Wood Rodgers, Inc. – Nawid Nessar, PE, TE, Mario Tambellini, EIT

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Project #: WR #: 8436.001

RE: US 50 South Shore Community Revitalization (Stateline) Project – Caltrans *Project Report*
Traffic Operations Analysis Update

INTRODUCTION & BACKGROUND

A Traffic Operations Analysis (TOA) memorandum (Wood Rodgers, dated 4/15/2009) was originally completed in support of the *Project Study Report* (PSR, approved by Caltrans District 3 in June 2010) phase for the construction of improvements to the segment of the US Highway 50 (US 50) corridor between Pioneer Trail and Lake Parkway, in/through the Stateline area. The *Project Approval and Environmental Documentation* (PA&ED) phase was subsequently initiated by Tahoe Transportation District (TTD) in September 2010 to prepare the Environmental Document and the Caltrans *Project Report* (PR) for the project. As part of the PR phase, a technical memorandum (Wood Rodgers, dated September 2010) was completed, that presented the results of Wood Rodgers' review of study area traffic trends between year 2007-2008 (existing conditions' year used in the PSR) and year 2009-2010 (existing conditions' year at the time the PR was initiated). The September 2010 Memorandum determined that the traffic operations analysis originally performed in the PSR phase was still reflective of existing conditions. A Traffic Operations Supplement (dated 01/25/2012) was also issued that evaluated design year (year 2035) traffic operations for the single project "build" alternative that was under active consideration at the time. The January 2012 Supplement was prepared in order to analyze two project "build" alternatives that had been updated/modified since the PSR phase under the then design year of 2035 only. Subsequently, a technical memorandum dated (12/14/2012) was issued that summarized Wood Rodgers' review and analysis of the latest 2012 traffic volumes, and presented a comprehensive update to existing counts and future-year traffic forecasts and traffic operations. The December 2012 Memorandum was prepared in order to reanalyze all proposed project alternatives using updated year 2012 existing (at the time) and future year forecast traffic volumes.

This current technical memorandum was prepared in order to summarize traffic operations under updated project alternatives that have been proposed as of January 2016, as well as comprehensively update all elements of analysis completed since the PSR phase. This memorandum includes the following elements:

- A discussion of current/recent and historical traffic/transportation conditions within the study area.

- Existing (or 2015 base year) conditions traffic operational analysis for study intersections and roadway/highway segments.
- A traffic safety (i.e. accident data) analysis for existing study facilities.
- An “Existing (2015) plus Project” conditions analysis in order to support a CEQA evaluation.
- A discussion of Year 2020 (interim future year or “project opening day”) traffic volume forecasts, and year 2020 traffic operational analysis with and without project improvements in place.
- A discussion of Year 2040 (i.e., 20-year design) traffic volume forecasts, and Year 2040 traffic operational analysis both with and without the proposed project improvement alternatives.

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CURRENT SETTING

The study area consists of the Tahoe South Shore “Stateline” area located on the border between the States of California and Nevada. The 1.1 mile-long corridor encompasses the casinos in the Stateline area, the Heavenly Village Redevelopment area, as well as adjacent commercial, lodging, and residential areas. The study area is defined by the following boundary points:

- US 50, 1,800 feet west of its intersection with Pioneer Trail
- Pioneer Trail, 1,400 feet south of its intersection with US 50
- The “Loop Road,” consisting of Pine Boulevard to the west and Lake Parkway to the east.
- US 50, 200 feet north of its intersection with Kingsbury Grade (Nevada State Route 207)

EXISTING TRANSPORTATION FACILITIES

US Highway 50 is a State and trans-continental highway that traverses east-west through the study area. Caltrans District 3’s *US 50 Transportation Concept Report and Corridor System Management Plan (June, 2014)* categorizes the study segment of US 50 as a “4-lane conventional urban arterial with a center turn lane”. The US 50 study corridor segment is functionally classified as a “Freeway & Expressway” (F&E) and Terminal Access Route. The corridor is considered a National Highway System (NHS) route and an Interregional Road System (IRRS) route, but not a scenic route or lifeline route. Regionally, US 50 connects the Sacramento metropolitan region in the State of California to Carson City in the State of Nevada and beyond. Within the Project area, US 50 is a four-lane arterial with a continuous two-way left-turn median lane that transitions to dedicated left-turn pockets at major intersections. During peak-hours in the winter and summer seasons, the US 50 corridor operates at near-capacity conditions in and around the casino core, resulting in long queues. As this area becomes congested during peak time periods, there is a known propensity by travelers to divert along the local street network to bypass congestion that occurs along the US 50 corridor. This typically prevents the corridor from attaining full operational failure (identified as the formation of extensive queuing to the east and west of the casino core area).

Figure 1 – Existing Eastbound US 50 Queuing West of Pioneer Trail (Looking West)

(Source: Google Maps, May 2015)



Long queues on eastbound US 50 heading into the casino core are very common. May 2015 conditions shown; queues are longer during summer.

US 50 intersections are traffic signal-controlled at Kingsbury Grade (Nevada State Route 207), Lake Parkway, Stateline Avenue, Friday Avenue, Park Avenue, Pioneer Trail, and Ski Run Boulevard, as well as at other intersections east and west of the study area. A traffic signal with pedestrian-activated scramble phase also exists along US 50 between the CVS Pharmacy / Montbleu Resort and the Hard Rock Casino and Resort. Based on a review of Caltrans 2014 traffic count data, the US 50 segment east of Pioneer Trail and west of Park Avenue experiences annual average daily traffic (AADT) of 27,500 vehicles and a peak month ADT of 34,500 vehicles. Based on 2014 NDOT traffic counts, the AADT on US 50 was 21,500 vehicles approximately 300 feet east of the California-Nevada border. This technical memorandum considers US 50 an east-west roadway.

Pioneer Trail is a two-lane arterial that connects US 50 in Meyers to US 50 (Lake Tahoe Boulevard) near Stateline. Within the study area, Pioneer Trail intersects US 50 at a signalized intersection located to the east of the Ski Run Boulevard intersection. The Pioneer Trail/US 50 intersection currently operates as a four-phase signal with protected left-turn movements for the eastbound and westbound approaches, and split phasing for the northbound and southbound approaches. As the only east-west parallel alternative to US 50, Pioneer Trail currently carries approximately 10,800 vehicles per day according to the most recent 2014 traffic counts from El Dorado County's Hourly Traffic Count Reports database available on their website.

Park Avenue is a two-lane local roadway serving the Stateline area. Park Avenue serves residential traffic, as well as recreational traffic associated with the various hotel/casino and retail uses located in the Stateline area. The Park Avenue intersection with US 50 is signalized, with protected east-west left-turn movements from US 50. **Heavenly Village Way** forms the southeast leg of this intersection and provides direct access to the Heavenly Village redevelopment area to the south of US 50. Heavenly Village Way continues southeast and connects with Montreal Road / Lake Parkway.

Stateline Avenue is a two-lane local roadway in the Stateline area that is aligned immediately adjacent to the California/Nevada border in California. Land use along Stateline Avenue consists mainly of hotel and motel lodging units, with some single-family residences on the north end near Lake Tahoe. Stateline Avenue intersects US 50 at a signalized intersection that operates with protected left-turn movements from US 50. The fourth (southern) leg of this intersection provides an entrance-only driveway access to the Lake Tahoe Resort Hotel.

Lake Parkway West forms the secondary access loop roadway on the west/north (Lake Tahoe) side of US 50 in Nevada, providing access to/from the Edgewood Golf Course, a bank building, and to the rear of Harvey's and the Hard Rock Hotel on the Nevada side of Stateline. At the state line, it provides direct continuity to **Pine Boulevard** that extends further west to connect with Park Avenue.

Lake Parkway East is the loop roadway on the east/south (mountain) side of US 50. It provides access to/from the rear of Montbleu Resort and Harrah's, and provides direct continuity to **Montreal Road** at Heavenly Village Way. Lake Parkway West and East intersect with US 50 at a signalized intersection that provides protected left-turn movements from US 50.

Montreal Road is a two-lane local roadway that extends between Chonokis Road to the west to Heavenly Village Way to the east and continues as Lake Parkway further east to connect to US 50. Montreal Road is an alternate route to US 50 for the critical segment between Pioneer Trail and Heavenly Village Way. Montreal Road currently carries approximately 6,000-7,000 vehicles per day (estimated from year 2013 peak period counts obtained from the *Heavenly Mountain Resort Epic Discovery Project EIR/EIS – Transportation, Parking, and Circulation Section* (Hauge Brueck Associates, February 2015)).

Local Roads within/near the project study area include Chonokis Road, Moss Road, and Echo Road. These two-lane residential roadways are located east of pioneer trail just south of the Village Center

Shopping Center. All three of these local roads provide direct access between Pioneer Trail and Montreal Road and are heavily used as “cut-through” routes to access Lake Parkway from Pioneer Trail in order to bypass congestion on US 50 through the casino core. Due to the large volumes cut-through traffic, these local roadways experience much higher than typical daily traffic volumes and speeds.

BICYCLE AND PEDESTRIAN FACILITIES

The study area currently includes a few bicycle facilities at the west end of the Project area. A “linear park” provides a separated Class I facility along the northwest side of US 50 between Pioneer Trail and Ski Run Boulevard.

Within the study area, there are a few segments of sidewalks on US 50 and Heavenly Village Way south of US 50. There is a pedestrian underpass beneath US 50 between Harvey’s and Harrah’s for pedestrians to walk between the casino buildings. A protected pedestrian crossing of US 50 is provided at the traffic signals located at Pioneer Trail, Park Avenue, Friday Avenue, Stateline Avenue and Lake Parkway. Along other streets, the sidewalks are limited and have frequent discontinuities. A traffic signal that has a pedestrian scramble signal phase crossing is provided on US 50, east of Stateline Avenue, between Montbleu Resort and Hard Rock Casino and Hotel.

Bicycle Route Classifications

Caltrans classifies bikeways as follows:

Class I Bikeway (Bike Path) – Provides a completely separated right-of-way for the exclusive use of bicycles and pedestrians with crossflow by motorists minimized.

Class II Bikeway (Bike Lane) – Provides a striped lane for one-way bicycle travel on a street or highway.

Class III Bikeway (Bike Route) – Provides for shared use with bicycle or motor vehicle traffic, typically on lower volume roadways.

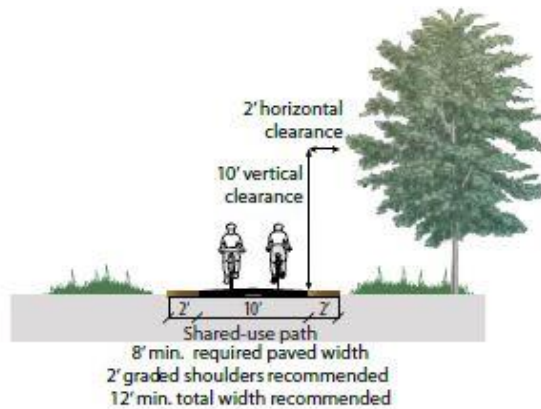
Class IV Bikeway (Separated Bikeway / Cycle Track) – A bikeway for the exclusive use of bicycles and includes a separation required between the separated bikeway and the through vehicular traffic. The separation may include, but is not limited to, grade separation, flexible posts, inflexible physical barriers, or on-street parking.

Figure 2 – Typical Class I, II, and III Bikeway Configurations

(Source: Lake Tahoe Regional Bicycle and Pedestrian Plan, 2010)

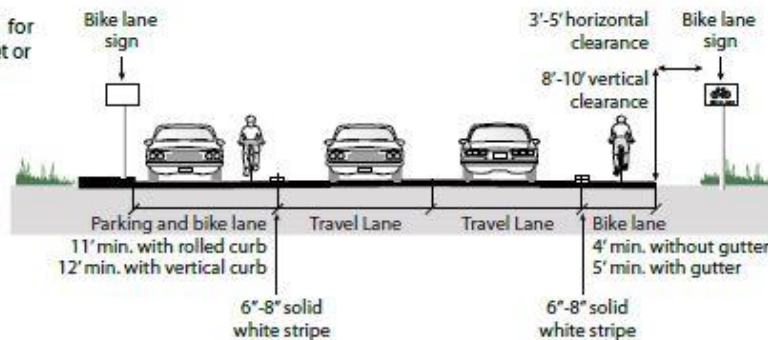
Shared-Use Path (Class I)

Provides a completely separated right of way for the exclusive use of bicycles and pedestrians with crossflow minimized.



Bike Lane (Class II)

Provides a striped lane for one-way bike travel on a street or highway.



Signed Shared Roadway (Class III/Bike Route)

Provides for shared use with pedestrian or motor vehicle traffic, typically on lower volume roadways.

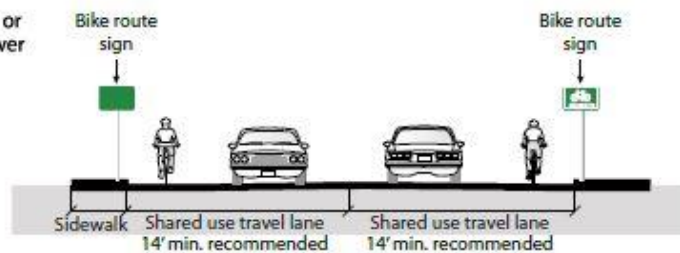
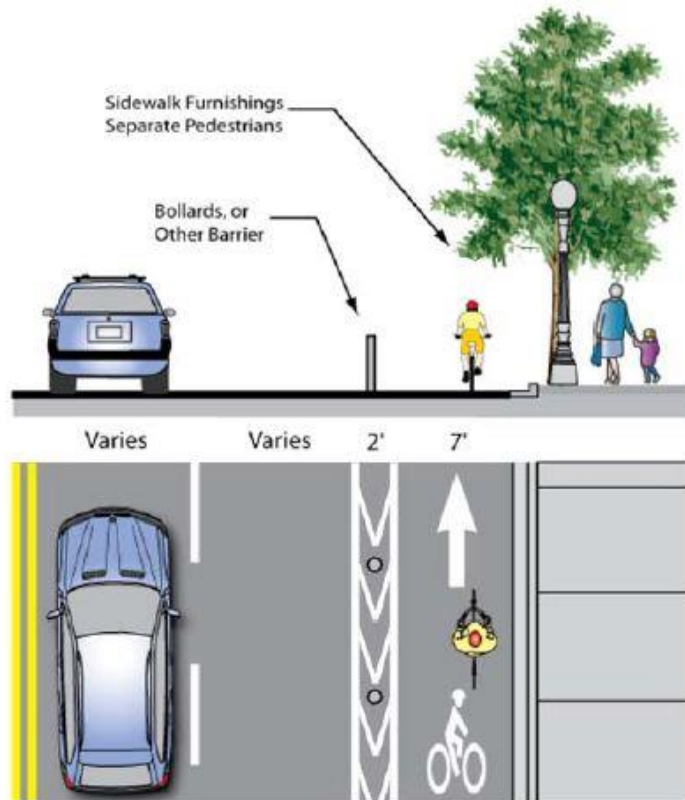


Figure 3 – Typical Class IV Bikeway (Cycle Track) Configuration
(Source: City of San Diego Bicycle Master Plan Update, June 2011)



One-way cycle track shown, but can be two-way as well.

TRANSIT ACCESS AND FACILITIES

The South Shore area is currently served by the BlueGO transit system, which includes local fixed-route and commuter bus services. The Stateline Transit Center is located within the study area at the intersection of US 50 and Transit Way, adjacent to Heavenly Mountain Resort. BlueGO bus routes that operate within the study area are as follows:

- Route 50 operates between the South Y and Kingsbury Transit Centers from 5:00 AM to 11:00 PM with one-hour headways.
- Route 53 operates between the South Y and Kingsbury Transit Centers at one-hour headways from about 7:00 AM to 11:00 PM Monday through Saturday with special hours offered on Sundays, holidays, and late nights.
- Route 23 – operates between the Stateline Transit Center, the Kingsbury Transit Center, and Ridge Resort/Heavenly Mountain Resort from approximately 7:00 AM to 12:30 AM at one-hour headways with extended service hours on Fridays and Saturdays.

BlueGO offers winter-time ski shuttles routes from Heavenly Mountain Resort to various South Shore and ski destinations. Tahoe Transportation District offers an ADA Demand Response Service throughout the area available during fixed-route service hours.

ANALYSIS METHODOLOGY

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

In this analysis, LOS has been calculated for all intersection control types using methods documented in the Transportation Research Board (TRB) Publication *Highway Capacity Manual, Fifth Edition, 2010 (HCM-2010)*. For signalized and all-way-stop-controlled (AWSC) intersections, the intersection delays and LOS reported are the average values for the whole intersection. For two-way-stop-controlled (TWSC) intersections, the "worst-case" movement delays and LOS are reported. The delay-based HCM-2010 LOS criteria for different types of intersection control are outlined in **Table 1**. The speed-based LOS thresholds for different types of urban street classifications are shown in **Table 2**.

Table 1 - Level-of-Service (LOS) Definitions and Criteria for Intersections

Level of Service	Flow Type	Operational Characteristics	Intersection Control Delay (seconds/vehicle)	
			Signal Control	Two-Way-Stop or All-Way Stop Control
"A"	Stable Flow	Free-flow conditions with negligible to minimal delays. Excellent progression with most vehicles arriving during the green phase and not having to stop at all. Nearly all drivers find freedom of operation.	≤ 10	0 – 10
"B"	Stable Flow	Good progression with slight delays. Short cycle-lengths typical. Relatively more vehicles stop than under LOS "A". Vehicle platoons are formed. Drivers begin to feel somewhat restricted within groups of vehicles.	> 10 – 20	> 10 – 15
"C"	Stable Flow	Relatively higher delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear. The number of vehicles stopping is significant, although many still pass through without stopping. Most drivers feel somewhat restricted.	> 20 – 35	> 15 – 25
"D"	Approaching Unstable Flow	Somewhat congested conditions. Longer but tolerable delays may result from unfavorable progression, long cycle lengths, and/or high volume-to-capacity ratios. Many vehicles are stopped. Individual cycle failures may be noticeable. Drivers feel restricted during short periods due to temporary back-ups.	> 35 – 55	> 25 – 35
"E"	Unstable Flow	Congested conditions. Significant delays result from poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures occur frequently. There are typically long queues of vehicles waiting upstream of the intersection. Driver maneuverability is very restricted.	> 55 – 80	> 35 – 50
"F"	Forced Flow	Jammed or grid-lock type operating conditions. Generally considered to be unacceptable for most drivers. Zero or very poor progression, with over-saturation or high volume-to-capacity ratios. Several individual cycle failures occur. Queue spillovers from other locations restrict or prevent movement.	> 80	> 50

Source: HCM-2010, Exhibits 18-6, 19-1 and 20-2

Table 2- Speed-based Level-of-Service (LOS) Criteria for Roadway/Highway Segments

Urban Street Class	I	II	III	IV
Free Flow Speed Range	55-45 mph	45-35 mph	35-30 mph	30-25 mph
Typical Free Flow Speed	50 mph	40 mph	35 mph	30 mph
LOS	Average Travel Speed (mph)			
A	> 42	> 35	> 30	> 25
B	>34 – 42	>28 – 35	>24 – 30	>19 – 25
C	>27 – 34	>22 – 28	>18 – 24	>13 – 19
D	>21 – 27	>17 – 22	>14 – 18	>9 – 13
E	>16 – 21	>13 – 17	>10 – 14	>7 – 9
F	≤ 16	≤ 13	≤ 10	≤ 7

Source: HCM 2000, Exhibit 15-2

The Caltrans' *Guide for the Preparation of Traffic Impact Studies* (dated December 2002) states that:

"Caltrans endeavors to maintain a target LOS at the transition between LOS "C" and LOS "D" on State highway facilities, however, Caltrans acknowledges that this may not be always feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS."

NDOT has established "LOS D" ("little driver freedom at tolerable operating speeds, approaching unstable flow") as its minimum objective for planned improvements. Pursuant to the Tahoe Regional Planning Agency (TRPA) Regional Plan Goals and Policies peak period traffic operations should not exceed the following levels:

- LOS C on rural scenic/recreational roads
- LOS D in rural developed areas.
- LOS D on urban roads
- LOS D for signalized intersections
- LOS E may be acceptable during peak periods not to exceed four hours per day.

Based on the above agency policies, LOS "D" has been generally used as the minimum acceptable LOS standard on all study facilities that fall under Caltrans or NDOT right of way. For study facilities that fall under local agency jurisdiction, TRPA-defined LOS "D" operations are still used as the minimum acceptable threshold, however, peak hour LOS "E" is regarded acceptable if the duration of such operations do not exceed four hours per day. Furthermore, Caltrans staff has indicated that LOS "E" is acceptable on Caltrans facilities if such operations meet the TRPA standard of LOS "E" for no more than four hours per day (discussed during the Project Development Team Meeting for US 50 Bypass Project Study Report Development, March 18, 2009; meeting minutes attached as **Appendix Exhibit 7**).

In this study, a general suburban "Peak Hour Factor" (PHF) of 0.92 (as recommended by HCM-2010) has been used in the study intersection analyses under all analysis scenarios. Based on a review of Caltrans and NDOT AADT, and truck counts for years 2007-2014, a heavy-vehicle percentage of 3% in the peak hour periods was applied to US 50 east-west through approaches at the study intersections and a 2% peak-hour heavy-vehicle percentage was used for the north-south local street approaches. Saturation flow rates of 1,300 vehicles per hour per lane (vphpl) for summer peak hour, and 1,500 vphpl for annual average peak hour, were used for eastbound & westbound movements at US 50 study intersections west of and including the US 50 / Stateline Avenue intersection. Saturation flow rate represents the number of vehicles that can pass through an intersection during an "hour of green time" and according to the Highway Capacity Manual, can be affected/reduced by a number of factors including lane widths, pedestrian crossings/conflicts, vehicle compositions, and a high number of turning vehicles, among others.

Figure 4 – Existing Bike and Pedestrian Activity at US 50 / Park Ave / Heavenly Village Way Intersection
(Source: Google Maps, May 2015)



US 50 between Pioneer Trail and Lake Parkway experiences high bike and pedestrian volumes that contribute to low saturation flow rates. May 2015 conditions shown; volumes are higher during summer.

Based on observation of low travel speeds and significant queueing on US 50 during the summer peak, US 50 in the Stateline area is assumed to have lower than typical saturation flow rates (typical saturation flow rates are generally 1,900 vphpl). The lower than typical saturation flow rates are caused by high volumes of bikes, pedestrians, busses, and other modes of non-motorized transportation (such as carriages) traveling along and/or crossing US 50 in the Stateline area, and a large number of high volume driveways (casinos, restaurants, shops, etc.) with direct access to US 50 between Pioneer Trail and Lake Parkway. Additionally, in many cases along the US 50 corridor, 95th percentile intersection queues are metered by upstream signals or volume exceeds intersection capacity. As a result, saturation headway would not be reached during the peak hour, also leading to lower than typical saturation flow rates.

A saturation flow rate of 1,750 vphpl was used for all other study intersections and turning movements, including facilities on Pine Boulevard and Lake Parkway, under all analysis scenarios. These facilities experience smaller amounts of pedestrian/bike/transit traffic than US 50 but have smaller than typical lane and shoulder widths. Therefore, a saturation flow rate slightly lower than the typical value was used.

Figure 5 – Other Modes of Transportation / Causes of US 50 Stateline Area Congestion

(Source: Google Maps, May 2015)



Horse drawn carriages frequently travel on US 50 near the resorts/casinos, slowing down traffic and contributing to low saturation flow rates. The US 50 / Stateline Avenue intersection is shown.

Synchro/ SimTraffic 8 operational analysis software was used to implement the HCM-2010 analysis procedures for intersection and arterial segment operations analysis. *SIDRA Version 6.0* software was used for evaluation of roundabout operations.

In order to determine whether “significance” should be associated with unsignalized intersection operating conditions, a supplemental traffic signal warrant analysis was also completed. The term “signal warrants” refers to the list of established criteria used by Caltrans, NDOT and other public agencies to quantitatively justify or ascertain the need for installation of a traffic signal at an unsignalized intersection location. Per Caltrans requirements, this study employs signal warrant criteria presented in the *California Manual on Uniform Traffic Control Devices, 2014 Edition* for unsignalized intersections located in California. Per NDOT requirements, this study employs signal warrant criteria presented in the Federal Highway Administration’s (FHWA) *2009 MUTCD with Revisions 1 and 2, May 2012* for unsignalized intersections located in Nevada. From here on out, it can be assumed that the term “MUTCD” in this technical memorandum refers to the California MUTCD for intersections in California, and the FHWA MUTCD for intersections in Nevada. The MUTCD signal warrant criteria are based upon several factors including volume of vehicular and pedestrian traffic, location of school areas, frequency of accidents, etc. This study has utilized MUTCD based Peak-Hour-Volume-based Warrant 3 (same under both California and FHWA MUTCD). Both the California and FHWA MUTCD indicate “the satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.”

To determine whether LOS “E” operations are projected to occur at a location for more than four hours a day, hourly traffic volumes were obtained from Caltrans’ Performance Measurement System (PeMS) database for Fridays and Saturdays during summer 2015 on US 50 near Midway Road (closest available count station to the project area). It was determined from the summer hourly counts that the fifth highest hour of traffic volumes throughout a summer day (note that the 5th highest hour of traffic volumes overall in a day was selected, regardless of what time of day it occurred and not necessarily near the PM peak hour/period) was typically about six (6) percent lower than the traffic volumes during the peak hour. Therefore, any facilities projected to operate at LOS “E” under the

peak hour were reanalyzed with six (6) percent lower volumes (i.e. analyzed under 5th highest hour traffic conditions). If the six (6) percent lower volumes still resulted in the facility operating at LOS “E”, it was determined that the LOS “E” conditions lasted for more than four hours.

Note that AADT-based projections, roadway Levels of Service, and capacity tables for all evaluated scenarios/alternatives are included as **Appendix Tables 2 – 4** for reference purposes. However, per agency criteria, the peak hour based intersectional and arterial operations are regarded as the most appropriate measures of effectiveness for study area traffic operations under all scenarios.

This study accounts for pedestrian conflicts by incorporating pedestrian volumes and pedestrian signal phases with estimated calls per hour according to the location of existing pedestrian crossings at each study intersection. Relative quantity of pedestrian conflicts per hour at each study intersection were estimated based on proximity to the commercial/retail core of the study network, i.e. the US 50 intersection with Stateline Avenue. Additionally, this study modeled the existing signalized intersection with pedestrian scramble phase located between Montbleu Resort and Hard Rock Hotel & Casino for all analyzed alternatives, with exception of the Skywalk alternative.

Vehicle miles traveled (VMT) is the total miles traveled by vehicles within a specific region over a certain time period. TRPA has a general VMT threshold standard of reducing overall VMT within the TRPA region to 10% below 1981 levels. Therefore, any projects that result in an increase in regional VMT are generally regarded as having a negative impact, while any projects that result in a decrease in regional VMT are generally regarded as having a beneficial impact. A general VMT analysis was performed for each proposed project alternative to determine compliance with TRPA’s VMT standard. VMT analysis is included in a later section of this report.

SAFETY ANALYSIS

Wood Rodgers reviewed TSAR traffic accident data records and TASAS accident data summaries provided by Caltrans District 3 for the US 50 study segments for the available most-recent three-year data period (January 1, 2010 through December 31, 2013). NDOT accident data was also obtained for the latest available three year period (October 1, 2012 through October 01, 2015) and summarized in Caltrans format for consistency. The data is summarized in **Table 3** and **Table 4**.

Table 3 - Accident Data Summary (Intersections)

Intersection Location (Post Mile) – Jurisdiction	Number of Accidents							Persons		Actual Accident Rates (# of accidents / MV)			Average Accident Rates (# of accidents / MV)		
	Tot	Fat	Inj	F+I	Multi Veh	Wet	Dark	Kld	Inj	Fat	F+I	Tot	Fat	F+I	Tot
US 50/ Pioneer Trail (PM 80.015) – Caltrans ¹	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.001	0.09	0.21
US 50/ Park Ave (PM 80.140) – Caltrans ¹	2	0	1	1	1	0	0	0	2	0.00	0.02	0.04	0.001	0.11	0.27
US 50/Stateline Ave (PM 80.439) – Caltrans ¹	2	0	0	0	1	0	2	0	0	0.00	0.00	0.06	0.001	0.11	0.27
US 50/Lake Parkway Loop - NDOT ²	14	0	4	4	10	6	8	0	5	0.00	0.13	0.46	0.001	0.11	0.27
Source: Caltrans District 3, NDOT Notes: MV = Million Vehicles, Fat = Fatalities, Inj = Injuries, Veh = Vehicle, Kld = Killed, F+I = Fatalities + Injuries, Tot = Total ¹ Caltrans District 3 accident data is for period from January 1, 2011 to December 31, 2013. (All data and accident rates were provided by Caltrans.) ² NDOT accident data is for period from October 1, 2012 to October 01, 2015. Average accident rates from Caltrans segments were used for the NDOT segment for comparison purposes. (Accident data was provided, but accident rates were calculated to match Caltrans format.)															

As shown in **Table 3**, at the US 50 intersections with Pioneer Trail, Park Avenue, and Stateline Avenue, the actual accident rates are less than the state average accident rates for fatal, fatal + injury

(F+I), and total accidents. The US 50 / Lake Parkway Loop intersection had the most reported accidents with 14 and the most reported injury accidents with four (4). The US 50 / Lake Parkway Loop intersection had actual accident rates **higher** than average accident rates for fatal + injury (F+I), and total accidents. Of the 14 accidents at the US 50 / Lake Parkway Loop intersection, a majority (10) were collisions between multiple vehicles. “Rear-end” (6) was the most commonly reported “type of collision”, which is the type most commonly associated with signalized intersections. The most frequently reported “collision factor” was “followed too closely” (4), while the most frequently reported “driver factors” were “inattention/distraction” (5) and “had been drinking” (1).

Table 4 - Accident Data Summary (Roadway Segments)

Roadway Segment (Post Mile) – Jurisdiction	Number of Accidents							Persons		Actual Accident Rates (# of accidents / MVM)			Average Accident Rates (# of accidents / MVM)		
	Tot	Fat	Inj	F+I	Multi Veh	Wet	Dark	Kld	Inj	Fat	F+I	Tot	Fat	F+I	Tot
US 50 - b/w Pioneer Trail (PM 80.055) and Stateline Ave (PM 80.440) - Caltrans ¹	6	0	3	3	4	0	4	0	4	0.00	0.27	0.53	0.009	0.97	2.22
US 50 - b/w Stateline Ave and Kingsbury Grade Rd (Mile Marker 0.00 – 0.65) - NDOT ²	35	1	17	18	22	13	22	1	19	0.07	1.11	2.29	0.009	0.97	2.22

Source: Caltrans District 3, NDOT
Notes: MVM = Million Vehicle Miles, Fat = Fatalities, Inj = Injuries, Veh = Vehicle, Kld = Killed, F+I = Fatalities + Injuries, Tot = Total
¹ Caltrans District 3 accident data is for period from January 1, 2011 to December 31, 2013. (All data and accident rates were provided by Caltrans.)
² NDOT accident data is for period from October 1, 2012 to October 1, 2015. Average accident rates from Caltrans segments were used for the NDOT segment for comparison purposes. (Accident data was provided, but accident rates were calculated to match Caltrans format.)

As shown in **Table 4**, the actual accident rates of the US 50 segment between Pioneer Trail and Stateline Avenue are less than the state average accident rates for fatal, F+I, and total accidents. However, the actual accident rates along the segment of US 50 between Stateline Avenue and Kingsbury Grade are **higher** than state average accident rates for fatal, F+I, and total accidents. Over the three year data period, a total of 35 accidents were reported on the US 50 segment between Stateline Avenue and Kingsbury Grade that involved one (1) fatality and injuries to 19 persons. A majority (22) of the accidents involved a collision between multiple vehicles. “Followed too Closely” (11) and “Speeding” (5) were the most frequently reported “collision factors” while “inattention/distraction” (6) was the most commonly reported “driver factor”. “Rear-end” (18) was the most frequently reported “type of collision”.

RECENT TRAFFIC TRENDS AND EXISTING COUNTS

Caltrans and NDOT-published Annual Average Daily Traffic (AADT) count data from year 1992 through year 2014 were reviewed for the study segments of US 50 extending from west of Pioneer Trail to east of Kingsbury Grade. **Table 5** illustrates the US 50 study highway/roadway segments traffic volumes from 1992 through 2014.

Table 5 - US 50 Segments through Study Intersections - Recent Traffic Trends

Year	US 50 Two-Way Annual Average Daily Traffic (AADT) Volumes					
	Just west of Pioneer Trail	Between Pioneer Trail and Park Ave	Just east of Park Avenue	Just west of Stateline Ave	Just east of Stateline Ave	Just east of Kingsbury Grade
1992	40,000	47,000	46,000	34,000	31,100	n/a
1993	40,000	47,000	46,000	34,000	29,300	n/a
1994	40,000	47,000	46,000	34,000	29,070	n/a
1995	38,000	44,000	44,000	33,000	28,740	n/a
1996	35,500	41,000	44,500	33,000	27,900	n/a
1997	35,500	41,000	44,500	33,000	27,900	n/a
1998	35,500	41,000	44,500	33,000	26,700	n/a
1999	35,500	41,000	44,500	29,500	26,700	n/a
2000	35,500	41,000	44,500	28,000	27,800	n/a
2001	35,500	41,000	44,500	29,000	27,300	n/a
2002	35,500	41,000	34,000	33,000	27,600	n/a
2003	32,000	37,500	34,000	33,000	30,500	n/a
2004	32,500	37,500	33,500	33,000	30,800	n/a
2005	32,500	36,000	32,000	33,000	28,900	27,700
2006	32,500	35,500	29,000	30,500	26,500	23,700
2007	32,500	35,000	29,000	30,500	25,000	20,000
2008	31,500	33,000	28,500	28,000	25,000	20,000
2009	31,500	31,500	27,500	27,500	24,000	21,000
2010	31,500	28,500	26,500	26,500	24,000	22,000
2011	31,500	29,000	26,500	26,000	27,000	24,000
2012	31,500	29,000	26,500	25,500	22,500	21,000
2013	31,500	29,000	26,500	25,500	21,500	22,000
2014	31,500	27,500	24,600	25,000	21,500	25,000

Source: Caltrans and NDOT Traffic Volumes Publications
Notes: At certain locations, Caltrans and NDOT counts may have been actually conducted only once in every three years.
n/a = data not available

As seen from **Table 5**, traffic volumes on US 50 study segments have generally been decreasing over the last 22 years. Between 1992 and 2014, overall AADT on US 50 study segments between Pioneer Trail and just east of Stateline Avenue have decreased by 8,500-21,400 AADT (approximately 21%-47%), which is equal to a rate of approximately 1% to 3% per year. More recently, between 2006 and 2014, AADT volumes through the study segments between Pioneer Trail and just east of Stateline Avenue appear to have decreased by 3% to 23%, which is equal to a rate of approximately 0.5% to 3% per year. However, between 2012 and 2014 AADT on US 50 east of Kingsbury Grade Road has increased from 21,000 AADT to 25,000 AADT (approximately 20% growth). Additionally, based on the last five year AADT counts on Pioneer Trail, obtained from El Dorado County's Hourly Traffic Count Reports database available on their website, AADT on Pioneer Trail at South Lake Tahoe city limits has increased from 9,218 AADT in 2011 to 10,772 AADT in 2014 (approximately 17% growth). Based on last three years PeMS data, summer ADT on US 50 west of the project study area at Bigler Road has increased from 36,000 ADT to 37,000 ADT (approximately 3% growth) between 2012 and 2015. The growth on Pioneer Trail and US 50 west of the project study area, and on US 50 east of Kingsbury Grade Road, combined with the slight decrease in volumes on US 50 near the casinos, suggests that traffic volumes are on the increase in the South Shore area, but that vehicles are bypassing US 50 near the casinos by cutting through the area on the local streets.

Existing summer peak hour conditions traffic counts for study intersections were obtained from the recently approved *Heavenly Mountain Resort Epic Discovery Project EIR/EIS – Transportation*,

Parking, and Circulation Section (Hauge Brueck Associates, February 2015). The Heavenly Mountain Resort counts were collected in December 2013 during the Friday PM peak hour (highest consecutive hour of counts between 3:00 PM and 6:00 PM) and then converted to August 2013 “summer peak hour” volumes using a seasonal conversion factor obtained from Caltrans PeMS data.

Volumes for study intersections not included in the *Heavenly Mountain Resort EIR* were estimated using existing volumes from Appendix Figure 1 of the *US 50 / South Shore Community Revitalization (Stateline) Project – Caltrans Project Report – Traffic Counts, Forecasts and Operations Update (Wood Rodgers, October 2012)* as they were the next most recently available existing volumes for the project area. Volumes obtained from the *October 2012 Operations Update* were adjusted as necessary to match/balance with the 2013 *Heavenly Mountain Resort EIR* counts at neighboring intersections. This was done by calculating the percent change (i.e. “growth factor”) in volumes between the *October 2012 Operations Update* and the *Heavenly Mountain Resort EIR* at neighboring common intersections and applying the resulting “growth factor” to the intersection volumes from the *October 2012 Operations Update*. These new factored intersection volumes were then manually adjusted as necessary to better balance with the neighboring intersection counts from the *Heavenly Mountain Resort EIR*. (Note: Since the volumes from the *October 2012 Operations Update* were based on the 2007 counts performed for the US 50 Loop Road project PSR, the volumes were generally higher than the 2013 *Heavenly Mountain Resort EIR* counts due to the downward traffic volume trend shown in **Table 5**. As a result, the volumes from the *October 2012 Operations Update* were generally factored downward to match *Heavenly Mountain Resort EIR* counts.)

Annual average counts were obtained using a conversion factor calculated from latest Caltrans Count Book and PeMS AADT data. Based on the above recent traffic trends and analysis of year 2013 vs year 2015 PeMS data, it was determined that volumes in the project study area have remained essentially constant (+/- 1%) between year 2013 and year 2015 conditions. Therefore, for the purposes of this study, existing traffic volumes included in the Heavenly Mountain Resort EIR were regarded as the current year 2015 (Existing) traffic volumes. The Existing (year 2015) annual average and summer peak hour traffic volumes are presented in **Appendix Figure 1**.

Prior traffic, air quality, and noise studies have been prepared using year 2012 volumes as existing conditions. Based on the above recent traffic trends and analysis of year 2012 vs year 2015 PeMS data, it was determined that volumes in the project study area have remained essentially constant (+/-1%) between year 2012 and year 2015 conditions. Therefore any existing conditions analysis done previously using year 2012 volumes may still be considered representative of current year 2015 existing conditions.

EXISTING CONDITIONS TRAFFIC OPERATIONS

Intersection traffic operations were quantified for the existing study area facilities under Existing traffic volumes (shown in **Appendix Figure 1**), and are presented in this section. Note that for traffic operational analysis purposes, US 50 is considered an east-west route and all intersecting cross-streets are regarded as north-south streets.

INTERSECTION OPERATIONS

Table 6 summarizes Existing study intersection traffic operations under Existing traffic volumes (shown in **Appendix Figure 1**) and current intersection geometrics and control (shown in **Appendix Figure 2**).

Table 6 – “Existing Conditions” Intersection Traffic Operations

#	Intersection	Control Type	Annual Average Peak Hour			Summer Peak Hour		
			Delay (S/V)	LOS	Wrnt Met? ³	Delay (S/V)	LOS	Wrnt Met?
1	Park Ave / Pine Blvd	TWSC ²	9.9	A	No	10.3	B	No
2	Pine Blvd / Stateline Ave	AWSC ¹	8.1	A	No	8.5	A	No
3	US 50 / Pioneer Trail	Signal ¹	18.7	B	-	37.5	D	-
4	US 50 / Park Ave / Heavenly Village Way	Signal	15.6	B	-	22.8	C	-
5	US 50 / Friday Ave	Signal	5.0	A	-	7.5	A	-
6	US 50 / Stateline Ave	Signal	8.1	A	-	11.1	B	-
7	US 50 / Lake Pkwy	Signal	14.8	B	-	19.9	B	-
8	Lake Pkwy / Heavenly Village Way	AWSC	10.5	B	No	12.6	B	No
9	Lake Pkwy / Harrah's Rd	TWSC	14.3	B	No	17.1	C	No

Notes:
1. “Average” control delays (in seconds/vehicle (S/V)) are indicated for signal-controlled and All way stop control (AWSC) intersections.
2. “Worst” case delays are indicated for Two way stop controlled (TWSC) intersections.
3. Wrnt = MUTCD based Peak-hour-Volume Signal Warrant #3.

As shown in **Table 6**, all study intersections are operating at annual average and summer peak hour LOS “D” or better under Existing traffic volumes. MUTCD based traffic signal peak hour volume warrant 3 is not currently met at any of the unsignalized study intersections.

ROADWAY OPERATIONS

Table 7 shows peak hour arterial/highway directional segment operations under Existing volumes.

Table 7 – “Existing Conditions” Arterial Segment Traffic Operations

Arterial Segment	Arterial Class	Direction	Annual Average Peak Hour		Summer Peak Hour	
			Speed	LOS	Speed	LOS
US 50 (b/w Pioneer Trail and Lake Pkwy.)	III	EB	22.2	C	19.1	C
US 50 (thru Pioneer Trail and Lake Pkwy.)	III	WB	21.6	C	20.5	C

Notes:
1. Speed = Average Travel Speed in miles per hour, EB = Eastbound, WB = Westbound, LOS = Level of Service
2. With a free flow speed of approx.35 mph for US 50, the study roadway segments are regarded as a HCM-2010 Class III Arterial.

As shown in **Table 7**, the study arterial segment operations (progression) are currently in the LOS “C” or better under both annual average and summer peak hour conditions.

PROJECT DESCRIPTION

Purpose and Need

The purpose of this project is to make improvements to the corridor consistent with the Loop Road System concept; reduce congestion; improve vehicle, pedestrian, and bicycle safety; advance multi-modal transportation opportunities; improve the environmental quality of the area; enhance visitor and community experience; and promote the economic vitality of the area. The project will fulfill the following specific needs:

- A. Article V(2) of the Tahoe Regional Planning Compact (Public Law 96-551), 1980 (the Compact), requires a transportation plan for the integrated development of a regional system of transportation within the Tahoe Region. The Compact requires the transportation plan to include consideration of the completion of the Loop Road System in the States of California and Nevada. Improvements are required to the corridor to meet the intent of the Loop Road System concept.

- B. Ongoing and proposed resort redevelopment in the project area has increased pedestrian traffic, creating a need for improved pedestrian safety, mobility, multi-modal transportation options. Improvements to pedestrian facilities, bicycle lanes, and mass transit are needed to connect the outlying residential and retail-commercial uses with employment and entertainment facilities, including hotels and gaming interests. Currently, there are no bike lanes on US 50 through the project area, and sidewalks are either not large enough to meet the increased demand, or do not exist. These issues impact the visitor and community experience within the area.
- C. Environmental improvements are needed in the area to help achieve the Tahoe Regional Planning Agency's (TRPA's) environmental thresholds, including water quality and air quality. Improvements to stormwater runoff collection and treatment facilities are needed to meet TRPA and Lahontan Regional Water Quality Control Board regulations and requirements. Reduction of vehicle congestion and reducing the number of vehicles on the roadway through enhanced pedestrian and multi-modal opportunities is needed to provide for improved air quality. Landscape improvements are needed to enhance the scenic resource element of the project area to facilitate compliance with TRPA's Scenic Threshold and to enhance the community and tourism experience.
- D. Project area intersections and roadway segments are operating marginally acceptable during a typical Summer PM Peak Hour. However, higher traffic during holidays, special events, and certain summer and winter peak periods results in long vehicle spillback to upstream intersections, long delays throughout the Stateline area and undesirable traffic operations. These undesirable traffic operations along US 50 cause traffic to use other routes to travel through the Stateline area, resulting in unwelcome "cut through" traffic on local residential neighborhood streets. The cut-through vehicles cause congestion in residential neighborhoods and have been observed to travel at high speeds, endangering local residents.
- E. Create opportunity for redevelopment and revitalization of the project area.

Alternatives

There are currently five alternatives (the "No-Build" alternative and four "build" alternatives) under consideration. The proposed alternatives are intended to improve transportation conditions for all modes of transportation - vehicles, pedestrians, bikes, and transit - along US 50 through the casino core by either rerouting the majority of vehicular traffic to the south, leaving the current alignment of US 50 as a more pedestrian friendly "complete street", or by rerouting pedestrians over the existing alignment of US 50 via a pedestrian bridge, reducing conflicts. If no improvements are made to the existing US 50 through the casino core, it is projected that the centrally located US 50 / Stateline Avenue intersection would operate at LOS "F" with high delays and queues by Year 2040. A discussion of Project Alternatives is provided as follows:

Alternative A (No-Build): The "No-Build" scenario entails no circulation/capacity/control improvements over existing facilities within the study area. The analysis of the No-Build condition constitutes the future "base" upon which the other project alternatives are evaluated. Alternative A (No-Build) is illustrated in **Appendix Exhibit 1**. Study area intersection lane geometrics and control under Alternative A are shown in **Appendix Figure 2**.

Alternative B (Triangle Alternative): The Triangle Alternative, or "Proposed Action", would construct a new alignment for US 50 to the south of existing US 50 from just west of the Pioneer Trail intersection in California to Lake Parkway in Nevada. The new alignment would begin at a new Pioneer Trail intersection located to the west of the existing intersection, and would proceed south along existing Moss Road. It would then turn east onto Montreal Road, passing to the south of the

Village Center shopping complex, and continuing along the existing Montreal Road and Lake Parkway alignment before ending at a new two-lane roundabout at the existing US 50/Lake Parkway intersection. The new US 50 alignment would have four 11-12-foot travel lanes, 5-foot shoulders, and turn pockets at major intersections and driveways. New signalized intersections would be located at Heavenly Village Way and Harrah's Road. The existing segment of US 50 between Pioneer Trail and Lake Parkway would be relinquished to the City of South Lake Tahoe in California, and Douglas County in Nevada. Between Park Avenue and Lake Parkway, the existing US 50 would be reduced to one lane in each direction, with landscaped medians and left-turn pockets at major intersections and driveways. Between Pioneer Trail and Park Avenue, there are two options under consideration. The first option would leave this segment of existing US 50 as a five-lane roadway. The second option would reduce the segment to a three-lane roadway by altering the US 50 / Pioneer Trail and US 50 / Park Avenue intersections. Possible alterations include reducing Old US 50 eastbound / westbound approaches to the intersections in question to a single approach lane with right and left turn pockets as necessary, and reducing the dual left-turn lanes bringing traffic onto the segment from northbound Heavenly Village Way to a single left-turn lane. The two receiving lanes on the north/east leg (old US 50) of the US 50 / Pioneer Trail intersection would be dropped several hundred feet to the east of the intersection. Bike lanes and sidewalks would be added and/or upgraded throughout the project area. A pedestrian bridge would be constructed over the new US 50 alignment near the California/Nevada State Line connecting the Van Sickle Bi-State Park to the Stateline area. As an option, the proposed two-lane roundabout at the US 50/Lake Parkway intersection would instead remain as a signalized intersection and be upgraded for the modified lane configuration. Under this alternative, existing transit routes and stops would remain unchanged and in their approximate locations. Alternative B (Triangle) is illustrated in **Appendix Exhibit 2**. Study area intersection lane geometrics and control under Alternative B are shown in **Appendix Figure 3A** (with a five-lane Old US 50 cross section between Pioneer Trail and Park Avenue) and **Appendix Figure 3B** (with a three-lane Old US 50 cross section between Pioneer Trail and Park Avenue).

Alternative C (Triangle One-Way Alternative): The Triangle One-Way Alternative would split eastbound and westbound directions of US 50 from the Pioneer Trail intersection in California to Lake Parkway in Nevada. Eastbound US 50 would remain on existing US 50, while westbound US 50 would be realigned onto a new alignment. Beginning at the Lake Parkway intersection, westbound US 50 would proceed south along the existing Lake Parkway alignment and continue onto Montreal Road on a one-way, two-lane roadway, with traffic only allowed in the westbound direction. Westbound US 50 would continue to the south of the Village Center shopping complex before turning west along existing Moss Road and rejoining eastbound US 50 at a new Pioneer Trail intersection. Between Park Avenue and Lake Parkway, existing US 50 would be reduced to a one-way, two-lane roadway, with traffic only allowed in the eastbound direction. This configuration was chosen in order to route the larger eastbound tourist traffic volume through the main casino/business core in order to promote the economic vitality of the South Lake Tahoe / Stateline area. Both eastbound and westbound US 50 would have 11-12-foot travel lanes, 5-foot right shoulders, 4-foot left shoulders, turn pockets at major intersections and driveways, and would add and/or upgrade bike lanes and sidewalks. New signalized intersections would be located on westbound US 50 at Heavenly Village Way and Harrah's Road. A pedestrian bridge would be constructed over westbound US 50 near the California/Nevada State Line connecting the Van Sickle Bi-State Park to the Stateline area. Under this alternative, existing transit routes and stops would remain unchanged and in their approximate locations. Alternative C (Triangle One-Way) is illustrated in **Appendix Exhibit 3**. Study area intersection lane geometrics and control under Alternative C are shown in **Appendix Figure 4**.

Alternative D (PSR Alternative): This alternative is based on the project described in the 12/14/2012 technical memo as “Alternative C (Modified) and Alternative D (Modified)”. The PSR Alternative would construct a new alignment for US 50 to the south of existing US 50 from the Pioneer Trail intersection in California to Lake Parkway in Nevada. The new alignment would begin at a reconstructed Pioneer Trail intersection, and proceed east between existing Echo Road and Fern Road. It would then turn north onto Montreal Road, passing to the south of the Village Center shopping complex, and continuing along the existing Montreal Road and Lake Parkway alignment before ending at a new two-lane roundabout at the existing US 50/Lake Parkway intersection. The new US 50 alignment would have four 11-12-foot travel lanes, 5-foot shoulders, and turn pockets at major intersections and driveways. New signalized intersections would be located at Heavenly Village Way and Harrah’s Road. The existing segment of US 50 between Pioneer Trail and Lake Parkway would be relinquished to the City of South Lake Tahoe in California, and Douglas County in Nevada. Between Park Avenue and Lake Parkway, the existing US 50 would be reduced to one lane in each direction, with landscaped medians and left-turn pockets at major intersections and driveways. Bike lanes and sidewalks would be added and/or upgraded throughout the project area. A pedestrian bridge would be constructed over the new US 50 alignment near the California/Nevada State Line connecting the Van Sickle Bi-State Park to the Stateline area. As an option, the proposed two-lane roundabout at the US 50/Lake Parkway intersection would instead remain as a signalized intersection and be upgraded for the modified lane configuration. Under this alternative, existing transit routes and stops would remain unchanged and in their approximate locations. Alternative D (PSR) is illustrated in **Appendix Exhibit 4**. Study area intersection lane geometrics and control under Alternative D are shown in **Appendix Figure 5**.

Alternative E (Skywalk Alternative): The Skywalk Alternative would construct a concrete bridge over the entire width and length of existing US 50 between Stateline Avenue and the eastern end of the Montbleu Resort that would serve pedestrians as a “skywalk” walkway along the casino corridor. The skywalk would be served by escalators at both ends and elevators located throughout. The existing at-grade pedestrian scramble located between the Hard Rock Hotel & Casino and Montbleu Resort would be removed under this alternative and replaced with sidewalk barriers similar to that in front of Harrah’s Hotel and Casino and Harvey’s Hotel and Casino. The existing at-grade pedestrian crosswalks at the US 50 / Stateline Avenue intersection would be removed as well. Otherwise, the roadway configuration under Alternative E (Skywalk) would be the same as that of Alternative A (No-Build). Under this alternative, existing transit routes and stops would remain unchanged and in their approximate locations. Alternative E (Skywalk) is illustrated in **Appendix Exhibit 5**. Study area intersection lane geometrics and control under Alternative E are shown in **Appendix Figure 6**.

Additional Options

Restripe Lake Parkway (Near Hard Rock Casino) to 4 Lanes: An option for this project has been considered in the past that would restripe the segment of Lake Parkway between US 50 and the Hard Rock Casino Driveway to four lanes. This option would eliminate the existing two-way left-turn median and reduce the shoulders (eliminating the existing bicycle lanes) to accommodate four lanes. This option was proposed specifically to increase the capacity of Lake Parkway to be able to handle large volumes of special event traffic that would be generated a few times a year by a proposed Live Theater at the Hard Rock Casino site and an expanded outdoor concert venue at Harvey’s. This option is only intended to improve traffic operations during special events, and would have no significant benefit to regular annual average or summer peak hour traffic operations.

An alternative option has been proposed in the past where event traffic could be handled by converting (using cones) the existing two-way left-turn median into an additional westbound (inbound) lane before special events as people are arriving, and then converting the existing two-way

left-turn median into an additional eastbound (outbound) lane after special events as people are leaving. This alternative option could handle the event traffic without the need for any restriping.

Cycle Track: The Cycle Track option would construct a Class IV, 2-way bike path along the northwestern (westbound) side of the old alignment of US 50 under Alternative B. Since there is already a high volume of pedestrians along US 50, this proposed bike path would have little to no additional effect on US 50 operations and therefore it was assumed that the lower than typical saturation flow rates assumed for this project would account for the effects of the proposed cycle track. Existing driveways along the project segment of westbound US 50 may experience a slight increase in delays due to construction of the Cycle Track option

FUTURE-YEAR TRAFFIC FORECASTS

YEAR 2020 TRAFFIC FORECASTS

Future Year 2020 “project opening day” traffic forecasts were calculated by estimating trips that would be generated by local projects that are expected to be complete by 2020 and distributing/adding those trips onto the Year 2015 existing annual average and summer peak counts. A list of approved projects that are currently under construction or scheduled to begin construction in the near future was assembled based on discussions with local business owners and TRPA staff, knowledge of the study area, and projects coded into the TRPA travel demand model. The following near-term development projects were assumed to be constructed under Year 2020 conditions:

Edgewood Lodge Development – Proposed resort development on the Edgewood Tahoe Golf Course located north of Stateline Avenue between Lake Tahoe and Pine Boulevard / Lake Parkway. The proposed resort would access Lake Parkway via the existing Golf Course Entrance Road between Stateline Avenue and US 50. The proposed resort would include approximately 154 hotel rooms and 40 fractional/timeshare residences, as well as a health spa, restaurant, and conference center. Per current project schedule and information obtained from TRPA, it is estimated that the proposed resort will likely complete construction and be operational by Year 2020.

Zalanta Resort at the Village – Proposed development consisting of 30 recreational condominiums located on the northeast corner of the existing US 50 / Friday Avenue intersection (assuming US 50 is the east-west direction). It was assumed the proposed development would access existing roadways via a driveway connecting to Friday Avenue. Per current project schedule and information obtained from TRPA, it is estimated that the proposed development will likely complete construction and be operational by Year 2020.

Beach Club – Proposed redevelopment of the existing mobile home park located near Arthur Drive / Kahle Drive just north of the Edgewood Tahoe Golf Course in Stateline, Nevada. The proposed new development would consist of approximately 143 single family detached homes as well as a recreational beach, swim club, and pier. The proposed development would access US 50 via Kahle Drive. Per current project schedule and information obtained from TRPA, it is estimated that the proposed development will likely complete construction and be operational by Year 2020.

Sierra Colina Village – Approved residential development project that would consist of 42 townhouse units in 21 duplex buildings and eight (8) single family detached homes. The proposed project would be located off of Lake Village Drive east of US 50 and north of Burke Creek, and would gain access to US 50 via Lake Village Drive. Per current project schedule and information obtained from TRPA, it is estimated that the proposed resort will likely complete construction and be operational by Year 2020.

YEAR 2040 TRAFFIC FORECASTS

The evaluation of traffic operations over a 20-year planning/design horizon is typically necessary for major transportation improvement projects. With the proposed US 50 project improvements anticipated to be complete by Year 2020, “Year 2040” is regarded as the long-term planning horizon and design year.

Future Year 2040 “design year” traffic forecasts were calculated by estimating trips that would be generated by local projects that are expected to be complete between years 2020 and 2040 and distributing/adding those trips onto the Year 2020 “project opening day” forecasts. Additionally, traffic on US 50 in the Stateline area is projected to grow at a rate of up to approximately half a percent per year based on projections from the *Caltrans District 3 US 50 Transportation Concept Report and Corridor System Management Plan (June, 2014)* and discussions with TRPA staff regarding TRPA Travel Demand Model forecasts. Additional growth in through traffic was assumed on top of the local growth as necessary to achieve an overall growth rate of approximately half a percent per year on US 50 in the project study area. A list of proposed projects likely to be complete by Year 2040 was assembled based on discussions with local business owners and TRPA staff, knowledge of the study area, and projects coded into the TRPA travel demand model. Above and beyond recently-approved development projects considered built out under 2020 conditions, the following long-term projects are considered built out under Year 2040 conditions:

Gondola Vista – Proposed residential development that would consist of 22 townhouse units in 10 duplex buildings. The proposed development would be located on the mountain side of Lake Parkway east across from the Forest Suites Resort. Per current project schedule and information obtained from TRPA, it is estimated that the proposed development will likely complete construction and be operational by Year 2040.

Chateau/Zalanta Full Buildout – Proposed expansion of the Chateau/Zalanta developments that are currently partially built out on the northwest corner of US 50 and Stateline Avenue (assuming US 50 is the east-west direction). Based on discussion with business owners and TRPA, full build out of the project is assumed to consist of up to an additional 287 hotel rooms, 20,000 square feet of retail, and 60 recreational condominiums. Per current discussions with business owners and knowledge of the area, it is estimated that the proposed development may complete construction and be operational by Year 2040.

Proposed short-term (2020) and long-term (2040) project trips were estimated using trip generation rates from the *Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition*. A detailed summary of all trip generation rates, reduction factors, and total estimated trips for the proposed local projects is shown in **Appendix Tables 1A** and **1B**. Year 2020 and 2040 No-Build traffic volume forecasts are included in **Appendix Figures 6** and **11**, respectively. **Table 8** shows a summary of all project years analyzed in this memorandum.

Table 8 - Traffic Volume Years

Traffic Volume Scenario	PSR Phase (as Approved in 2010)	PR Phase (Ongoing)	Notes
Existing	2007-08	2015	Existing volumes from Heavenly Mountain Resort EIR.
Project Opening Day	2015	2020	Existing volumes plus short-term project trips.
Project Design Year	2035	2040	Project Opening Day forecasts plus long-term project trips and growth in through traffic on US 50.

FUTURE YEAR TRANSPORTATION NETWORK IMPROVEMENTS

Only one future year transportation network improvement, not related to the proposed project, is assumed to be constructed under all future year scenarios. It is assumed that the existing crosswalks at the US 50 / Stateline Avenue intersection would be removed and a pedestrian scramble would be constructed at the intersection in their place. The pedestrian scramble at the US 50 / Stateline Avenue intersection is assumed complete by Year 2020.

WITH PROJECT (ALTERNATIVES B, C, D, AND E) FORECASTS

Existing (Year 2015), Year 2020, and Year 2040 No-Build traffic volumes were redistributed/rerouted as necessary to calculate “with project” traffic forecasts for proposed project Alternatives B (Triangle), C (Triangle One-Way), and D (PSR). Alternatives B and D have the same volume forecasts as the only major difference between the two is the location of the realigned US 50 / Pioneer Trail intersection (the realigned Pioneer Trail intersection would be located further west of the existing intersection under Alternative B due to right of way considerations). Alternative E (Skywalk) utilizes No-Build forecasts as it only proposes pedestrian improvements, which have no significant impact on vehicular volume forecasts. Existing (Year 2015) with project volume forecasts are illustrated in **Appendix Figures 7 - 10**. Year 2020 with project volume forecasts are illustrated in **Appendix Figures 12 - 15**. Year 2040 with project volume forecasts are illustrated in **Appendix Figures 17 - 20**.

YEAR 2020 “NO-BUILD” TRAFFIC OPERATIONS

INTERSECTION OPERATIONS

Year 2020 “No-Build” intersection traffic operations were quantified under Year 2020 traffic volumes (shown in **Appendix Figure 11**) and existing study area transportation facilities, plus construction of the Stateline Avenue pedestrian scramble, and are summarized in **Table 9**.

Table 9 - “Year 2020 No-Build” Intersection Traffic Operations

#	Intersection	Control Type	Annual Average Peak Hour			Summer Peak Hour		
			Delay (S/V)	LOS	Wrnt Met? ³	Delay (S/V)	LOS	Wrnt Met?
1	Park Ave / Pine Blvd	TWSC ²	10.1	B	No	10.6	B	No
2	Pine Blvd / Stateline Ave	AWSC ¹	8.3	A	No	8.7	A	No
3	US 50 / Pioneer Trail	Signal ¹	18.9	B	-	46.1	D	-
4	US 50 / Park Ave / Heavenly Village Way	Signal	13.3	B	-	39.4	D	-
5	US 50 / Friday Ave	Signal	5.1	A	-	9.4	A	-
6	US 50 / Stateline Ave	Signal	27.9	C	-	56.9	E*	-
7	US 50 / Lake Pkwy	Signal	18.1	B	-	22.7	C	-
8	Lake Pkwy / Heavenly Village Way	AWSC	10.7	B	No	13.0	B	No
9	Lake Pkwy / Harrah's Rd	TWSC	14.5	B	No	17.5	C	No

Notes:
1. “Average” control delays (in seconds/vehicle (S/V)) are indicated for signal-controlled and All way stop control (AWSC) intersections.
2. “Worst” case delays are indicated for Two way stop controlled (TWSC) intersections.
3. Wrnt = MUTCD based Peak-hour-Volume Signal Warrant #3.
* Projected to operate at LOS “E” for 4 hours or less per day based on analysis of 5th highest hour, which is considered acceptable per TRPA standards.

As shown in **Table 9**, all study intersections are projected to operate at annual average and summer peak hour LOS “E” for four hours or less per day or better under “Year 2020 No-Build” volumes and

existing capacity/control configurations. MUTCD based traffic signal peak hour volume warrant 3 is not projected to be met at any of the unsignalized study intersections under “Year 2020 No-Build” conditions.

ROADWAY OPERATIONS

Table 10 shows peak hour arterial/highway directional segment operations under “Year 2020 No-Build” traffic volumes.

Table 10 - Year 2020 “No-Build” Conditions Arterial Segment Traffic Operations

Arterial Segment	Arterial Class	Direction	Annual Average Peak Hour		Summer Peak Hour	
			Speed	LOS	Speed	LOS
US 50 (b/w Pioneer Trail and Lake Pkwy.)	III	EB	20.1	C	17.3	D
US 50 (thru Pioneer Trail and Lake Pkwy.)	III	WB	20.2	C	13.3	E*

Notes:
 1. Speed = Average Travel Speed in miles per hour, EB = Eastbound, WB = Westbound, LOS = Level of Service
 2. With a free flow speed of approx.35 mph for US 50, the study roadway segments are regarded as a HCM-2010 Class III Arterial.
 * Projected to operate at LOS “E” for 4 hours or less per day based on analysis of 5th highest hour, which is considered acceptable per TRPA standards.

As shown in **Table 10**, all study arterial segments are projected to operate at annual average and summer peak hour peak hour LOS “E” for four hours or less per day or better under “Year 2020 No-Build” volumes and existing capacity configurations.

YEAR 2040 “NO-BUILD” TRAFFIC OPERATIONS

INTERSECTION OPERATIONS

Year 2040 “No-Build” intersection traffic operations were quantified under Year 2040 traffic volumes (shown in **Appendix Figure 16**) and existing study area transportation facilities, plus construction of the Stateline Avenue pedestrian scramble, and are summarized in **Table 11**.

Table 11 - “Year 2040 No Build” Intersection Traffic Operations

#	Intersection	Control Type	Annual Average Peak Hour			Summer Peak Hour		
			Delay (S/V)	LOS	Wrnt Met? ³	Delay (S/V)	LOS	Wrnt Met?
1	Park Ave / Pine Blvd	TWSC ²	10.1	B	No	10.6	B	No
2	Pine Blvd / Stateline Ave	AWSC ¹	8.3	A	No	8.7	A	No
3	US 50 / Pioneer Trail	Signal ¹	23.7	C	-	64.5	E	-
4	US 50 / Park Ave / Heavenly Village Way	Signal	15.8	B	-	52.4	D	-
5	US 50 / Friday Ave	Signal	6.6	A	-	19.1	B	-
6	US 50 / Stateline Ave	Signal	35.9	D	-	90.6	F	-
7	US 50 / Lake Pkwy	Signal	19.9	B	-	27.6	C	-
8	Lake Pkwy / Heavenly Village Way	AWSC	11.5	B	No	15.3	C	No
9	Lake Pkwy / Harrah's Rd	TWSC	15.1	C	No	18.8	C	No

Notes:
 1. “Average” control delays (in seconds/vehicle (S/V)) are indicated for signal-controlled and All way stop control (AWSC) intersections.
 2. “Worst” case delays are indicated for Two way stop controlled (TWSC) intersections.
 3. Wrnt = MUTCD based Peak-hour-Volume Signal Warrant #3.

As shown in **Table 11**, the US 50 intersection with Pioneer Trail is projected to operate at summer peak hour LOS “E” (and projected to operate at LOS “E” for more than four hours per day) and the US 50 intersection with Stateline Avenue is projected to operate at summer peak hour LOS “F”

under “Year 2040 No-Build” volumes and existing capacity/control configurations. The remaining study intersections are projected to operate at annual average and summer peak hour LOS “D” or better under “Year 2020 No-Build” volumes and existing capacity/control configurations. MUTCD based traffic signal peak hour volume warrant 3 is not projected to be met at any of the unsignalized study intersections under “Year 2040 No-Build” conditions.

ROADWAY OPERATIONS

Table 12 shows peak hour arterial/highway directional segment operations under “Year 2040 No-Build” traffic volumes.

Table 12 - Year 2040 “No-Build” Conditions Arterial Segment Traffic Operations

Arterial Segment	Arterial Class	Direction	Annual Average Peak Hour		Summer Peak Hour	
			Speed	LOS	Speed	LOS
US 50 (b/w Pioneer Trail and Lake Pkwy.)	III	EB	19.3	C	13.8	E*
US 50 (thru Pioneer Trail and Lake Pkwy.)	III	WB	18.7	C	10.5	E
Notes: 1. Speed = Average Travel Speed in miles per hour, EB = Eastbound, WB = Westbound, LOS = Level of Service 2. With a free flow speed of approx.35 mph for US 50, the study roadway segments are regarded as a HCM-2010 Class III Arterial. * Projected to operate at LOS “E” for 4 hours or less per day based on analysis of 5 th highest hour, which is considered acceptable per TRPA standards.						

As shown in **Table 12**, the Westbound US 50 arterial segment between Lake Parkway and Pioneer Trail is projected to operate at summer peak hour LOS “E” (and projected to operate at LOS “E” for more than four hours per day) under “Year 2040 No-Build” volumes and existing capacity configurations. All remaining study arterial segments are projected to operate at annual average and summer peak hour peak hour LOS “E” for four hours or less per day or better under “Year 2020 No-Build” volumes and existing capacity configurations.

“EXISTING PLUS PROJECT” TRAFFIC OPERATIONS

INTERSECTION OPERATIONS

Table 13 summarizes “Existing plus Project” conditions intersection traffic operations under all project alternatives. “Existing plus Project” conditions should be regarded as if a proposed alternative had been constructed under Year 2015 conditions. “Existing plus Project” traffic volumes for Alternatives B, C, D and E are illustrated in **Appendix Figures 7, 8, 9 and 10**, respectively.

As shown in **Table 13**:

Alternative B (Triangle): All study intersections are projected to operate at annual average and summer peak hour LOS “C” or better under “Existing plus Project” conditions.

Alternative C (Triangle One-Way): All study intersections are projected to operate at acceptable “Existing plus Project” peak hour operations except for the US 50 intersections with Pioneer Trail and Lake Parkway for the summer peak hour.

The New US 50 / Pioneer Trail / Old US 50 intersection is projected to operate at summer peak hour LOS “F” under “Existing plus Project” conditions. In order to improve LOS at the New US 50 / Pioneer Trail / Old US 50 intersection to an acceptable (LOS “E” for four hours or less per day or better) level, a third dedicated left turn lane/pocket would need to be constructed on the eastbound approach, and a third receiving lane would need to be constructed on the Old US 50 leg of the intersection. However, these improvements are not feasible as they would necessitate significant additional right of way to be acquired, and have significant impacts to TRPA thresholds, including water quality, soil conservation, vegetation, and scenic.

The proposed signal and roundabout-controlled New US 50 / Lake Parkway / Old US 50 intersections are projected to operate at summer peak hour LOS “E/F” (and are projected to operate at LOS “E” for more than four hours per day) under “Existing plus Project” conditions. In order to improve LOS at the proposed signalized New US 50 / Lake Parkway / Old US 50 intersection to an acceptable (LOS “E” for four hours or less per day or better) level, a third dedicated left turn lane/pocket would need to be constructed on the westbound approach, and a third receiving lane would need to be constructed on the One-Way Westbound leg of the intersection. However, these improvements are not feasible as they would necessitate significant additional right of way to be acquired, and have significant impacts to TRPA thresholds, including water quality, soil conservation, vegetation, and scenic. A SIDRA-software based roundabout concept-level analysis for the New US 50 / Lake Parkway / Old US 50 location under Alternative C has determined that a roundabout is not a feasible solution at this intersection due to the high volume of circulating left turns that would be made from westbound US 50 onto the new US 50 Loop. Adding additional lanes to the roundabout would have no significant effect on the LOS because the high volume of westbound left turns already in the roundabout would prevent eastbound through traffic from entering the roundabout without substantial delay.

One possible mitigation for Alternative C is to reverse the directionality of the proposed one-way segments of US 50 (i.e. the old alignment of US 50 would carry westbound traffic and the new southern loop alignment of US 50 would carry eastbound traffic). This proposed reversal of directionality would reroute/eliminate the significant US 50 eastbound left-turn traffic entering the casino core that would be conflicting with the one-way westbound New US 50 through traffic at the US 50 / Pioneer Trail intersection.

Table 13 - "Existing plus Project" Intersection Traffic Operations

#	Intersection	Control Type	Alternative A (No Build)				Alternative B (Triangle)				Alternative C (Triangle One-Way)				Alternative D (PSR)				Alternative E (Skywalk)			
			Annual Avg		Summer Pk		Annual Avg		Summer Pk		Annual Avg		Summer Pk		Annual Avg		Summer Pk		Annual Avg		Summer Pk	
			Delay (S/V)	LOS	Delay (S/V)	LOS	Delay (S/V)	LOS	Delay (S/V)	LOS	Delay (S/V)	LOS	Delay (S/V)	LOS	Delay (S/V)	LOS	Delay (S/V)	LOS	Delay (S/V)	LOS	Delay (S/V)	LOS
1	Park Ave / Pine Blvd	TWSC ²	9.9	A	10.3	B	9.4	A	9.7	A	9.4	A	10.4	B	9.4	A	9.7	A	9.9	A	10.3	B
2	Pine Blvd / Stateline Ave	AWSC ¹	8.1	A	8.5	A	8.1	A	8.5	A	8.2	A	8.6	A	8.1	A	8.5	A	8.1	A	8.5	A
3	New US 50 / Pioneer Trail / Old US 50 ⁷	Signal A	18.7	B	37.5	D	19.5	B	23.2	C	52.6	D	88.4	F	19.3	B	23.1	C	17.2	B	37.0	D
		Signal B	-	-	-	-	19.6	B	22.7	C	-	-	-	-	-	-	-	-	-	-	-	-
4	Old US 50 / Park Ave / Heavenly Village Way ⁸	Signal A	15.6	B	22.8	C	18.3	B	19.1	B	12.4	B	16.1	B	17.6	B	20.8	C	15.0	B	28.3	C
		Signal B	-	-	-	-	20.2	C	27.1	C	-	-	-	-	-	-	-	-	-	-	-	-
5	Old US 50 / Friday Ave	Signal ¹	5.0	A	7.5	A	6.2	A	7.8	A	2.7	A	13.8	B	6.1	A	7.7	A	3.8	A	5.0	A
6	Old US 50 / Stateline Ave	Signal	8.1	A	11.1	B	8.7	A	10.7	B	3.9	A	19.9	B	8.6	A	10.6	B	7.3	A	11.2	B
7	New US 50 / Lake Pkwy / Old US 50 ⁴	Signal	14.8	B	19.9	B	15.8	B	20.0	B	37.7	D	69.4	E	15.9	B	19.2	B	19.3	B	25.0	C
		Rndabt ^{5,6}	10.5	B	12.6	B	7.3 (12.9)	A (B)	7.7 (14.9)	A (B)	15.3 (27.8)	C (D)	74.3 (151.8)	F (F)	7.3 (12.9)	A (B)	7.7 (14.9)	A (B)	-	-	-	-
8	New US 50 / Heavenly Village Way	Signal (AWSC ⁹)	14.3	B	17.1	C	8.6	A	10.3	B	5.3	A	5.8	A	8.8	A	10.6	B	10.5	B	12.6	B
9	New US 50 / Harrah's Rd	Signal (TWSC ¹⁰)	5.0	A	7.5	A	4.8	A	4.9	A	1.2	A	3.7	A	4.7	A	4.6	A	14.3	B	17.1	C

Notes:

- "Average" control delays (in seconds/vehicle (S/V)) are indicated for signal-controlled and All way stop control (AWSC) intersections.
- "Worst-case" delays are indicated for Two-way-stop (TWSC) controlled intersections.
- Wmnt = MUTCD based Peak-hour-Volume Signal Warrant #3.
- US 50 / Lake Pkwy intersection is controlled by a signal under "Skywalk Alternative" and by either a roundabout or a signal under "Triangle Alternative", "Triangle One-Way Alternative", and "PSR Alternative".
- A layout drawing of the roundabout option for the US 50 / Lake Parkway intersection is provided in Appendix Exhibit 6.
- "Average" and "Worst-case" control delays are indicated for roundabout intersection in avg (w.c.) format.
- Signal A assumes a 5-lane cross-section of Old US 50 b/w Pioneer Trail and Park Avenue. Pioneer Trail intersection SB approach: 1 through lane, 1 free-right lane, 1 left turn pocket.
Signal B assumes a 3-lane cross-section of Old US 50 b/w Pioneer Trail and Park Avenue. Pioneer Trail intersection SB approach: 1 through lane, 1 free-right turn pocket, 1 left turn pocket.
- Signal A assumes a 5-lane cross-section of Old US 50 b/w Pioneer Trail and Park Avenue. Park Avenue intersection EB approach: 1 through lane, 1 right turn trap lane, 1 left turn pocket. NB approach: dual left turn pockets.
Signal B assumes a 3-lane cross-section of Old US 50 b/w Pioneer Trail and Park Avenue. Park Avenue intersection EB approach: 1 through-right lane, 1 left turn pocket. NB approach: single left turn pocket.
- Control Type for this intersection is AWSC under "Alternative A (No-Build)" and "Alternative E (Skywalk)" conditions.
- Control Type for this intersection is TWSC under "Alternative A (No-Build)" and "Alternative E (Skywalk)" conditions.
- "- Intersection does not exist under the specified alternative or otherwise "Not Applicable".

Similarly, this proposed reversal of directionality would reroute/eliminate the significant US 50 westbound left-turn traffic entering the one-way westbound New US 50 that would be conflicting with the one-way eastbound US 50 through traffic at the US 50 / Lake Parkway intersection. Rerouting these left turns would lead to a significant improvement in delays and LOS throughout the project study area, particularly at the New US 50 / Pioneer Trail / Old US 50 and New US 50 / Lake Parkway / Old US 50 intersections.

Alternative D (PSR): All study intersections are projected to operate at annual average and summer peak hour LOS “C” or better under “Existing plus Project” conditions.

Alternative E (Skywalk): All study intersections are projected to operate at annual average and summer peak hour LOS “D” or better under “Existing plus Project” conditions.

MUTCD based traffic signal peak hour volume warrant 3 is not projected to be met at any of the unsignalized study intersections under all “Existing plus Project” alternatives.

ROADWAY OPERATIONS

Table 14 shows the peak hour arterial/highway directional segment operations under “Existing plus Project” conditions.

As shown in **Table 14**:

Alternative B (Triangle): All study arterial segments are projected to operate at annual average and summer peak hour LOS “D” or better under “Existing plus Project” conditions, including the Old US 50 arterial segment with a three-lane cross-section between Pioneer Trail and Lake Parkway.

Alternative C (Triangle One-Way): Westbound Old US 50 between Pioneer Trail and Park Avenue is projected to operate at annual average and summer peak hour LOS “E” (and is projected to operate at LOS “E” for more than four hours per day) under “Existing plus Project” conditions. All other study arterial segments are projected to operate at acceptable annual average and summer peak hour LOS “D” or better under “Existing plus Project” conditions.

Alternative D (PSR): All study arterial segments are projected to operate at annual average and summer peak hour LOS “D” or better under “Existing plus Project” conditions.

Alternative E (Skywalk): All study arterial segments are projected to operate at annual average and summer peak hour LOS “C” or better under “Existing plus Project” conditions.

Table 14 - "Existing plus Project" Arterial Segment Traffic Operations

Arterial Segment	Arterial Class	Dir	Alternative A (No-Build)				Alternative B (Triangle)				Alternative C (Triangle One-Way)				Alternative D (PSR)				Alternative E (Skywalk)			
			Annual Average		Summer Peak		Annual Average		Summer Peak		Annual Average		Summer Peak		Annual Average		Summer Peak		Annual Average		Summer Peak	
			Spd	LOS	Spd	LOS	Spd	LOS	Spd	LOS	Spd	LOS	Spd	LOS	Spd	LOS	Spd	LOS	Spd	LOS	Spd	LOS
New US 50 (b/w Pioneer Trail & Lake Pkwy)	II	EB	-	-	-	-	25.8	C	25.8	C	-	-	-	-	24.4	C	24.7	C	-	-	-	-
New US 50 (b/w Pioneer Trail & Lake Pkwy)	II	WB	-	-	-	-	33.1	B	31.7	B	-	-	-	-	31.8	B	31.2	B	-	-	-	-
Old US 50 (b/w Pioneer Trail & Lake Pkwy, w/ 5-lane segment b/w Pioneer Trail & Park Ave)	III	EB	22.2	C	19.1	C	20.0	C	17.3	D	-	-	-	-	18.6	C	17.6	D	22.7	C	19.8	C
Old US 50 (b/w Pioneer Trail & Lake Pkwy, w/ 5-lane segment b/w Pioneer Trail & Park Ave)	III	WB	21.6	C	20.5	C	16.6	D	15.1	D	-	-	-	-	16.7	D	14.0	D	23.5	C	20.7	C
Old US 50 (b/w Pioneer Trail & Lake Pkwy, w/ 3-lane segment b/w Pioneer Trail & Park Ave)	III	EB	-	-	-	-	19.8	C	18.4	C	-	-	-	-	-	-	-	-	-	-	-	-
Old US 50 (b/w Pioneer Trail & Lake Pkwy, w/ 3-lane segment b/w Pioneer Trail & Park Ave)	III	WB	-	-	-	-	16.4	D	14.6	D	-	-	-	-	-	-	-	-	-	-	-	-
Old US 50 (b/w Pioneer Trail & Park Ave)	III	EB	-	-	-	-	-	-	-	-	25.4	B	21.3	C	-	-	-	-	-	-	-	-
Old US 50 (b/w Pioneer Trail & Park Ave)	III	WB	-	-	-	-	-	-	-	-	11.5	E	13.8	E	-	-	-	-	-	-	-	-
One-Way EB US 50 (b/w Park Ave & Lake Pkwy)	III	EB	-	-	-	-	-	-	-	-	22.9	C	15.8	D	-	-	-	-	-	-	-	-
One-Way WB US 50 (b/w Pioneer Trail & Lake Pkwy)	II	WB	-	-	-	-	-	-	-	-	22.1	C	21.1	D	-	-	-	-	-	-	-	-

Notes:

Spd = Average Travel Speed in miles per hour, EB = Eastbound, WB = Westbound, LOS = Level of Service

The study roadway segments with a free flow speed of approx. 30-35 mph are regarded as HCM-2010 Class III Arterial.

The study roadway segments with a free flow speed of approx. 40 mph are regarded as HCM-2010 Class II Arterial.

"-" Roadway segment does not exist under the specified alternative or otherwise operations "Not Applicable".

“YEAR 2020 WITH PROJECT” (OPENING DAY) TRAFFIC OPERATIONS

INTERSECTION OPERATIONS

Table 15 summarizes “Year 2020 with Project” conditions intersection traffic operations under all project alternatives. “Year 2020 with Project” conditions should be regarded as if a proposed alternative had been constructed under Year 2020 conditions. “Year 2020 plus Project” traffic volumes for Alternatives B, C, D and E are illustrated in Appendix Figures 12, 13, 14 and 15, respectively.

As shown in **Table 15**:

Alternative B (Triangle): All study intersections are projected to operate at annual average and summer peak hour LOS “C” or better under “Year 2020 with Project” conditions.

Alternative C (Triangle One-Way): All study intersections are projected to operate at acceptable “Year 2020 with Project” peak hour operations except for the US 50 intersections with Pioneer Trail and Lake Parkway for the summer peak hour.

The New US 50 / Pioneer Trail / Old US 50 intersection is projected to operate at summer peak hour LOS “F” under “Year 2020 with Project” conditions. In order to improve LOS at the New US 50 / Pioneer Trail / Old US 50 intersection to an acceptable (LOS “E” for four hours or less per day or better) level, a third dedicated left turn lane/pocket would need to be constructed on the eastbound approach, and a third receiving lane would need to be constructed on the Old US 50 leg of the intersection. However, these improvements are not feasible as they would necessitate significant additional right of way be acquired, and have significant impacts to TRPA thresholds, including water quality, soil conservation, vegetation, and scenic.

The proposed signal and roundabout-controlled New US 50 / Lake Parkway / Old US 50 intersections are projected to operate at summer peak hour LOS “F” under “Year 2020 with Project” conditions. In order to improve LOS at the proposed signalized New US 50 / Lake Parkway / Old US 50 intersection to an acceptable (LOS “E” for four hours or less per day or better) level, a third dedicated left turn lane/pocket would need to be constructed on the westbound approach, and a third receiving lane would need to be constructed on the One-Way Westbound leg of the intersection. However, these improvements are not feasible as they would necessitate significant additional right of way be acquired, and have significant impacts to TRPA thresholds, including water quality, soil conservation, vegetation, and scenic. A SIDRA-software based roundabout concept-level analysis for the New US 50 / Lake Parkway / Old US 50 location under Alternative C has determined that a roundabout is not a feasible solution at this intersection due to the high volume of circulating left turns that would be made from westbound US 50 onto the new US 50 Loop. Adding additional lanes to the roundabout would have no significant effect on the LOS because the high volume of westbound left turns already in the roundabout that would prevent eastbound through traffic from entering the roundabout without substantial delay.

One possible mitigation for Alternative C is to reverse the directionality of the proposed one-way segments of US 50 (i.e. the old alignment of US 50 would carry westbound traffic and the new southern loop alignment of US 50 would carry eastbound traffic). This proposed reversal of directionality would reroute/eliminate the significant US 50 eastbound left-turn traffic entering the casino core that would be conflicting with the one-way westbound New US 50 through traffic at the US 50 / Pioneer Trail intersection.

Table 15 - "Year 2020 with Project" Intersection Traffic Operations

#	Intersection	Control Type	Alternative A (No Build)				Alternative B (Triangle)				Alternative C (Triangle One-Way)				Alternative D (PSR)				Alternative E (Skywalk)			
			Annual Avg		Summer Pk		Annual Avg		Summer Pk		Annual Avg		Summer Pk		Annual Avg		Summer Pk		Annual Avg		Summer Pk	
			Delay (S/V)	LOS	Delay (S/V)	LOS	Delay (S/V)	LOS	Delay (S/V)	LOS	Delay (S/V)	LOS	Delay (S/V)	LOS	Delay (S/V)	LOS	Delay (S/V)	LOS	Delay (S/V)	LOS	Delay (S/V)	LOS
1	Park Ave / Pine Blvd	TWSC ²	10.1	B	10.6	B	9.5	A	9.8	A	9.6	A	10.0	B	9.5	A	9.8	A	10.1	B	10.6	B
2	Pine Blvd / Stateline Ave	AWSC ¹	8.3	A	8.7	A	8.3	A	8.7	A	8.5	A	8.9	A	8.3	A	8.7	A	8.3	A	8.7	A
3	New US 50 / Pioneer Trail / Old US 50 ⁷	Signal A	18.9	B	46.1	D	19.9	B	24.5	C	60.1	E*	99.2	F	19.8	B	22.4	C	20.0	C	46.1	D
		Signal B	-	-	-	-	20.5	C	23.6	C	-	-	-	-	-	-	-	-	-	-	-	-
4	Old US 50 / Park Ave / Heavenly Village Way ⁸	Signal A	13.3	B	39.4	D	17.4	B	21.2	C	13.6	B	16.7	B	18.1	B	22.2	C	17.2	B	31.9	C
		Signal B	-	-	-	-	21.2	C	27.7	C	-	-	-	-	-	-	-	-	-	-	-	-
5	Old US 50 / Friday Ave	Signal ¹	5.1	A	9.4	A	9.1	A	10.0	A	3.9	A	16.3	B	7.7	A	9.9	A	5.0	A	6.9	A
6	Old US 50 / Stateline Ave	Signal	27.9	C	56.9	E*	16.1	B	22.4	C	7.0	A	54.5	D	16.7	B	20.5	C	8.6	A	11.2	B
7	New US 50 / Lake Pkwy / Old US 50 ⁴	Signal	18.1	B	22.7	C	16.3	B	20.0	B	40.5	D	82.4	F	16.1	B	19.8	B	16.3	B	25.7	C
		Rndabt ^{5,6}	10.7	B	13.0	B	7.4 (13.9)	A (B)	7.9 (15.5)	A (C)	21.5 (41.7)	C	104.4 (219.6)	F (F)	7.4 (13.9)	A (B)	7.9 (15.5)	A (C)	-	-	-	-
8	New US 50 / Heavenly Village Way	Signal (AWSC ⁹)	14.5	B	17.5	C	8.9	A	11.1	B	4.4	A	5.1	A	9.3	A	10.3	B	10.7	B	13.0	B
9	New US 50 / Harrah's Rd	Signal (TWSC ¹⁰)	5.1	A	9.4	A	4.3	A	4.8	A	1.6	A	4.9	A	4.4	A	4.9	A	14.5	B	17.5	C

Notes:

- "Average" control delays (in seconds/vehicle (S/V)) are indicated for signal-controlled and All way stop control (AWSC) intersections.
- "Worst-case" delays are indicated for Two-way-stop (TWSC) controlled intersections.
- Wmnt = MUTCD based Peak-hour-Volume Signal Warrant #3.
- US 50 / Lake Pkwy intersection is controlled by a signal under "Skywalk Alternative" and by either a roundabout or a signal under "Triangle Alternative", "Triangle One-Way Alternative", and "PSR Alternative".
- A layout drawing of the roundabout option for the US 50 / Lake Parkway intersection is provided in Appendix Exhibit 6.
- "Average" and "Worst-case" control delays are indicated for roundabout intersection in avg (w.c.) format.
- Signal A assumes a 5-lane cross-section of Old US 50 b/w Pioneer Trail and Park Avenue. Pioneer Trail intersection SB approach: 1 through lane, 1 free-right lane, 1 left turn pocket.
Signal B assumes a 3-lane cross-section of Old US 50 b/w Pioneer Trail and Park Avenue. Pioneer Trail intersection SB approach: 1 through lane, 1 free-right turn pocket, 1 left turn pocket.
- Signal A assumes a 5-lane cross-section of Old US 50 b/w Pioneer Trail and Park Avenue. Park Avenue intersection EB approach: 1 through lane, 1 right turn trap lane, 1 left turn pocket. NB approach: dual left turn pockets.
Signal B assumes a 3-lane cross-section of Old US 50 b/w Pioneer Trail and Park Avenue. Park Avenue intersection EB approach: 1 through-right lane, 1 left turn pocket. NB approach: single left turn pocket.
- Control Type for this intersection is AWSC under "Alternative A (No-Build)" and "Alternative E (Skywalk)" conditions.
- Control Type for this intersection is TWSC under "Alternative A (No-Build)" and "Alternative E (Skywalk)" conditions.
- "Intersection does not exist under the specified alternative or otherwise "Not Applicable".
- * Projected to operate at LOS "E" for 4 hours or less per day based on analysis of 5th highest hour, which is considered acceptable per TRPA standards.

Similarly, this proposed reversal of directionality would reroute/eliminate the significant US 50 westbound left-turn traffic entering the one-way westbound New US 50 that would be conflicting with the one-way eastbound US 50 through traffic at the US 50 / Lake Parkway intersection. Rerouting these left turns would lead to a significant improvement in delays and LOS throughout the project study area, particularly at the New US 50 / Pioneer Trail / Old US 50 and New US 50 / Lake Parkway / Old US 50 intersections.

Alternative D (PSR): All study intersections are projected to operate at annual average and summer peak hour LOS “C” or better under “Year 2020 with Project” conditions.

Alternative E (Skywalk): All study intersections are projected to operate at annual average and summer peak hour LOS “D” or better under “Year 2020 with Project” conditions.

MUTCD based traffic signal peak hour volume warrant 3 is not projected to be met at any of the unsignalized study intersections under all “Year 2020 with Project” alternatives.

ROADWAY OPERATIONS

Table 16 shows the peak hour arterial/highway directional segment operations under “Year 2020 with Project” conditions for all project alternatives.

As shown in **Table 16**:

Alternative B (Triangle): All study arterial segments are projected to operate at annual average and summer peak hour LOS “D” or better under “Year 2020 with Project” conditions, including the Old US 50 arterial segment with a three-lane cross-section between Pioneer Trail and Lake Parkway.

Alternative C (Triangle One-Way): Westbound Old US 50 between Pioneer Trail and Park Avenue are projected to operate at annual average and summer peak hour LOS “E” (and is projected to operate at LOS “E” for more than four hours per day) under “Year 2020 with Project” conditions. All other study arterial segments are projected to operate at acceptable annual average and summer peak hour LOS “E” for four hours or less per day or better under “Existing plus Project” conditions.

Alternative D (PSR): All study arterial segments are projected to operate at annual average and summer peak hour LOS “D” or better under “Year 2020 with Project” conditions.

Alternative E (Skywalk): All study arterial segments are projected to operate at annual average and summer peak hour LOS “C” or better under “Year 2020 with Project” conditions.

Table 16 - "Year 2020 with Project" Arterial Segment Traffic Operations

Arterial Segment	Arterial Class	Dir	Alternative A (No-Build)				Alternative B (Triangle)				Alternative C (Triangle One-Way)				Alternative D (PSR)				Alternative E (Skywalk)			
			Annual Average		Summer Peak		Annual Average		Summer Peak		Annual Average		Summer Peak		Annual Average		Summer Peak		Annual Average		Summer Peak	
			Spd	LOS	Spd	LOS	Spd	LOS	Spd	LOS	Spd	LOS	Spd	LOS	Spd	LOS	Spd	LOS	Spd	LOS	Spd	LOS
New US 50 (b/w Pioneer Trail & Lake Pkwy)	II	EB	-	-	-	-	24.8	C	24.2	C	-	-	-	-	23.4	C	24.2	C	-	-	-	-
New US 50 (b/w Pioneer Trail & Lake Pkwy)	II	WB	-	-	-	-	32.7	B	31.8	B	-	-	-	-	31.3	B	31.1	B	-	-	-	-
Old US 50 (b/w Pioneer Trail & Lake Pkwy, w/ 5-lane segment b/w Pioneer Trail & Park Ave)	III	EB	20.1	C	17.3	D	18.8	C	17.4	D	-	-	-	-	18.3	C	15.7	D	23.2	C	19.5	C
Old US 50 (b/w Pioneer Trail & Lake Pkwy, w/ 5-lane segment b/w Pioneer Trail & Park Ave)	III	WB	20.2	C	13.3	E*	16.7	D	14.0	D	-	-	-	-	16.4	D	14.9	D	22.4	C	20.7	C
Old US 50 (b/w Pioneer Trail & Lake Pkwy, w/ 3-lane segment b/w Pioneer Trail & Park Ave)	III	EB	-	-	-	-	18.2	C	17.7	D	-	-	-	-	-	-	-	-	-	-	-	-
Old US 50 (b/w Pioneer Trail & Lake Pkwy, w/ 3-lane segment b/w Pioneer Trail & Park Ave)	III	WB	-	-	-	-	15.4	D	14.9	D	-	-	-	-	-	-	-	-	-	-	-	-
Old US 50 (b/w Pioneer Trail & Park Ave)	III	EB	-	-	-	-	-	-	-	-	25.1	B	20.2	C	-	-	-	-	-	-	-	-
Old US 50 (b/w Pioneer Trail & Park Ave)	III	WB	-	-	-	-	-	-	-	-	12.8	E	13.1	E	-	-	-	-	-	-	-	-
One-Way EB US 50 (b/w Park Ave & Lake Pkwy)	III	EB	-	-	-	-	-	-	-	-	21.8	C	12.9	E*	-	-	-	-	-	-	-	-
One-Way WB US 50 (b/w Pioneer Trail & Lake Pkwy)	II	WB	-	-	-	-	-	-	-	-	19.6	D	19.8	D	-	-	-	-	-	-	-	-

Notes:

Spd = Average Travel Speed in miles per hour, EB = Eastbound, WB = Westbound, LOS = Level of Service

The study roadway segments with a free flow speed of approx. 30-35 mph are regarded as HCM-2010 Class III Arterial.

The study roadway segments with a free flow speed of approx. 40 mph are regarded as HCM-2010 Class II Arterial.

"-" Roadway segment does not exist under the specified alternative or otherwise operations "Not Applicable".

* Projected to operate at LOS "E" for 4 hours or less per day based on analysis of 5th highest hour, which is considered acceptable per TRPA standards.

“YEAR 2040 WITH PROJECT” TRAFFIC OPERATIONS

INTERSECTION OPERATIONS

Table 17 summarizes “Year 2040 with Project” conditions intersection traffic operations under all project alternatives. “Year 2040 with Project” conditions should be regarded as if a proposed alternative had been constructed under Year 2040 conditions. “Year 2040 with Project” traffic volumes for Alternatives B, C, D and E are illustrated in **Appendix Figures 17, 18, 19 and 20**, respectively.

As shown in **Table 17**:

Alternative B (Triangle): All study intersections are projected to operate at annual average and summer peak hour LOS “C” or better under “Year 2040 with Project” conditions.

Alternative C (Triangle One-Way): All study intersections are projected to operate at acceptable “Year 2040 with Project” peak hour operations except for the US 50 intersections with Pioneer Trail, Stateline Avenue, and Lake Parkway.

The New US 50 / Pioneer Trail / Old US 50 intersection is projected to operate at annual average and summer peak hour LOS “E/F” (and projected to operate at LOS “E” for more than four hours per day) under “Year 2040 with Project” conditions. In order to improve LOS at the New US 50 / Pioneer Trail / Old US 50 intersection to an acceptable (LOS “E” for four hours or less per day or better) level, a third dedicated left turn lane/pocket would need to be constructed on the eastbound approach, and a third receiving lane would need to be constructed on the Old US 50 leg of the intersection. However, these improvements are not feasible as they would necessitate significant additional right of way be acquired, and have significant impacts to TRPA thresholds, including water quality, soil conservation, vegetation, and scenic.

The Old US 50 / Stateline Avenue intersection is projected to operate at summer peak hour LOS “F” under “Year 2040 with Project” conditions. A possible improvement for the Old US 50 / Stateline Avenue intersection, that is projected to result in acceptable operations of LOS “E” for four hours or less per day or better, would be to construct an eastbound right turn pocket.

The proposed signal and roundabout-controlled US 50 / Lake Parkway intersections are projected to operate at summer peak hour LOS “F” under “Year 2040 with Project” conditions. For the annual average peak hour, the proposed roundabout at the US 50 / Lake Parkway intersection is projected to operate at LOS “F” for the worst case movement. In order to improve LOS at the proposed signalized New US 50 / Lake Parkway / Old US 50 intersection to an acceptable (LOS “E” for four hours or less per day or better) level, a third dedicated left turn lane/pocket would need to be constructed on the westbound approach, and a third receiving lane would need to be constructed on the One-Way Westbound leg of the intersection. However, these improvements are not feasible as they would necessitate significant additional right of way be acquired, and have significant impacts to TRPA thresholds, including water quality, soil conservation, vegetation, and scenic. A SIDRA-software based roundabout concept-level analysis for the US 50 / Lake Parkway location under Alternative C has determined that a roundabout is not a feasible solution at this intersection due to the high volume of circulating left turns that would be made from westbound US 50 onto the new US 50 Loop. Adding additional lanes to the roundabout would have no significant effect on the LOS because the high volume of westbound left turns already in the roundabout that would prevent eastbound through traffic from entering the roundabout without substantial delay.

Table 17 – “Year 2040 with Project” Intersection Traffic Operations

#	Intersection	Control Type	Alternative A (No Build)				Alternative B (Triangle)				Alternative C (Triangle One-Way)				Alternative D (PSR)				Alternative E (Skywalk)			
			Annual Avg		Summer Pk		Annual Avg		Summer Pk		Annual Avg		Summer Pk		Annual Avg		Summer Pk		Annual Avg		Summer Pk	
			Delay (S/V)	LOS	Delay (S/V)	LOS	Delay (S/V)	LOS	Delay (S/V)	LOS	Delay (S/V)	LOS	Delay (S/V)	LOS	Delay (S/V)	LOS	Delay (S/V)	LOS	Delay (S/V)	LOS	Delay (S/V)	LOS
1	Park Ave / Pine Blvd	TWSC ²	10.1	B	10.6	B	9.5	A	9.8	A	9.8	A	10.2	B	9.5	A	9.8	A	10.1	B	10.6	B
2	Pine Blvd / Stateline Ave	AWSC ¹	8.3	A	8.7	A	8.3	A	8.7	A	8.6	A	9.2	A	8.3	A	8.7	A	8.3	A	8.7	A
3	New US 50 / Pioneer Trail / Old US 50 ⁷	Signal A	23.7	C	64.5	E	21.6	C	25.2	C	70.3	E	124.8	F	21.5	C	24.6	C	24.0	C	64.8	E*
		Signal B	-	-	-	-	21.8	C	25.0	C	-	-	-	-	-	-	-	-	-	-	-	-
4	Old US 50 / Park Ave / Heavenly Village Way ⁸	Signal A	15.8	B	52.4	D	20.6	C	27.3	C	15.1	B	38.6	D	19.6	B	23.4	C	17.7	B	61.2	E*
		Signal B	-	-	-	-	22.5	C	32.9	C	-	-	-	-	-	-	-	-	-	-	-	-
5	Old US 50 / Friday Ave	Signal ¹	6.6	A	19.1	B	10.8	B	14.9	B	5.7	A	31.1	C	14.6	B	14.8	B	7.6	A	17.8	B
6	Old US 50 / Stateline Ave	Signal	35.9	D	90.6	F	18.7	B	20.6	C	13.3	B	81.6	F	19.4	B	22.9	C	10.7	B	12.9	B
7	New US 50 / Lake Pkwy / Old US 50 ⁴	Signal	19.9	B	27.6	C	18.5	B	25.4	C	50.9	D	106.5	F	23.7	C	26.6	C	22.2	C	30.1	C
		Rndabt ^{5,6}	11.5	B	15.3	C	7.6 (14.6)	A (B)	8.7 (17.2)	A (C)	45.4 (93.1)	E* (F)	160.6 (340.1)	F (F)	7.6 (14.6)	A (B)	8.7 (17.2)	A (C)	-	-	-	-
8	New US 50 / Heavenly Village Way	Signal (AWSC ⁹)	15.1	C	18.8	C	10.7	B	12.5	B	2.1	A	7.6	A	11.9	B	11.2	B	11.5	B	15.3	C
9	New US 50 / Harrah's Rd	Signal (TWSC ¹⁰)	6.6	A	19.1	B	4.4	A	4.9	A	9.8	A	6.5	A	4.1	A	4.3	A	15.1	C	18.8	C

Notes:

1. "Average" control delays (in seconds/vehicle (S/V)) are indicated for signal-controlled and All way stop control (AWSC) intersections.
 2. "Worst-case" delays are indicated for Two-way-stop (TWSC) controlled intersections.
 3. Wmnt = MUTCD based Peak-hour-Volume Signal Warrant #3.
 4. US 50 / Lake Pkwy intersection is controlled by a signal under "Skywalk Alternative" and by either a roundabout or a signal under "Triangle Alternative", "Triangle One-Way Alternative", and "PSR Alternative".
 5. A layout drawing of the roundabout option for the US 50 / Lake Parkway intersection is provided in Appendix Exhibit 6.
 6. "Average" and "Worst-case" control delays are indicated for roundabout intersection in avg(w.c.) format.
 7. Signal A assumes a 5-lane cross-section of Old US 50 b/w Pioneer Trail and Park Avenue. Pioneer Trail intersection SB approach: 1 through lane, 1 free-right lane, 1 left turn pocket. Signal B assumes a 3-lane cross-section of Old US 50 b/w Pioneer Trail and Park Avenue. Pioneer Trail intersection SB approach: 1 through lane, 1 free-right turn pocket, 1 left turn pocket.
 8. Signal A assumes a 5-lane cross-section of Old US 50 b/w Pioneer Trail and Park Avenue. Park Avenue intersection EB approach: 1 through lane, 1 right turn trap lane, 1 left turn pocket. NB approach: dual left turn pockets. Signal B assumes a 3-lane cross-section of Old US 50 b/w Pioneer Trail and Park Avenue. Park Avenue intersection EB approach: 1 through-right lane, 1 left turn pocket. NB approach: single left turn pocket.
 9. Control Type for this intersection is AWSC under "Alternative A (No-Build)" and "Alternative E (Skywalk)" conditions.
 10. Control Type for this intersection is TWSC under "Alternative A (No-Build)" and "Alternative E (Skywalk)" conditions.
- “-” Intersection does not exist under the specified alternative or otherwise "Not Applicable".
- * Projected to operate at LOS “E” for 4 hours or less per day based on analysis of 5th highest hour, which is considered acceptable per TRPA standards.

One possible mitigation for Alternative C is to reverse the directionality of the proposed one-way segments of US 50 (i.e. the old alignment of US 50 would carry westbound traffic and the new southern loop alignment of US 50 would carry eastbound traffic). This proposed reversal of directionality would reroute/eliminate the significant US 50 eastbound left-turn traffic entering the casino core that would be conflicting with the one-way westbound New US 50 through traffic at the US 50 / Pioneer Trail intersection. Similarly, this proposed reversal of directionality would reroute/eliminate the significant US 50 westbound left-turn traffic entering the one-way westbound New US 50 that would be conflicting with the one-way eastbound US 50 through traffic at the US 50 / Lake Parkway intersection. Rerouting these left turns would lead to a significant improvement in delays and LOS throughout the project study area, particularly at the New US 50 / Pioneer Trail / Old US 50 and New US 50 / Lake Parkway / Old US 50 intersections.

Alternative D (PSR): All study intersections are projected to operate at annual average and summer peak hour LOS “C” or better under “Year 2040 with Project” conditions.

Alternative E (Skywalk): The New US 50 / Pioneer Trail / Old US 50 intersection is projected to operate at summer peak hour LOS “F” under “Year 2040 with Project” conditions.

MUTCD based traffic signal peak hour volume warrant 3 is not projected to be met at any of the unsignalized study intersections under all “Year 2040 with Project” alternatives.

ROADWAY OPERATIONS

Table 18 shows peak hour arterial/highway directional segment operations under “Year 2040 with Project” conditions for all project alternatives.

As shown in **Table 18**:

Alternative B (Triangle): All study arterial segments are projected to operate at annual average and summer peak hour LOS “E” for four hours or less per day or better under “Year 2040 with Project” conditions.

Alternative C (Triangle One-Way): Westbound Old US 50 between Pioneer Trail and Park Avenue is projected to operate at annual average and summer peak hour LOS “E” (and is projected to operate at LOS “E” for more than four hours per day) under “Year 2040 with Project” conditions. One-Way Eastbound US 50 between Park Avenue and Lake Parkway is projected to operate at summer peak hour LOS “F” under “Year 2040 with Project” conditions. All other study arterial segments are projected to operate at acceptable annual average and summer peak hour LOS “E” for four hours or less per day or better under “Existing plus Project” conditions.

Alternative D (PSR): All study arterial segments are projected to operate at annual average and summer peak hour LOS “D” or better under “Year 2040 with Project” conditions.

Alternative E (Skywalk): All study arterial segments are projected to operate at annual average and summer peak hour LOS “E” for four hours or less per day or better under “Year 2040 with Project” conditions.

Table 18 - "Year 2040 with Project" Arterial Segment Traffic Operations

Arterial Segment	Arterial Class	Dir	Alternative A (No-Build)				Alternative B (Triangle)				Alternative C (Triangle One-Way)				Alternative D (PSR)				Alternative E (Skywalk)			
			Annual Average		Summer Peak		Annual Average		Summer Peak		Annual Average		Summer Peak		Annual Average		Summer Peak		Annual Average		Summer Peak	
			Spd	LOS	Spd	LOS	Spd	LOS	Spd	LOS	Spd	LOS	Spd	LOS	Spd	LOS	Spd	LOS	Spd	LOS	Spd	LOS
New US 50 (b/w Pioneer Trail & Lake Pkwy)	II	EB	-	-	-	-	24.3	C	24.2	C	-	-	-	-	25.8	C	26.0	C	-	-	-	-
New US 50 (b/w Pioneer Trail & Lake Pkwy)	II	WB	-	-	-	-	31.9	B	31.4	B	-	-	-	-	30.3	B	30.6	B	-	-	-	-
Old US 50 (b/w Pioneer Trail & Lake Pkwy, w/ 5-lane segment b/w Pioneer Trail & Park Ave)	III	EB	19.3	C	13.8	E*	17.3	D	14.9	D	-	-	-	-	16.3	D	15.1	D	21.6	C	16.8	D
Old US 50 (b/w Pioneer Trail & Lake Pkwy, w/ 5-lane segment b/w Pioneer Trail & Park Ave)	III	WB	18.7	C	10.5	E	15.6	D	14.0	D	-	-	-	-	14.6	D	14.1	D	21.8	C	12.7	E*
Old US 50 (b/w Pioneer Trail & Lake Pkwy, w/ 3-lane segment b/w Pioneer Trail & Park Ave)	III	EB	-	-	-	-	17.0	D	16.4	D	-	-	-	-	-	-	-	-	-	-	-	-
Old US 50 (b/w Pioneer Trail & Lake Pkwy, w/ 3-lane segment b/w Pioneer Trail & Park Ave)	III	WB	-	-	-	-	14.6	D	13.4	E*	-	-	-	-	-	-	-	-	-	-	-	-
Old US 50 (b/w Pioneer Trail & Park Ave)	III	EB	-	-	-	-	-	-	-	-	23.2	C	11.2	E*	-	-	-	-	-	-	-	-
Old US 50 (b/w Pioneer Trail & Park Ave)	III	WB	-	-	-	-	-	-	-	-	10.7	E	13.1	E	-	-	-	-	-	-	-	-
One-Way EB US 50 (b/w Park Ave & Lake Pkwy)	III	EB	-	-	-	-	-	-	-	-	20.4	C	9.4	F	-	-	-	-	-	-	-	-
One-Way WB US 50 (b/w Pioneer Trail & Lake Pkwy)	II	WB	-	-	-	-	-	-	-	-	15.5	E*	15.1	E*	-	-	-	-	-	-	-	-

Notes:

Spd = Average Travel Speed in miles per hour, EB = Eastbound, WB = Westbound, LOS = Level of Service

The study roadway segments with a free flow speed of approx. 30-35 mph are regarded as HCM-2010 Class III Arterial.

The study roadway segments with a free flow speed of approx. 40 mph are regarded as HCM-2010 Class II Arterial.

"-" Roadway segment does not exist under the specified alternative or otherwise operations "Not Applicable".

* Projected to operate at LOS "E" for 4 hours or less per day based on analysis of 5th highest hour, which is considered acceptable per TRPA standards.

PROPOSED DEVELOPMENT TRAFFIC IMPACTS

The proposed Alternatives B, C, and D would all require some existing residences and businesses to be acquired and removed to provide right of way for the proposed new alignment of US 50. In order to mitigate the lost residences and business space, three (3) sites have been identified from the remaining slivers of acquired right of way that could be used for the construction of up to three (3) new developments in order to essentially “replace” those existing land uses that will be removed. It is anticipated that each of the three (3) proposed developments would contain a mixture of multi-family residential and commercial land uses, and each proposed site size, description, and location would vary slightly under each of the three build alternatives in question. All three proposed development sites combined could contain up to approximately 150 more residential units and 40,000 square feet more commercial area than would be removed because the new developments would be built at a higher unit density than the removed properties (see **Appendix Tables 5A-7B** for more detail). The following section analyzes how much additional traffic would be generated by the proposed developments, assuming all three sites are built to accommodate the maximum size/density allowed by current City of South Lake Tahoe land use and zoning ordinances and TRPA thresholds, and what, if any, traffic impacts the developments would have on study area roadway facilities. Proposed development land uses and locations presented at the December 2015 Open House are shown in **Table 19**. The latest available commercial, housing, and hotel unit take numbers are shown in **Table 20**.

Table 19 – Proposed Developments

Alternative / Development	Apartments (DU ²)	Commercial (KSF)	Location
Alternative B (Triangle):			
Site 1	72	28.25	NW corner of realigned US 50 / Pioneer Trail intersection.
Site 2	70	8	NE corner of realigned US 50 / Pioneer Trail intersection.
Site 3	87	10	NW ¹ corner of New US 50 / Heavenly Village Parkway intersection.
Alternative C (Triangle One-Way):			
Site 1	72	28.25	NW corner of realigned US 50 / Pioneer Trail intersection.
Site 2	70	8	NE corner of realigned US 50 / Pioneer Trail intersection.
Site 3	87	10	NW ¹ corner of New US 50 / Heavenly Village Parkway intersection.
Alternative D (PSR):			
Site 1	76	5	SW and SE corners of realigned US 50 / Pioneer Trail intersection.
Site 2	70	20	NE corner of realigned US 50 / Pioneer Trail intersection.
Site 3	78	10	NW ¹ corner of New US 50 / Heavenly Village Parkway intersection.
¹ NW corner assuming US 50 is the east-west direction. (i.e. south of Heavenly Village Parkway and west of New US 50).			
² Assumed max units allowed per site instead of currently planned number of units to be conservative.			

Table 20 – Proposed Housing and Hotel Take Numbers

Alternative	Land Use	Unit	Quantity
Alternative B (Triangle)	General Housing	DU	28
	Affordable Housing	DU	65
	Commercial	KSF	4
	Motel	Rooms	155
Alternative C (Triangle One-Way)	General Housing	DU	18
	Affordable Housing	DU	60
	Commercial	KSF	4
	Motel	Rooms	155
Alternative D (PSR)	General Housing	DU	4
	Affordable Housing	DU	74
	Commercial	KSF	15.5
	Motel	Rooms	41

Trip generation rates from the *Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition* were used to estimate trips generated by the proposed developments, as well as those that were generated by the land uses that will be removed with the construction of the project. Trips generated by the land uses to be removed were subtracted from the trips generated by the closest proposed developments in order to calculate net new trips generated by the proposed developments. It was determined that the proposed new developments would generate between approximately 1,400 and 1,700 net new trips per day. **Appendix Tables 5A-7B** include detailed trip generation calculations and assumptions for each project alternative.

Net new trips generated by the proposed developments were assigned to the worst case scenario analyzed (i.e. “Year 2040 with Project” summer peak hour conditions) under Alternatives B, C, and D. New Development Only turning movement volumes at study area intersections as well as percent distributions are shown in **Appendix Figures 21, 22, and 23**. Year 2040 plus New Development turning movement volumes at study area intersections are shown in **Appendix Figures 24, 25, and 26**.

Intersection and roadway delays and LOS were obtained for “Year 2040 with Project and Proposed Developments” conditions using Synchro software. The proposed new developments are not anticipated to be fully constructed until after 2020; therefore, this study analyzes the impact of the proposed developments under Year 2040 conditions only. Furthermore, this study assumes any deficiencies resulting from the addition of these new developments under Year 2040 conditions to be “worst case”, i.e. if a study facility is projected to operate acceptably under “Year 2040 With Project and Proposed Developments” conditions, it can be assumed to operate the same or better under “Existing/Year 2020 With Project and Proposed Developments” conditions.

INTERSECTION OPERATIONS

“Year 2040 with Project and Proposed Developments” intersection operations are summarized in **Table 21** under Alternatives B, C, and D.

Table 21 - "Year 2040 with Project and Proposed Developments" Intersection Traffic Operations

#	Intersection	Control Type	Alternative B (Triangle)				Alternative C (Triangle One-Way)				Alternative D (PSR)			
			Summer Peak				Summer Peak				Summer Peak			
			Before Developments		With Developments		Before Developments		With Developments		Before Developments		With Developments	
			Delay (S/V)	LOS	Delay (S/V)	LOS	Delay (S/V)	LOS	Delay (S/V)	LOS	Delay (S/V)	LOS	Delay (S/V)	LOS
1	Park Ave / Pine Blvd	TWSC ²	9.8	A	9.8	A	10.2	B	10.2	B	9.8	A	9.8	A
2	Pine Blvd / Stateline Ave	AWSC ¹	8.7	A	8.7	A	9.2	A	9.2	A	8.7	A	8.7	A
3	New US 50 / Pioneer Trail / Old US 50 ⁷	Signal A	25.2	C	25.1	C	124.8	F	134.4	F	24.6	C	29.3	C
		Signal B	25.0	C	25.5	C	-	-	-	-	-	-	-	-
4	Old US 50 / Park Ave / Heavenly Village Way ⁸	Signal A	27.3	C	25.3	C	38.6	D	41.5	D	23.4	C	24.0	C
		Signal B	32.9	C	31.2	C	-	-	-	-	-	-	-	-
5	Old US 50 / Friday Ave	Signal	14.9	B	14.6	B	31.1	C	36.8	D	14.8	B	18.8	B
6	Old US 50 / Stateline Ave	Signal	20.6	C	23.7	C	81.6	F	89.4	F	22.9	C	23.1	C
7	New US 50 / Lake Pkwy / Old US 50 ⁴	Signal	25.4	C	26.4	C	106.5	F	113.6	F	26.6	C	25.4	C
		Rndabt ^{5,6}	8.7 (17.2)	A (C)	8.9 (17.9)	A (C)	160.6 (340.1)	F (F)	189.1 (399.6)	F (F)	8.7 (17.2)	A (C)	8.9 (17.9)	A (C)
8	New US 50 / Heavenly Village Way	Signal	12.5	B	12.7	B	6.6	A	7.9	A	11.2	B	13.3	B
9	New US 50 / Harrah's Rd	Signal	4.9	A	5.0	A	7.6	A	6.8	A	4.3	A	5.0	A

Notes:

1. "Average" control delays (in seconds/vehicle (S/V)) are indicated for signal-controlled and All way stop control (AWSC) intersections.
 2. "Worst-case" delays are indicated for Two-way-stop (TWSC) controlled intersections.
 3. Wmnt = MUTCD based Peak-hour-Volume Signal Warrant #3.
 4. US 50 / Lake Pkwy intersection is controlled by a signal under "Skywalk Alternative" and by either a roundabout or a signal under "Triangle Alternative", "Triangle One-Way Alternative", and "PSR Alternative".
 5. A layout drawing of the roundabout option for the US 50 / Lake Parkway intersection is provided in Appendix Exhibit 6.
 6. "Average" and "Worst-case" control delays are indicated for roundabout intersection in avg(w.c.) format.
 7. Signal A assumes a 5-lane cross-section of Old US 50 b/w Pioneer Trail and Park Avenue. Pioneer Trail intersection SB approach: 1 through lane, 1 free-right lane, 1 left turn pocket.
Signal B assumes a 3-lane cross-section of Old US 50 b/w Pioneer Trail and Park Avenue. Pioneer Trail intersection SB approach: 1 through lane, 1 free-right turn pocket, 1 left turn pocket.
 8. Signal A assumes a 5-lane cross-section of Old US 50 b/w Pioneer Trail and Park Avenue. Park Avenue intersection EB approach: 1 through lane, 1 right turn trap lane, 1 left turn pocket. NB approach: dual left turn pockets.
Signal B assumes a 3-lane cross-section of Old US 50 b/w Pioneer Trail and Park Avenue. Park Avenue intersection EB approach: 1 through-right lane, 1 left turn pocket. NB approach: single left turn pocket.
- "-" Intersection does not exist under the specified alternative or otherwise "Not Applicable".
* Projected to operate at LOS "E" for 4 hours or less per day based on analysis of 5th highest hour, which is considered acceptable per TRPA standards.

As shown in **Table 21**:

Alternative B (Triangle): All study intersections are projected to operate at summer peak hour LOS "C" or better under "Year 2040 With Project and Proposed Developments" conditions. The addition of new development project trips from all three proposed sites is not projected to create any deficiencies at study area roadway facilities.

Alternative C (Triangle One-Way): The New US 50 / Pioneer Trail / Old US 50, Old US 50 / Stateline Avenue, and New US 50 / Lake Parkway / Old US 50 intersections are projected to operate at unacceptable summer peak hour LOS "F" under "Year 2040 With Project and Proposed Developments" conditions. All of the failing intersections are projected to fail before the addition of new development project trips.

Alternative D (PSR): All study intersections are projected to operate at summer peak hour LOS "C" or better under "Year 2040 With Project and Proposed Developments" conditions. The addition of

new development project trips from all three proposed sites is not projected to create any deficiencies at study area roadway facilities.

MUTCD based traffic signal peak hour volume warrant 3 is not projected to be met at any of the unsignalized study intersections under all “Year 2040 plus Project and Proposed Development” alternatives.

ROADWAY OPERATIONS

Table 22 shows peak hour arterial/highway directional segment operations under “Year 2040 with Project and Proposed Developments” conditions for Alternatives B, C, and D.

As shown in **Table 22**:

Alternative B (Triangle): All directional US 50 arterial study segments are projected to operate at summer peak hour LOS “E” for four hours or less per day or better under “Year 2040 With Project and Proposed Developments” conditions. The addition of new development project trips from all three proposed sites is not projected to create any deficiencies at study area roadway facilities.

Alternative C (Triangle One-Way): Westbound Old US 50 between Pioneer Trail and Park Avenue is projected to operate at summer peak hour LOS “E” (and is projected to operate at LOS “E” for more than four hours per day) under “Year 2040 with Project and Proposed Developments” conditions. One-Way Eastbound US 50 between Park Avenue and Lake Parkway is projected to operate at summer peak hour LOS “F” under “Year 2040 with Project and Proposed Developments” conditions. All of the failing arterial segments are projected to fail before the addition of new development project trips.

Alternative D (PSR): All study arterial segments are projected to operate at summer peak hour LOS “E” for four hours or less per day or better under “Year 2040 With Project and Proposed Developments” conditions. The addition of new development project trips from all three proposed sites is not projected to create any deficiencies at study area roadway facilities.

PARKING IMPACTS

The proposed new development Site 3 would be located on the southeast end of the Village Center Shopping Center adjacent to Montreal Road under Alternatives B, C, and D. The southeast end of the shopping center is currently an employee parking lot with capacity for several hundred vehicles. If Site 3 were constructed at the proposed location, the existing employee parking would either be maintained, with the proposed new mixed-use development constructed above the existing lot, or a new parking solution would be developed and constructed at the time of buildout of the proposed new development.

All proposed new development sites would include enough parking spaces to meet or exceed City of South Lake Tahoe and TRPA requirements.

Table 22 - "Year 2040 with Project and Proposed Developments" Arterial Segment Traffic Operations

Arterial Segment	Arterial Class	Direction	Alternative B (Triangle)				Alternative C (Triangle One-Way)				Alternative D (PSR)			
			Summer Peak				Summer Peak				Summer Peak			
			Before Development		With Developments		Before Development		With Developments		Before Development		With Developments	
			Speed	LOS	Speed	LOS	Speed	LOS	Speed	LOS	Speed	LOS	Speed	LOS
New US 50 (b/w Pioneer Trail & Lake Pkwy)	II	EB	24.2	C	24.2	C	-	-	-	-	26.0	C	22.7	C
New US 50 (b/w Pioneer Trail & Lake Pkwy)	II	WB	31.4	B	31.1	B	-	-	-	-	30.6	B	27.2	C
Old US 50 (b/w Pioneer Trail & Lake Pkwy, w/ 5-lane segment b/w Pioneer Trail & Park Ave)	III	EB	14.9	D	14.4	D	-	-	-	-	15.1	D	13.4	E*
Old US 50 (b/w Pioneer Trail & Lake Pkwy, w/ 5-lane segment b/w Pioneer Trail & Park Ave)	III	WB	14.0	D	14.6	D	-	-	-	-	14.1	D	14.7	D
Old US 50 (b/w Pioneer Trail & Lake Pkwy, w/ 3-lane segment b/w Pioneer Trail & Park Ave)	III	EB	16.4	D	15.7	D	-	-	-	-	-	-	-	-
Old US 50 (b/w Pioneer Trail & Lake Pkwy, w/ 3-lane segment b/w Pioneer Trail & Park Ave)	III	WB	13.4	E*	13.5	E*	-	-	-	-	-	-	-	-
Old US 50 (b/w Pioneer Trail & Park Ave)	III	EB	-	-	-	-	11.2	E*	11.2	E*	-	-	-	-
Old US 50 (b/w Pioneer Trail & Park Ave)	III	WB	-	-	-	-	13.1	E	12.0	E	-	-	-	-
One-Way EB US 50 (b/w Park Ave & Lake Pkwy)	III	EB	-	-	-	-	9.4	F	8.3	F	-	-	-	-
One-Way WB US 50 (b/w Pioneer Trail & Lake Pkwy)	II	WB	-	-	-	-	15.1	E*	15.1	E*	-	-	-	-
Notes: Speed = Average Travel Speed in miles per hour, EB = Eastbound, WB = Westbound, LOS = Level of Service The study roadway segments with a free flow speed of approx. 30-35 mph are regarded as HCM-2010 Class III Arterial. The study roadway segments with a free flow speed of approx. 40 mph are regarded as HCM-2010 Class II Arterial. "-" Roadway segment does not exist under the specified alternative or otherwise operations "Not Applicable". * Projected to operate at LOS "E" for 4 hours or less per day based on analysis of 5 th highest hour, which is considered acceptable per TRPA standards.														

VMT ANALYSIS

Vehicle miles traveled (VMT) is the total miles traveled by vehicles within a specific region over a certain time period. VMT per capita is defined as total VMT in a region divided by the total population of the region. VMT and VMT per capita are both measures of efficiency of the transportation system. As stated in the Analysis Methodology section of this document, TRPA has a general VMT standard of reducing overall VMT within the TRPA region to 10% below 1981 levels. Therefore, any projects that result in an increase in regional VMT (or VMT per capita) are generally regarded as having a negative impact, while any projects that result in a decrease in regional VMT (or VMT per capita) are generally regarded as having a beneficial impact.

PROPOSED TRANSPORTATION IMPROVEMENTS VMT ANALYSIS

Alternative A (No-Build): The No-Build Alternative would make no changes to the existing roadway network. Therefore, there would be no change to existing regional VMT and the project would have **no significant impact**.

Alternative B (Triangle): Alternative B would lengthen US 50 through the Stateline area for both eastbound and westbound traffic by approximately 0.4 miles. This increase in roadway length would lead to vehicles on US 50 having to travel a longer distance through the Stateline area, which would lead to a small increase in Regional VMT. The project would have a small negative impact.

While the proposed Alternative B would have a small negative impact on VMT when analyzed on its own, the US 50 South Shore Revitalization Project has also been assumed as a part of several transportation strategy packages and alternatives proposed/analyzed in the *Mobility 2035 Regional Transportation Plan / Sustainable Communities Strategy Draft EIR / EIS* (Ascent Environmental, April 25, 2012) (RTP EIR/EIS) for the Tahoe Metropolitan Planning Organization and the Tahoe Regional Planning Agency. The RTP EIR/EIS assumed a version of the US 50 South Shore Revitalization Project similar to the proposed Alternatives B and D considered in this document, which would both have similar effects on regional VMT.

According to the RTP EIR/EIS, Alternative 3 is the RTP alternative that most closely reflects the preliminary recommendation of the TRPA Governing Board's Regional Plan Update Committee. Additionally, RTP EIR/EIS Alternative 3 has since been selected and approved by the TRPA Governing Board as the alternative that would best achieve TRPA's regional objectives. The RTP EIR/EIS Alternative 3 assumes construction of a number of transportation improvement projects, including the US 50 South Shore Revitalization Project, as well as reduced development in the region plus highly incentivized redevelopment in Town Centers, Regional Center, and the High Density Tourist District. The RTP EIR/EIS found that Alternative 3 would have a beneficial impact on VMT as it would cause VMT per capita to decrease from 36.4 in 2010 to 35.3 in 2035, a 3.1 percent reduction. Therefore, since a version of the US 50 South Shore Revitalization Project similar to Alternative B was assumed under RTP EIR/EIS Alternative 3, and RTP EIR/EIS Alternative 3 was assumed to have a beneficial impact on VMT, it can be assumed that construction of the proposed Alternative B would not prevent the TRPA region from reaching its goal of reducing VMT below 1981 levels, and Alternative B would have **no significant impact**.

Alternative C (Triangle One-Way): Alternative C would lengthen US 50 through the Stateline area for westbound traffic only by approximately 0.4 miles. This increase in roadway length would lead to westbound vehicles on US 50 having to travel a longer distance through the Stateline area, which would lead to a very small increase in Regional VMT. The project would have a very small negative impact.

While the proposed Alternative C would have a very small negative impact on VMT when analyzed on its own, the US 50 South Shore Revitalization Project has also been assumed as a part of several transportation strategy packages and alternatives proposed/analyzed in the *Mobility 2035 Regional Transportation Plan / Sustainable Communities Strategy Draft EIR / EIS* (Ascent Environmental, April 25, 2012) (RTP EIR/EIS) for the Tahoe Metropolitan Planning Organization and the Tahoe Regional Planning Agency. The RTP EIR/EIS assumed a version of the US 50 South Shore Revitalization Project similar to the proposed Alternatives B and D considered in this document, which would both have similar effects on regional VMT.

According to the RTP EIR/EIS, Alternative 3 is the RTP alternative that most closely reflects the preliminary recommendation of the TRPA Governing Board's Regional Plan Update Committee. Additionally, RTP EIR/EIS Alternative 3 has since been selected and approved by the TRPA Governing Board as the alternative that would best achieve TRPA's regional objectives. The RTP EIR/EIS Alternative 3 assumes construction of a number of transportation improvement projects, including the US 50 South Shore Revitalization Project, as well as reduced development in the region plus highly incentivized redevelopment in Town Centers, Regional Center, and the High Density Tourist District. The RTP EIR/EIS found that Alternative 3 would have a beneficial impact on VMT as it would cause VMT per capita to decrease from 36.4 in 2010 to 35.3 in 2035, a 3.1 percent reduction. Therefore, since a version of the US 50 South Shore Revitalization Project was assumed under RTP EIR/EIS Alternative 3 that would have a slightly larger negative impact on regional VMT than Alternative C would (i.e. would increase regional VMT by a slightly larger amount), and RTP EIR/EIS Alternative 3 was assumed to have a beneficial impact on VMT, it can be assumed that construction of the proposed Alternative C would not prevent the TRPA region from reaching its goal of reducing VMT below 1981 levels, and Alternative C would have **no significant impact**.

Alternative D (PSR): Alternative D would lengthen US 50 through the Stateline area for both eastbound and westbound traffic by approximately 0.4 miles. This increase in roadway length would lead to vehicles on US 50 having to travel a longer distance through the Stateline area, which would lead to a small increase in Regional VMT. The project would have a small negative impact.

While the proposed Alternative D would have a small negative impact on VMT when analyzed on its own, the US 50 South Shore Revitalization Project has also been assumed as a part of several transportation strategy packages and alternatives proposed/analyzed in the *Mobility 2035 Regional Transportation Plan / Sustainable Communities Strategy Draft EIR / EIS* (Ascent Environmental, April 25, 2012) (RTP EIR/EIS) for the Tahoe Metropolitan Planning Organization and the Tahoe Regional Planning Agency. The RTP EIR/EIS assumed a version of the US 50 South Shore Revitalization Project similar to the proposed Alternatives B and D considered in this document, which would both have similar effects on regional VMT.

According to the RTP EIR/EIS, Alternative 3 is the RTP alternative that most closely reflects the preliminary recommendation of the TRPA Governing Board's Regional Plan Update Committee. Additionally, RTP EIR/EIS Alternative 3 has since been selected and approved by the TRPA Governing Board as the alternative that would best achieve TRPA's regional objectives. The RTP EIR/EIS Alternative 3 assumes construction of a number of transportation improvement projects, including the US 50 South Shore Revitalization Project, as well as reduced development in the region plus highly incentivized redevelopment in Town Centers, Regional Center, and the High Density Tourist District. The RTP EIR/EIS found that Alternative 3 would have a beneficial impact on VMT as it would cause VMT per capita to decrease from 36.4 in 2010 to 35.3 in 2035, a 3.1 percent reduction. Therefore, since a version of the US 50 South Shore Revitalization Project similar to Alternative D was assumed under RTP EIR/EIS Alternative 3, and RTP EIR/EIS Alternative 3 was assumed to have a beneficial impact on VMT, it can be assumed that construction of the proposed

Alternative D would not prevent the TRPA region from reaching its goal of reducing VMT below 1981 levels, and Alternative D would have **no significant impact**.

Alternative E (Skywalk): Alternative E would only make pedestrian facility changes to the existing transportation network. Therefore, there would be no change to existing regional VMT and the project would have no impact.

PROPOSED NEW DEVELOPMENTS VMT ANALYSIS

The proposed new developments under Alternatives B, C, and D would all generate slightly more trips than the land uses they would replace (approximately 1,400 – 1,700 additional daily trips), which could potentially lead to a slight increase in regional VMT. However, buildout of the TRPA region was considered under the RTP EIR/EIS and VMT impacts were analyzed. Since the proposed new developments are actually redevelopments (they are essentially “replacing” existing land uses) and would all occur within the City of South Lake Tahoe near the casinos, which is one of the areas designated by the RTP as a Town Center / High Density Tourist District, it can be assumed that the proposed new developments were accounted for under RTP EIR/EIS Alternative 3, which assumed construction of the US 50 South Shore Community Revitalization Project and incentivized redevelopment in Town Centers, Regional Center, and the High Density Tourist District. The RTP EIR/EIS found that VMT per capita would decrease under RTP EIR/EIS Alternative 3 from 36.4 in 2010 to 35.3 in 2035, a 3.1 percent reduction, due to trip reductions from incentivizing redevelopment in centralized areas (Town Centers, High Density Tourist District, etc.). RTP EIR/EIS Alternative 3 was found to have a beneficial impact on VMT. Therefore, since the proposed new developments were accounted for in RTP EIR/EIS Alternative 3, it can be assumed that the proposed new developments under Alternatives B, C, and D would have **no significant impact**.

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Intersection and Arterial LOS Synchro Outputs
Roundabout LOS Sidra Outputs
MUTCD Signal Warrant Worksheets

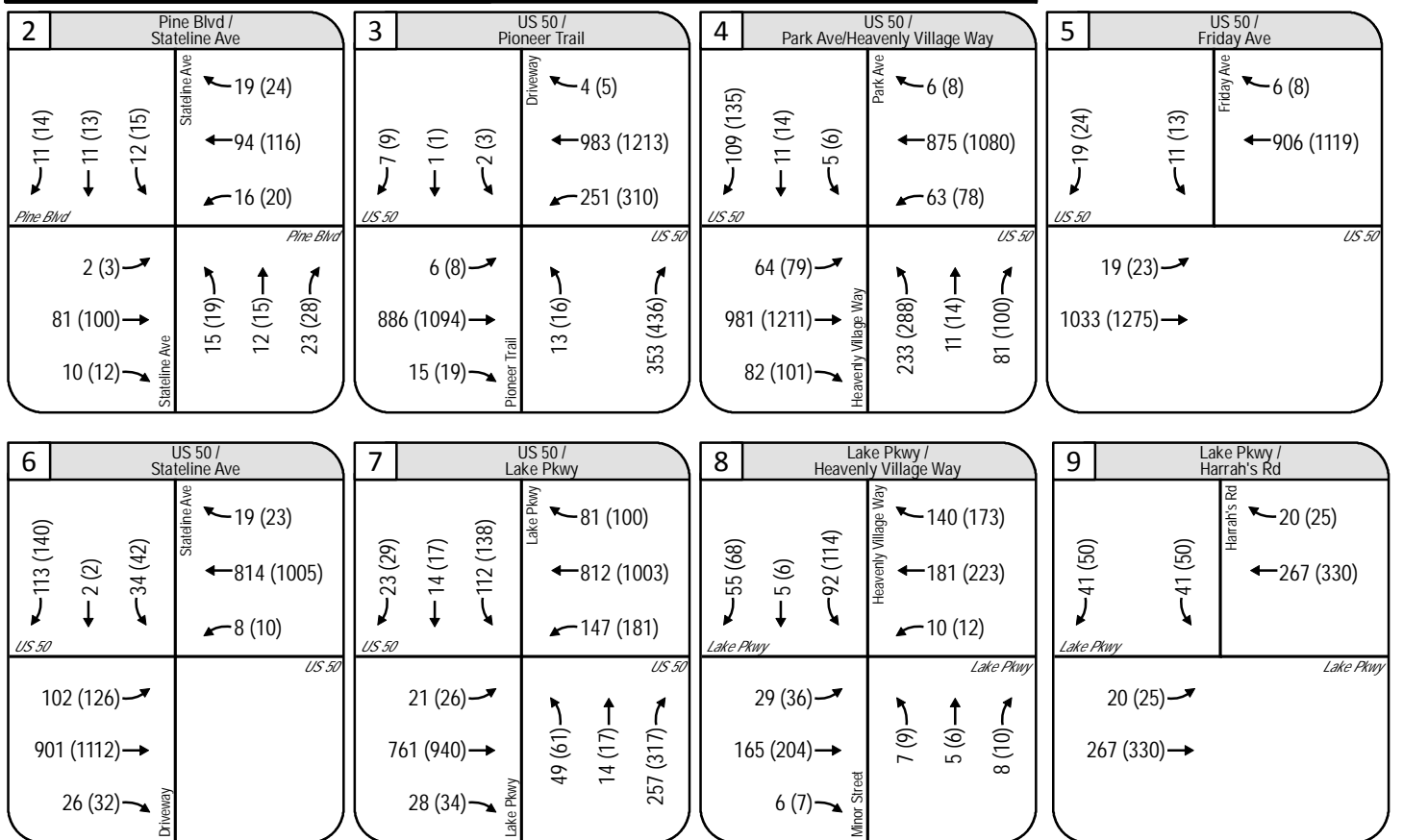
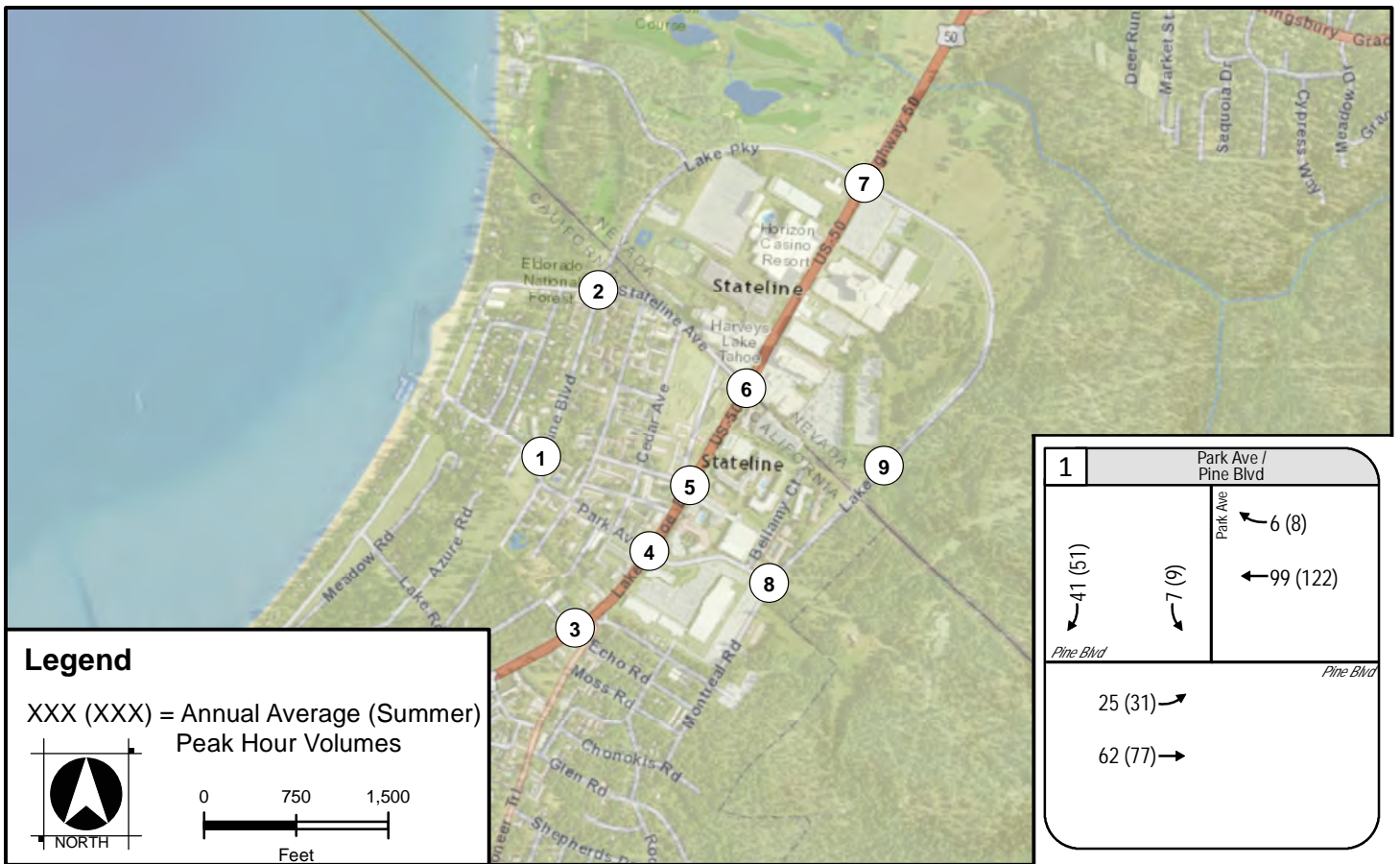


Figure 1 - Existing Traffic Volumes (Year 2015)

US 50 State PR Traffic Operations Analysis
South Lake Tahoe, CA
January 2016



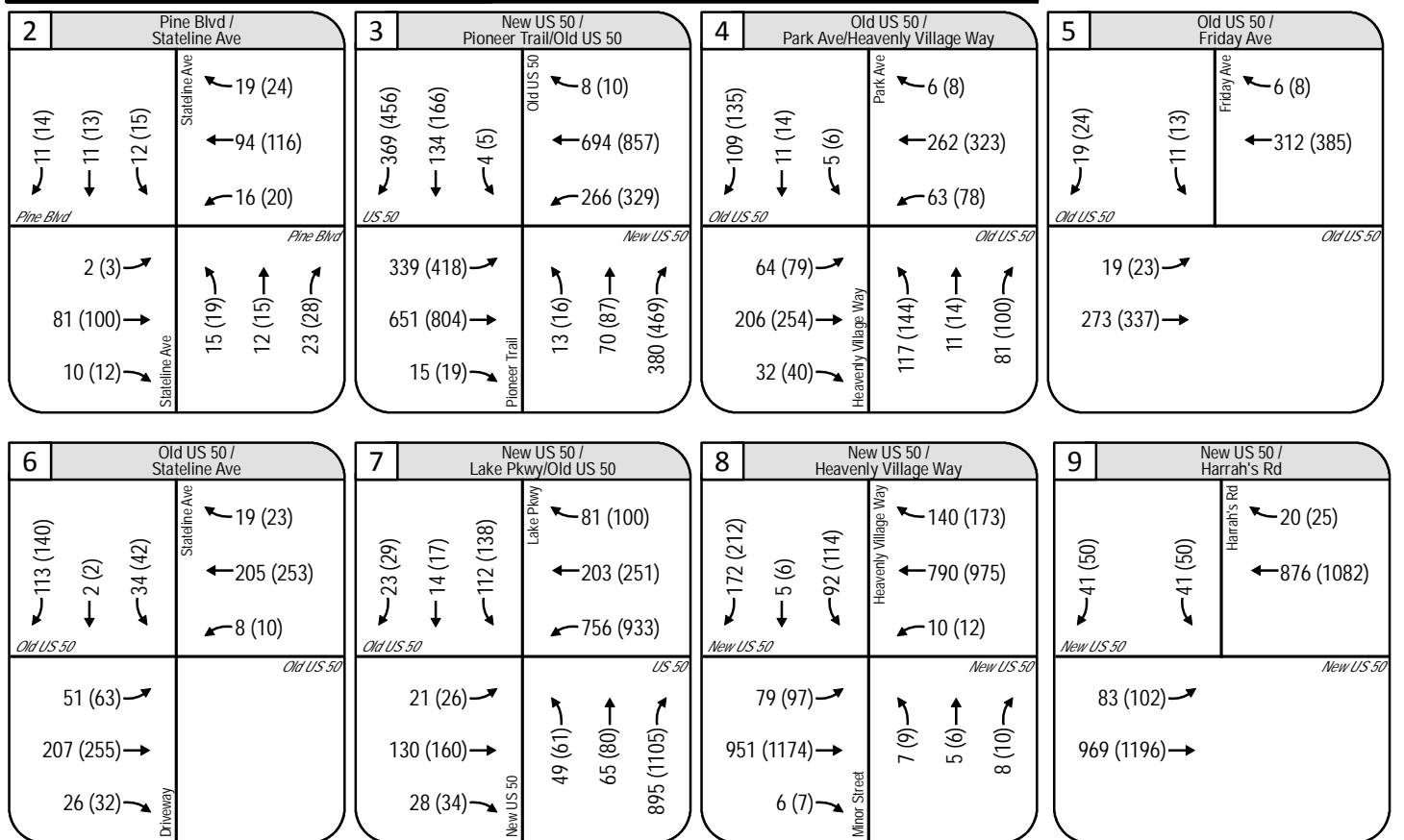
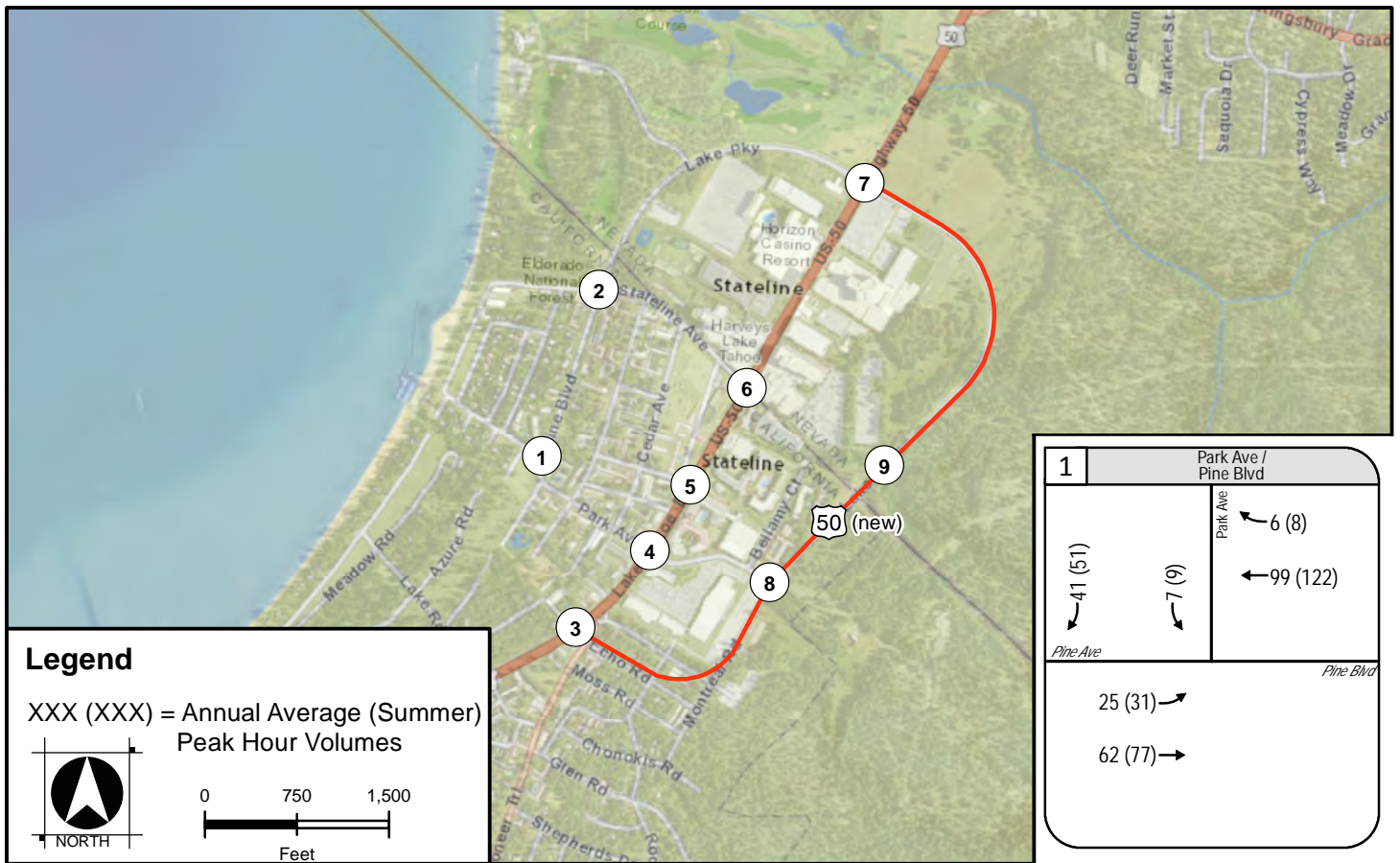


Figure 2 - Year 2015 "Alternative B (Triangle)" Traffic Volumes
 US 50 State PR Traffic Operations Analysis
 South Lake Tahoe, CA
 January 2016

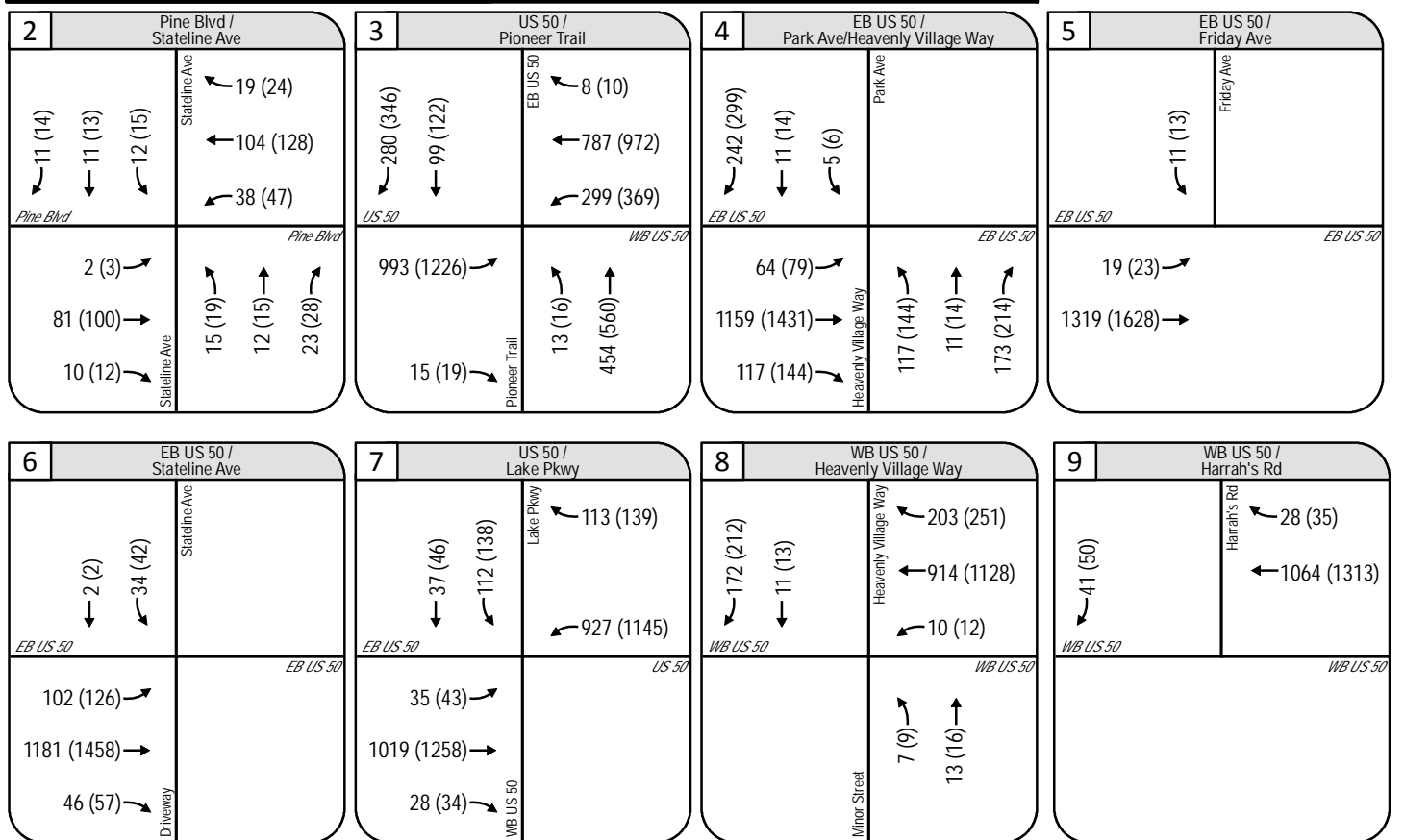
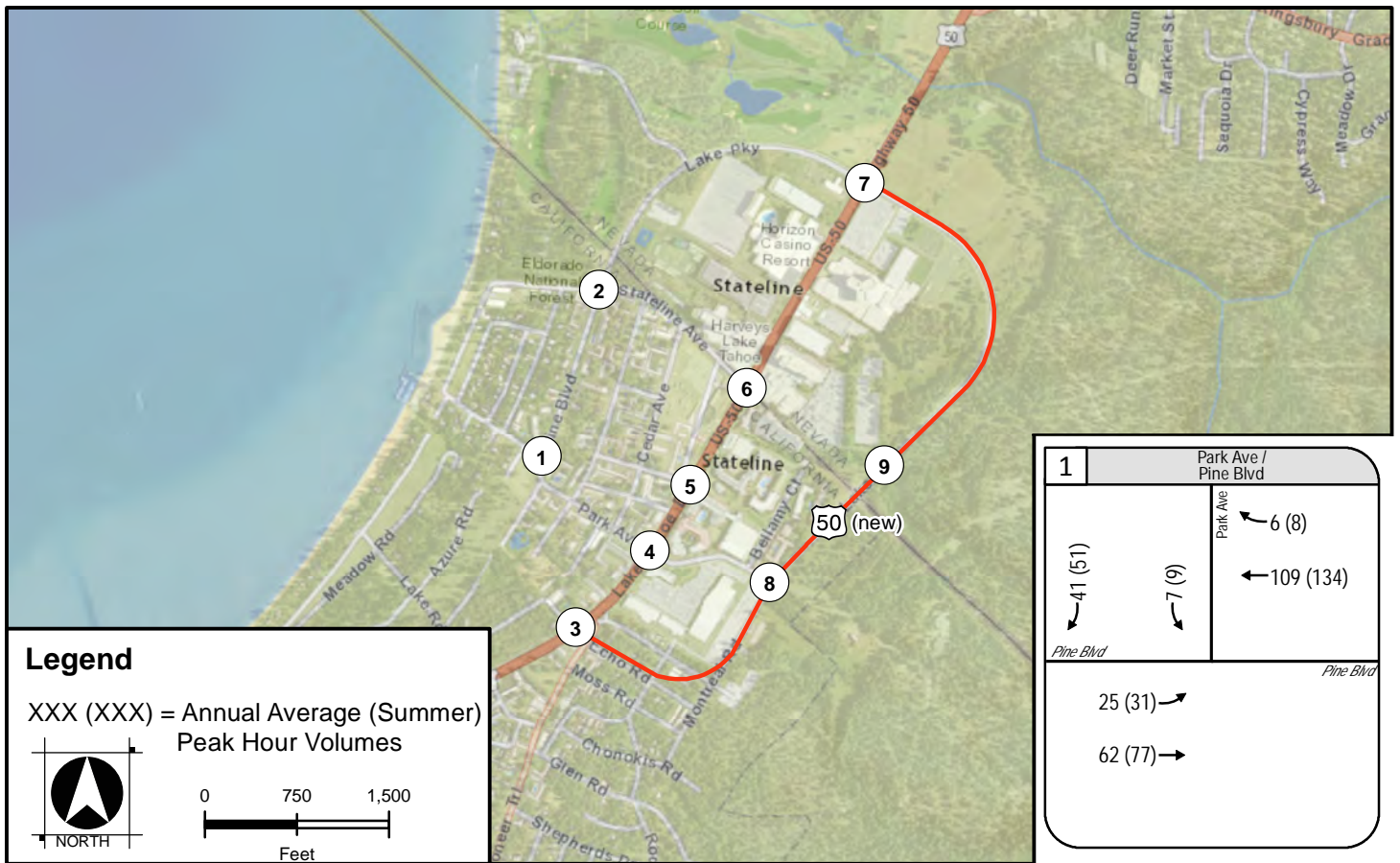


Figure 3 - Year 2015 "Alternative C (Triangle One-Way)" Traffic Volumes
 US 50 State PR Traffic Operations Analysis
 South Lake Tahoe, CA
 January 2016

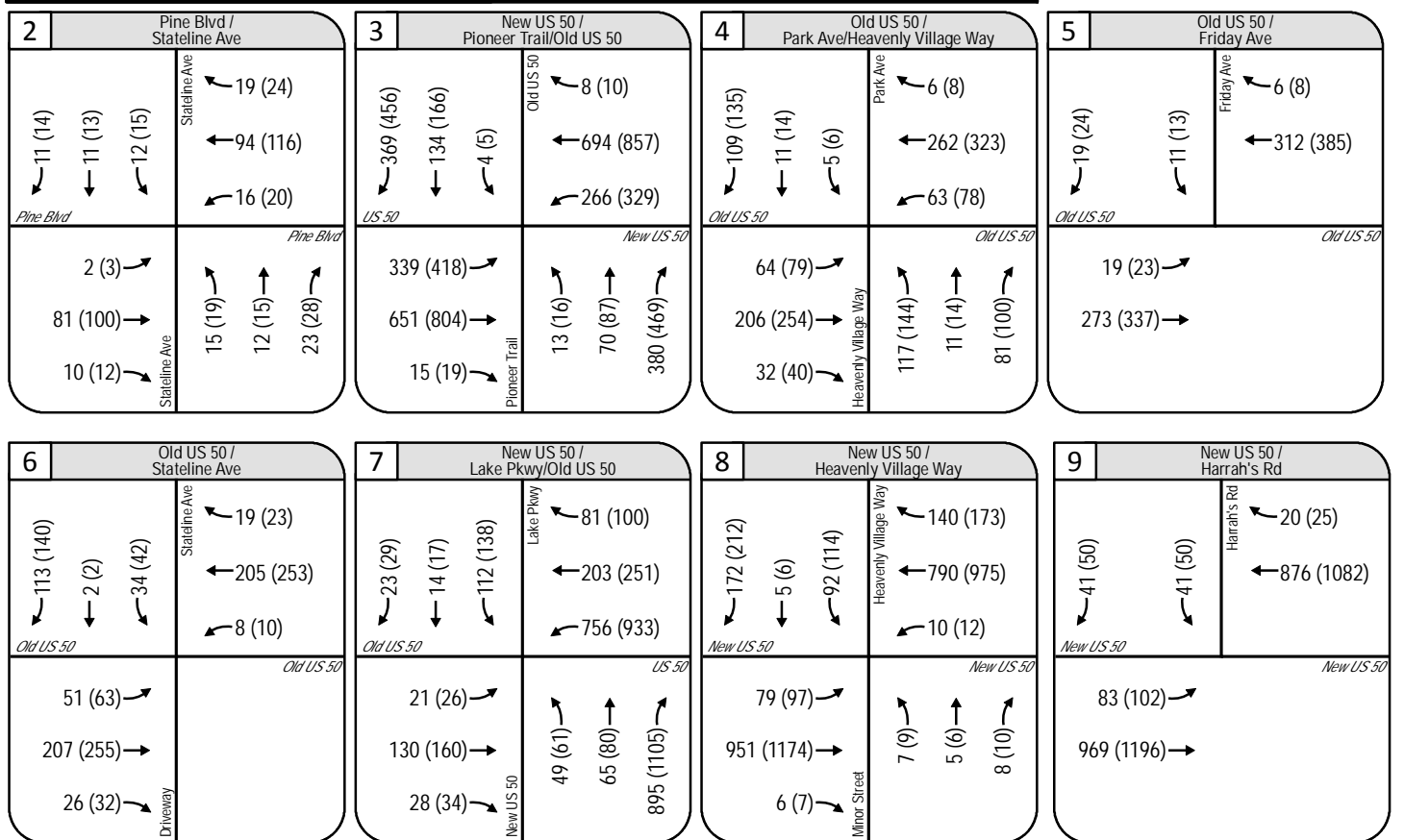
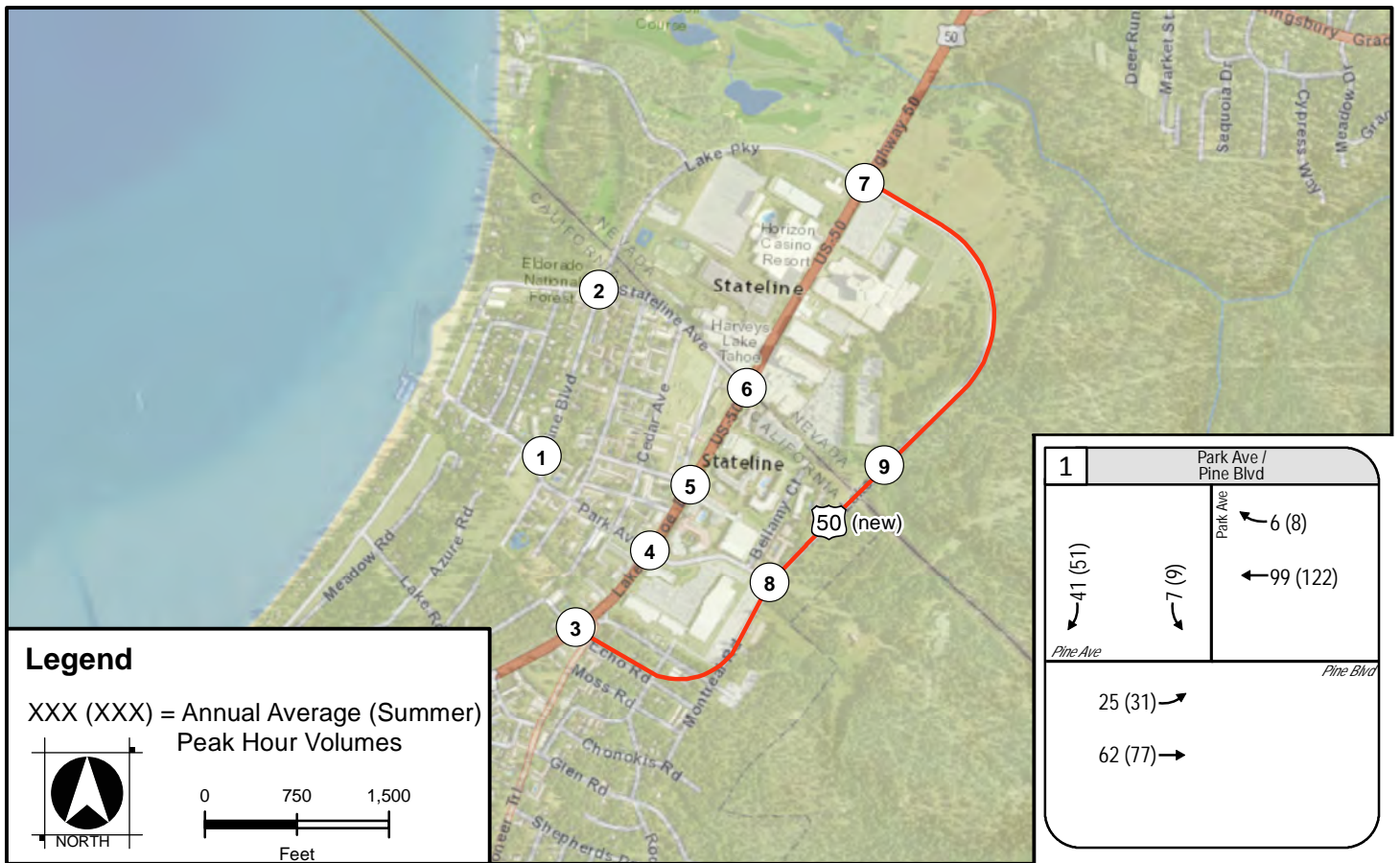


Figure 4 - Year 2015 "Alternative D (PSR)" Traffic Volumes
 US 50 State PR Traffic Operations Analysis
 South Lake Tahoe, CA
 January 2016

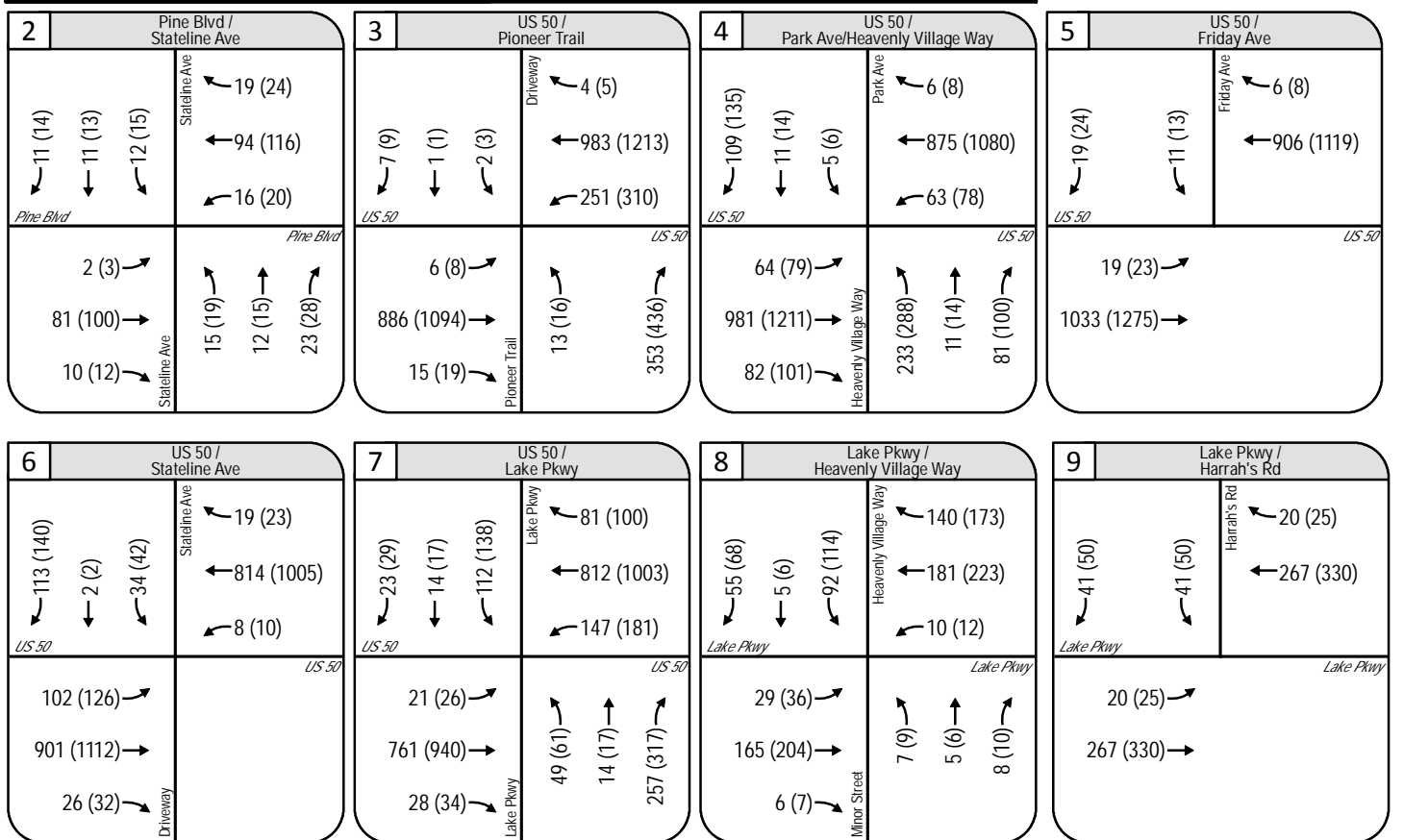
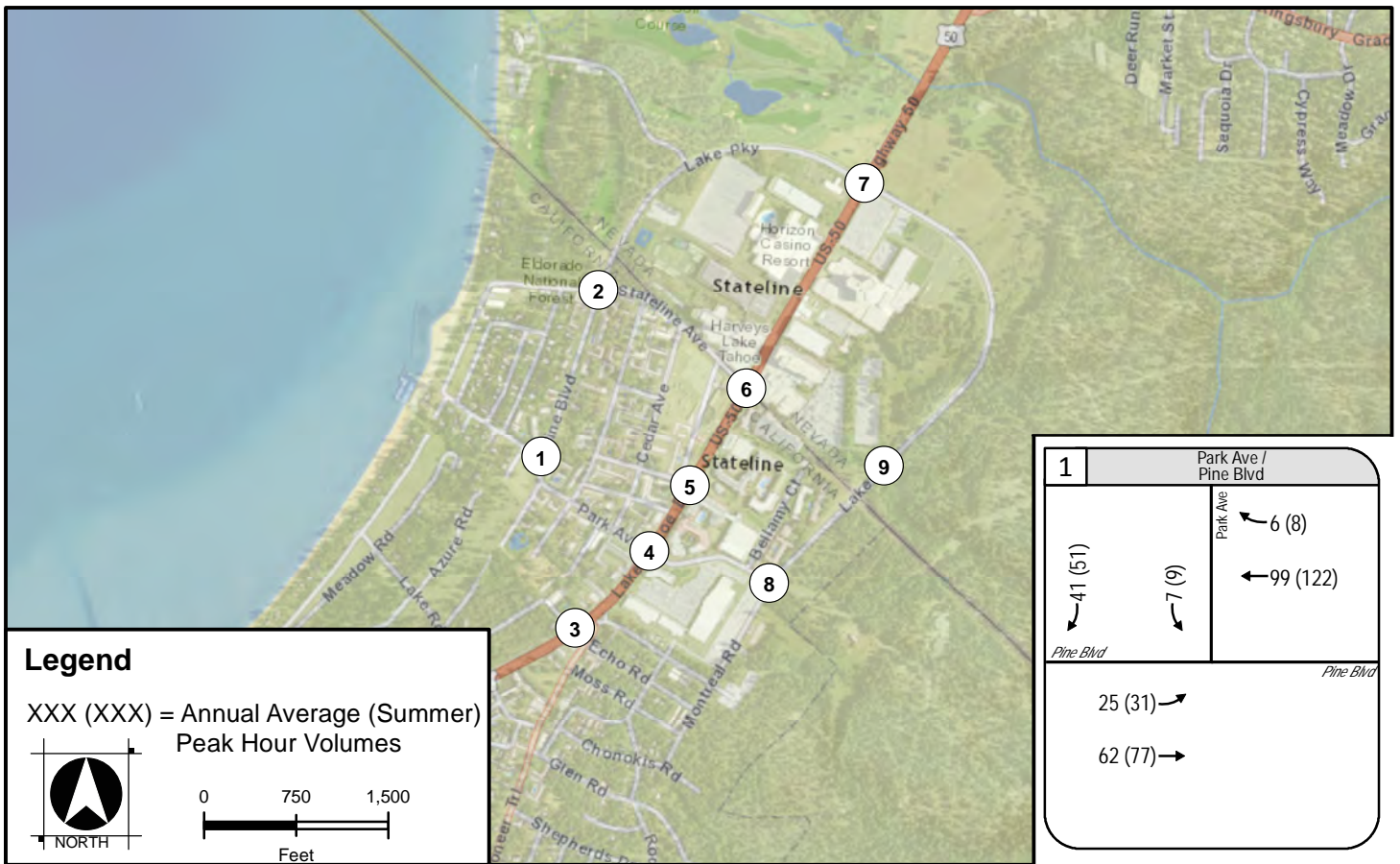
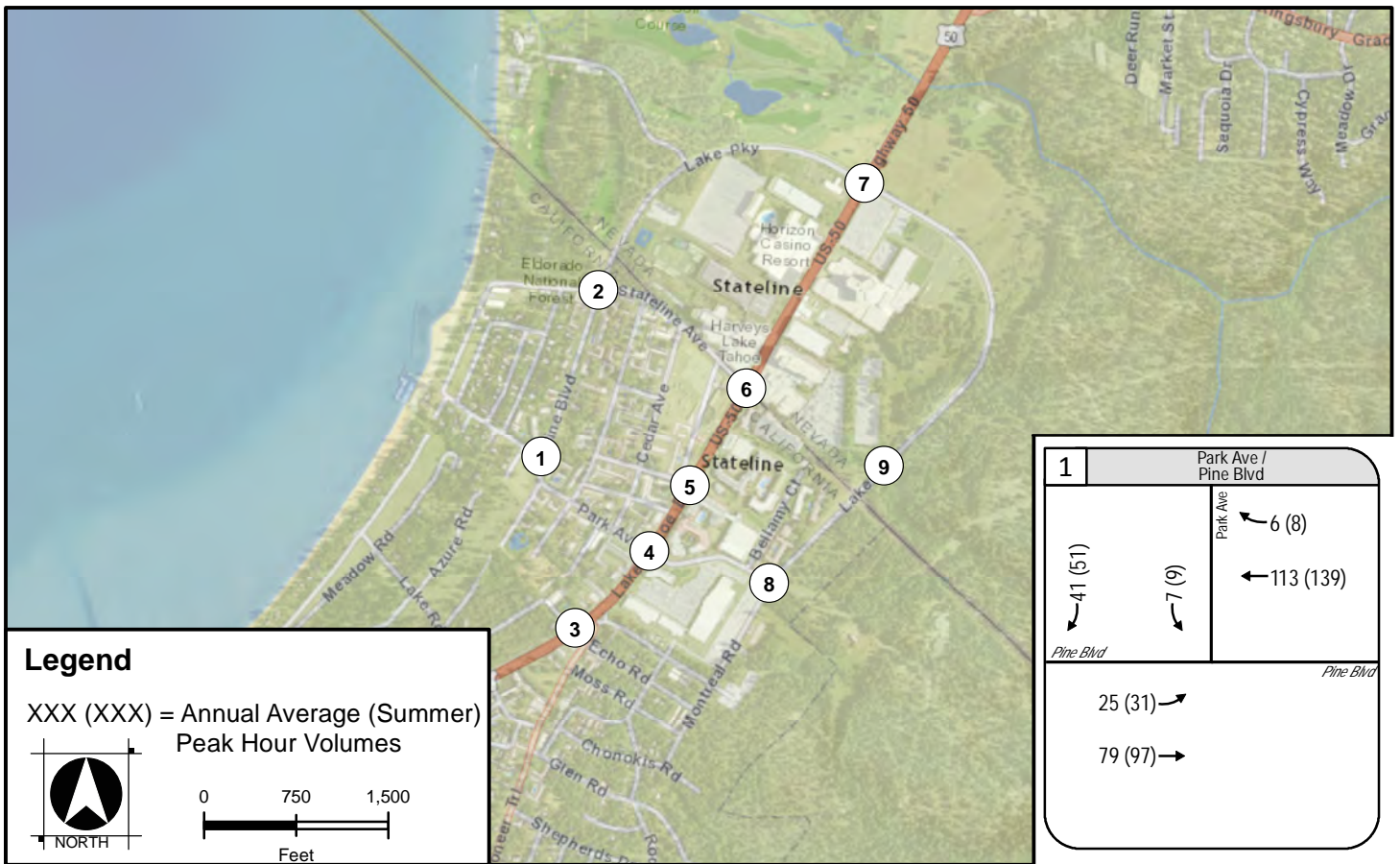


Figure 5 - Year 2015 "Alternative E (Skywalk)" Traffic Volumes

US 50 State PR Traffic Operations Analysis
South Lake Tahoe, CA
January 2016





1	Park Ave / Pine Blvd
<div> <div> <div>41 (51)</div> <div>7 (9)</div> </div> <div> <div>6 (8)</div> <div>113 (139)</div> </div> </div>	<div> <div>Pine Blvd</div> <div>Park Ave</div> </div>
<div> <div>25 (31)</div> <div>79 (97)</div> </div>	<div> <div>Pine Blvd</div> </div>

2	Pine Blvd / Stateline Ave
<div> <div> <div>11 (14)</div> <div>11 (13)</div> <div>12 (15)</div> </div> <div> <div>19 (24)</div> <div>108 (133)</div> <div>16 (20)</div> </div> </div>	<div> <div>Pine Blvd</div> <div>Stateline Ave</div> </div>
<div> <div>2 (3)</div> <div>97 (120)</div> <div>10 (12)</div> </div>	<div> <div>15 (19)</div> <div>12 (15)</div> <div>23 (28)</div> </div>

3	US 50 / Pioneer Trail
<div> <div> <div>7 (9)</div> <div>1 (1)</div> <div>2 (3)</div> </div> <div> <div>4 (5)</div> <div>1037 (1280)</div> <div>269 (332)</div> </div> </div>	<div> <div>US 50</div> <div>Pioneer Trail</div> </div>
<div> <div>6 (8)</div> <div>934 (1153)</div> <div>15 (19)</div> </div>	<div> <div>13 (16)</div> <div>369 (456)</div> </div>

4	Park Ave/Heavenly Village Way
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<div> <div>80 (99)</div> <div>1021 (1261)</div> <div>89 (110)</div> </div>	<div> <div>243 (300)</div> <div>11 (14)</div> <div>81 (100)</div> </div>

5	US 50 / Friday Ave
<div> <div> <div>33 (41)</div> <div>24 (30)</div> </div> <div> <div>22 (27)</div> <div>941 (1162)</div> </div> </div>	<div> <div>US 50</div> <div>Friday Ave</div> </div>
<div> <div>34 (42)</div> <div>1058 (1306)</div> </div>	<div> <div>US 50</div> </div>

6	US 50 / Stateline Ave
<div> <div> <div>113 (140)</div> <div>2 (2)</div> <div>34 (42)</div> </div> <div> <div>19 (23)</div> <div>864 (1067)</div> <div>8 (10)</div> </div> </div>	<div> <div>US 50</div> <div>Stateline Ave</div> </div>
<div> <div>102 (126)</div> <div>940 (1160)</div> <div>26 (32)</div> </div>	<div> <div>US 50</div> <div>Driveway</div> </div>

7	US 50 / Lake Pkwy
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<div> <div>30 (37)</div> <div>791 (977)</div> <div>28 (34)</div> </div>	<div> <div>49 (61)</div> <div>14 (17)</div> <div>264 (326)</div> </div>

8	Lake Pkwy / Heavenly Village Way
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<div> <div>29 (36)</div> <div>165 (204)</div> <div>6 (7)</div> </div>	<div> <div>7 (9)</div> <div>5 (6)</div> <div>8 (10)</div> </div>

9	Lake Pkwy / Harrah's Rd
<div> <div> <div>41 (50)</div> <div>41 (50)</div> </div> <div> <div>20 (25)</div> <div>276 (341)</div> </div> </div>	<div> <div>Lake Pkwy</div> <div>Harrah's Rd</div> </div>
<div> <div>20 (25)</div> <div>275 (339)</div> </div>	<div> <div>Lake Pkwy</div> </div>

Figure 6 - Year 2018 "Alternative A (No-Build)" Traffic Volumes
 US 50 State PR Traffic Operations Analysis
 South Lake Tahoe, CA
 January 2016

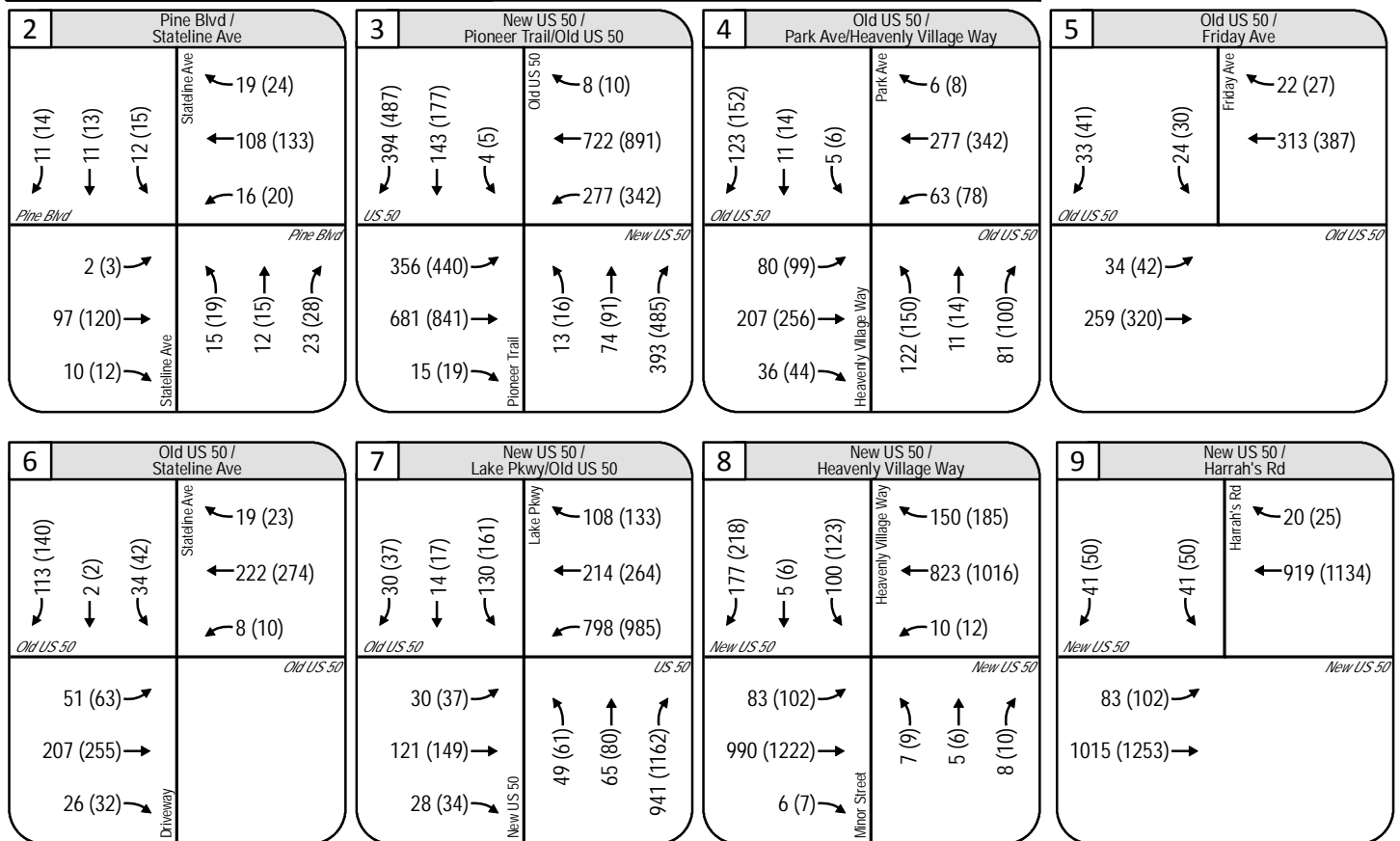
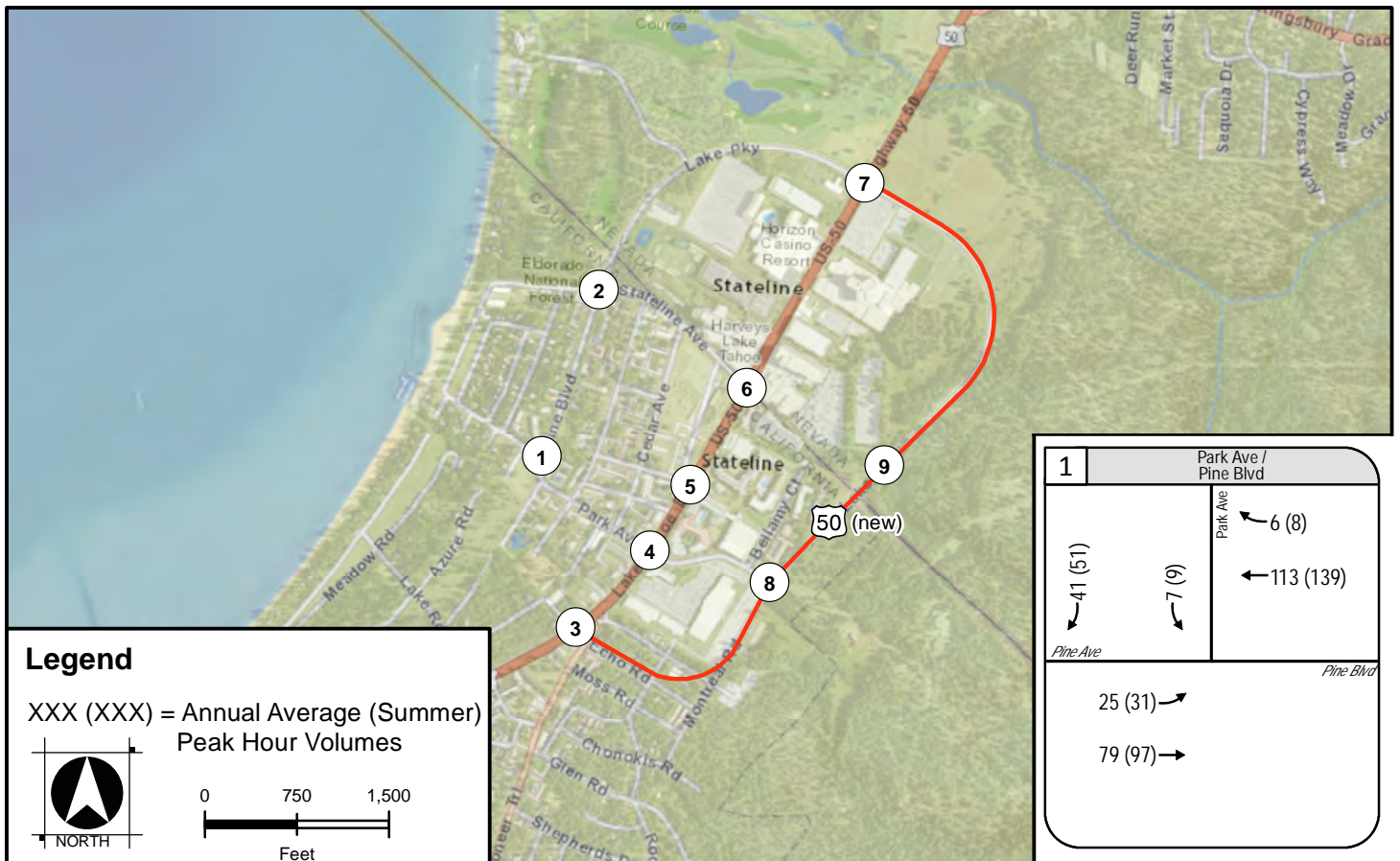
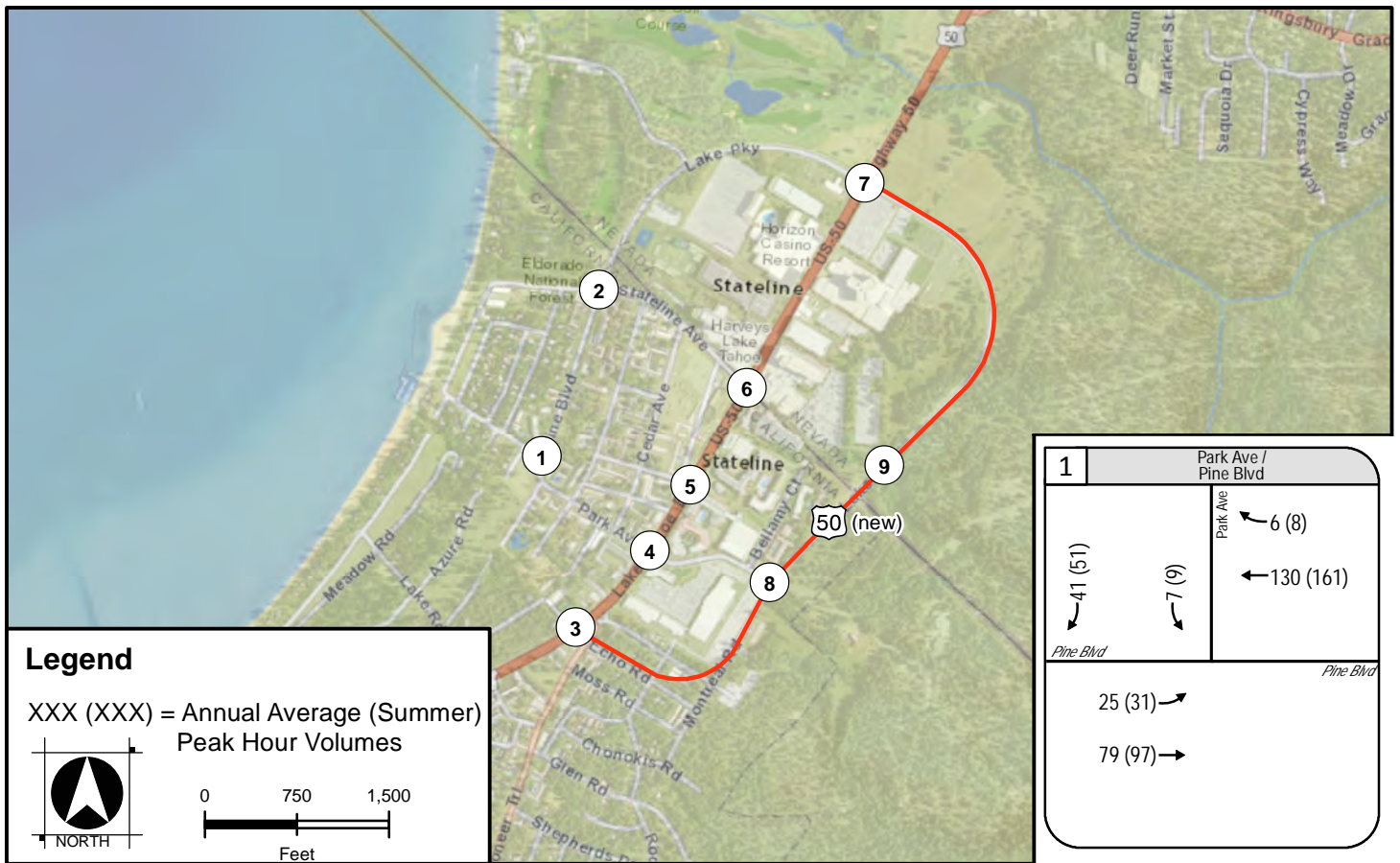


Figure 7 - Year 2018 "Alternative B (Triangle)" Traffic Volumes
 US 50 State PR Traffic Operations Analysis
 South Lake Tahoe, CA
 January 2016



1	Park Ave / Pine Blvd
<div> <div> <div>41 (51)</div> <div>7 (9)</div> </div> <div> <div>6 (8)</div> <div>130 (161)</div> </div> </div>	<div> <div>Pine Blvd</div> <div>Park Ave</div> </div>
<div> <div>25 (31)</div> <div>79 (97)</div> </div>	<div> <div>Pine Blvd</div> </div>

2	Pine Blvd / Stateline Ave
<div> <div> <div>11 (14)</div> <div>11 (13)</div> <div>12 (15)</div> </div> <div> <div>19 (24)</div> <div>126 (155)</div> <div>46 (57)</div> </div> </div>	<div> <div>Pine Blvd</div> <div>Stateline Ave</div> </div>
<div> <div>2 (3)</div> <div>97 (120)</div> <div>10 (12)</div> </div>	<div> <div>15 (19)</div> <div>12 (15)</div> <div>23 (28)</div> </div>

3	US 50 / Pioneer Trail
<div> <div> <div>304 (375)</div> <div>108 (133)</div> </div> <div> <div>8 (10)</div> <div>816 (1007)</div> <div>309 (382)</div> </div> </div>	<div> <div>US 50</div> <div>Pioneer Trail</div> </div>
<div> <div>1041 (1285)</div> <div>15 (19)</div> </div>	<div> <div>13 (16)</div> <div>470 (580)</div> </div>

4	EB US 50 / Park Ave/Heavenly Village Way
<div> <div> <div>270 (333)</div> <div>11 (14)</div> <div>5 (6)</div> </div> <div> <div>80 (99)</div> <div>1200 (1481)</div> <div>124 (153)</div> </div> </div>	<div> <div>EB US 50</div> <div>Park Ave</div> </div>
<div> <div>122 (150)</div> <div>11 (14)</div> <div>181 (223)</div> </div>	<div> <div>Heavenly Village Way</div> <div>EB US 50</div> </div>

5	EB US 50 / Friday Ave
<div> <div>24 (30)</div> </div>	<div> <div>Friday Ave</div> <div>EB US 50</div> </div>
<div> <div>34 (42)</div> <div>1351 (1668)</div> </div>	<div> <div>EB US 50</div> </div>

6	EB US 50 / Stateline Ave
<div> <div> <div>2 (2)</div> <div>34 (42)</div> </div> <div> <div>102 (126)</div> <div>1227 (1515)</div> <div>46 (57)</div> </div> </div>	<div> <div>Stateline Ave</div> <div>EB US 50</div> </div>
<div> <div>44 (54)</div> <div>130 (161)</div> </div>	<div> <div>EB US 50</div> <div>US 50</div> </div>

7	US 50 / Lake Pkwy
<div> <div> <div>44 (54)</div> <div>130 (161)</div> </div> <div> <div>155 (191)</div> <div>965 (1191)</div> </div> </div>	<div> <div>US 50</div> <div>Lake Pkwy</div> </div>
<div> <div>44 (54)</div> <div>1056 (1304)</div> <div>28 (34)</div> </div>	<div> <div>WB US 50</div> <div>US 50</div> </div>

8	WB US 50 / Heavenly Village Way
<div> <div> <div>177 (218)</div> <div>11 (13)</div> </div> <div> <div>213 (263)</div> <div>949 (1171)</div> <div>10 (12)</div> </div> </div>	<div> <div>WB US 50</div> <div>Heavenly Village Way</div> </div>
<div> <div>7 (9)</div> <div>13 (16)</div> </div>	<div> <div>WB US 50</div> <div>Minor Street</div> </div>

9	WB US 50 / Harrah's Rd
<div> <div>41 (50)</div> </div>	<div> <div>Harrah's Rd</div> <div>WB US 50</div> </div>
<div> <div>28 (35)</div> <div>1107 (1367)</div> </div>	<div> <div>WB US 50</div> </div>

Figure 8 - Year 2018 "Alternative C (Triangle One-Way)" Traffic Volumes
 US 50 State PR Traffic Operations Analysis
 South Lake Tahoe, CA
 January 2016

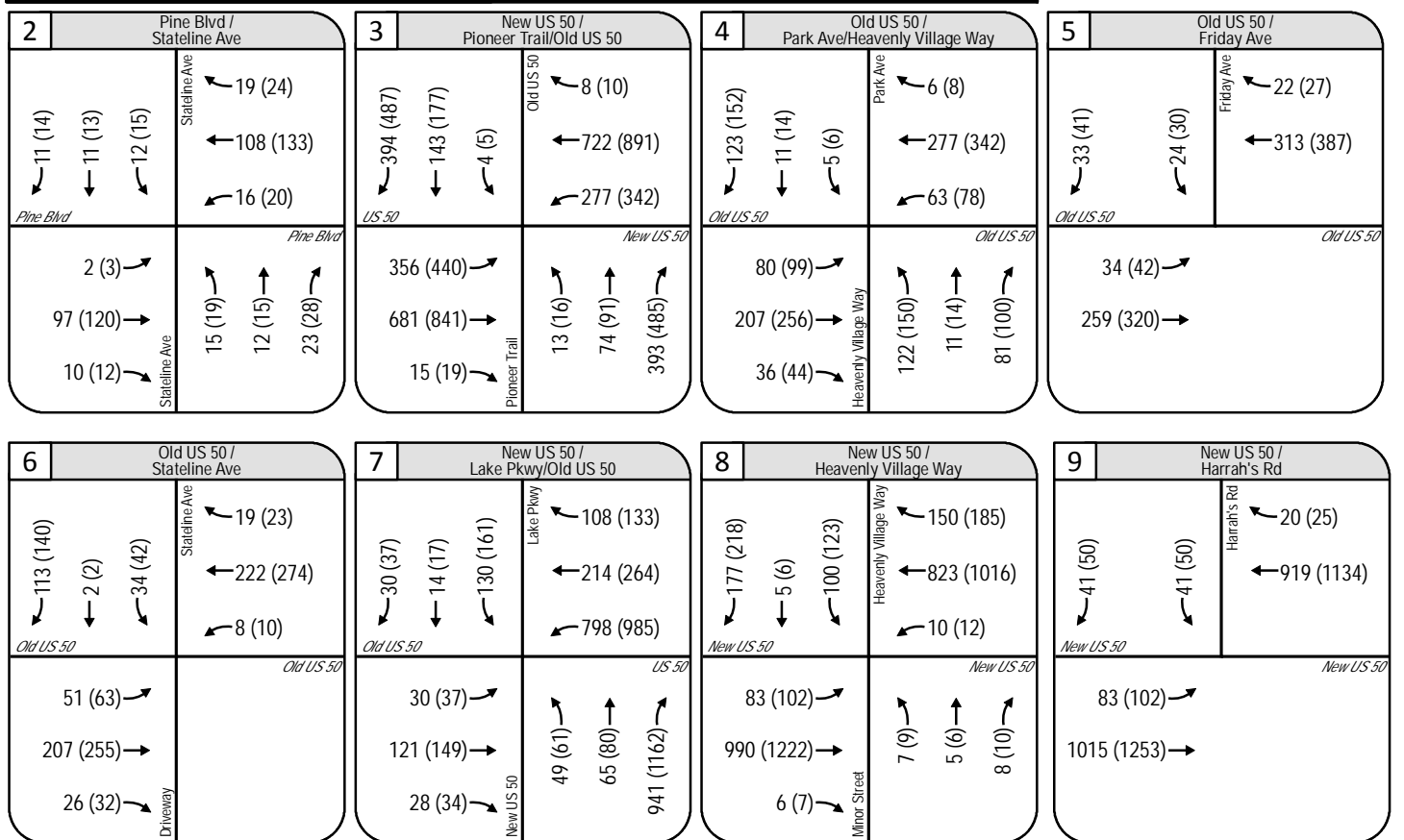
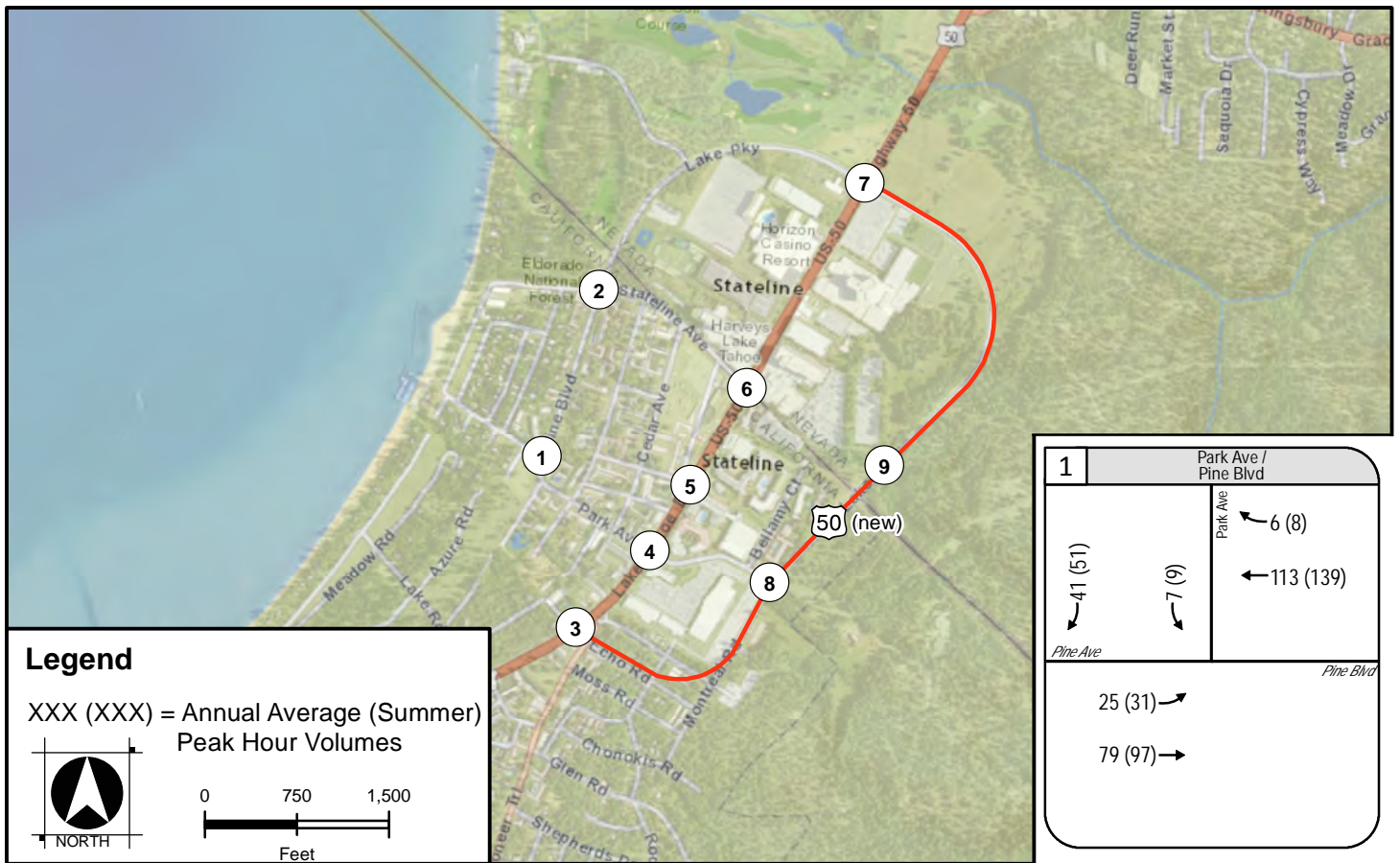


Figure 9 - Year 2018 "Alternative D (PSR)" Traffic Volumes
 US 50 State PR Traffic Operations Analysis
 South Lake Tahoe, CA
 January 2016

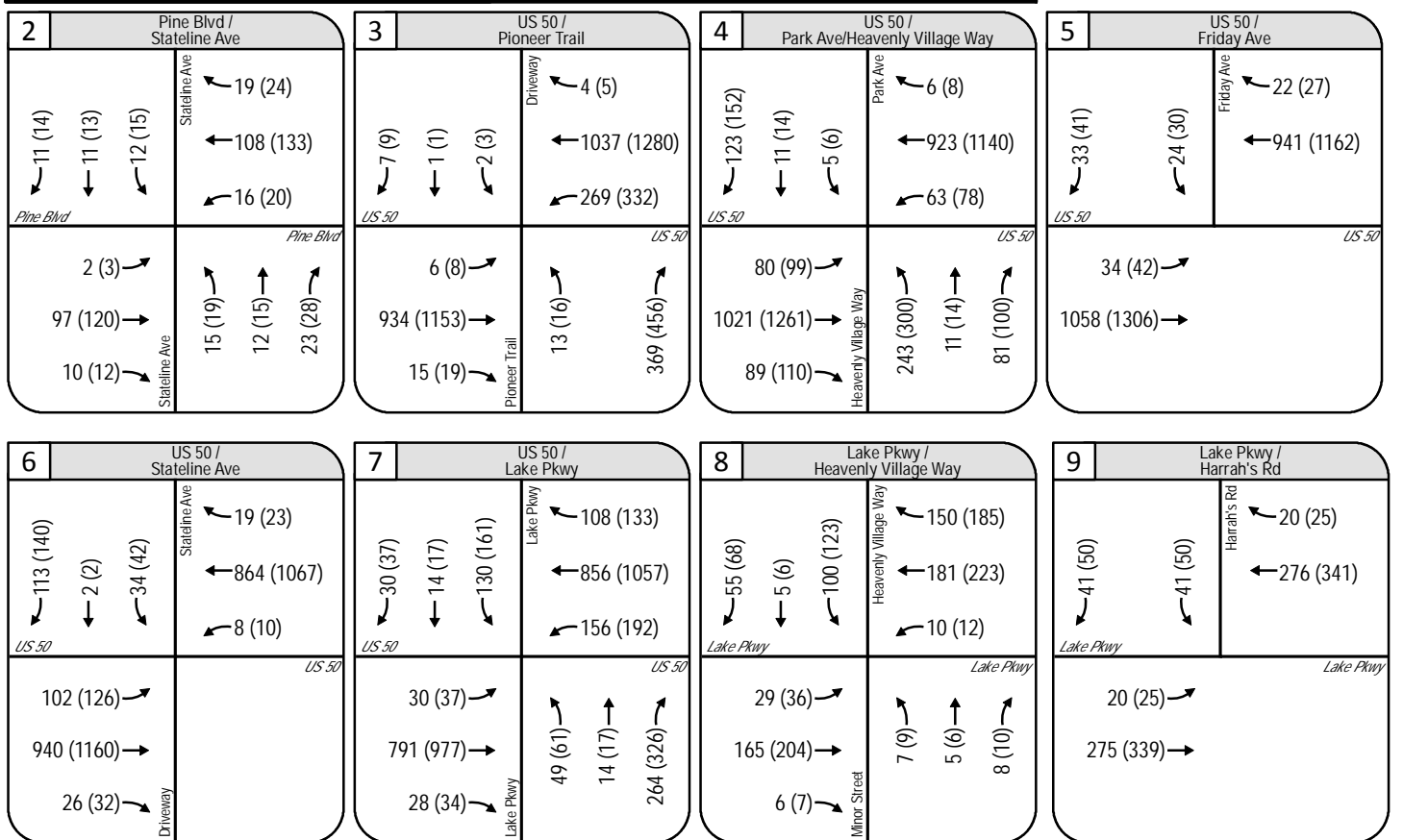
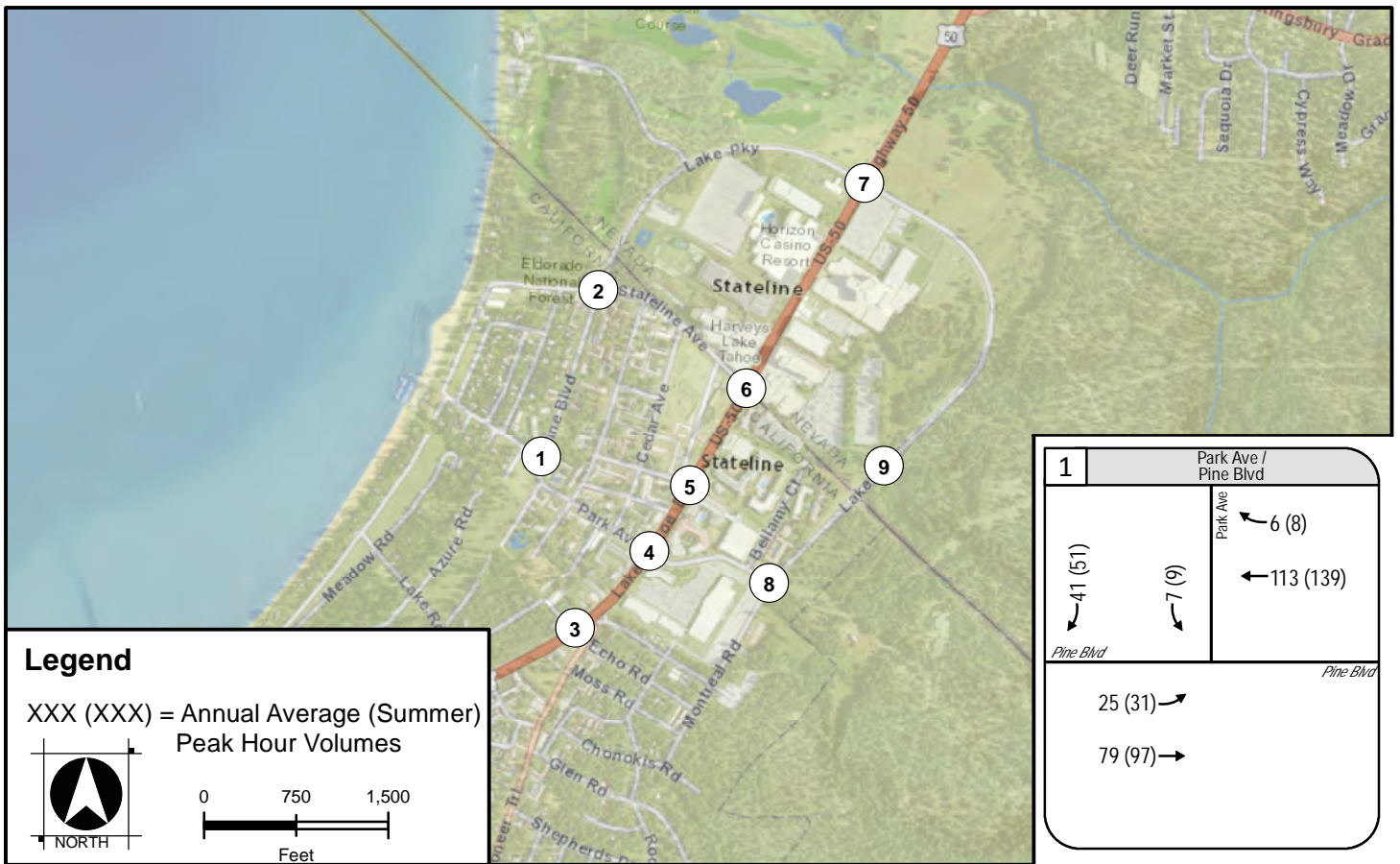


Figure 10 - Year 2018 "Alternative E (Skywalk)" Traffic Volumes
 US 50 State PR Traffic Operations Analysis
 South Lake Tahoe, CA
 January 2016

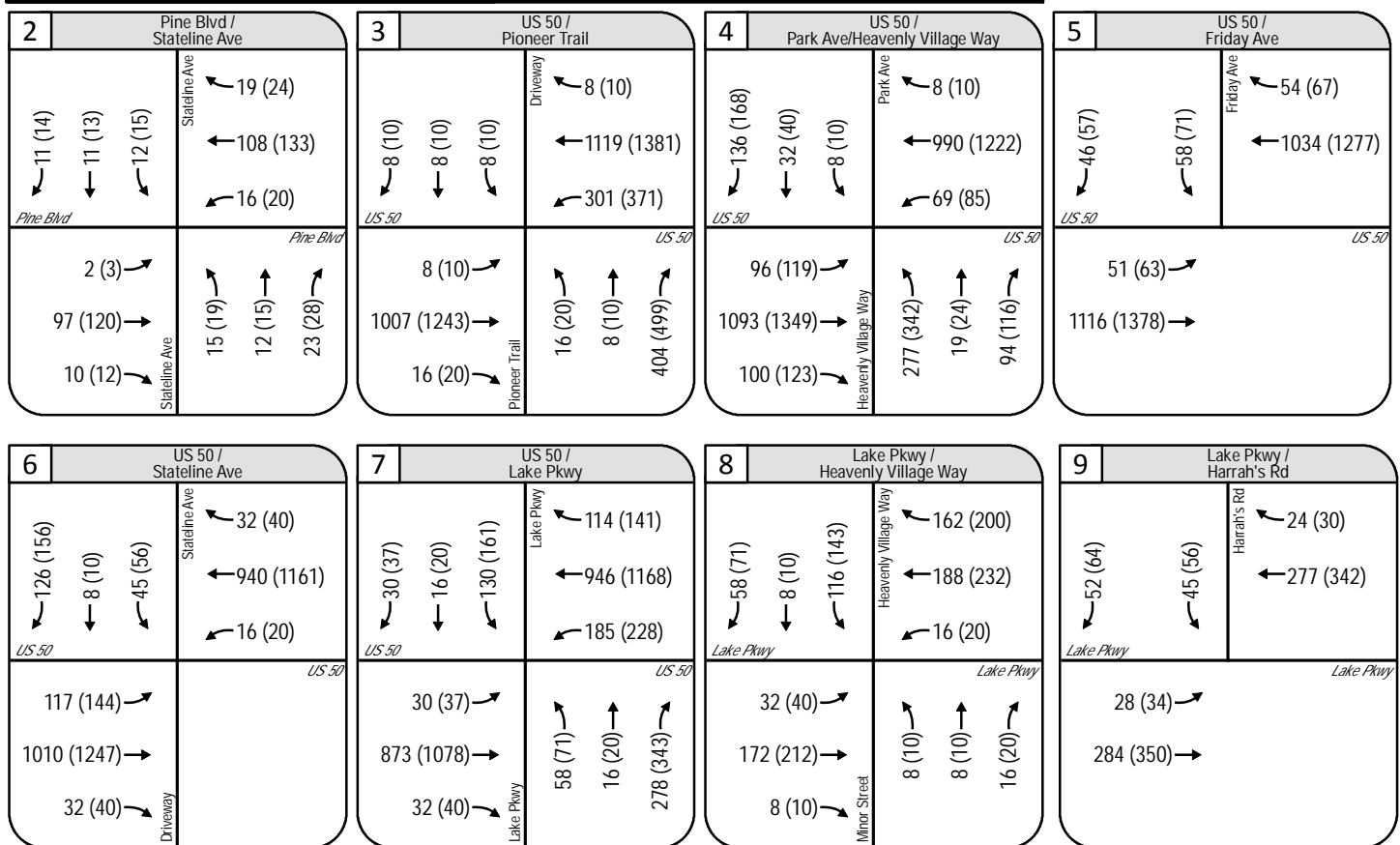
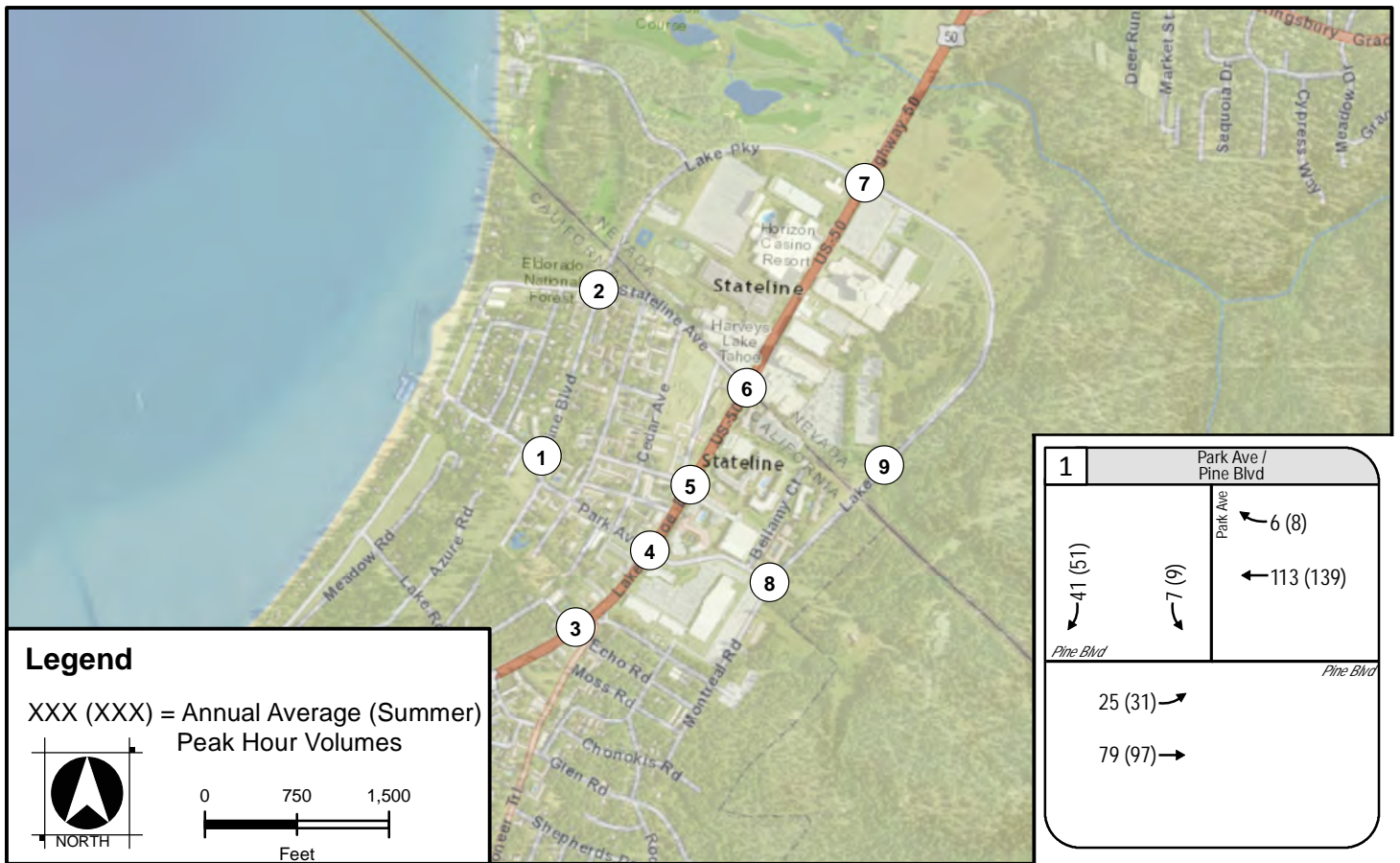


Figure 11 - Year 2038 "Alternative A (No-Build)" Traffic Volumes

US 50 State PR Traffic Operations Analysis
South Lake Tahoe, CA
January 2016



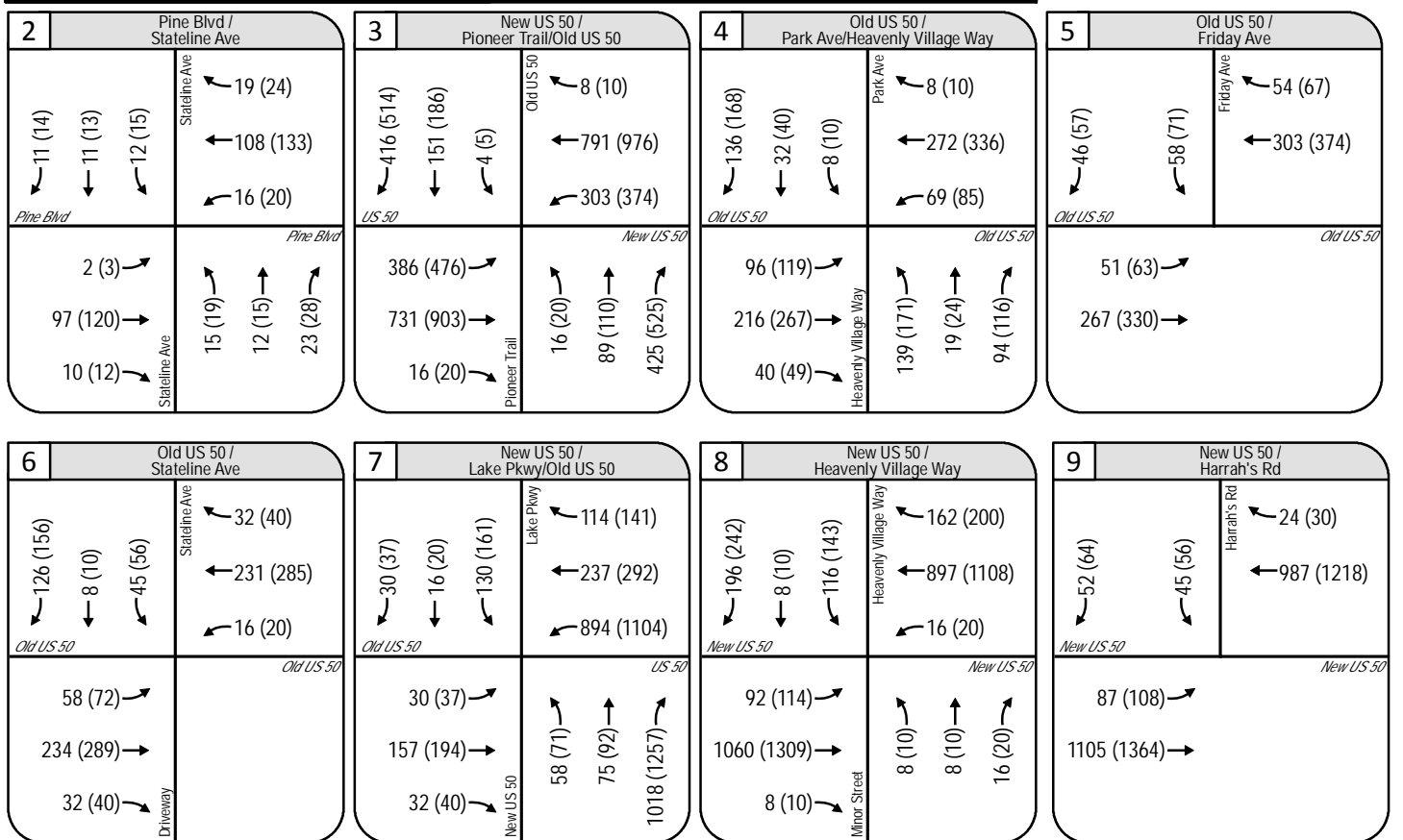
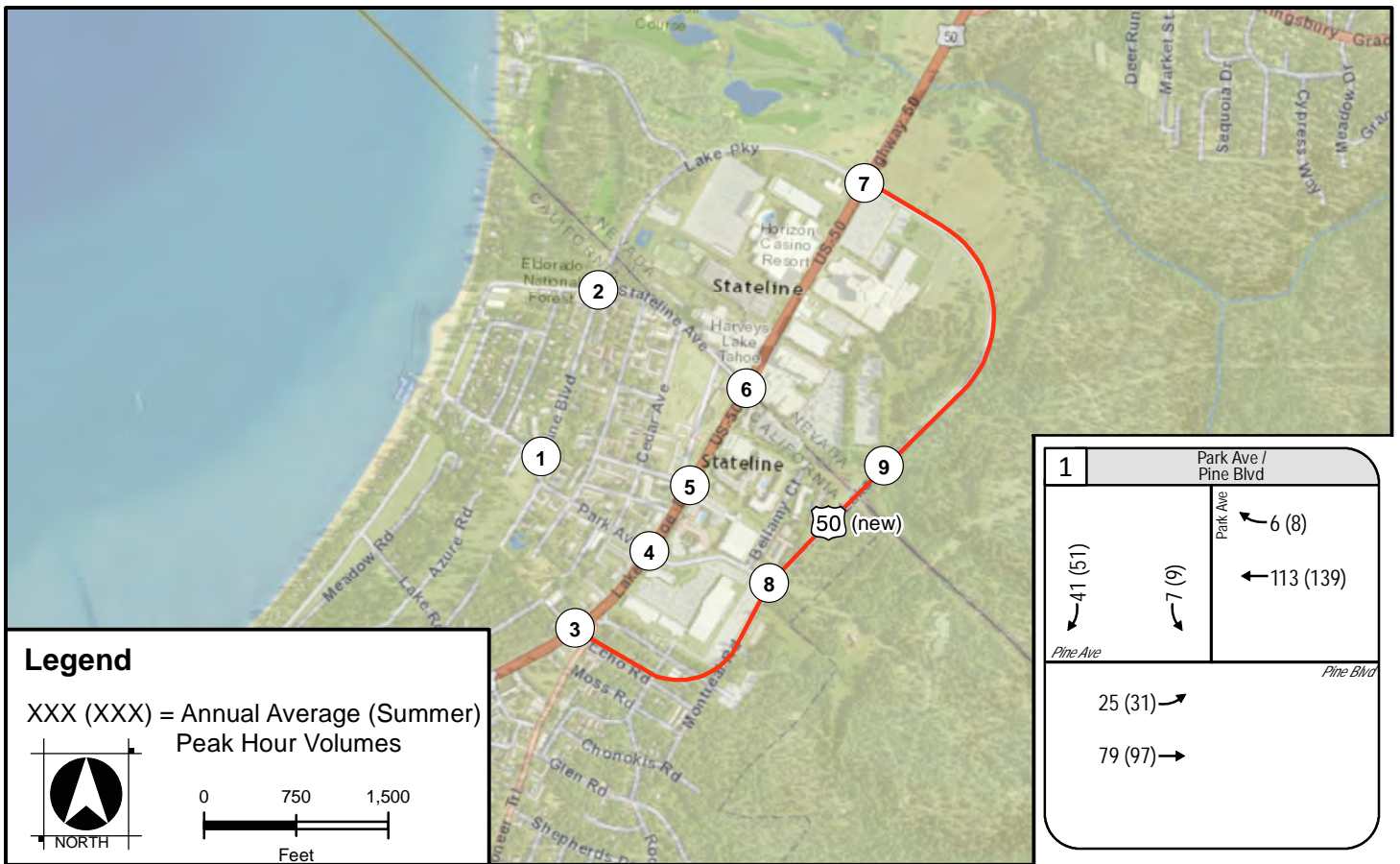
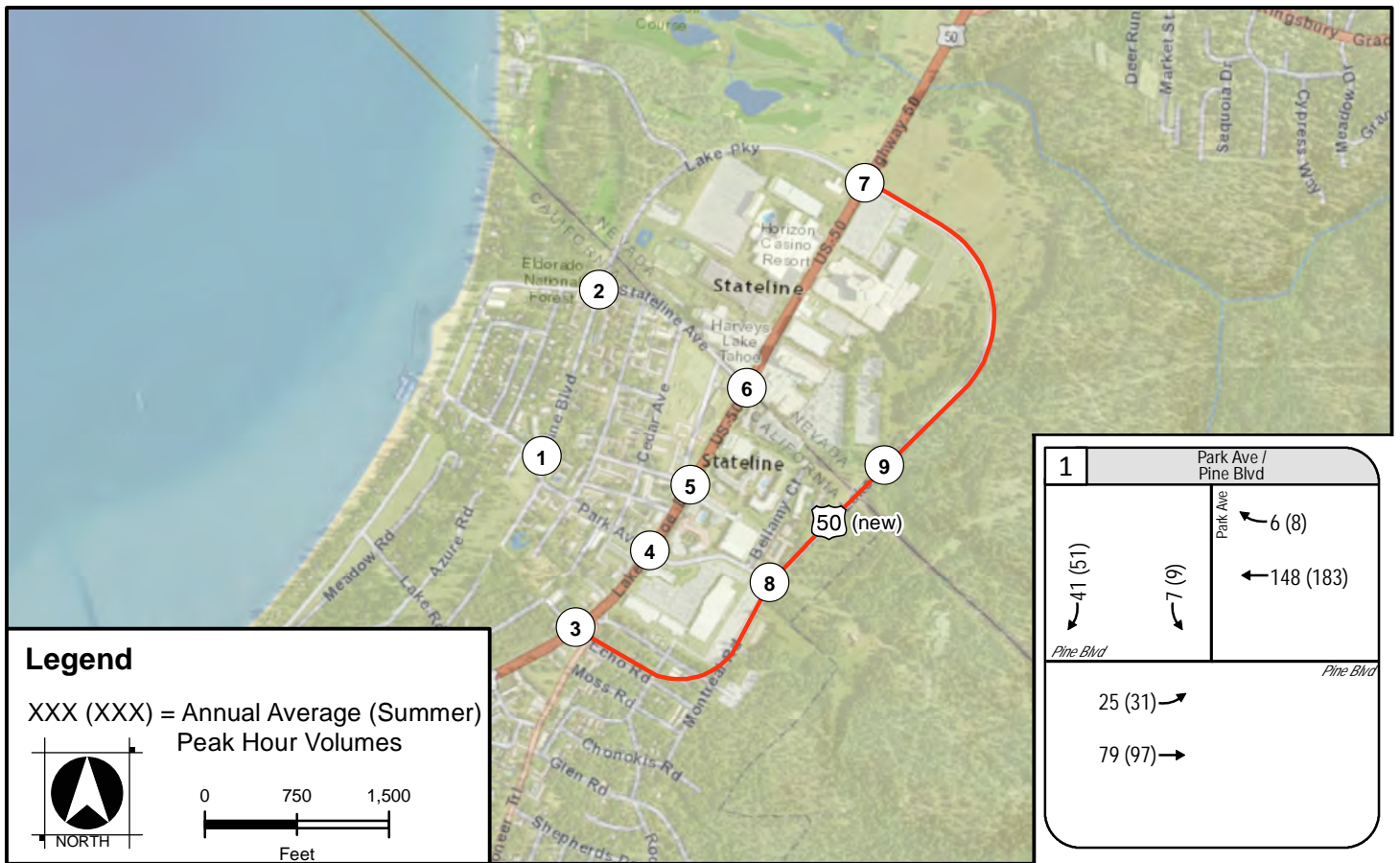


Figure 12 - Year 2038 "Alternative B (Triangle)" Traffic Volumes
 US 50 State PR Traffic Operations Analysis
 South Lake Tahoe, CA
 January 2016



1	Park Ave / Pine Blvd
<div> <div> <div>← 41 (51)</div> <div>← 7 (9)</div> </div> <div> <div>← 6 (8)</div> <div>← 148 (183)</div> </div> </div>	<div> <div>← 6 (8)</div> <div>← 148 (183)</div> </div>
<div> <div>25 (31) →</div> <div>79 (97) →</div> </div>	<div> <div>25 (31) →</div> <div>79 (97) →</div> </div>

2	Pine Blvd / Stateline Ave
<div> <div> <div>← 11 (14)</div> <div>← 11 (13)</div> <div>← 12 (15)</div> </div> <div> <div>← 19 (24)</div> <div>← 143 (177)</div> <div>← 76 (94)</div> </div> </div>	<div> <div>← 19 (24)</div> <div>← 143 (177)</div> <div>← 76 (94)</div> </div>
<div> <div>2 (3) →</div> <div>97 (120) →</div> <div>10 (12) →</div> </div>	<div> <div>15 (19) →</div> <div>12 (15) →</div> <div>23 (28) →</div> </div>

3	US 50 / Pioneer Trail
<div> <div> <div>← 348 (430)</div> <div>← 123 (152)</div> </div> <div> <div>← 8 (10)</div> <div>← 855 (1056)</div> <div>← 325 (401)</div> </div> </div>	<div> <div>← 8 (10)</div> <div>← 855 (1056)</div> <div>← 325 (401)</div> </div>
<div> <div>1121 (1384) →</div> <div>16 (20) →</div> </div>	<div> <div>16 (20) →</div> <div>518 (640) →</div> </div>

4	EB US 50 / Park Ave/Heavenly Village Way
<div> <div> <div>← 309 (381)</div> <div>← 32 (40)</div> <div>← 8 (10)</div> </div> <div> <div>← 96 (119)</div> <div>← 1281 (1581)</div> <div>← 140 (173)</div> </div> </div>	<div> <div>← 96 (119)</div> <div>← 1281 (1581)</div> <div>← 140 (173)</div> </div>
<div> <div>139 (171) →</div> <div>19 (24) →</div> <div>210 (259) →</div> </div>	<div> <div>139 (171) →</div> <div>19 (24) →</div> <div>210 (259) →</div> </div>

5	EB US 50 / Friday Ave
<div> <div>← 58 (71)</div> </div>	<div> <div>← 58 (71)</div> </div>
<div> <div>51 (63) →</div> <div>1447 (1787) →</div> </div>	<div> <div>51 (63) →</div> <div>1447 (1787) →</div> </div>

6	EB US 50 / Stateline Ave
<div> <div> <div>← 8 (10)</div> <div>← 45 (56)</div> </div> <div> <div>← 117 (144)</div> <div>← 1328 (1640)</div> <div>← 60 (74)</div> </div> </div>	<div> <div>← 8 (10)</div> <div>← 45 (56)</div> </div>
<div> <div>117 (144) →</div> <div>1328 (1640) →</div> <div>60 (74) →</div> </div>	<div> <div>117 (144) →</div> <div>1328 (1640) →</div> <div>60 (74) →</div> </div>

7	US 50 / Lake Pkwy
<div> <div> <div>← 46 (57)</div> <div>← 130 (161)</div> </div> <div> <div>← 209 (258)</div> <div>← 1036 (1279)</div> </div> </div>	<div> <div>← 46 (57)</div> <div>← 130 (161)</div> </div>
<div> <div>46 (57) →</div> <div>1163 (1436) →</div> <div>32 (40) →</div> </div>	<div> <div>46 (57) →</div> <div>1163 (1436) →</div> <div>32 (40) →</div> </div>

8	WB US 50 / Heavenly Village Way
<div> <div> <div>← 196 (242)</div> <div>← 16 (20)</div> </div> <div> <div>← 231 (285)</div> <div>← 984 (1215)</div> <div>← 16 (20)</div> </div> </div>	<div> <div>← 196 (242)</div> <div>← 16 (20)</div> </div>
<div> <div>8 (10) →</div> <div>24 (30) →</div> </div>	<div> <div>8 (10) →</div> <div>24 (30) →</div> </div>

9	WB US 50 / Harrah's Rd
<div> <div> <div>← 52 (64)</div> </div> <div> <div>← 41 (50)</div> <div>← 1142 (1410)</div> </div> </div>	<div> <div>← 52 (64)</div> </div>
<div> <div>52 (64) →</div> </div>	<div> <div>52 (64) →</div> </div>

Figure 13 - Year 2038 "Alternative C (Triangle One-Way)" Traffic Volumes
 US 50 State PR Traffic Operations Analysis
 South Lake Tahoe, CA
 January 2016

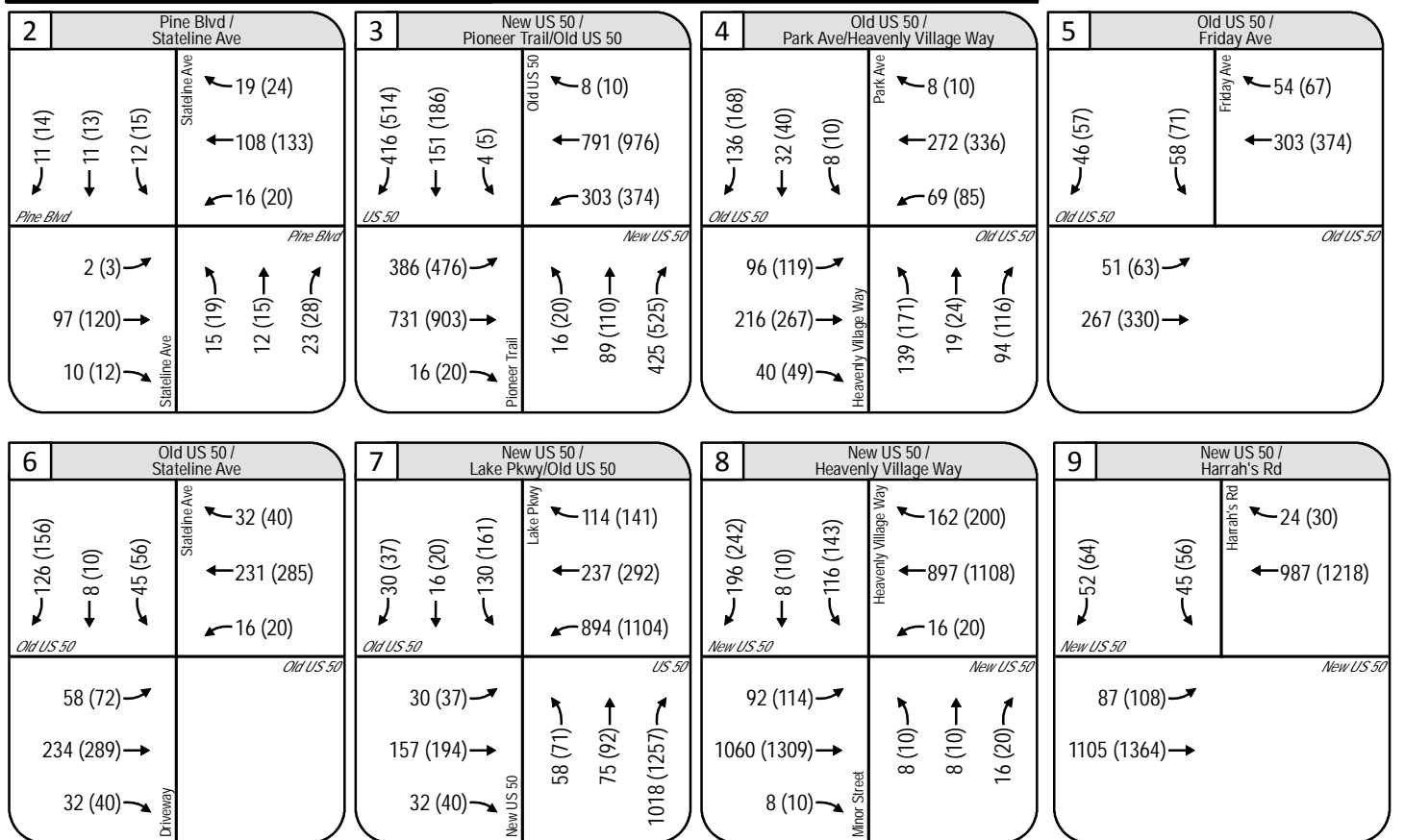
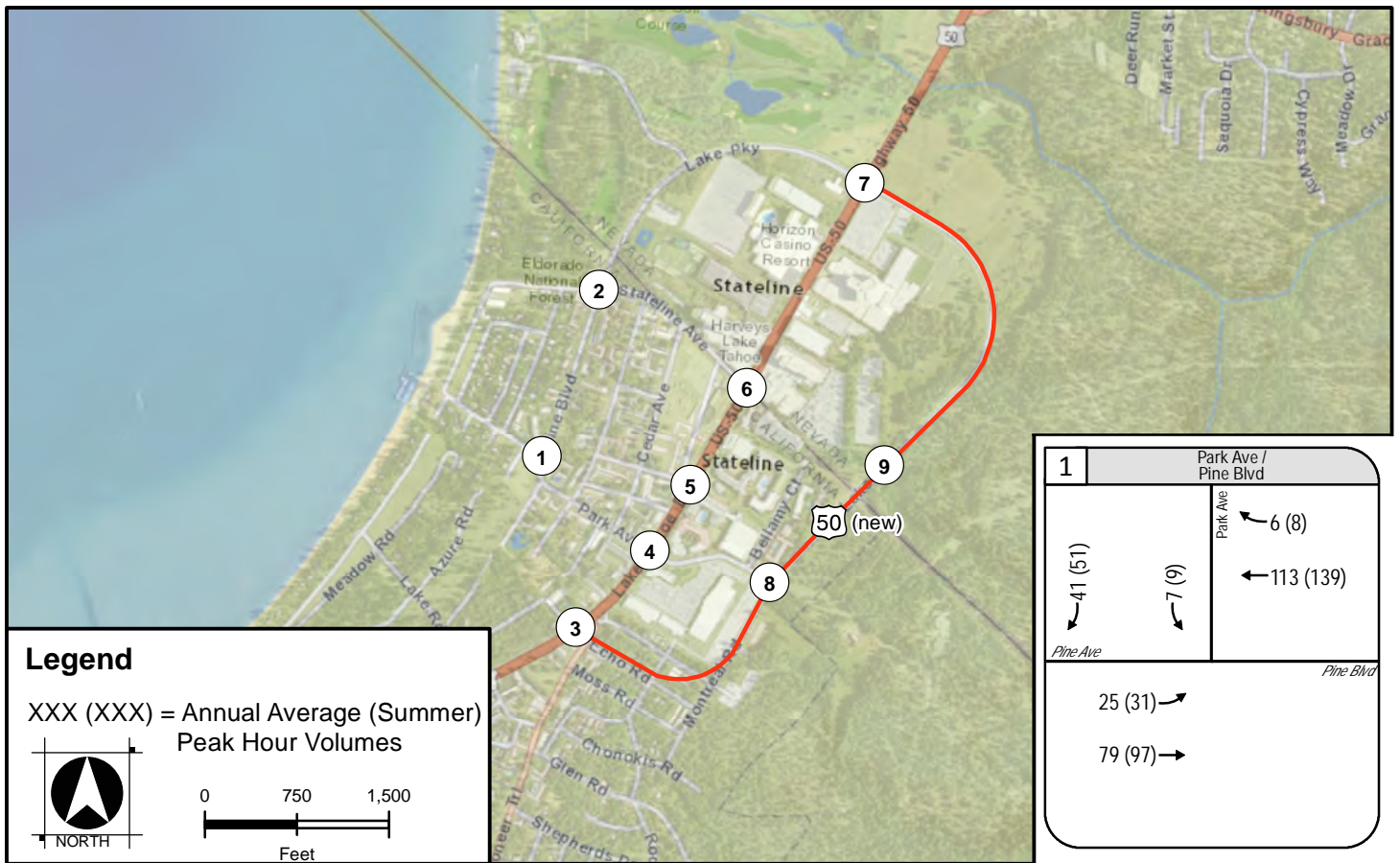


Figure 14 - Year 2038 "Alternative D (PSR)" Traffic Volumes
 US 50 State PR Traffic Operations Analysis
 South Lake Tahoe, CA
 January 2016

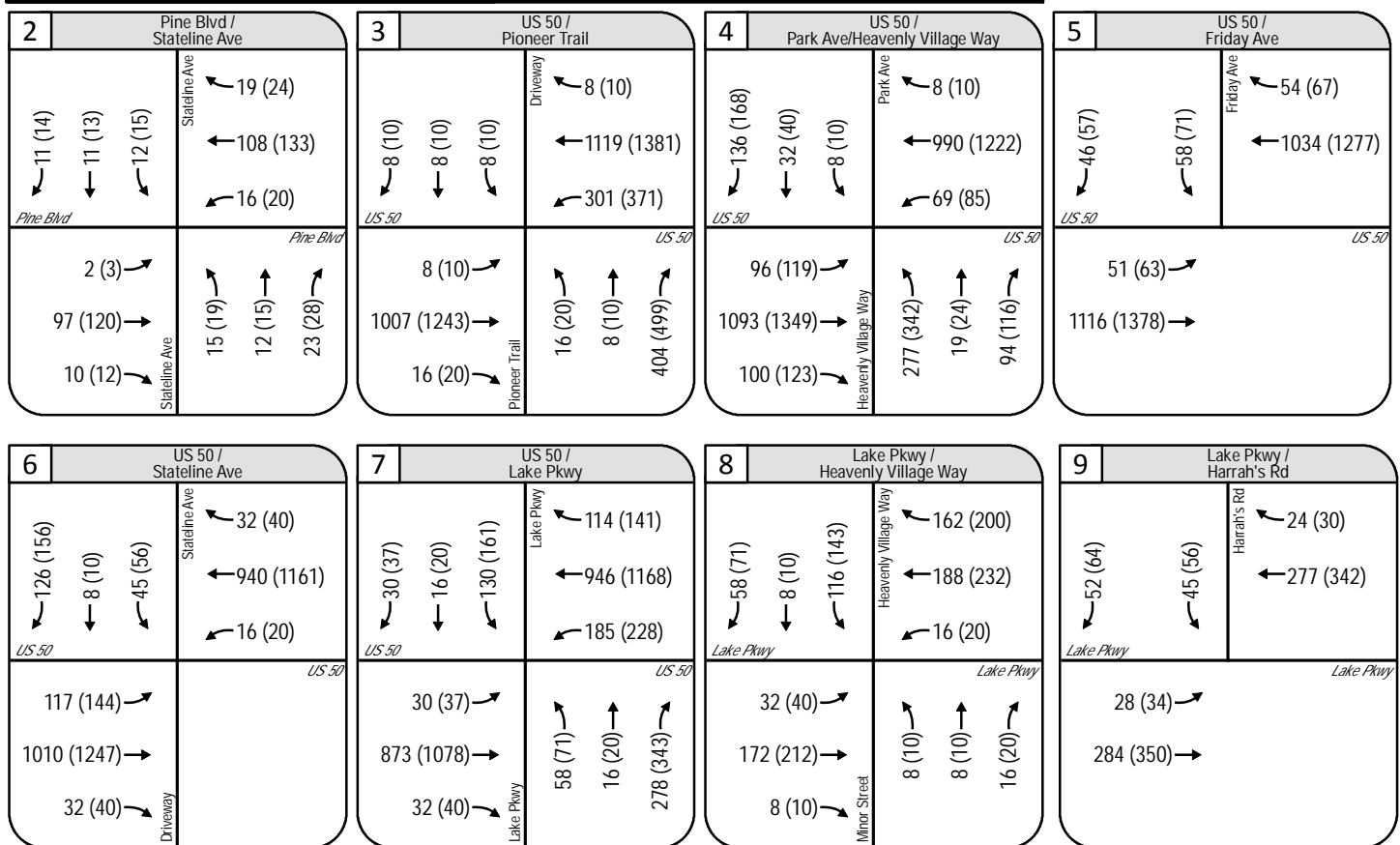
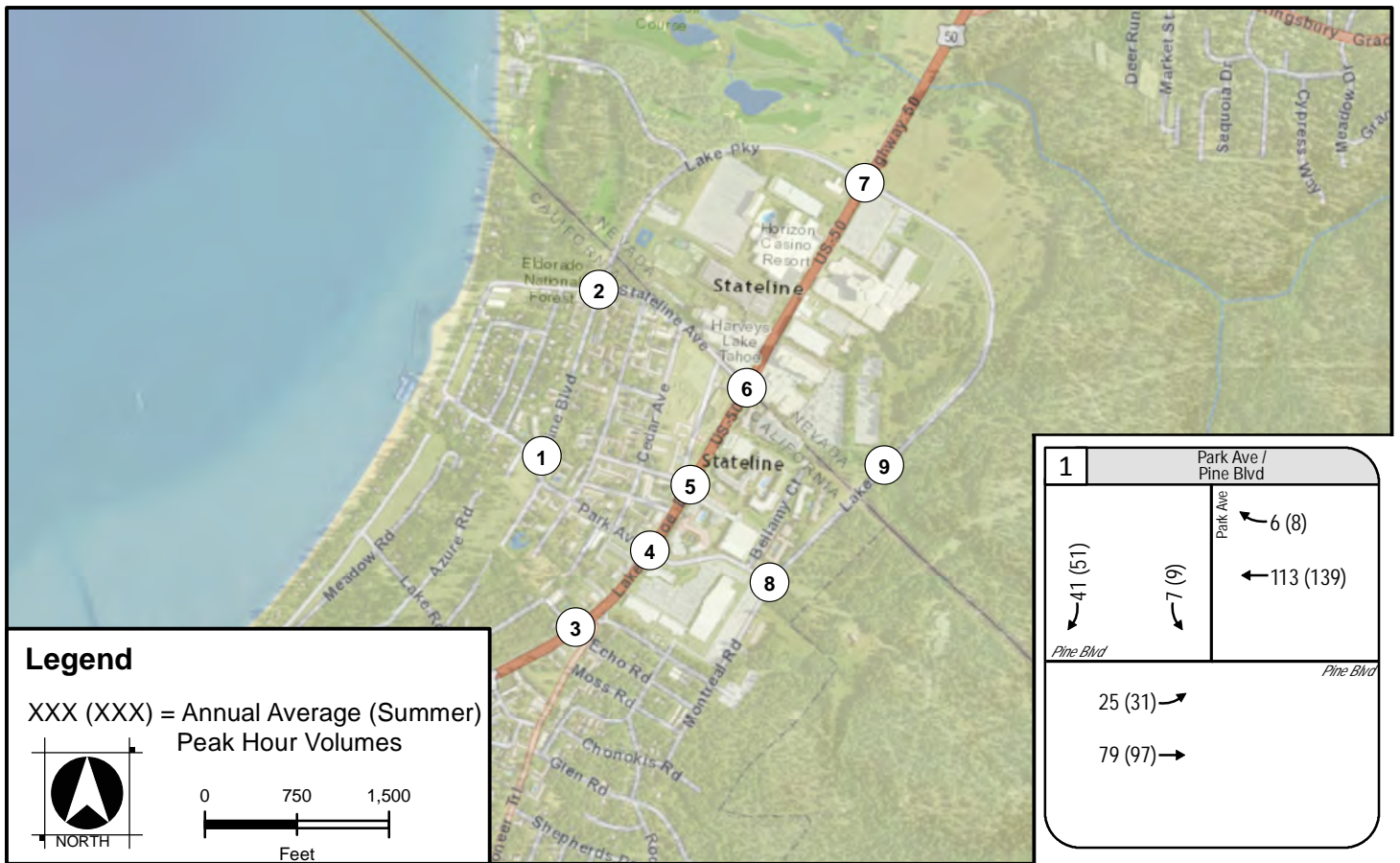


Figure 15 - Year 2038 "Alternative E (Skywalk)" Traffic Volumes
 US 50 State PR Traffic Operations Analysis
 South Lake Tahoe, CA
 January 2016

ALTERNATIVE A - NO PROJECT/NO ACTION ALTERNATIVE

EXHIBIT 1



LAKE TAHOE

ALTERNATIVE B (PROPOSED ACTION)

OPTION A - 3 LANE EXHIBIT 2

TAHOE MEADOWS
HISTORIC DISTRICT

PINE BOULEVARD

EDGEWOOD
GOLF COURSE

50

PIONEER TRAIL

GLEN ROAD

ECHO ROAD

FERN ROAD

VILLAGE
CENTER

HEAVENLY
VILLAGE WAY

HEAVENLY
VILLAGE

HARRAH'S

MONTBLEU

MONTREAL ROAD

NEW
50

VAN SICKLE
BI-STATE PARK

STATELINE AVENUE

LAKE PARKWAY

NEW
50

50



OPTION B - 4 LANE

HARVEY'S

LAKE TAHOE

ALTERNATIVE C - TRIANGLE ONE-WAY

OPTION A - 3 LANE
EXHIBIT 3

TAHOE MEADOWS
HISTORIC DISTRICT

EDGEWOOD
GOLF COURSE

PINE BOULEVARD

CEDAR AVENUE

HARVEY'S

HARRAH'S

MONTBLEU

HEAVENLY
VILLAGE

VILLAGE
CENTER

VAN SICKLE
BI-STATE PARK

NEW
50

NEW
50

50

OPTION B - 4 LANE

HARVEY'S

LAKE TAHOE

ALTERNATIVE D - PSR ALTERNATIVE

OPTION A - 3 LANE

EXHIBIT 4

OPTIONAL
INTERSECTION

TAHOE MEADOWS
HISTORIC DISTRICT

EDGEWOOD
GOLF COURSE

PINE BOULEVARD

CEDAR AVENUE

HARVEY'S

HARRAH'S

HEAVENLY
VILLAGE

MONTBLEU

VILLAGE
CENTER

VAN SICKLE
BI-STATE PARK

NEW
50

NEW
50

OPTION B - 4 LANE

HARVEY'S

LAKE TAHOE

ALTERNATIVE E - SKYWALK

EXHIBIT 5

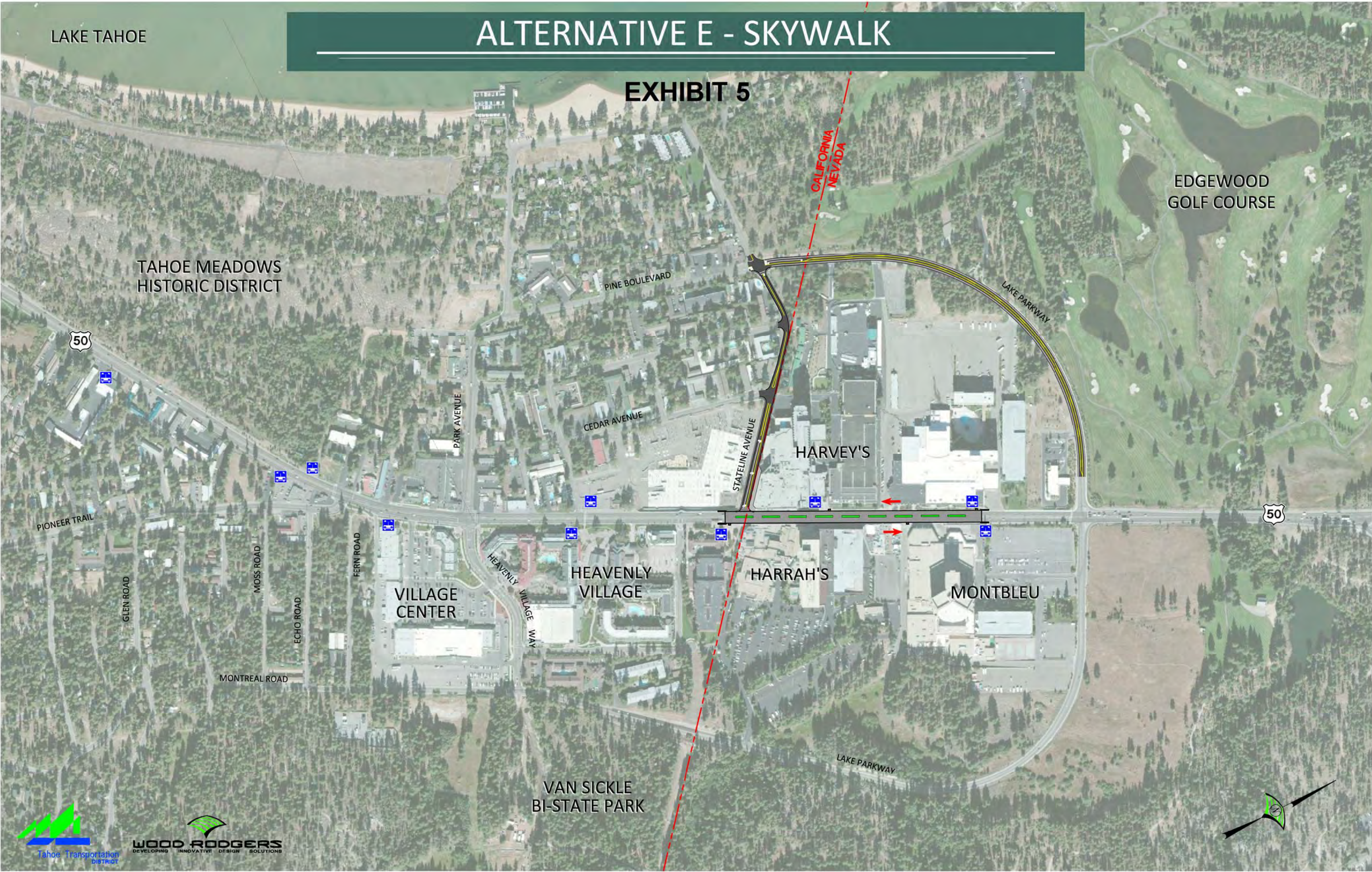
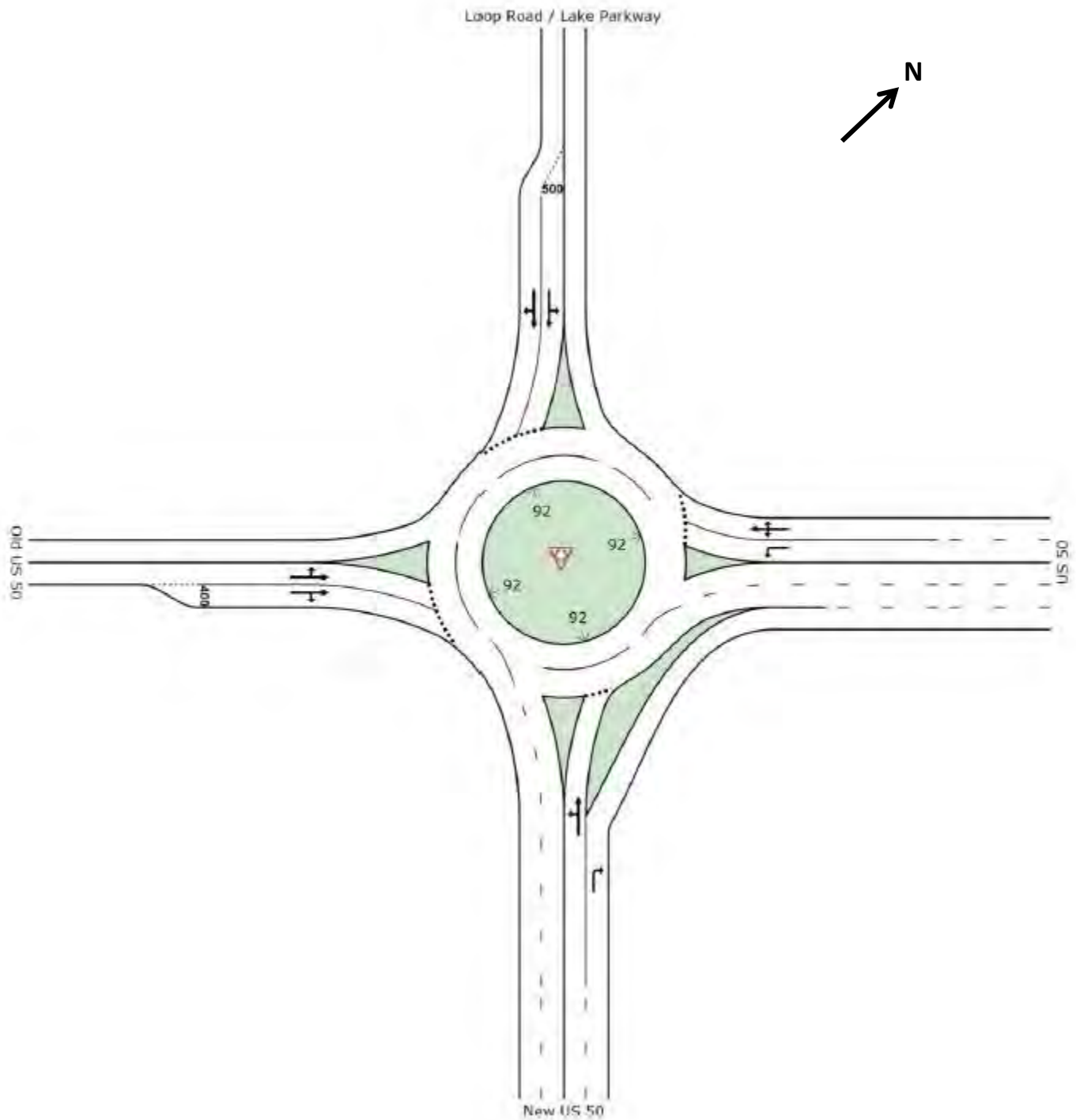


EXHIBIT 6 – “US 50 / LAKE PARKWAY ROUNDABOUT” LAYOUT
(UNDER ALTERNATIVES B AND D)



**TABLE 1A
NEAR-TERM (2018) AND LONG-TERM (2038) DEVELOPPMENTS
TRIP GENERATION RATES**

Land Category	ITE Code	Rate Unit	Daily Trips Rate/Unit	Weekday AM Peak Hour Rate/Unit			Weekday PM Peak Hour Rate/Unit		
				Total	In%	Out%	Total	In%	Out%
Single Family Detached Housing	210	DU	9.52	0.75	25%	75%	1.00	63%	37%
Residential Condominium/Townhouse	230	DU	5.81	0.44	17%	83%	0.52	67%	33%
Recreational Homes	260	DU	3.16	0.16	67%	33%	0.26	41%	59%
Timeshare*	265	DU	10.56	0.51	67%	33%	0.79	41%	59%
Resort Hotel	330	Rooms	n/a	0.37	72%	28%	0.49	43%	57%
Shopping Center	820	KSF	42.70	0.96	62%	38%	3.71	48%	52%

Notes: Trip Generation Rates are based on "average" ITE 9th Edition trip generation rates

*Directional distribution (In/Out percentages) are based on Recreational Homes, ITE Land Use 260

A 10% transit trip reduction was assumed as guests will likely not drive to other local destinations once at a hotel.

**TABLE 1B
NEAR-TERM (2018) AND LONG-TERM (2038) DEVELOPPMENTS
TRIP GENERATION VOLUMES**

Land Category	ITE Code Used	Quantity	Units	Daily Trips	Weekday AM Peak Hour			Weekday PM Peak Hour		
					Trips			Trips		
					Total	In	Out	Total	In	Out
Project Opening Day (2018) Trip Generation										
Edgewood Lodge										
Resort Hotel	330	154	Rooms	n/a	57	41	16	75	32	43
Timeshare	265	40	DU	422	20	13	7	32	13	19
10% Transit/Bike/Pedestrian Trip Reduction				-42	-8	-5	-2	-11	-5	-6
Total				380	69	49	21	96	40	56
Zalanta Resort at the Village										
Recreational Homes	260	30	DU	95	5	3	2	8	3	5
Shopping Center	820	19.5	KSF	833	19	12	7	72	35	37
10% Transit/Bike/Pedestrian Trip Reduction				-93	-2	-2	-1	-8	-4	-4
Total				835	22	13	8	72	34	38
Beach Club										
Single Family Detached Housing	210	143	DU	1,361	107	27	80	143	90	53
10% Transit/Bike/Pedestrian Trip Reduction				-136	-11	-3	-8	-14	-9	-5
Total				1,225	96	24	72	129	81	48
Sierra Colina Village										
Residential Condominium/Townhouse	230	42	DU	244	18	3	15	22	15	7
Single Family Detached Housing	210	8	DU	76	6	2	4	8	5	3
10% Transit/Bike/Pedestrian Trip Reduction				-32	-2	-1	-2	-3	-2	-1
Total				288	22	4	17	27	18	9
Total Project Opening Day (2018) Trips				2,728	209	90	118	324	173	151
Cumulative Conditions (2038) Trip Generation										
Gondola Vista										
Residential Condominium/Townhouse	230	22	DU	128	10	2	8	11	7	4
10% Transit/Bike/Pedestrian Trip Reduction				-13	-1	0	-1	-1	-1	0
Total				115	9	2	7	10	6	4
Chateau										
Resort Hotel	330	287	Rooms	n/a	106	76	30	141	61	80
Shopping Center	820	20	KSF	854	19	12	7	74	36	38
Recreational Homes	260	60	DU	190	10	7	3	16	7	9
10% Transit/Bike/Pedestrian Trip Reduction				-104	-14	-10	-4	-23	-10	-13
Total				940	121	85	36	208	94	114
Total Cumulative Only (2038) Trips				1,055	130	87	43	218	100	118
Total Cumulative (2038) Trips (includes 2018 trips)				3,783	339	177	161	542	273	269

Appendix Table 2 - ADT Volume Summary
(All Scenarios)

Alternative	Highway/Roadway Segment	Existing/Proposed Capacity Configuration	ADT					
			Year 2012 (Existing)		Year 2018 (Opening Day)		Year 2038 (Design Year)	
			Annual Average	Summer Peak	Annual Average	Summer Peak	Annual Average	Summer Peak
Alternative A (No-Build)	Existing US 50 (b/w Pioneer Trail & Park Ave)	Five-Lane Highway/Arterial	27,500	34,500	29,100	36,500	31,600	39,600
	Existing US 50 (b/w Park Ave & Stateline Ave)	Five-Lane Highway/Arterial	25,000	34,400	26,100	35,900	28,100	38,700
	Existing US 50 (b/w Stateline Ave & Lake Pkwy)	Five-Lane Highway/Arterial	21,500	27,400	22,600	28,800	24,700	31,600
Alternative B (Triangle)	New US 50 (b/w Pioneer Trail and Heavenly Village Way)	Five-Lane Highway/Arterial	24,200	30,900	25,200	32,200	27,300	34,900
	New US 50 (b/w Heavenly Village Way and Lake Pkwy)	Five-Lane Highway/Arterial	24,100	30,700	25,100	32,100	27,400	35,000
	Old US 50 (b/w Pioneer Trail & Park Ave)	Five-Lane Highway/Arterial	9,300	11,600	9,900	12,400	10,500	13,200
	Old US 50 - Alternative Layout (b/w Pioneer Trail & Park Ave)	Three-Lane Highway/Arterial	9,300	11,600	9,900	12,400	10,500	13,200
	Old US 50 (b/w Park Ave & Stateline Ave)	Two-Lane Arterial (with left-turn lane)	7,700	10,700	7,900	10,900	8,300	11,400
	Old US 50 (b/w Stateline Ave & Lake Pkwy)	Two-Lane Arterial (with left-turn lane)	5,700	7,300	5,900	7,600	6,800	8,600
Alternative C (Triangle One-Way)	New US 50 (b/w Pioneer Trail and Heavenly Village Way)	Two-Lane Arterial (one-way westbound)	13,200	16,900	13,700	17,500	14,400	18,300
	New US 50 (b/w Heavenly Village Way and Lake Pkwy)	Two-Lane Arterial (one-way westbound)	13,600	17,400	14,200	18,100	14,900	19,000
	Old US 50 (b/w Pioneer Trail & Park Ave)	Five-Lane Highway/Arterial	19,900	25,000	21,100	26,400	23,100	28,900
	Old US 50 (b/w Park Ave & Stateline Ave)	Two-Lane Arterial (one-way eastbound)	16,600	22,900	17,200	23,700	18,600	25,600
	Old US 50 (b/w Stateline Ave & Lake Pkwy)	Two-Lane Arterial (one-way eastbound)	14,700	18,800	15,300	19,500	16,600	21,200
Alternative D (PSR Alternative)	New US 50 (b/w Pioneer Trail and Heavenly Village Way)	Five-Lane Highway/Arterial	24,200	30,900	25,200	32,200	27,300	34,900
	New US 50 (b/w Heavenly Village Way and Lake Pkwy)	Five-Lane Highway/Arterial	24,100	30,700	25,100	32,100	27,400	35,000
	Old US 50 (b/w Pioneer Trail & Park Ave)	Five-Lane Highway/Arterial	9,300	11,600	9,900	12,400	10,500	13,200
	Old US 50 (b/w Park Ave & Stateline Ave)	Two-Lane Arterial (with left-turn lane)	7,700	10,700	7,900	10,900	8,300	11,400
	Old US 50 (b/w Stateline Ave & Lake Pkwy)	Two-Lane Arterial (with left-turn lane)	5,700	7,300	5,900	7,600	6,800	8,600
Alternative E (Skywalk)	Existing US 50 (b/w Pioneer Trail & Park Ave)	Five-Lane Highway/Arterial	27,500	34,500	29,100	36,500	31,600	39,600
	Existing US 50 (b/w Park Ave & Stateline Ave)	Five-Lane Highway/Arterial	25,000	34,400	26,100	35,900	28,100	38,700
	Existing US 50 (b/w Stateline Ave & Lake Pkwy)	Five-Lane Highway/Arterial	21,500	27,400	22,600	28,800	24,700	31,600

Appendix Table 3 - ADT Based LOS Summary
(All Scenarios)

Alternative	Highway/Roadway Segment	Existing/Proposed Capacity Configuration	ADT					
			Year 2012 (Existing)		Year 2018 (Opening Day)		Year 2038 (Design Year)	
			Annual Average	Summer Peak	Annual Average	Summer Peak	Annual Average	Summer Peak
Alternative A (No-Build)	Existing US 50 (b/w Pioneer Trail & Park Ave)	Five-Lane Highway/Arterial	B	D	C	E	C	E
	Existing US 50 (b/w Park Ave & Stateline Ave)	Five-Lane Highway/Arterial	B	D	B	D	C	E
	Existing US 50 (b/w Stateline Ave & Lake Pkwy)	Five-Lane Highway/Arterial	A	B	A	C	B	C
Alternative B (Triangle)	New US 50 (b/w Pioneer Trail and Heavenly Village Way)	Five-Lane Highway/Arterial	B	C	B	D	B	D
	New US 50 (b/w Heavenly Village Way and Lake Pkwy)	Five-Lane Highway/Arterial	B	C	B	D	B	D
	Old US 50 (b/w Pioneer Trail & Park Ave)	Five-Lane Highway/Arterial	A	A	A	A	A	A
	Old US 50 - Alternative Layout (b/w Pioneer Trail & Park Ave)	Three-Lane Highway/Arterial	A	B	A	B	A	C
	Old US 50 (b/w Park Ave & Stateline Ave)	Two-Lane Arterial (with left-turn lane)	A	A	A	A	A	B
	Old US 50 (b/w Stateline Ave & Lake Pkwy)	Two-Lane Arterial (with left-turn lane)	A	A	A	A	A	A
Alternative C (Triangle One-Way)	New US 50 (b/w Pioneer Trail and Heavenly Village Way)	Two-Lane Arterial (one-way westbound)	C	E	C	E	C	F
	New US 50 (b/w Heavenly Village Way and Lake Pkwy)	Two-Lane Arterial (one-way westbound)	C	E	C	F	D	F
	Old US 50 (b/w Pioneer Trail & Park Ave)	Five-Lane Highway/Arterial	A	B	A	B	A	C
	Old US 50 (b/w Park Ave & Stateline Ave)	Two-Lane Arterial (one-way eastbound)	E	F	E	F	F	F
	Old US 50 (b/w Stateline Ave & Lake Pkwy)	Two-Lane Arterial (one-way eastbound)	D	F	D	F	E	F
Alternative D (PSR Alternative)	New US 50 (b/w Pioneer Trail and Heavenly Village Way)	Five-Lane Highway/Arterial	B	C	B	D	B	D
	New US 50 (b/w Heavenly Village Way and Lake Pkwy)	Five-Lane Highway/Arterial	B	C	B	D	B	D
	Old US 50 (b/w Pioneer Trail & Park Ave)	Five-Lane Highway/Arterial	A	A	A	A	A	A
	Old US 50 (b/w Park Ave & Stateline Ave)	Two-Lane Arterial (with left-turn lane)	A	A	A	A	A	B
	Old US 50 (b/w Stateline Ave & Lake Pkwy)	Two-Lane Arterial (with left-turn lane)	A	A	A	A	A	A
Alternative E (Skywalk)	Existing US 50 (b/w Pioneer Trail & Park Ave)	Five-Lane Highway/Arterial	B	D	C	E	C	E
	Existing US 50 (b/w Park Ave & Stateline Ave)	Five-Lane Highway/Arterial	B	D	B	D	C	E
	Existing US 50 (b/w Stateline Ave & Lake Pkwy)	Five-Lane Highway/Arterial	A	B	A	C	B	C

Appendix Table 4 - ADT Based Level-of-Service (LOS) Criteria for Roadway/Highway Segments

Roadway Segment Type	Total Two-way Average Daily Traffic (ADT)				
	LOS A	LOS B	LOS C	LOS D	LOS E
4-Lane Divided Freeway	28,000	43,200	61,600	74,400	80,000
2-Lane Rural Highway	2,400	4,800	7,900	13,500	22,900
6-lane Divided Expressway (with left-turn lanes)	35,500	42,200	46,200	55,800	60,000
6-Lane Divided Arterial (with left-turn lane)	32,000	38,000	43,000	49,000	54,000
4-Lane Arterial, high access control	24,000	28,000	32,000	36,000	40,000
4-Lane Divided Arterial (with left-turn lane)	22,000	25,000	29,000	32,500	36,000
4-Lane Undivided Arterial (no left-turn lane)	18,000	21,000	24,000	27,000	30,000
2-Lane Arterial (one-way)	11,000	12,500	14,500	16,000	18,000
2-Lane Arterial (with left-turn median lane)	11,000	12,500	14,500	16,000	18,000
2-Lane Arterial, low access control	9,000	10,500	12,000	13,500	15,000
2-Lane Arterial (no left-turn median lane)	9,000	10,500	12,000	13,500	15,000
2-Lane Collector/Local Street	6,000	7,500	9,000	10,500	12,000

Notes:

1. Based on "Highway Capacity Manual", Transportation Research Board, Fifth Edition, 2010.
2. All volumes are approximate and assume ideal roadway characteristics. Actual threshold volumes for each Level of Service listed above may vary depending on a variety of factors including (but not limited to) - roadway curvature and grade, intersection or interchange spacing, driveway spacing, percentage of trucks and other heavy vehicles, travel lane widths, signal timing characteristics, on-street parking, volume of cross traffic and pedestrians, pavement conditions, etc.
3. 2-Lane Arterial (one-way) capacities assumed to be the same as 2-Lane Arterial (with left-turn median lane) capacities
4. Arterial "high access control" and "low access control" capacities from: Sacramento County Traffic Impact Study Guideline, July 2000

**APPENDIX TABLE 5A
ALTERNATIVE B (TRIANGLE) - PROPOSED NEW DEVELOPMENTS
TRIP GENERATION RATES**

Land Category	ITE Code	Rate Unit	Daily Trips Rate/Unit	Weekday AM Peak Hour Rate/Unit			Weekday PM Peak Hour Rate/Unit		
				Total	In%	Out%	Total	In%	Out%
Single Family Detached Housing	210	DU	9.52	0.75	25%	75%	1.00	63%	37%
Apartment	220	DU	6.65	0.51	20%	80%	0.62	65%	35%
Shopping Center	820	KSF	42.70	0.96	62%	38%	3.71	48%	52%
Motel	320	Rooms	5.63	0.45	36%	64%	0.47	54%	46%

Notes: Trip Generation Rates are based on "average" ITE 9th Edition trip generation rates

**APPENDIX TABLE 5B
ALTERNATIVE B (TRIANGLE) - PROPOSED NEW DEVELOPMENTS
TRIP GENERATION VOLUMES**

Land Category	ITE Code Used	Quantity	Units	Daily Trips	Weekday AM Peak Hour Trips			Weekday PM Peak Hour Trips		
	Total				In	Out	Total	In	Out	
Proposed Site 1										
Apartment	220	72	Rooms	479	37	7	30	45	29	16
Shopping Center	820	28.25	KSF	1,206	27	17	10	105	50	55
10% Transit/Bike/Pedestrian Trip Reduction				-169	-6	-2	-4	-15	-8	-7
Total				1,516	58	22	36	135	71	64
Proposed Site 2										
Apartment	220	70	DU	466	36	7	29	43	28	15
Shopping Center	820	8	KSF	342	8	5	3	30	14	16
10% Transit/Bike/Pedestrian Trip Reduction				-81	-4	-1	-3	-7	-4	-3
Total				727	40	11	29	66	38	28
Total Site 1 and 2 Trips (Before Displaced Trips)				2,243	98	33	65	201	109	92
Displaced Units Near Sites 1 and 2										
Single Family Detached Housing	210	28	DU	-267	-21	-5	-16	-28	-18	-10
Apartment	220	65	DU	-432	-33	-7	-26	-40	-26	-14
Shopping Center	820	4	KSF	-171	-4	-2	-2	-15	-7	-8
Motel	320	155	Rooms	-873	-70	-25	-45	-73	-39	-34
10% Transit/Bike/Pedestrian Trip Reduction				174	13	4	9	16	9	7
Total Displaced Trips				-1,569	-115	-35	-80	-140	-81	-59
Net New Trips at Sites 1 and 2				674	-17	-2	-15	61	28	33
Site 3										
Apartment	220	87	DU	579	44	9	35	54	35	19
Shopping Center	820	10	KSF	427	10	6	4	37	18	19
10% Transit/Bike/Pedestrian Trip Reduction				-101	-5	-2	-4	-9	-5	-4
Total				905	49	13	35	82	48	34
Total Site 3 Trips (Before Displaced Trips)				905	49	13	35	82	48	34
Displaced Units Near Sites 3										
Single Family Detached Housing	210	0	DU	0	0	0	0	0	0	0
Apartment	220	0	DU	0	0	0	0	0	0	0
Shopping Center	820	0	KSF	0	0	0	0	0	0	0
Motel	320	0	Rooms	0	0	0	0	0	0	0
10% Transit/Bike/Pedestrian Trip Reduction				0	0	0	0	0	0	0
Total Displaced Trips				0	0	0	0	0	0	0
Net New Trips at Site 3				905	49	13	35	82	48	34
Net New Trips Added by All Proposed Developments				1,579	32	11	20	143	76	67

**APPENDIX TABLE 6A
ALTERNATIVE C (TRIANGLE ONE-WAY) - PROPOSED NEW DEVELOPMENTS
TRIP GENERATION RATES**

Land Category	ITE Code	Rate Unit	Daily Trips Rate/Unit	Weekday AM Peak Hour Rate/Unit			Weekday PM Peak Hour Rate/Unit		
				Total	In%	Out%	Total	In%	Out%
Single Family Detached Housing	210	DU	9.52	0.75	25%	75%	1.00	63%	37%
Apartment	220	DU	6.65	0.51	20%	80%	0.62	65%	35%
Shopping Center	820	KSF	42.70	0.96	62%	38%	3.71	48%	52%
Motel	320	Rooms	5.63	0.45	36%	64%	0.47	54%	46%

Notes: Trip Generation Rates are based on "average" ITE 9th Edition trip generation rates

**APPENDIX TABLE 6B
ALTERNATIVE C (TRIANGLE ONE-WAY) - PROPOSED NEW DEVELOPMENTS
TRIP GENERATION VOLUMES**

Land Category	ITE Code	Quantity	Units	Daily Trips	Weekday AM Peak Hour Trips			Weekday PM Peak Hour Trips		
	Used				Total	In	Out	Total	In	Out
Proposed Site 1										
Apartment	220	72	Rooms	479	37	7	30	45	29	16
Shopping Center	820	28.25	KSF	1,206	27	17	10	105	50	55
10% Transit/Bike/Pedestrian Trip Reduction				-169	-6	-2	-4	-15	-8	-7
Total				1,516	58	22	36	135	71	64
Proposed Site 2										
Apartment	220	70	DU	466	36	7	29	43	28	15
Shopping Center	820	8	KSF	342	8	5	3	30	14	16
10% Transit/Bike/Pedestrian Trip Reduction				-81	-4	-1	-3	-7	-4	-3
Total				727	40	11	29	66	38	28
Total Site 1 and 2 Trips (Before Displaced Trips)				2,243	98	33	65	201	109	92
Displaced Units Near Sites 1 and 2										
Single Family Detached Housing	210	18	DU	-171	-14	-4	-10	-18	-11	-7
Apartment	220	60	DU	-399	-31	-6	-25	-37	-24	-13
Shopping Center	820	4	KSF	-171	-4	-2	-2	-15	-7	-8
Motel	320	155	Rooms	-873	-70	-25	-45	-73	-39	-34
10% Transit/Bike/Pedestrian Trip Reduction				161	12	4	8	14	8	6
Total Displaced Trips				-1,453	-107	-33	-74	-129	-73	-56
Net New Trips at Sites 1 and 2				790	-9	0	-9	72	36	36
Site 3										
Apartment	220	87	DU	579	44	9	35	54	35	19
Shopping Center	820	10	KSF	427	10	6	4	37	18	19
10% Transit/Bike/Pedestrian Trip Reduction				-101	-5	-2	-4	-9	-5	-4
Total				905	49	13	35	82	48	34
Total Site 3 Trips (Before Displaced Trips)				905	49	13	35	82	48	34
Displaced Units Near Sites 3										
Single Family Detached Housing	210	0	DU	0	0	0	0	0	0	0
Apartment	220	0	DU	0	0	0	0	0	0	0
Shopping Center	820	0	KSF	0	0	0	0	0	0	0
Motel	320	0	Rooms	0	0	0	0	0	0	0
10% Transit/Bike/Pedestrian Trip Reduction				0	0	0	0	0	0	0
Total Displaced Trips				0	0	0	0	0	0	0
Net New Trips at Site 3				905	49	13	35	82	48	34
Net New Trips Added by All Proposed Developments				1,695	40	13	26	154	84	70

**APPENDIX TABLE 7A
ALTERNATIVE D (PSR) - PROPOSED NEW DEVELOPMENTS
TRIP GENERATION RATES**

Land Category	ITE Code	Rate Unit	Daily Trips Rate/Unit	Weekday AM Peak Hour Rate/Unit			Weekday PM Peak Hour Rate/Unit		
				Total	In%	Out%	Total	In%	Out%
Single Family Detached Housing	210	DU	9.52	0.75	25%	75%	1.00	63%	37%
Apartment	220	DU	6.65	0.51	20%	80%	0.62	65%	35%
Shopping Center	820	KSF	42.70	0.96	62%	38%	3.71	48%	52%
Motel	320	Rooms	5.63	0.45	36%	64%	0.47	54%	46%

Notes: Trip Generation Rates are based on "average" ITE 9th Edition trip generation rates

**APPENDIX TABLE 7B
ALTERNATIVE D (PSR) - PROPOSED NEW DEVELOPMENTS
TRIP GENERATION VOLUMES**

Land Category	ITE Code Used	Quantity	Units	Daily Trips	Weekday AM Peak Hour Trips			Weekday PM Peak Hour Trips		
	Total				In	Out	Total	In	Out	
Proposed Site 1										
Apartment	220	76	Rooms	505	39	8	31	47	31	16
Shopping Center	820	5	KSF	214	5	3	2	19	9	10
10% Transit/Bike/Pedestrian Trip Reduction				-72	-4	-1	-3	-7	-4	-3
Total				647	40	10	30	59	36	23
Proposed Site 2										
Apartment	220	70	DU	466	36	7	29	43	28	15
Shopping Center	820	20	KSF	854	19	12	7	74	36	38
10% Transit/Bike/Pedestrian Trip Reduction				-132	-6	-2	-4	-12	-6	-5
Total				1,188	49	17	32	105	58	48
Total Site 1 and 2 Trips (Before Displaced Trips)				1,835	89	27	62	164	94	71
Displaced Units Near Sites 1 and 2										
Single Family Detached Housing	210	4	DU	-38	-3	-1	-2	-4	-3	-1
Apartment	220	74	DU	-492	-38	-8	-30	-46	-30	-16
Shopping Center	820	15.5	KSF	-662	-15	-9	-6	-58	-28	-30
Motel	320	41	Rooms	-231	-18	-6	-12	-19	-10	-9
10% Transit/Bike/Pedestrian Trip Reduction				142	7	2	5	13	7	6
Total Displaced Trips				-1,281	-67	-22	-45	-114	-64	-50
Net New Trips at Sites 1 and 2				554	22	5	17	50	30	21
Site 3										
Apartment	220	78	DU	519	40	8	32	48	31	17
Shopping Center	820	10	KSF	427	10	6	4	37	18	19
10% Transit/Bike/Pedestrian Trip Reduction				-95	-5	-1	-4	-9	-5	-4
Total				851	45	13	32	76	44	32
Total Site 3 Trips (Before Displaced Trips)				851	45	13	32	76	44	32
Displaced Units Near Sites 3										
Single Family Detached Housing	210	0	DU	0	0	0	0	0	0	0
Apartment	220	0	DU	0	0	0	0	0	0	0
Shopping Center	820	0	KSF	0	0	0	0	0	0	0
Motel	320	0	Rooms	0	0	0	0	0	0	0
10% Transit/Bike/Pedestrian Trip Reduction				0	0	0	0	0	0	0
Total Displaced Trips				0	0	0	0	0	0	0
Net New Trips at Site 3				851	45	13	32	76	44	32
Net New Trips Added by All Proposed Developments				1,405	67	18	49	126	74	53