3.12 Transportation and Circulation

This section describes and evaluates issues related to Transportation and Circulation in the context of the proposed Master Plan update for Nut Tree Airport (herein referred to as the "proposed project"). Discussed are the physical and regulatory setting; the baseline for determining environmental impacts; the criteria used for determining the significance of environmental impacts; and potential impacts and appropriate mitigation measures associated with implementation of the proposed project.

3.12.1 Environmental Setting

The existing transportation-related context for the proposed project is described below, beginning with a description of the regional and local street network that serves the project site. Existing transit service, bicycle and pedestrian facilities in the vicinity of the proposed project are also described.

3.12.1.1 Existing Roadway Network

The proposed project site is located at the Nut Tree Airport, in the City of Vacaville and is generally bounded by East Monte Vista Avenue to the east, Piper Drive to the north, open space and Putah South Canal to the west and south. Access to the airport is via County Airport Road via East Monte Vista Avenue, which connects to various local and regional roadways.

Regional Roadways

Interstate 80 (I-80) is an eight-lane, east-west, freeway that generally aligns southwest-to-northeast within the City of Vacaville limits. The freeway provides regional access to various communities within Solano County and provides connections to several other regional roadways (e.g., I-505, I-680, State Route (SR) 12, SR 113) within the county. Full interchanges near the project site are provided at Allison Drive / Nut Tree Parkway / Monte Vista Avenue, and at Orange Drive / Nut Tree Road / I-505. The most recent data published by the California Department of Transportation (Caltrans) indicates that the annual average daily traffic (AADT) volume on I-80 is about 138,000 vehicles near the proposed project site (Caltrans, 2012a). The freeway is a designated roadway in the Solano Transportation Authority's *Congestion Management Program* (CMP) transportation system (Solano Transportation Authority [STA], 2009a). The freeway is a designated truck route in the City of Vacaville *General Plan Update* (City of Vacaville, 2010).

Interstate 505 (I-505) is a four-lane, north-south, freeway that extends from I-5 (north) to its junction at I-80 (south). The freeway provides regional access to the communities of Vacaville, Allendale and Winters (in Yolo County). A full interchange near the project site is provided at Vaca Valley Parkway and Midway Road. The most recent data published by Caltrans indicates that the AADT volume on I-505 is about 28,000 vehicles near the proposed project site (Caltrans, 2012a). The freeway is a designated roadway in the Solano Transportation Authority's CMP

transportation system (STA, 2009a). The freeway is a designated truck route in the City of Vacaville *General Plan Update* (2010).

Local Roadways

Browns Valley Parkway is a north-south road that extends between Cantelow Road to the north (beyond city limits) and East Monte Vista Avenue to the south. The roadway is a three-lane, undivided roadway (one southbound lane and two northbound lanes) from East Monte Vista Avenue to Brown Street and then becomes a two-lane roadway to its northern terminus. The street is classified as an Arterial Roadway in the City of Vacaville *General Plan Update* and is a designated truck route (2010). The roadway is also classified as a Minor Arterial roadway in the Solano County *General Plan* (2008).

East Monte Vista Avenue is a two-lane, north-south road that extends between Vaca Valley Parkway to the north (where it becomes Crocker Drive) and County Airport Road to the south. The roadway becomes a four-lane, undivided roadway south of County Airport Road, and then becomes an east-west roadway within the City of Vacaville and extends further west and becomes West Monte Vista Avenue, west of West Street. The street is classified as an Arterial Roadway in the City of Vacaville *General Plan Update* and is a designated truck route (2010).

Nut Tree Road is generally a north-south roadway that extends between Foxboro Parkway to the south to its terminus at Nut Tree Airport to the north, within the City of Vacaville. The roadway is primarily a two-lane facility from its southern terminus to north of Marshall Road and becomes a divided (raised median) four-lane facility to points further north. The roadway provides direct access to the main entrance to Nut Tree Airport. The street is classified as an Arterial Roadway in the City of Vacaville *General Plan Update* and is a designated truck route (2010). The roadway is also classified as a Minor Arterial roadway in the Solano County *General Plan* (2008).

Orange Drive is a northeast-southwest, four- to six-lane roadway that extends between Leisure Town Road to the north and Allison Drive to the south. The street is classified as an Arterial Roadway in the City of Vacaville *General Plan Update* and is a designated truck route (2010). The roadway is also classified as a Minor Arterial roadway in the Solano County *General Plan* (2008).

Vaca Valley Parkway is a two- to four-lane, east-west roadway that extends between Wrentham Drive to the west (City of Vacaville western limits) and I-80, where the roadway becomes Leisure Town Parkway and becomes a north-south roadway. The street is classified as an Arterial Roadway in the City of Vacaville *General Plan Update* and is a designated truck route (City of Vacaville, 2010) and is classified as a Minor Arterial roadway in the Solano County *General Plan* (2008). A portion of the arterial, from I-80 to I-505 is a designated roadway in the Solano Transportation Authority's CMP transportation system (STA, 2009a).

3.12.1.2 Existing Transit Network

The City of Vacaville operates the Vacaville City Coach fixed-route bus transit service. There are currently six City Coach bus routes that operate during weekday (Monday through Friday) and

Saturdays; there is no scheduled service on Sundays. These routes generally operate between 7:00 a.m. and 7:00 p.m., and primarily travel along local roadways within the City of Vacaville. City Coach routes #4 and #6 operate along roadways near the project site, and specifically along portions of I-505, Nut Tree Road, Vaca Valley Parkway, and East Monte Vista Avenue. During hours of operation, these fixed-route bus lines operate at 30-minute headways (the frequency, or interval of time between buses traveling in any given direction along a designated route). The nearest City Coach bus stop (for City Coach Route #6) is located at the intersection of Nut Tree Road and East Monte Vista Avenue (City of Vacaville, 2012a). There is no direct City Coach service to the project site, nor are there bus stops at, or adjacent to, the project site.

Fairfield Suisun Transit (FAST) operates fixed-route local bus service and inter-city express bus transit service during weekdays and Saturdays within the cities of Fairfield, Suisun City, and Vacaville. The FAST system includes ten local-serving bus routes and four inter-city routes. These routes service several residential, commercial, institutional, and recreational areas throughout each municipality. Although the majority of FAST bus routes serve Fairfield and Suisun, three inter-city routes (routes #20, #30, and #40) provide access to and from the Vacaville Transportation Center, located at Davis Street and Hickory Lane. These routes primarily operate along I-80 within the City of Vacaville (FAST, 2012). There is no direct FAST transit to the project site, nor are there bus stations/stops located at, or adjacent to, the project site.

The Yolo County Transportation District operates the Yolobus bus transit service through the various communities within Yolo County and portions of Solano County. The Yolobus 220 provides regional bus transit service to the City of Vacaville. This route operates Monday through Saturday, and operates between the cities of Davis, Winters, and Vacaville. The route provides service to the Vacaville Transportation Center and the bus route travels along I-80, I-505, East Monte Vista Avenue, Nut Tree Road, and Orange Drive. Although there is no direct Yolobus service to the project site, the nearest bus stop in proximity to the project site is located at the intersection of Nut Tree Road and Orange Drive (Yolobus, 2010).

3.12.1.3 Existing Bicycle and Pedestrian Network

Bicycle Facilities

According to the *Transportation and Circulation Element* of the City of Vacaville General Plan Update (2010), bikeways are classified as Class I (bicycle paths separated from roads), Class II (striped bicycle lanes within the paved areas of roadways), or Class III (signed bike routes that allow cyclists to share streets with vehicles). There are several existing and recently approved (per General Plan) bicycle facilities located near the project site. These facilities include Class I multi-use paths along Vaca Valley Parkway and Browns Valley Parkway, and Class II bicycle lanes along Orange Drive, Nut Tree Road, and East Monte Vista Avenue.

As presented in the Solano County *Countywide Bicycle Transportation Plan* (2011) and the City of Vacaville *General Plan*, there are many planned bicycle projects proposed within the City of Vacaville. These planned projects include the implementation of a Class I multi-use path and Class II bicycle lanes at various locations along Ulatis Creek from Vaca Valley Road to Leisure

Town Road. Other planned facilities include proposed Class I facilities along portions of Leisure Town Road and central/eastern areas of Vacaville.

Pedestrian Facilities

Pedestrian facilities generally include sidewalks, crosswalks, curb ramps, pedestrian signals, and streetscape/landscape amenities (i.e., benches, tree-lined buffers, planters, bulb-outs, street lighting, etc). The majority of streets within the City of Vacaville offer convenient pedestrian circulation complete with raised concrete sidewalks and pedestrian signals and other safety devices at various intersection locations. The majority of roadways adjacent to the project site do not provide such established pedestrian facilities. Currently, there are intermittent sidewalks located along the south side of County Airport Road, along the north side of East Monte Vista Avenue, along the north side of Nut Tree Road, and along the south side of Vaca Valley Parkway.

The Solano Transportation Authority *Solano Countywide Pedestrian Transportation Plan* (STA, 2012), lists several planned pedestrian projects in the City of Vacaville; however, the Plan focuses primarily on improving pedestrian connectivity to existing pedestrian destination locations and enhancements to the downtown area. As also discussed in the Bicycle Transportation Plan, planned pedestrian projects in proximity to the project site include the Class I multi-use path at various locations along Ulatis Creek from Vaca Valley Road to Leisure Town Road. There are no planned projects at, or adjacent to, the project site.

3.12.1.4 Existing Traffic Conditions

Intersection Level of Service Analysis Methodologies

The operation of a local roadway network is commonly measured and described using a grading system called Level of Service (LOS). The LOS grading system qualitatively characterizes traffic conditions associated with varying levels of vehicle traffic, ranging from LOS A (indicating free-flow traffic conditions with little or no delay experienced by motorists) to LOS F (indicating congested conditions where traffic flows exceed design capacity and result in long delays). This LOS grading system applies to both roadway segments and intersections.

Signalized Intersections

In accordance with Title 14, *Land Use and Development Code*, Section 14.13.180.060, *Level of Service*, intersections were measured using the Intersection Capacity Utilization method (City of Vacaville, 2012b). To comply with intersection level of service analysis in the City's *General Plan*, the Transportation Research Circular 212 Planning Method was applied to determine intersection capacity utilization for signalized intersections (Transportation Research Board, 1980). The Circular 212 Planning Method relates a service level grade to volume-to-capacity (v/c) ratio. The v/c ratio relates the total traffic volume for critical opposing movements to the theoretical capacity for those movements. Evaluation of traffic conditions using the Circular 212 methodology was performed using the Synchro software package. The relationships between level of service and v/c ratios for the Circular 212 methodology are shown in **Table 3.12-1.**

TABLE 3.12-1
SIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS
(INTERSECTION CAPACITY UTILIZATION METHOD)

Level of Service	Typical Volume-To-Capacity Ratio	Description
A	≤ 0.60	Uncongested operations, all queues clear in a single cycle.
B	0.61 - 0.70	Uncongested operations, all queues clear in a single cycle.
C	0.71 - 0.80	Light congestion, occasional backups on critical approaches.
D	0.81 - 0.90	Significant congestion of critical approaches, but intersection remains functional. Some vehicles required to wait through more than one cycle during brief periods. No long queues form.
E	0.91 - 1.00	Severe congestion with long standing queues on critical approaches. Blockage may occur if intersection does not provide protected left-turns. Volumes approaching capacity. Queues may extend into adjacent intersections
F	> 1.00	Represents conditions at capacity, with extremely long delays. Total breakdown, stop and go conditions.

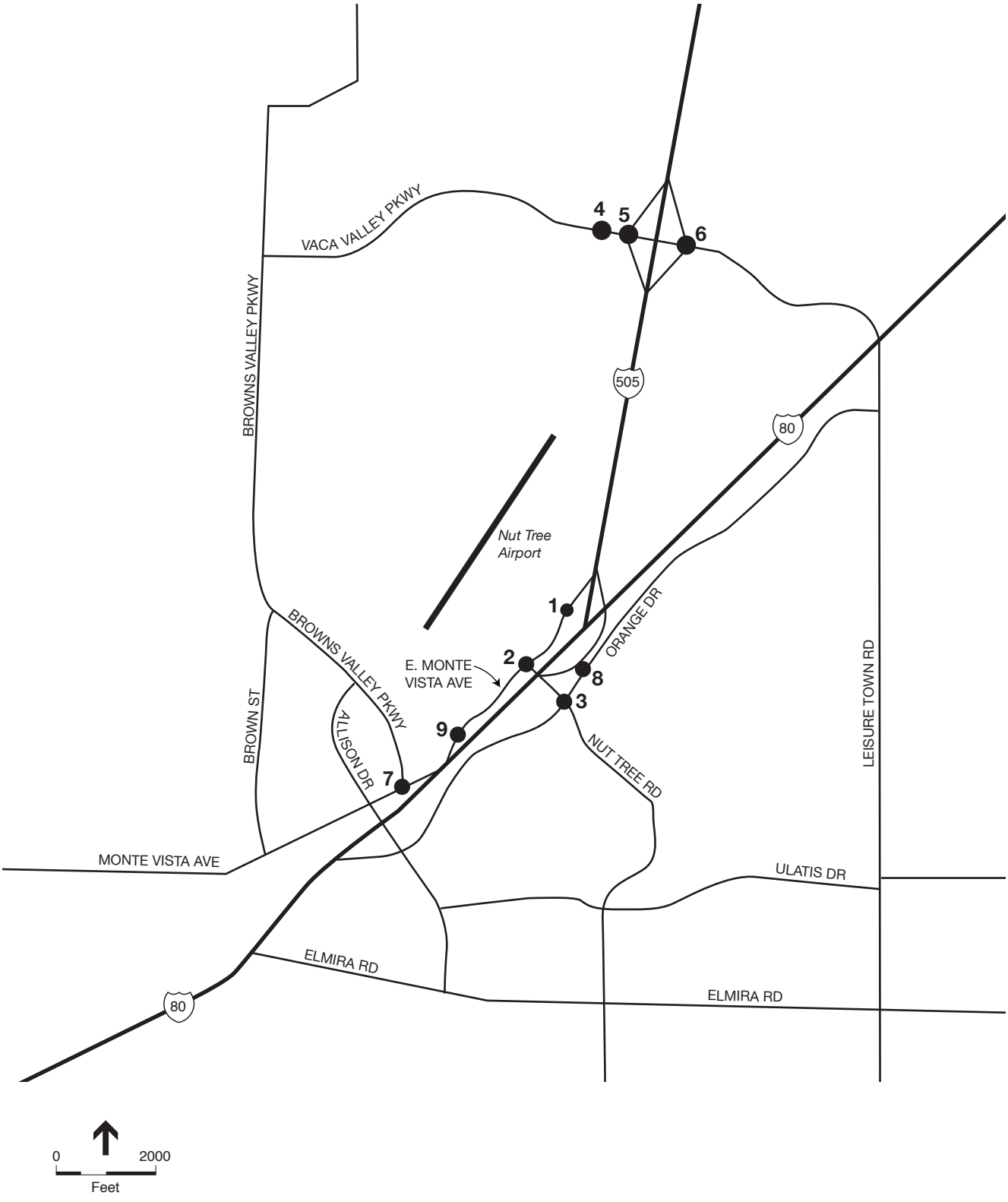
SOURCE: Transportation Research Board, *Interim Materials on Highway Capacity*, Transportation Research Circular 212, 1980.

Unsignalized Intersections

For unsignalized (all-way stop-controlled and side-street stop-controlled) intersections, traffic conditions are evaluated using the Highway Capacity Manual (HCM) operations methodology (Transportation Research Board, 2000) and the Traffix software program. With this methodology, the LOS is related to the total delay per vehicle for the intersection as a whole (for all-way stop-controlled intersections), and for each stop-controlled movement or approach only (for side-street stop-controlled intersections). Total delay is defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line. This time includes the time required for a vehicle to travel from the last-in-queue position to the first-in-queue position. **Table 3.12-2** presents the relationships between delay and level of service for signalized and unsignalized intersections.

Study Intersections

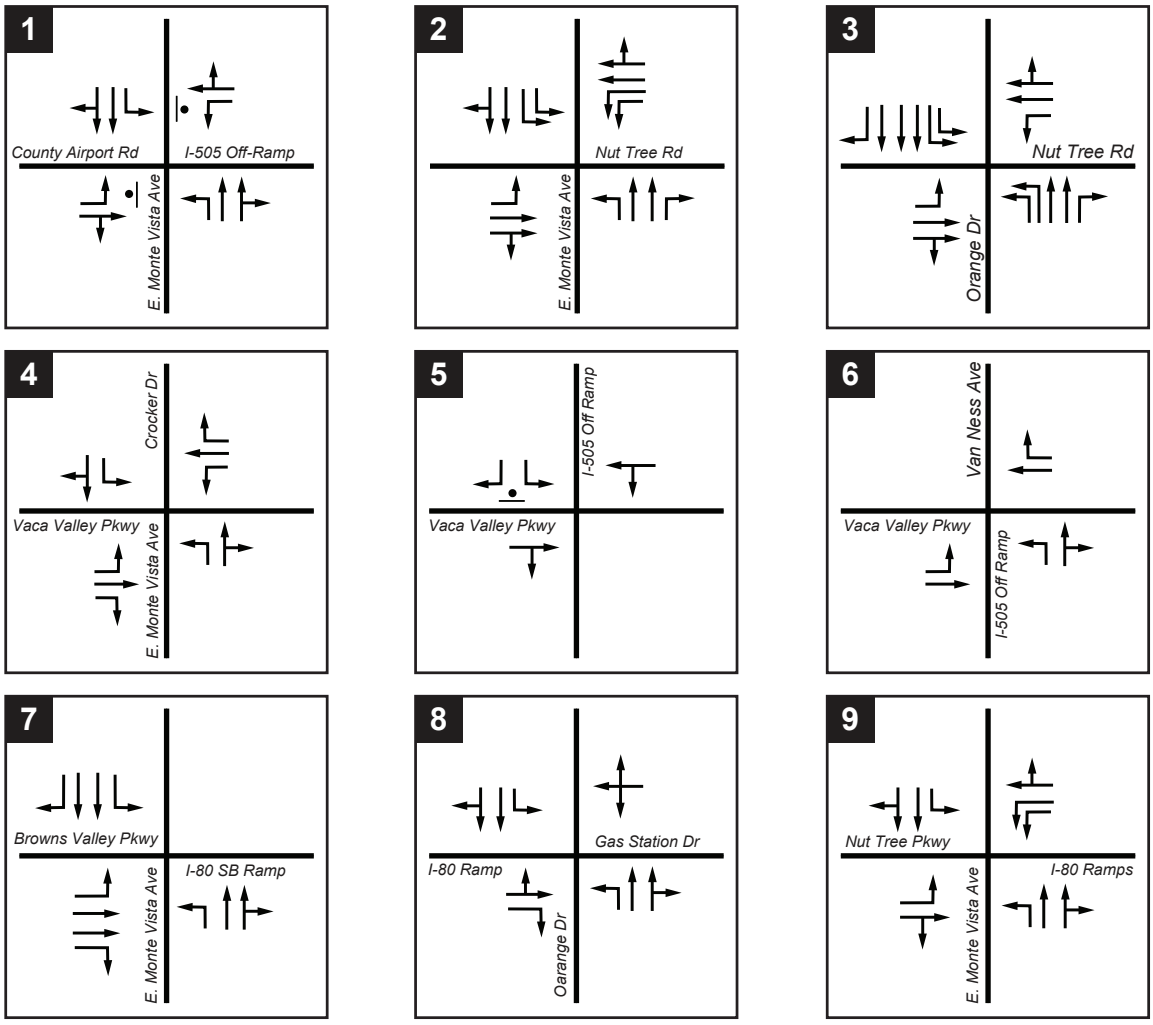
Peak-hour intersection operations at nine study intersections were conducted by the City of Vacaville between November 2011 and October 2012, and were evaluated during weekday morning (7:00 to 9:00 a.m.) and afternoon (4:00 to 6:00 p.m.) peak traffic periods. The intersections were selected based on the expectation that they would be the locations most affected by project-generated traffic. None of the study intersections are part of the Solano Transportation Authority's CMP transportation system (STA, 2009a). **Figure 3.12-1** and **Figure 3.12-2** present the location and lane configurations of the study intersections.

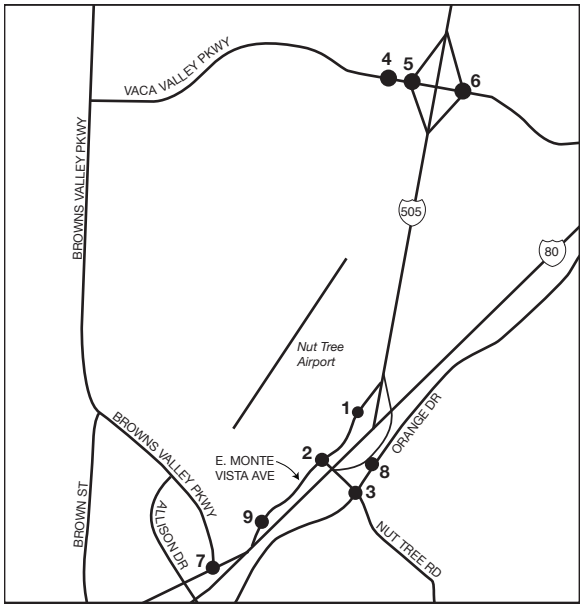


SOURCE: ESA

Nut Tree Airport Master Plan EIR . 120526

Figure 3.12-1
Study Intersection Location





SOURCE: ESA

Nut Tree Airport Master Plan EIR . 120526

Figure 3.12-2
Study Intersection Lane Configurations

TABLE 3.12-2
UNSIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS
(HCM METHODOLOGY)

Level of Service	Average Control Delay Per Vehicle (Seconds)	Description
A	≤10.0	No delay for stop-controlled approaches.
B	10.0 and ≤15.0	Operations with minor delay.
C	>15.0 and ≤25.0	Operations with moderate delays.
D	>25.0 and ≤35.0	Operations with increasingly unacceptable delays.
E	>35.0 and ≤50.0	Operations with high delays, and long queues.
F	>50.0	Operations with extreme congestion, and with very high delays and long queues unacceptable to most drivers.

SOURCE: Transportation Research Board, Special Report 209, *Highway Capacity Manual*, updated 2000.

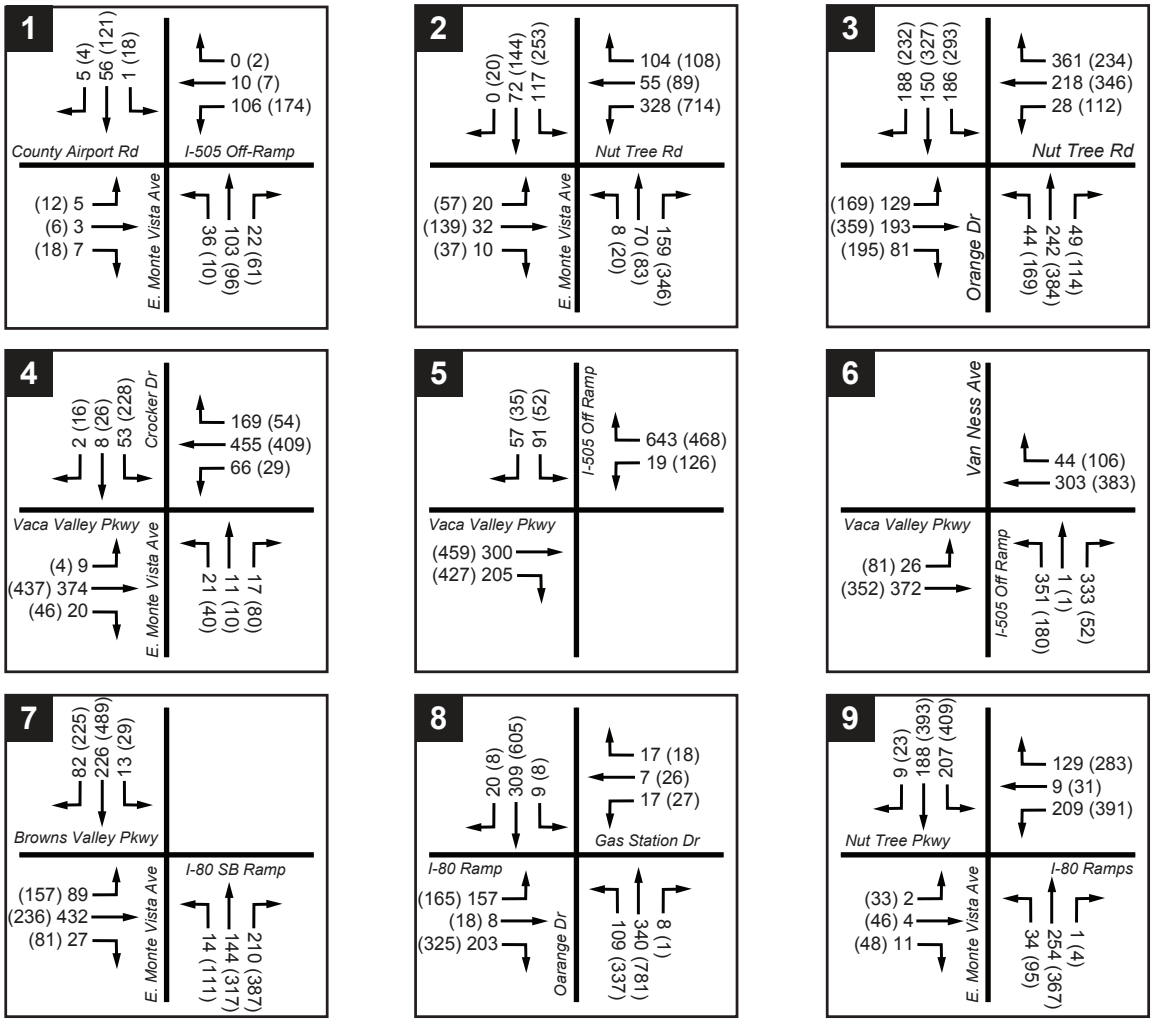
1. East Monte Vista Avenue / County Airport Road / I-505 Southbound Off-Ramp and I-80 Eastbound On-Ramp
2. Nut Tree Road / East Monte Vista Avenue
3. Nut Tree Road / Orange Drive
4. East Monte Vista Avenue / Vaca Valley Parkway / Crocker Drive
5. Vaca Valley Parkway / Southbound I-505 Ramps
6. Vaca Valley Parkway / Northbound I-505 Ramps
7. Browns Valley Parkway / I-80 Westbound On-Ramp
8. Orange Drive / I-505 Northbound On-Ramp and I-80 Eastbound Off-Ramp
9. East Monte Vista Avenue / I-80 Westbound Ramps

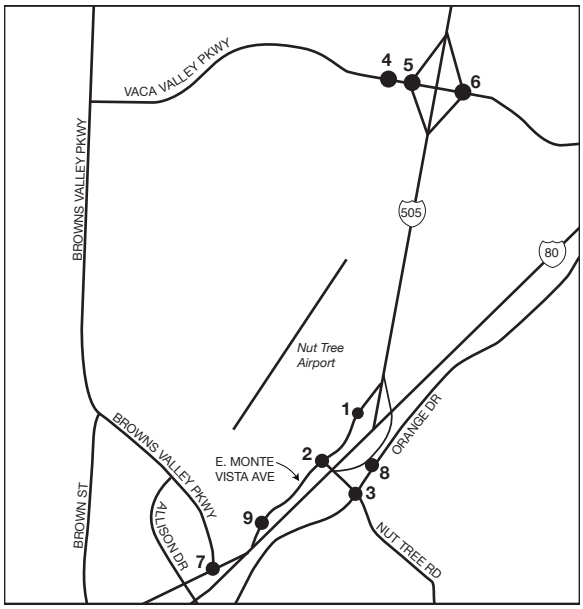
Existing Intersection Levels of Service

The a.m. and p.m. peak-hour intersection level of service under existing conditions is shown in **Table 3.12-3**. The results indicate that the majority of the study intersections operate at acceptable levels of service (LOS D or better); however, the intersection of Vaca Valley Parkway and Southbound I-505 Ramps currently operates at unacceptable LOS conditions (LOS E) during both peak hours. **Figure 3.12-3** presents traffic volumes at each study intersection under existing conditions. LOS calculation sheets are provided in **Appendix K**.

Roadway Segment Capacity Analysis Methodology

Roadway segments in the project area were analyzed based on the functional classification and daily vehicle carrying capacity of the roadway using the roadway capacity standards established and documented in the *Transportation and Circulation Element* of the City of Vacaville General Plan Update (2010). To determine Level of Service (LOS) on study area roadway segments, peak-hour traffic volume thresholds were compared to the roadway capacity (at LOS C or LOS D per City standards) of the study area roadway segments. The concept of LOS is defined as a qualitative measure describing operational conditions within a traffic stream, and the motorist's and/or passenger's perception of operations. LOS categories are assigned grades, from LOS A representing free flow conditions to LOS F representing considerable congestion and delays. LOS





SOURCE: ESA

Nut Tree Airport Master Plan EIR . 120526

Figure 3.12-3

Existing AM/PM Peak Hour Intersection Volumes

definitions generally describe these conditions in terms of such factors as speed, travel time, freedom to maneuver, comfort, convenience, and safety. The roadway segment analysis compared peak flow directional volumes with and without the proposed project to the *General Plan Segment Capacity* standards presented in **Table 3.12-4**, below.

TABLE 3.12-3
EXISTING INTERSECTION LEVELS OF SERVICE (LOS) [a]

Intersection	Control Type[b]	A.M. Peak V/C or Delay[c]	A.M. Peak LOS	P.M. Peak V/C or Delay[c]	P.M. Peak LOS
1. East Monte Vista Avenue / County Airport Road – I-505 Southbound Off-Ramp / I-80 Eastbound On-Ramp	AWSC	8.6	A	9.6	A
2. Nut Tree Road / East Monte Vista Avenue	Signal	0.38	A	0.49	A
3. Nut Tree Road / Orange Drive	Signal	0.50	A	0.59	A
4. East Monte Vista Avenue / Vaca Valley Parkway / Crocker Drive	Signal	0.47	A	0.50	A
5. Vaca Valley Parkway / Southbound I-505 Ramp	SSSC	**45.3 (SB)**	**E**	**47.1 (SB)**	**E**
6. Vaca Valley Parkway / Northbound I-505 Ramp	Signal	0.49	A	0.54	A
7. Browns Valley Parkway / I-80 Westbound On-Ramp	Signal	0.34	A	0.46	A
8. Orange Drive / I-505 Northbound On-Ramp / I-80 Eastbound Off-Ramp	Signal	0.41	A	0.62	B
9. East Monte Vista Avenue / I-80 Westbound Ramps	Signal	0.41	A	0.71	C

a LOS calculations performed using TRAFFIX and the Transportation Research Circular 212 Planning Method.
b Signal = signalized intersection; AWSC = All-Way Stop-Controlled intersection; SSSC = Side-Street Stop-Controlled intersection.
c Volume-to-capacity ratio calculated for signalized intersections. Average vehicle delay (in seconds per vehicle) is reported for the intersection as a whole (for all-way stop-controlled intersections), and for each stop-controlled movement or approach only (for side-street stop-controlled intersections).

Bold indicates unacceptable LOS conditions (LOS D or lower).

SOURCE: ESA, 2013.

TABLE 3.12-4
CITY OF VACAVILLE GENERAL PLAN
ROADWAY SEGMENT CAPACITIES BY CLASSIFICATION

Segment Classification	General Plan "LOS C" Total Two-Way Capacity	Calculated Directional "LOS C" Capacity[a]	Calculated Directional "LOS D" Capacity	Calculated Directional Capacity
8-Lane Freeway	12,000	6,600	7,425	8,250
6-Lane Freeway	8,000	4,400	4,950	5,500
6-Lane Divided Arterial	4,500	2,700	3,038	3,375
4-Lane Divided Arterial	3,500	2,100	2,363	2,625
4-Lane Arterial	2,500	1,500	1,688	1,875
2-Lane Arterial	1,500	900	1,013	1,125
2-Lane Collector	1,000	600	675	750

a Calculated LOS C Directional Capacity based on assumed splits: 60%/40% Local Streets; 55%/45% Freeway. Calculated Directional Capacity = LOS C/0.8 and Calculated LOS D Capacity = Directional Capacity/0.9.

SOURCE: City of Vacaville, General Plan (Figure 6-1), 2007.

Roadway segment capacity analysis was conducted for the following four roadway segments in proximity to the proposed project:

Roadway	From	To
1. East Monte Vista Avenue	Nut Tree Road	County Airport Road
2. East Monte Vista Avenue	County Airport Road	Vaca Valley Parkway
3. Vaca Valley Parkway	East Monte Vista Avenue	I-505 Southbound Ramp
4. Vaca Valley Parkway[1]	I-505 Southbound Ramp	I-505 Northbound Ramp

Existing Roadway Segment Capacity Analysis

Based on roadway classifications presented in Table 3.12-4, above, and existing peak directional traffic during the a.m. and p.m. peak hours along the study roadways, all four roadway segments currently operate at acceptable conditions and do not exceed the LOS D volume thresholds, as shown below in **Table 3.12-5**.

TABLE 3.12-5
EXISTING ROADWAY SEGMENT (PEAK FLOW DIRECTION)
LEVEL OF SERVICE (LOS) AND VOLUME TO CAPACITY RATIO (V/C)

				Directional Capacity[a]		AM Peak Hour		PM Peak Hour	
Roadway	From	To	Classification	LOS C	LOS D	Volume	V/C	Volume	V/C
East Monte Vista Avenue	County Airport Road	Vaca Valley Parkway	2-Lane Arterial	900	1,013	51	0.06	25	0.03
	Nut Tree Road	County Airport Road	4-Lane Arterial	1,500	1,688	63	0.04	362	0.21
Vaca Valley Parkway	East Monte Vista Ave	I-505 SB Ramps	2-Lane Arterial	900	1,013	734	0.82	533	0.59
	I-505 SB Ramps	I-505 NB Ramps	2-Lane Arterial	900	1,013	654	0.73	563	0.63

a Calculated LOS C Directional Capacity based on assumed splits: 60%/40% Local Streets; 55%/45% Freeway. Calculated Directional Capacity = LOS C/0.8 and Calculated LOS D Capacity = Directional Capacity/0.9.

SOURCE: City of Vacaville, General Plan (Figure 6-1), 2007; ESA 2013.

Existing Freeway Conditions

According to Caltrans' *Guide for the Preparation of Traffic Impact Studies*, a detailed analysis is required to assess freeway and highway facilities under Caltrans' jurisdiction if and when a proposed project would (1) generate over 100 peak-hour trips assigned to a State highway facility; or (2) generate 50 to 100 peak-hour trips assigned to a State highway facility that is experiencing and/or is approaching unstable traffic flow conditions (LOS C or D); or (3) generate 1 to 49 peak-

[1] This segment of Vaca Valley Parkway is part of the Solano Transportation Authority's CMP transportation system (STA, 2009a).

hour trips assigned to a State highway facility that experiences and/or approaching unstable or forced traffic flow conditions (LOS E or F). State highway facilities should also be examined in detail if the proposed project would result in an increased risk for a potential traffic incident, and if the proposed project would change in local circulation networks that result in an adverse effect to State highway facilities (Caltrans, 2002).

Project-related traffic is projected to use two State highway facilities near the project site: I-80 and I-505. The Solano Transportation Authority *Congestion Management Program* indicates that during the p.m. peak hour, roadway conditions along I-80 near the project site are currently operating at an acceptable LOS C, and roadway conditions along I-505 near the project site are operating at an acceptable LOS B (STA, 2009a).

The project would assign up to 40 a.m. peak-hour vehicle trips and up to 28 p.m. peak-hour vehicle trips to I-80, and approximately eight a.m. peak-hour vehicle trips and five p.m. peak-hour vehicle trips to I-505 (see Section 3.12.3, *Project Vehicle Trip Generation*). Because the project would generate a maximum of 40 peak-hour vehicle trips to a State highway facility and because both I-80 and I-505 are currently operating at acceptable service levels, no further freeway analysis is warranted, as the project would not result in unstable or forced traffic flow conditions or degrade traffic conditions along State facilities to unacceptable levels.

3.12.2 Regulatory Setting

State

California Department of Transportation

The California Department of Transportation (Caltrans) is responsible for the planning, design, construction and maintenance of all State highways. Caltrans' jurisdiction includes improvements to the interchange ramps serving area freeways. The *Guide for the Preparation of Traffic Impact Studies* provides consistent guidance for Caltrans staff who reviews local development and land use change proposals (Caltrans, 2002). The *Guide* also informs local agencies about the information needed for Caltrans to analyze the traffic impacts to State highway facilities, including freeway segments, on- or off-ramps, and signalized intersections. Caltrans facilities in the Project Site and surroundings include I-80 and I-505, as well as the on- and off-ramps from those State facilities.

The *Guide* stated that "Caltrans endeavors to maintain a target level of service (LOS) at the transition between LOS C and LOS D on State highway facilities; however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing State highway facility is operating at less than the appropriate target LOS, the existing Measure of Effectiveness (MOE) should be maintained."

Regional

Solano Transportation Authority

The Solano Transportation Authority (STA) serves as the Congestion Management Agency (CMA) of Solano County (STA, 2009a). As required by State law, STA must prepare a Congestion Management Program (CMP) or an equivalent comprehensive plan that outlines strategies for managing the regional transportation network. One requirement of the CMP is to set traffic level of service standards for the State Highways and principal arterials. The CMP is periodically updated to identify existing and future transportation facilities that would operate below the acceptable service level and to identify improvements and strategies for intersection and segments where future growth would degrade that service level. Standards for roadway operations in Solano County are defined on a countywide basis per the CMP. The CMP sets level of service standards for all CMP roadway segments and CMP intersection, and has a level of service standard of LOS E (volume-to-capacity [v/c] ratio between 0.88 and 1.00), except at those locations where the initial LOS measurement (calculated for the 1991 CMP) was already at LOS F. The CMP includes several roadways and intersections that currently operate under poor LOS conditions (LOS F); however, none of these roadway identified are in proximity of the project site (STA, 2009a).

Solano County General Plan

The *Transportation and Circulation Chapter* of the Solano County General Plan (2008) provides guiding principles for maintaining and managing the County's transportation network. Goals and policies pertaining to transportation that are relevant to the project include the following:

> **Policy TC.G-1:** Maintain and improve the County's transportation systems to enhance safety, resident access to basic needs, mobility, and convenience.
>
> **Policy TC.P-4:** Evaluate proposals for new development for their compatibility with and potential effects on transportation systems.

Local

City of Vacaville General Plan

The *Transportation and Circulation Element* of the City of Vacaville General Plan Update (2010) establishes goals and policies that guide the development of the city. Specific goals and policies outlined in the *Transportation and Circulation Element* of the General Plan that pertain to the project are described below.

> **Policy 6.1-G1:** Strive to maintain LOS C as the minimum standard at all intersections, interchanges, and road links. Design improvements to provide for LOS C in the year 2025 based on the City's development forecast.
>
> **Policy 6.1-G2:** LOS D, for particular intersection, interchange or road link, shall be allowed by a decision maker on a project as an interim level of service where improvements are programmed by the City which will improve the level of service to LOS C or better. LOS D may also be approved by the City as an allowable standard by the City

Council or designee for infill areas or situations where existing development or other practical considerations limit improvements.

Policy 6.1-G3: LOS E or LOS F for a particular intersection, interchange or road link may be allowed by the City Council on the basis of one of the following findings:

Finding 1

- The interchange, intersection or road link that will experience the projected lower level of service is an infill or isolated area; and
- There is no practical and feasible way to mitigate the lower level of service; and
- The project resulting in the lower level of service is of clear, overall public benefit.

Finding 2

- A capital improvement project is reasonably scheduled to be completed which will improve the projected level of service to LOS D or better; and
- The interim impact of the projected traffic congestion is offset by the public benefits of the project.

Finding 3

- The City has entered into a development agreement which legally commits the City to approve the proposed project.

Policy 6.1-I3: Ensure that traffic improvements necessary to serve the development without violating the level of service standards of the Transportation Element will be in place in time to accommodate trips generated by the project through continued implementation of the City's Traffic Impact Mitigation Program.

Policy 6.2-G3: Provide adequate capacity on arterial roadways to meet LOS standards and to avoid traffic diversion to local roadways or the freeway. Frontage roads, or parallel roadway facilities, should be provided adjoining the freeways wherever possible in order to avoid traffic diversions on the freeways.

Policy 6.3-G1: Design local roadways and implement traffic-control measures to maintain LOS C on local streets.

Policy 6.3-G3: Discourage through-traffic on local roadways.

Policy 6.3-G4: Designate truck routes, and discourage unnecessary through-traffic in residential areas through circulation system design and planning.

In addition to the goals and implementation measures presented above, the *General Plan* also recommends the widening of Vaca Valley Parkway from two to four lanes (and new four lane arterial where is does not yet exist), between Orchard Avenue to I-505 and widen the roadways from two to six lanes from I-505 to I-80. Additional recommendations include widening East Monte Vista Avenue from two to four lanes between Browns Valley Parkway and Vaca Valley Parkway.

City of Vacaville Traffic Mitigation Ordinance

The City of Vacaville Traffic Impact Mitigation Ordinance (Ordinance), which establishes a procedure to assess and mitigate the potential impacts of proposed development projects on the transportation system, is of particular relevance to the project. The Ordinance establishes traffic impact standards, which specifically allow City decision-makers to allow and accept LOS D without mitigation measures. This standard is more lenient than that indicated in the City's General Plan, where Policy 6.1-G1 has established a minimum standard of LOS C for all intersections, road links, and interchanges (as presented above). The Ordinance also provides for LOS E and LOS F approval under defined circumstances similar to those identified in General Plan Policy 6.1-G3 (see above).

The Ordinance requires traffic studies for development projects found to meet the trip generation thresholds established in the ordinance. Traffic studies are required to include traffic analysis for three conditions: Existing conditions, Existing conditions plus projects that have been approved and a 20- to 25-year projection (see detailed definition of each scenario under Section 3.12.3, *Analysis, Impacts, and Mitigation*, below). Transportation improvements required to mitigate impacts are based on results of the traffic analysis presented herein. Right-of-way dedication is required for roadway improvements identified in the current General Plan to accommodate traffic conditions associated with buildout of all allowable land uses. Conditions of approval for development project involving transportation improvement are based on short-term impacts (e.g., Existing plus Approved Projects), and the 20- to 25-year projections.

3.12.3 Analysis, Impacts, and Mitigation

Significance Criteria

Based on CEQA Guidelines Appendix G, a project would cause a significant impact on transportation and traffic if it would:

a. Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for performance of study intersections and roadways, including those in an applicable congestion management program, under Existing plus Project Conditions?[2]

b. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.

c. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).

d. Result in inadequate emergency access.

[2] This significance criteria combines criteria 'a' and 'b' from the CEQA checklist: a) Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit. b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways.

e. Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

f. Result in temporary circulation impacts on the street system due to construction activities?

City of Vacaville Traffic Standards of Significance

The City of Vacaville has adopted standards of significance for evaluating traffic impacts. Therefore, in addition to the standard significance criteria above, this EIR shall also analyze these standards to indicate a traffic impact would be classified as ***significant*** if the project would:

- Degrade intersection and/or roadway segment operations from an acceptable level (LOS D or better) with baseline traffic volumes to an unacceptable level of service conditions (LOS E or worse);
- Increase the volume-to-capacity ratio by 0.02 or more for signalized intersections and/or roadway segment operations that already operate at unacceptable level of service conditions (LOS E or F);
- Increase the average delay by five seconds or more for unsignalized intersections that already operate at an unacceptable service level (LOS E or F).[3]

Methodology and Assumptions

Project Vehicle Trip Generation

Project travel demand refers to the new vehicle trips generated by the proposed project. The trip generation estimate was based on the forecast number of based aircraft of the proposed project by Year 2032 and the non-aviation land uses proposed within project site. As described in Section 2.4, *Proposed Project* (see Chapter 2, Project Description), unconstrained activity levels at the proposed project would result in a net increase of 78 based aircraft by full buildout of the project (an increase from an existing 189 based aircraft to a projected 267 based aircraft by Year 2032, respectively). However, the number of based aircraft during only Phase I (year 1 – 5) would result in a net increase of 44 based aircraft (to a projected 233 total based aircraft).

The *Master Plan Update* also proposes the development of non-aviation facilities within the airport boundaries. The proposed land use development would include a professional office building located on a 1.3-acre site, and two general commercial/light industrial developments located on 5.5- and 2.75-acre sites. Although the specific timing of these developments are not identified in the *Nut Tree Airport Master Plan Update* (Solano County, 2011), for the purposes of this EIR, the assumed timeframe for construction of non-aviation uses would be within Phase I (years 1 – 5), as described below.

Using trip generation rates provided by the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 9th Edition (ITE, 2012), the Phase I aviation developments and non-aviation uses would generate approximately 878 trips per day, 115 trips during the a.m. peak hour, and 116 trips during the p.m. peak hour. Full project build-out (all phases completed) would generate

[3] Due to the normal fluctuation in daily traffic counts and motorists perception of traffic conditions, a change in v/c ratio of less than 0.02 and in average delay by less than five seconds are considered to be imperceptible.

approximately 1,093 trips per day, 133 trips during the a.m. peak hour, and 138 trips during the p.m. peak hour. Trip generation estimates are presented in **Table 3.12-6**, below.

TABLE 3.12-6
PROJECT TRIP GENERATION

Land Use	Amount	Daily	A.M. Peak Hour (IN/OUT)[f]	P.M. Peak Hour (IN/OUT)
General Aviation Facility (based aircraft)[a,b]				
Phase I Development	44	220	18 (9/9)	23 (13/10)
Full Build-out (All Phases Complete)	78	390	32 (16/16)	40 (21/19)
Non-Aviation Uses (development capacity)				
Light Industrial Development on two parcels (acres) [c]	8.25	427	62 (51/11)	60 (43/17)
Office Development (1,000 gsf) [d]	25 [e]	276	39 (34/5)	38 (6/32)
Total Vehicle Trips (Phase I + Non-Aviation Uses)		**923**	**119** (94/25)	**121** (62/59)
Total Vehicle Trips (All Phases + Non-Aviation Uses)		**1,093**	**133** (101/32)	**138** (70/68)

a Planned net increase in based aircraft is 189 to 267 by Year 2032.
b Daily Trip rate is 5.0 trips per based aircraft; AM Peak Hour Trip rate is 0.41 trips per based aircraft; PM Peak Hour Trip rate is 0.52 trips per based aircraft.
c Daily trip rate is 51.8/acre; AM Peak-Hour Trip rate is 7.51/acre; PM Peak-Hour Trip rate is 7.26/acre.
d Daily trip rate is 11.03/1,000 square feet (ksf); AM Peak-Hour Trip rate is 1.56/ksf; PM Peak-Hour Trip rate 1.49/ksf.
e Gross square footage was approximated from data in SANDAG Trip Generation Manual based on planned 1.3-acre parcel.
f Estimated inbound (IN) and outbound (OUT) trips per peak hour.

SOURCES: ESA (2013); Solano County, *Nut Tree Master Plan Update* (2012); and ITE, *Trip Generation Manual* (2012), Land Use (LU) Code 022: General Aviation Airport; LU Code 110 General Light Industrial; LU Code 710 General Office Building; San Diego Association of Governments (SANDAG), *Trip Generation Rate Summary* (2003).

Project Trip Distribution and Assignment

Vehicular access to the current airport is gained primarily via County Airport Road, by way of East Monte Vista Avenue, which provides access to local roadways (i.e., Vaca Valley Parkway, Nut Tree Road, and Allison Drive), and regional roadways (i.e., I-80 and I-505). Trip distribution and assignment was developed for the proposed project based on existing travel patterns in the site vicinity, roadway accessibility to the site, and on population densities (distribution of population and housing within Vacaville and nearby communities) to assess the origin-location of airport patrons and future employees (from where patrons/employees would likely travel to access the airport area).

Project trips traveling from north of the airport would travel southbound along I-80 and exit at East Monte Vista Avenue, then travel north along East Monte Vista Avenue to County Airport Road, or vehicles would travel along I-80 and exit at Vaca Valley Parkway, then travel west along Vaca Valley Parkway then southbound along East Monte Vista Avenue to County Airport Road. Trips from north of the airport traveling along I-505 would exit at Vaca Valley Parkway, then travel onto East Monte Vista Avenue, or would exit to I-80, and then exit to East Monte

Vista Avenue to access County Airport Road. Vehicles traveling from the south would travel northbound along I-80, and exit at Orange Drive/Nut Tree Road or exit at Allison Drive, and then travel north along East Monte Vista Avenue to County Airport Road. Vehicles from the east would utilize local, surface streets, including Nut Tree Road, Allison Drive, and Leisure Town Road (which becomes Vaca Valley Parkway) to gain access to East Monte Vista Avenue and County Airport Road. Trips traveling from west of the airport would utilize Vaca Valley Parkway and Browns Valley Parkway in order to access East Monte Vista Avenue and County Airport Road. **Table 3.12-7** and **Figure 3.12-4** present the trip distribution/assignment pattern to and from the project site.

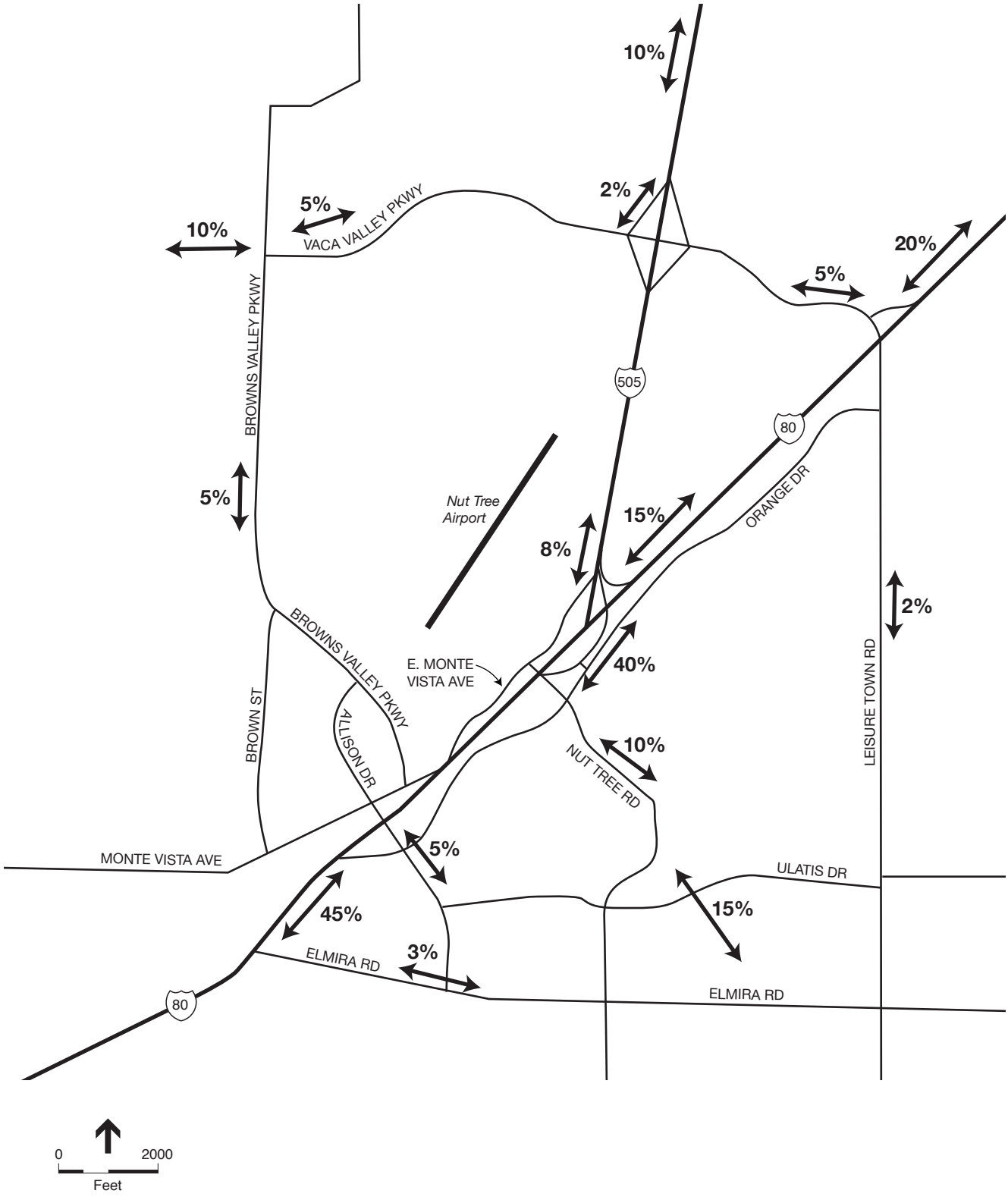
TABLE 3.12-7
PROJECT TRIP DISTRIBUTION AND ASSIGNMENT PATTERNS

Roadway	Percent
To/From Northeast of Site: I-80	**20%**
Vaca Valley Parkway	*5%*
East Monte Vista Avenue	*15%*
To/From Southwest of Site: I-80	**45%**
Allison Drive	*5%*
Nut Tree Road	*40%*
To/From North of Site: I-505	**10%**
Vaca Valley Parkway	*2%*
East Monte Vista Avenue	*8%*
To/From East of Site (Local)	**15%**
Vaca Valley Parkway (Leisure Town Road)	*2%*
Nut Tree Road	*10%*
Allison Drive	*3%*
To/From West of Site (Local)	**10%**
Vaca Valley Parkway	*5%*
Browns Valley Parkway	*5%*
TOTAL	**100%**

SOURCE: ESA, 2013.

Analysis Scenarios

Five analysis scenarios were analyzed to determine the extent to which the proposed project may affect the surrounding transportation environment during both weekday a.m. and p.m. peak hours. These scenarios are summarized below:



SOURCE: ESA

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Figure 3.12-4
Project Trip Distribution

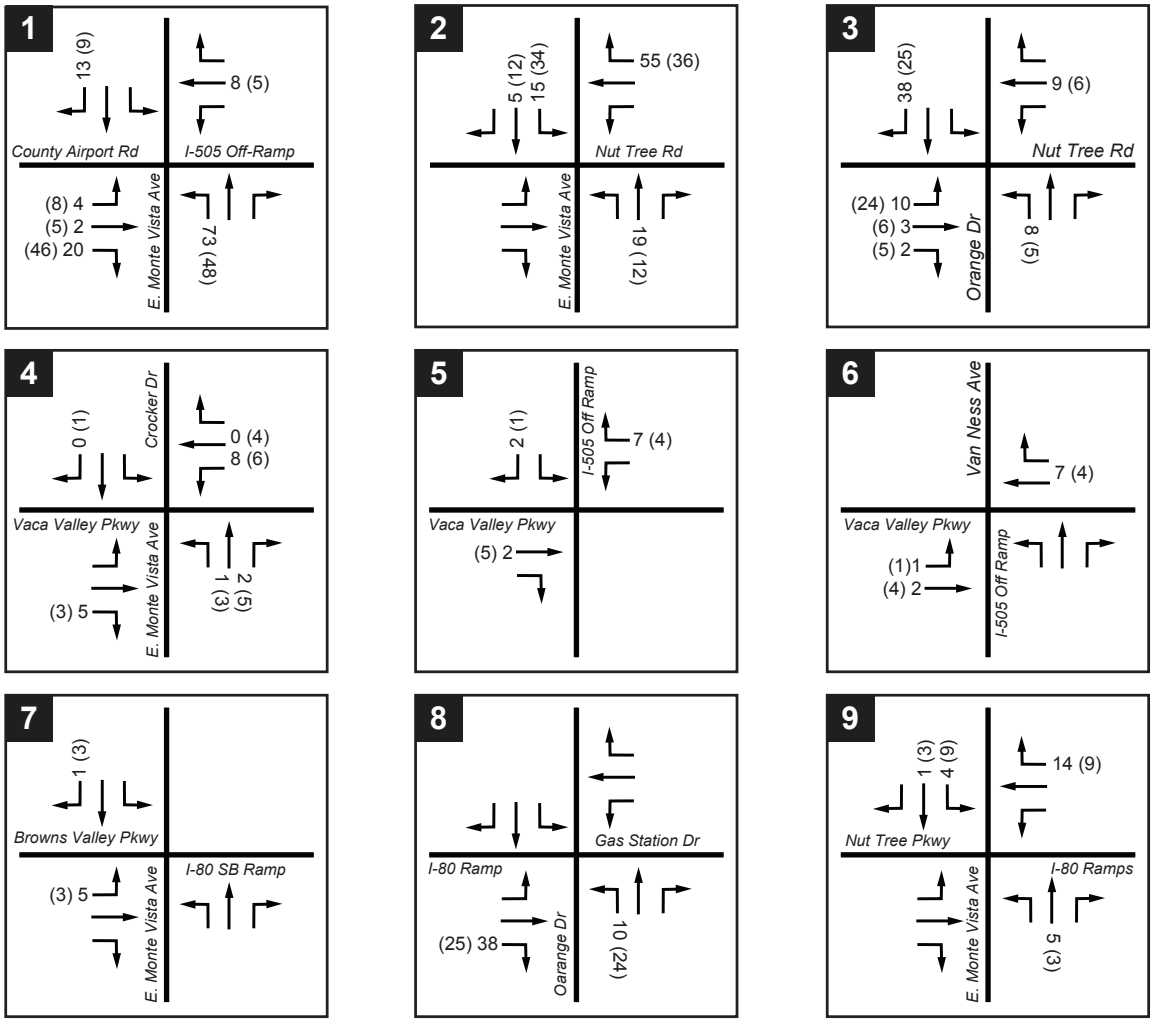
- ***Existing Plus Approved Projects*** – Existing conditions plus traffic generated from a selected number of approved (not yet occupied) projects as well as planned transportation system improvements contained in the latest City of Vacaville Travel Demand Forecasting (TDF) Model. These developments represent either approved projects, approved projects under construction, and/or approved projects completed but not yet occupied. Project-related traffic was not included in the scenario.
- ***Existing Plus Approved Projects Plus Phase I Developments*** – Existing conditions plus traffic generated from approved (not yet occupied) projects and the projected traffic generated by the Phase I aviation developments and all non-aviation land use developments.
- ***Existing Plus Approved Projects Plus Project Build-Out*** – Existing conditions plus traffic generated from approved (not yet built) projects and the projected traffic generated by all phased aviation developments and all non-aviation land use developments.
- ***Cumulative (2035)*** – Future conditions including projected population and employment growth as well as planned transportation system improvements contained in the latest City of Vacaville Travel Demand Forecasting Model for Year 2035.
- ***Cumulative (2035) Plus Project Build-Out*** – Year 2035 conditions with the addition of traffic generated by all phased aviation developments and all non-aviation land use developments.

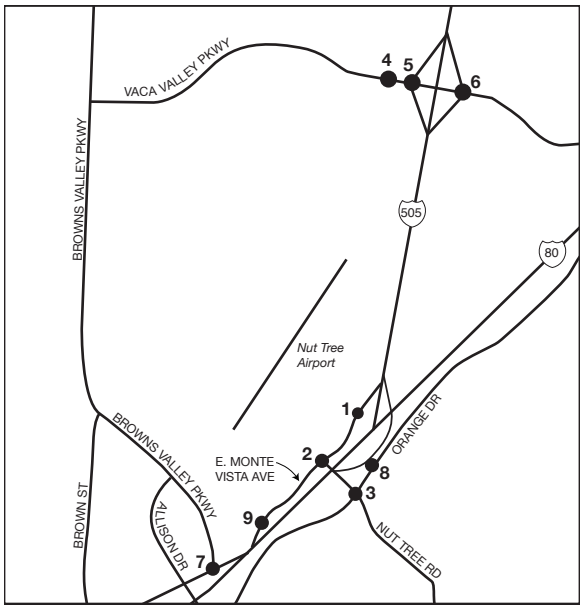
As discussed in Section 2.4, *Proposed Project*, in Chapter 2, the project proposes to develop aviation-related facilities and other land uses over the next 20 years and proposes to develop these uses in three separate phases. Phase I would occur between Years 1 – 5, Phase II would occur between Years 6 – 10, and Phase III would occur between Years 11 – 20, with each phase comprised of various new on-site developments, relocation of existing utilities and other airport-related facilities, as well as constructing new airport- and non-airport-related buildings within the airport boundaries. For purposes of this EIR, the transportation analysis includes an evaluation to identify the extent to which traffic associated with the proposed project (with only Phase I developments and with all phased developments) would affect the surrounding existing and future transportation network.

Figure 3.12-5 and **Figure 3.12-6** present project-only trips at each study intersection under Phase I and All Phases (project buildout) scenarios.

Cumulative Year Transportation System Improvements

The *Transportation and Circulation Element* of the City of Vacaville General Plan Update (2010) and Solano Transportation Authority's *Comprehensive Transportation Plan* (STA, 2009b) identify several future transportation improvements throughout Solano County and City of Vacaville. For purposes of the analysis, two specific transportation improvement projects were incorporated into the Existing plus Approved Projects and Cumulative (Year 2035) scenarios. These projects are fiscally-constrained and are expected to be constructed and completed prior to the build-out of the proposed project. These transportation improvement projects per analysis scenario are discussed below:

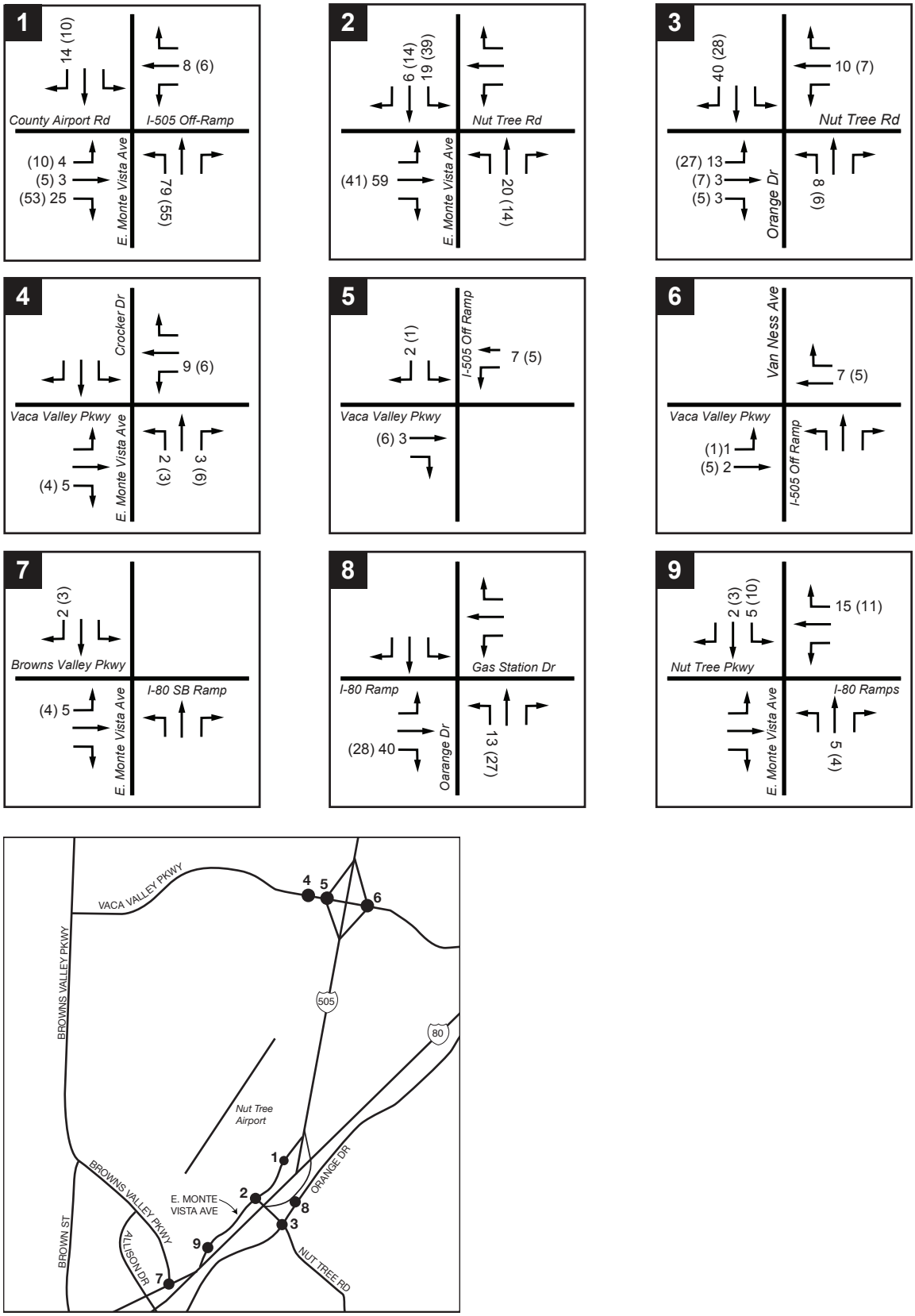




SOURCE: ESA

Figure 3.12-5

Project (Phase I) AM/PM Peak Hour Intersection Volumes



SOURCE: ESA

Figure 3.12-6

Project (All Phases) AM/PM Peak Hour Intersection Volumes

Existing plus Approved Projects Scenario

Vaca Valley Parkway / Interstate 505 Southbound Ramps Interim Improvements – a project funded by the Local Development Impact Fee Program to widen Vaca Valley Parkway to provide a protected westbound left-turn lane and an eastbound right-turn lane and widen southbound off-ramp to provide a southbound right-turn lane. The project would also provide signalization at the southbound ramp intersection. Construction is scheduled to begin in April 2013 and completed by September 2013 (City of Vacaville, 2012c).

Cumulative (2035) Scenario

Vaca Valley Parkway / Interstate 505 Interchange – a project funded by the Local Development Impact Fee Program to widen existing overcrossing with protected turn pockets and to accommodate pedestrians and Class II bicycle lanes, and modify interchange to provide partial cloverleaf design. Please note the Development Impact Fee Program would fund a four-lane overcrossing with slip ramps.

Impacts and Mitigation Measures

Impact 3.12-1: Could the Proposed Project conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for performance of study intersections and roadways, including those in an applicable congestion management program, under Existing plus Project Conditions? (*Less than Significant*)

Existing plus Approved Projects plus Project – Phase I

Intersection Conditions

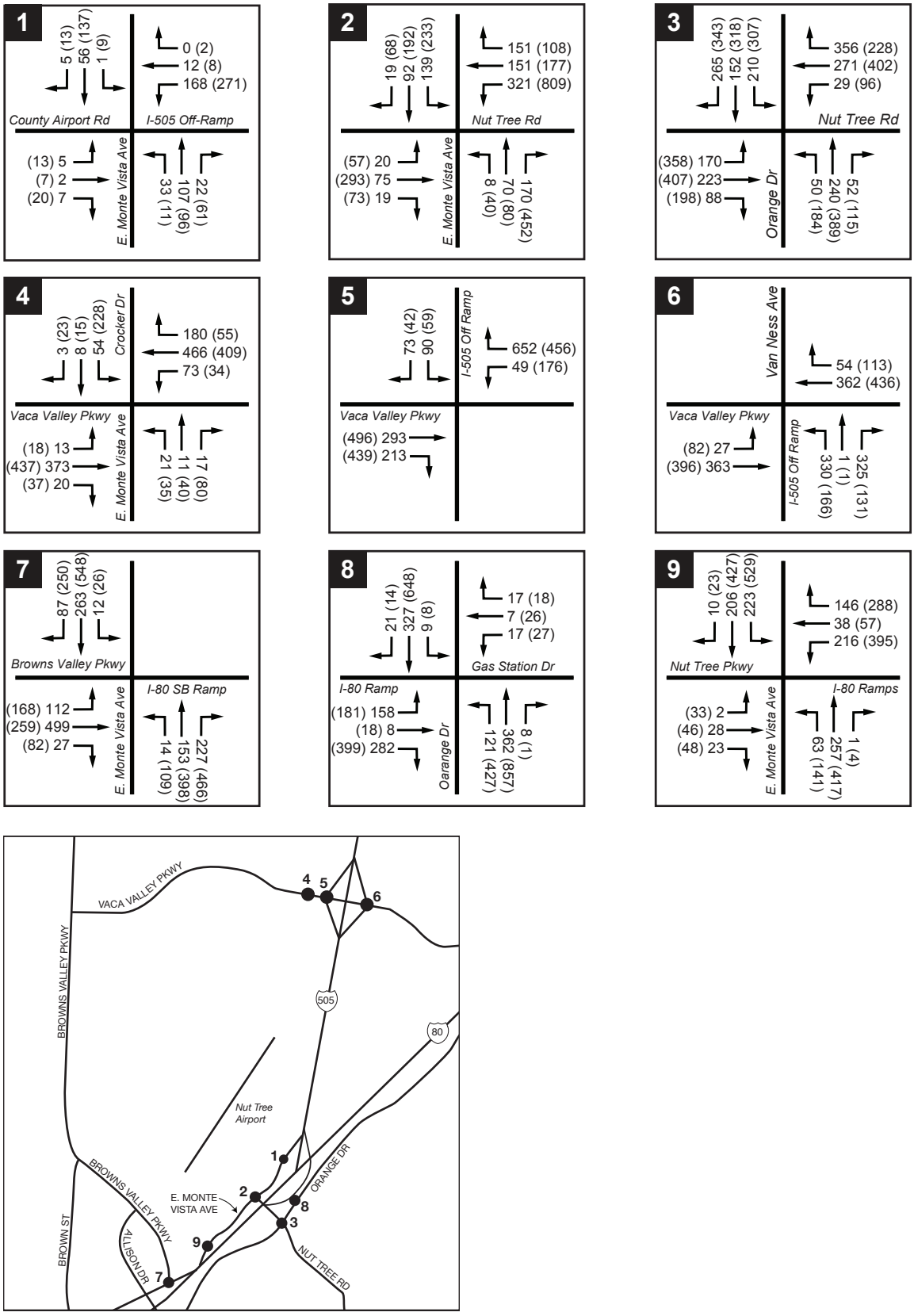
The level of service (LOS) results for Existing plus Approved Projects and Existing plus Approved Projects plus Project (Phase 1) conditions are summarized in **Table 3.12-8**. The results indicate that all of study intersections would operate within acceptable LOS standards (LOS D or better) under Existing plus Approved Projects conditions, and would continue to operate acceptably under Existing plus Approved Projects plus Project (Phase 1) conditions. Based on these findings, the project would result in a less than significant impact. No mitigation measures are required.

Figure 3.12-7 presents intersection volumes under Existing plus Approved Projects conditions and **Figure 3.12-8** presents intersection volumes under Existing plus Approved Projects plus Project (Phase 1) conditions. LOS calculation sheets are provided in **Appendix K**.

Roadway Segment Conditions

As shown in **Table 3.12-9**, the roadway segments along East Monte Vista Avenue, between Nut Tree Road and Vaca Valley Parkway, operate at acceptable LOS conditions under Existing plus Approved Projects conditions during both peak periods. The roadway segments along Vaca Valley Parkway between East Monte Vista Avenue and I-505 Northbound Ramps, a portion of which is part of the Solano County CMP system, would also operate at acceptable LOS conditions during both peak periods.

Mitigation Measures: None required.



SOURCE: ESA

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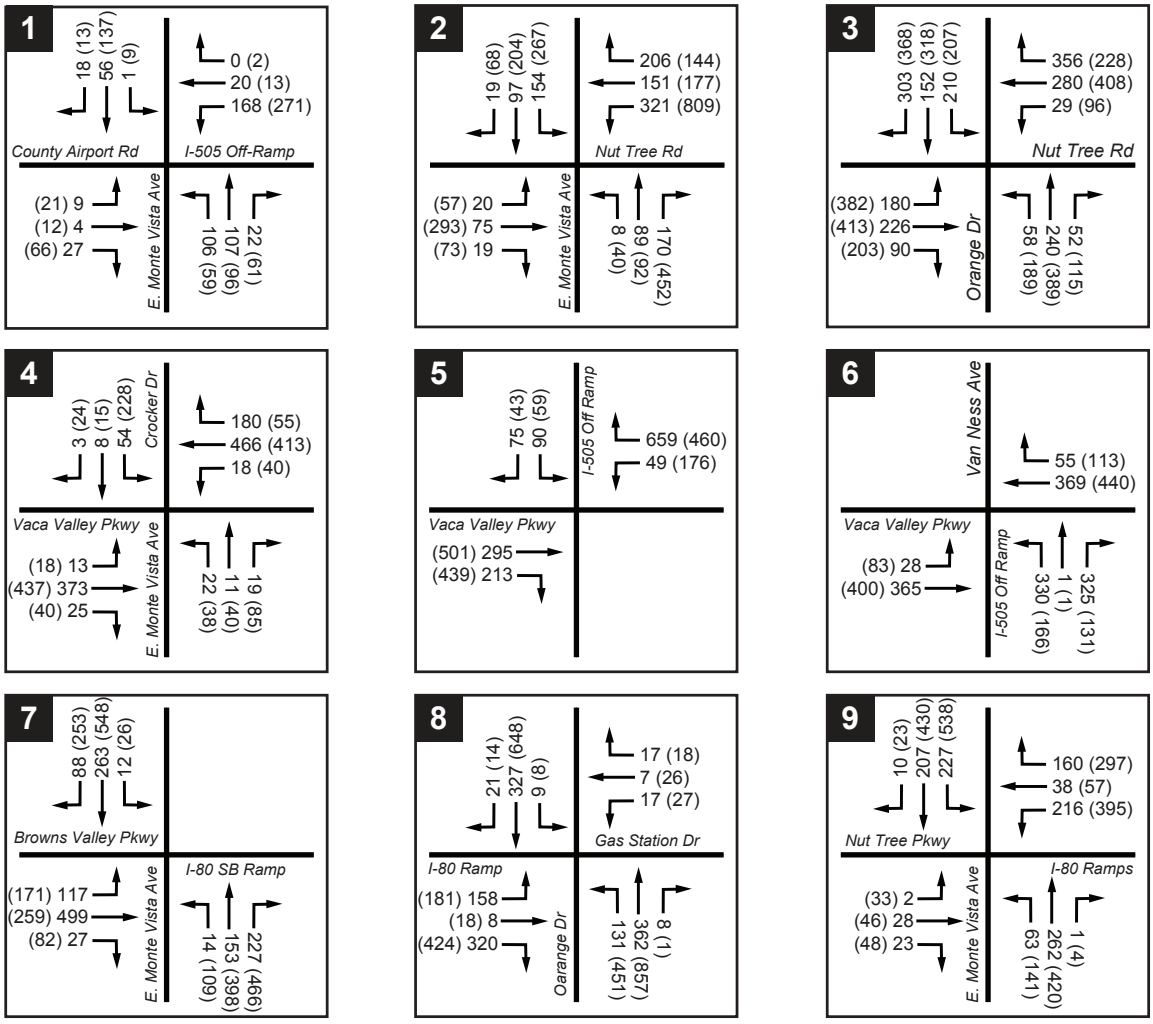
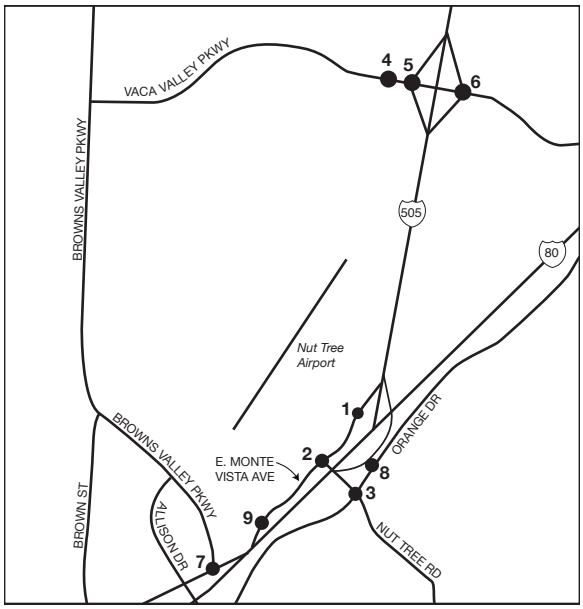
Figure 3.12-7

Existing+Approved Projects AM/PM Peak Hour Intersection Volumes





SOURCE: ESA

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Figure 3.12-8
Existing+Approved Projects+Project (Phase I)
AM/PM Peak Hour Intersection Volumes

TABLE 3.12-8
INTERSECTION LEVEL OF SERVICE (LOS) – EXISTING PLUS APPROVED PROJECTS AND EXISTING PLUS APPROVED PROJECTS PLUS PROJECT CONDITIONS

				Existing + Approved Projects		Existing + Approved Projects plus Project (Phase 1)			Existing + Approved Projects plus Project (All Phases)		
	Intersection	Traffic Control[b]	Peak Hour	LOS[a]	V/C or Delay[c]	LOS[a]	V/C or Delay[c]	Change[d]	LOS[a]	V/C or Delay[c]	Change[d]
1	East Monte Vista Avenue / County Airport Road – I-505 ~~West~~ **South**bound Off-Ramp/ I-80 Eastbound On-Ramp	AWSC	AM	A	9.3	A	9.7	0.4	A	9.7	0.4
			PM	B	11.4	B	11.8	0.4	B	11.9	0.5
2	Nut Tree Road / East Monte Vista Avenue	Signal	AM	A	0.33	A	0.34	0.01	A	0.35	0.02
			PM	B	0.57	B	0.58	0.01	B	0.58	0.01
3	Nut Tree Road / Orange Drive	Signal	AM	A	0.54	A	0.55	0.01	A	0.55	0.01
			PM	C	0.71	B	0.70	-0.01	C	0.73	0.02
4	East Monte Vista Avenue / Vaca Valley Parkway / Crocker Drive	Signal	AM	A	0.48	A	0.41	-0.07	A	0.48	0.00
			PM	A	0.54	B	0.60	0.06	B	0.60	0.06
5	Vaca Valley Parkway / I-505 Southbound Ramp[d]	Signal[e]	AM	A	0.53	A	0.53	0.00	A	0.53	0.00
			PM	A	0.56	A	0.56	0.00	A	0.56	0.00
6	Vaca Valley Parkway / I-505 Northbound Ramp	Signal	AM	A	0.53	A	0.53	0.00	A	0.53	0.00
			PM	A	0.56	A	0.56	0.00	A	0.56	0.00
7	Browns Valley Parkway / I-80 Westbound On-Ramp	Signal	AM	A	0.37	A	0.37	0.00	A	0.37	0.00
			PM	A	0.51	A	0.51	0.00	A	0.51	0.00
8	Orange Drive / I-505 Northbound On-Ramp / I-80 Eastbound Off-Ramp	Signal	AM	A	0.42	A	0.43	0.01	A	0.43	0.01
			PM	B	0.70	C	0.71	0.01	C	0.71	0.01
9	East Monte Vista Avenue / I-80 Westbound Ramps	Signal	AM	A	0.42	A	0.43	0.01	A	0.43	0.01
			PM	C	0.79	C	0.79	0.00	C	0.80	0.01

a LOS calculations performed using TRAFFIX and the *2000 Highway Capacity Manual* Circular 212 Planning Method operations analysis methodology.
b Signal = signalized intersection; AWSC = All-Way Stop-Controlled intersection
c Volume-to-capacity ratio calculated for signalized intersections. Average vehicle delay (in seconds per vehicle) is reported for unsignalized intersections (i.e., AWSC)
d Represents the change in V/C or Delay relative to Existing plus Approved Projects (baseline) Conditions.
e Intersections are signalized under Existing plus Approved Projects Conditions.

Bold indicates unacceptable LOS conditions (LOS E or lower). Shaded cells indicate a significant project impact.

SOURCE: ESA, 2013.

TABLE 3.12-9
ROADWAY SEGMENT LEVEL OF SERVICE – PEAK FLOW DIRECTION
EXISTING PLUS APPROVED PROJECTS AND EXISTING PLUS APPROVED PROJECTS PLUS PROJECT

Roadway	From	To	LOS Directional Capacity[a]		Existing plus Approved		Existing plus Approved Plus Project (Phase 1)		Change[b]		Existing plus Approved Plus Project (All Phases)		Change[b]	
			LOS C	LOS D	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
East Monte Vista Avenue	County Airport Road	Vaca Valley Parkway	900	1,013	112	380	116	388	4	8	116	390	4	10
					0.12	*0.42*	*0.13*	*0.43*	*0.00*	*0.01*	*0.13*	*0.43*	*0.00*	*0.01*
	Nut Tree Road	County Airport Road	1,500	1,688	241	946	315	958	74	12	320	960	79	14
					0.14	*0.56*	*0.19*	*0.57*	*0.04*	*0.01*	*0.19*	*0.57*	*0.05*	*0.01*
Vaca Valley Parkway	East Monte Vista Ave	I-505 SB Ramps	900	1,013	725	745	734	750	9	5	734	751	9	6
					0.81	*0.83*	*0.82*	*0.83*	*0.01*	*0.01*	*0.82*	*0.83*	*0.01*	*0.01*
	I-505 SB Ramps	I-505 NB Ramps	900	1,013	692	602	699	606	7	4	699	607	7	5
					0.77	*0.67*	*0.78*	*0.67*	*0.01*	*0.00*	*0.78*	*0.67*	*0.01*	*0.01*

a Calculated LOS C Directional Capacity based on assumed splits: 60%/40% Local Streets; 55%/45% Freeway. Calculated Directional Capacity = LOS C/0.8 and Calculated LOS D Capacity = Directional Capacity/0.9.
b Represents the change in volumes and volume-to-capacity ratio relative to Existing plus Approved Projects conditions.

SOURCE: City of Vacaville, General Plan (Figure 6-1), 2007; ESA 2013.

Existing plus Approved Projects plus Project – All Phases

Intersection Conditions

As described, all study intersections would continue to operate within acceptable service levels (LOS D or better) under Existing plus Approved Projects conditions. With full build-out of the project, all of the study intersections would continue to operate within acceptable LOS conditions (LOS D or better) during both peak hours. Based on these findings, the project would result in a less than significant impact. No mitigation measures are required.

Figure 3.12-9 presents intersection volumes under Existing plus Approved Projects plus Project (All Phases) conditions. LOS calculation sheets are provided in **Appendix K**.

Roadway Segment Conditions

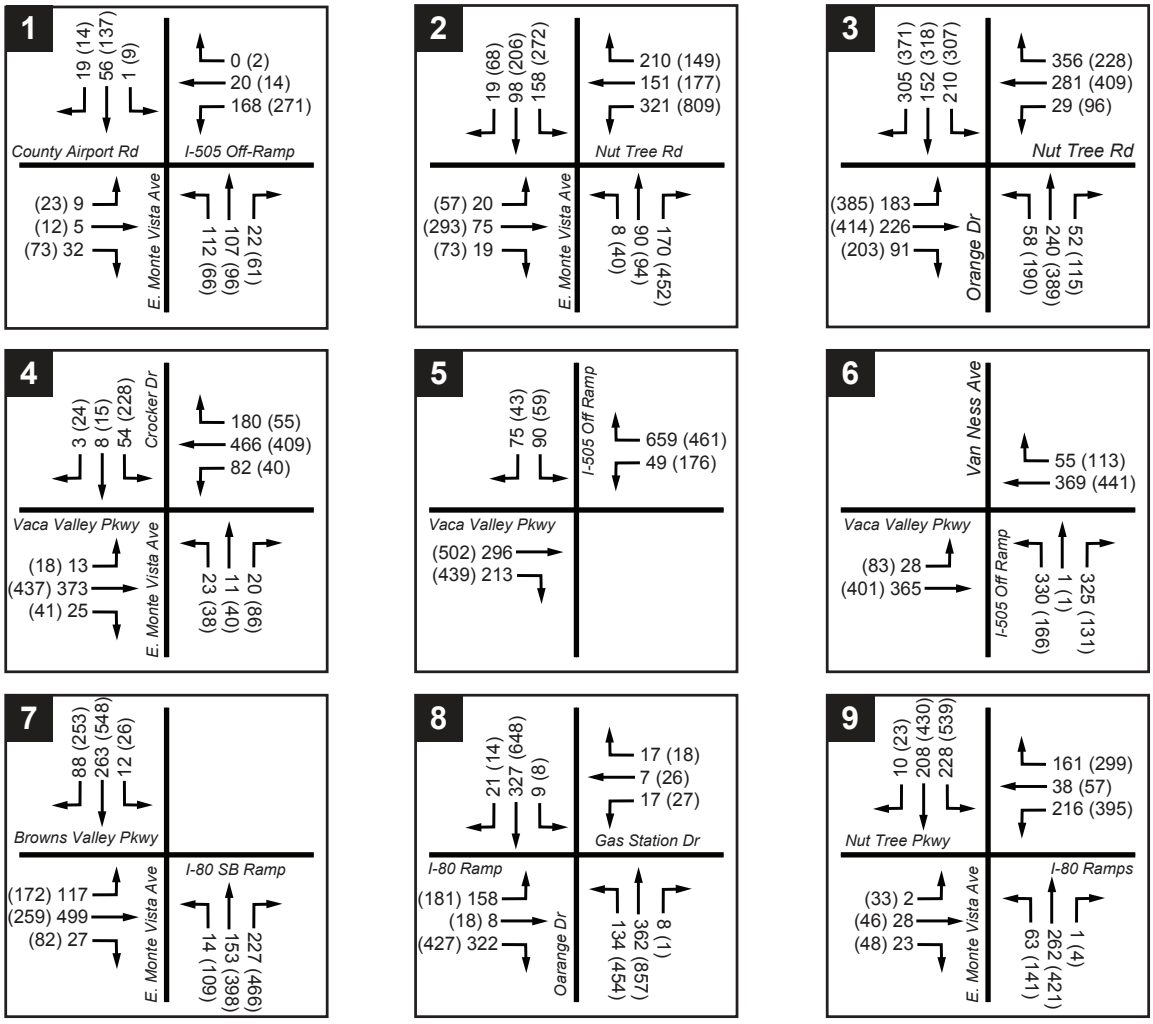
As shown in Table 3.12-8, above, under Existing plus Approved Projects plus Project (All Phases) conditions, all study roadway segments, including the portion that is part of the Solano County CMP system, would continue to operate at acceptable conditions. Project-generated traffic would not result in any substantial increases in traffic that would exceed the LOS D volume thresholds during the a.m. and p.m. peak periods, and no mitigation measures are required.

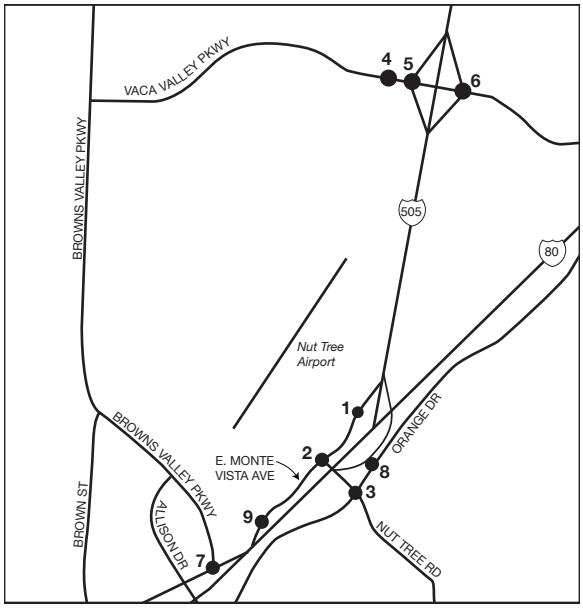
Mitigation Measures: None required.

Impact 3.12-2: Could the Proposed Project result in a change in air traffic patterns, including either an increase in traffic levels or a change in location, which would result in substantial safety risks? (*Less than Significant*)

Nut Tree Airport is a non-towered general aviation facility that handled about 101,500 aircraft operations in 2011. Operations at the Airport are conducted for a wide variety of purposes; including, but not limited to business travel, personal/recreational flying, flight training, medical transport, and government agency travel (e.g., prisoner transport, drug enforcement activity, etc.). These various operation types generally break down into two categories: local (aircraft based at the Airport) and itinerant (non-based aircraft) operations.

General aviation aircraft arriving from or departing to other destinations will operate under two classifications of flight rules: instrument flight rules (IFR) or visual flight rules (VFR). These two classifications are used by any pilot that meets the regulatory requirements stated in the Federal Aviation Regulations and has properly equipped aircraft to fly in either (or both) classifications. IFR flights require advanced pilot and aircraft certifications, and virtually all commercial and military flights are conducted under IFR due to the speed, instrumentation, and complexity of the aircraft. (Many corporate jets today operate under IFR.) VFR flights, however, are generally conducted by smaller aircraft that navigate visually and are responsible for seeing and avoiding obstacles and other aircraft without assistance from air traffic control (ATC), depending on the airspace in which they are operating.





SOURCE: ESA

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Figure 3.12-9
Existing+Approved Projects+Project (All Phases)
AM/PM Peak Hour Intersection Volumes

Implementation of the Proposed Project would result in the construction of additional hangar and aircraft parking apron space. The Project would also result in the shifting of the runway by 200 feet to the northeast in Phase I, and an extension of 600 feet on the Runway 20 end by Phase III. The Master Plan update for Nut Tree Airport also forecasts that aircraft operations are expected to increase to 127,330 by 2031; an increase of 25,830 operations over baseline (2011) conditions.

The predominant traffic flow at Nut Tree Airport is to the west, with aircraft arriving and departing from Runway 20 60 percent of the time. Aircraft operating under IFR will fly pre-determined flight paths. Aircraft operating under VFR, however, do not follow prescribed departure or arrival procedures, depending on the aircraft's intended destination and the location of other aircraft operating in Nut Tree Airport's airspace. Flight training activity (e.g., touch-and-gos) would also continue to occur predominately to the west of the Airport. This standard air traffic flow will continue after development of the Proposed Project, and the forecasted increase of general aviation aircraft to the Airport.

Though the Master Plan update forecasts the increase in general aviation activity at the Airport, the overall impact to the safety of those living and working in the vicinity of the Airport is minimal. Land use development patterns in the vicinity of Nut Tree Airport have occurred in consistency with the compatibility standards set forth in the *Nut Tree Airport/Land Use Compatibility Plan*. As such, development surrounding the Airport predominately consists of open space, with commercial, office, and light industrial uses spaced at appropriate distances from where the chance of aircraft accidents occurring are greatest. Moreover, aircraft operators are asked to adhere to noise abatement procedures, which requests that pilots do not make crosswind turns below 800 feet. These procedures, while voluntary, decrease noise and safety issues for residents located west of the Airport.

The proposed extension of Runway 20 would bring arriving aircraft closer to the ground at an earlier rate than under current conditions, given that aircraft would be capable of touching down 600 feet sooner. The extension of Runway 20 would push out and extend the existing runway safety areas (e.g., the runway protection zone (RPZ), the runway safety area (RSA), the runway object free zone (ROFZ), etc.); however, these safety areas would remain entirely on Airport property. Therefore, no significant changes to the safety of those working near the end of Runway 20 would occur as a result of the Proposed Project.

In summary, the forecasted growth in general aviation operations, as well as construction of the Proposed Project, would not result in any significant changes to the existing air traffic pattern at Nut Tree Airport, and as such potential impacts to the safety of people living or working near the Airport are considered less than significant.

Mitigation Measures: None required.

Impact 3.12-3: Could the Project substantially increase hazards due to a design feature? (*Less than Significant*)

The project site would continue to be served by the main entry location via County Airport Road at East Monte Vista Avenue. As presented in the *Nut Tree Airport Master Plan Update*, should future apron and hangar development areas be separated from the main terminal area be considered, additional access roadways would be required (Solano County, 2011). As such, planned aviation and non-aviation uses within the project site currently not accessible via existing roads or sidewalks, would require additional internal roads, parking areas, and sidewalks to allow access for patrons of these uses. However, such facilities would be designed to minimize any potential adverse effects to public safety and to avoid conflicts between vehicles and other modes of transportation.

Although the project would generate new vehicle trips to surrounding roadways, the project would not introduce unsafe design features or a mix of vehicle types (i.e., large-scale trucks versus passenger vehicles) that would incompatible with the existing vehicle mix. More so, the project would not change the character of nearby or adjacent roadways nor would the project create any obstructions that would disrupt access to neighboring uses or degrade the level of safety to users of the roadways. Based on these findings, the project would not substantially increase traffic safety hazards and would result in a less than significant impact. No mitigation measures are required.

Mitigation Measures: None required.

Impact 3.12-4: Could the Project result in inadequate emergency access? (*Less than Significant*)

As stated in the *Nut Tree Airport Master Plan Update*, there are no on-site emergency services or Aircraft Rescue and Fire Fighting (ARFF) facilities currently located within the project site (Solano County, 2011). Emergency services for the project site are provided by the Vacaville Fire Department Station No.73, which is located approximately one mile north of the airport (at Vaca Valley Parkway and Eubanks Drive).

In the event of an emergency, vehicles can only access the project site via County Airport Road, as there are no other auxiliary roadways that could be used. The absence of a second emergency access location could pose a safety hazard for project operations. However, this is the existing condition; the project would neither change this condition, nor contribute to any adverse consequences of the lack of secondary (emergency) access. The impact, therefore, would be less than significant. No mitigation measures are required.

Mitigation Measures: None required.

Impact 3.12-5: Could the Project conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities? (*Less than Significant*)

Transit Access

The closest bus transit stop to the project site is located immediately south of the airport, near Nut Tree Road and East Monte Vista Avenue, and is served by Vacaville City Coach. As stated in Section 3.12.1.2, *Existing Transit Network*, there are no bus routes that directly serve the project, and there are no bus stops located adjacent to the site. The project would not interfere with any existing City Coach, FAST, or YoloBus routes and would not remove or relocate any existing bus stops in the surrounding area. Because transit access would be maintained and the the project would not conflict with any transit programs nor affect the quality of transit stops and ease of transit use for patrons, the potential impacts on transit facilities and services is considered to be less than significant.

Bicycle Access

The majority of existing bicycle facilities are located to the north, south, and east of the project site, and there are Class II bicycle lanes along East Monte Vista Avenue that would provide direct bicycle access to the project site. The project could generate bicycle traffic; however, given the nature of the proposed project and current access to bicycle lanes and routes from the project site, it is unlikely that both airport patrons and employees would forego their private automobiles or bus transit service and ride their bicycles in order to access the site. Although the project would not be expected to generate a substantial amount of bicycle trips, it is reasonable to assume that any potential increase in bicycles from the project would be accommodated by the existing bicycle network.

As stated, the City of Vacaville *General Plan* and related documents (i.e., Solano County *Countywide Bicycle Transportation Plan*) proposes a number of new and improved bicycle facilities along roadways and paths throughout the city and county; however, none of these planned facilities would be located adjacent to the project site. Furthermore, the project would only involve physical changes to the site and would not alter the configuration or characteristics of the surrounding roadway network and the bicycles facilities located therein. Given the design features of the project and the surrounding area, the project would not increase the potential for conflicts between vehicles and bicycles, nor would the project constrain access for users of such facilities. Based on these findings, the impacts on established bicycle programs and on users of such facilities would be less than significant.

Pedestrian Access

The location of the project site generally precludes pedestrian access and circulation, primarily due to the lack of developed, interconnected pedestrian network at, or near the project site. The project would require internal improvements to on-site pedestrian facilities, as the development of sidewalks would need to be incorporated to allow new access to these uses for airport patrons and employees. These internal pedestrian facilities would be designed to minimize any potential conflicts between pedestrians and vehicle circulation (both along airport roadways and within

parking areas) and avoid any conflicts to pedestrian safety. In addition, the project would not result in the increase in walk trips to and from the site from external locations and the planned aviation and non-aviation developments associated with the project would not result in unsafe conditions for pedestrians or conflict with any adopted policies or plans.

Mitigation Measures: None required.

Impact 3.12-6: Could construction activities associated with the Project result in temporary circulation impacts on the street system? (*Less than Significant*)

The project construction effort would have short-term, adverse transportation impacts. The intensity and nature of the construction activity would vary over the construction period, and the range of adverse impacts would similarly vary. Adverse construction-related transportation impacts would primarily relate to temporary increases in traffic volumes (including heavy trucks) on area roadways, which would cause an increase in potential conflicts between different traffic streams because of the slower movements and larger turning radii of construction trucks compared to passenger vehicles.

Construction activities would generate varying numbers of vehicle trips (depending on the type of work) to accommodate construction workers, trucks, and equipment. Construction-related truck trips would be dispersed throughout the day, and although they would cause a temporary and intermittent lessening of the capacities of area roadways because of the slower movements and larger turning radii of construction trucks compared to passenger vehicles, those trips would fall within the daily fluctuations of traffic volumes on affected roadways, causing short-term, minor adverse impacts on traffic flow conditions in the project area.

Best Management Practices (BMP) would be employed to reduce transportation effects and would be made conditions of agreements with contractors. Generally, these BMP include implementation of a traffic control plan, which would involve measures (e.g., advance warning signs, and flaggers to direct traffic) to maintain safe and efficient traffic flow during the construction period. The BMP measures would lessen the magnitude of the adverse construction-related impacts to a less-than-significant level.

Mitigation Measures: None required.

Cumulative Impacts

Impact 3.12-7: Would the Project, in conjunction with past, present and other reasonably foreseeable future development in the area, increase traffic volumes on area roadways and affect levels of service at the local and CMP study intersections and freeways under Cumulative plus Project conditions? (*Significant and Unavoidable*)

Intersection Conditions

Under Cumulative Year 2035 (No Project) conditions, all of the study intersections would continue to operate at acceptable levels of service (LOS D or better) during the a.m. peak hour. During the p.m. peak hour, eight of the nine study intersections would operate at unacceptable conditions (LOS E or worse). **Table 3.12-10** summarizes these findings, and **Figure 3.12-10** presents intersection volumes under Cumulative Year 2035 (No Project) conditions and **Figure 3.12-11** presents intersection volumes under Cumulative plus Project conditions. LOS calculation sheets are provided in **Appendix K**.

During the a.m. peak hour, project-generated traffic would not result in the degradation in LOS conditions at any of the nine study intersections, and these intersections would continue to operate at LOS D or better during this period.

During the p.m. peak hour, six of the eight study intersections would continue to operate at LOS F under Cumulative plus Project conditions, but at those intersections, the project would not cause the v/c ratio to increase by 0.02 or more during this period, and the project's cumulative impact would be less than significant.

During the p.m. peak hour, the unsignalized (all-way stop-control) intersection of East Monte Vista Avenue and County Airport Road and I-505 Southbound Off-Ramp / I-80 Eastbound On-Ramp would operate at LOS F under both Cumulative and Cumulative plus Project conditions. The project would increase the average delay to increase by more than five seconds (exceeding the threshold of significance), which would be considered a significant cumulative impact.

During the p.m. peak hour, the signalized intersection of Orange Drive and I-505 Northbound On-Ramp / I-80 Eastbound Off-Ramp would operate at LOS F under both Cumulative and Cumulative plus Project conditions. The project would cause the v/c ratio to increase by 0.02 (exceeding the threshold of significance), which would be considered a significant cumulative impact.

Roadway Segment Conditions

As shown in **Table 3.12-11**, under Cumulative conditions, during the a.m. peak hour all study roadway segments along East Monte Vista Avenue and Vaca Valley Parkway would operate at acceptable conditions and not exceed LOS D volume thresholds. During the p.m. peak hour, all study roadway segments along East Monte Vista and Vaca Valley Parkway would operate at acceptable conditions and would not exceed LOS D volume thresholds with the exception of Vaca Valley Parkway, between I-505 Southbound Ramps and I-505 Northbound Ramps. This roadway segment would operate at unacceptable conditions and exceed LOS D volume thresholds.

Under Cumulative plus Project conditions, all study roadway segments would continue to operate at acceptable LOS conditions during the a.m. peak hour. During the p.m. peak hour, the project would add peak-hour vehicle trips along the above-described roadway segment operating at unacceptable LOS. However, the project-generated traffic would not increase the v/c ratio to exceed 0.02; therefore, the project would not result in a significant traffic impact to the roadway segments, and no mitigation measures are required.

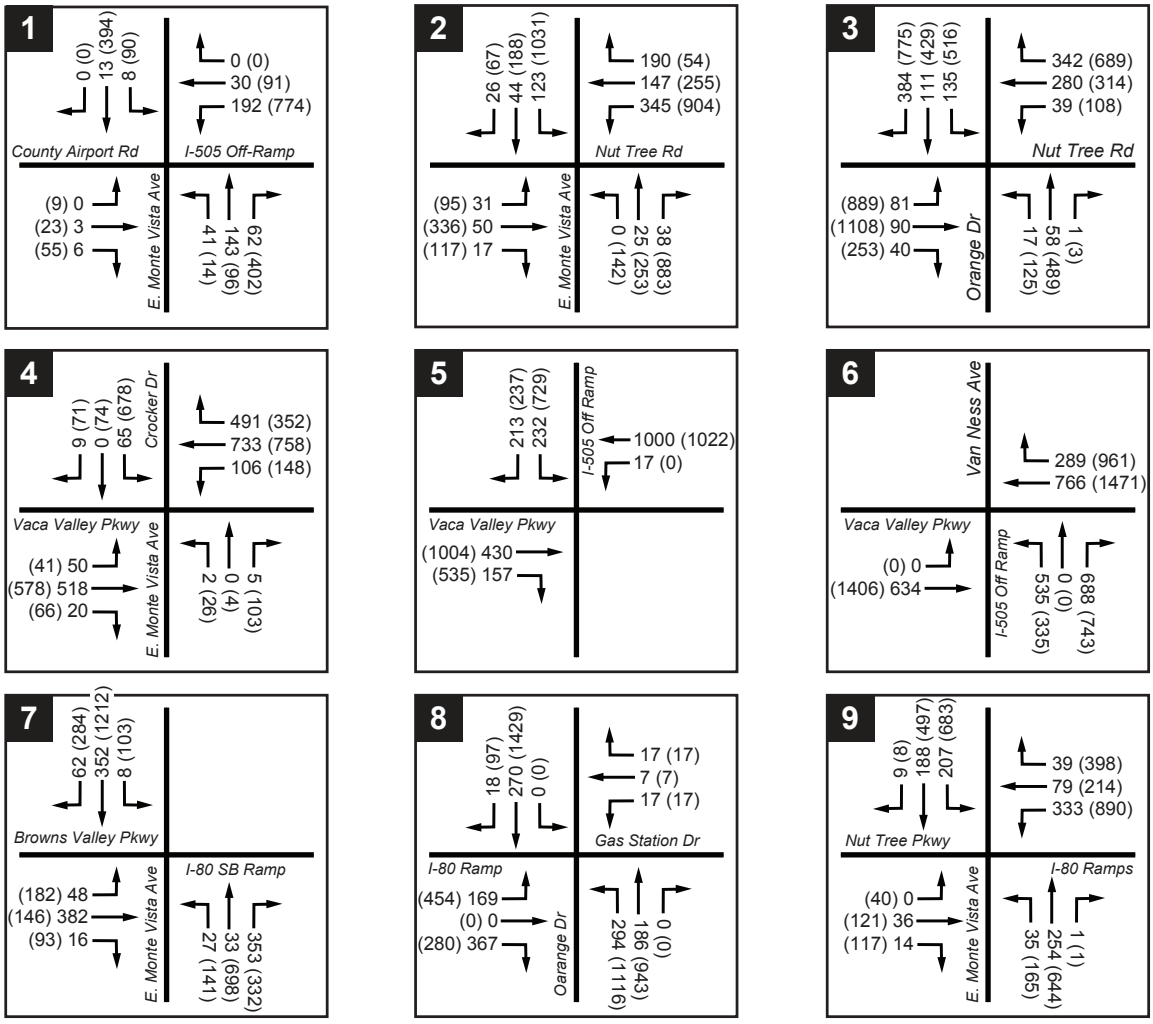
TABLE 3.12-10
INTERSECTION LEVEL OF SERVICE (LOS) –
CUMULATIVE AND CUMULATIVE PLUS PROJECT CONDITIONS

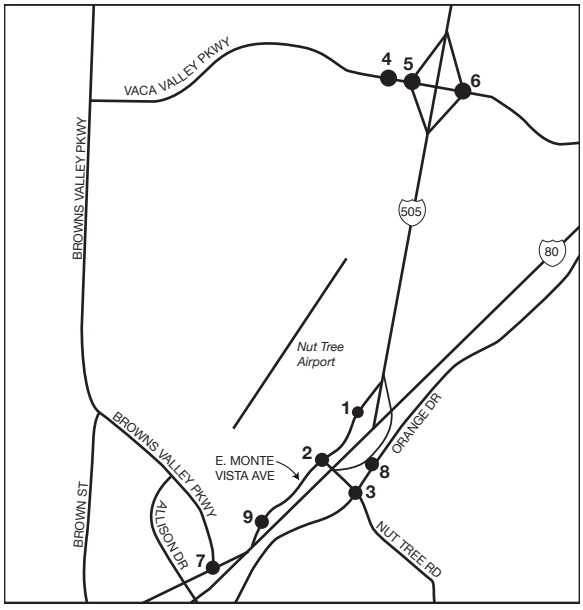
				Cumulative		Cumulative plus Project		
	Intersection	Traffic Control[b]	Peak Hour	LOS[a]	V/C or Delay[c]	LOS[a]	V/C or Delay[c]	Change[d]
1	East Monte Vista Avenue / County Airport Road – I-505 ~~West~~ **South**bound Off-Ramp/ I-80 Eastbound On-Ramp	AWSC	AM	A	9.7	B	10.1	0.4
			PM	**F**	**>120**	**F**	**>120**	**7.5**
2	Nut Tree Road / East Monte Vista Avenue	Signal	AM	A	0.34	A	0.36	0.02
			PM	**F**	**1.07**	**F**	**1.08**	**0.01**
3	Nut Tree Road / Orange Drive	Signal	AM	A	0.56	A	0.59	0.03
			PM	**F**	**1.22**	**F**	**1.23**	**0.01**
4	East Monte Vista Avenue / Vaca Valley Parkway / Crocker Drive	Signal	AM	B	0.62	B	0.62	0.00
			PM	**F**	**1.02**	**F**	**1.03**	**0.01**
5	Vaca Valley Parkway / I-505 Southbound Ramp[d]	Signal[e]	AM	D	0.77	D	0.77	0.00
			PM	**F**	**1.19**	**F**	**1.19**	**0.00**
6	Vaca Valley Parkway / I-505 Northbound Ramp	Signal	AM	D	0.77	D	0.77	0.00
			PM	**F**	**1.19**	**F**	**1.19**	**0.00**
7	Browns Valley Parkway / I-80 Westbound On-Ramp	Signal	AM	A	0.41	A	0.41	0.00
			PM	B	0.62	B	0.62	0.00
8	Orange Drive / I-505 NB On-Ramp / I-80 Eastbound Off-Ramp	Signal	AM	A	0.50	A	0.51	0.01
			PM	**F**	**1.46**	**F**	**1.48**	**0.02**
9	East Monte Vista Avenue / I-80 Westbound Ramps	Signal	AM	A	0.45	A	0.47	0.02
			PM	**F**	**1.08**	**F**	**1.09**	**0.01**

a LOS calculations performed using Synchro and the *2000 Highway Capacity Manual* Circular 212 Planning Method.
b Signal = signalized intersection; AWSC = All-Way Stop-Controlled intersection
c Volume-to-capacity ratio calculated for signalized intersections. Average vehicle delay (in seconds per vehicle) is reported for unsignalized intersections (i.e., AWSC)
d Represents the change in V/C or Delay relative to Cumulative (baseline) Conditions.
e Intersection would be signalized under Cumulative Conditions.

Bold indicates unacceptable LOS conditions (LOS E or lower). Shaded cells indicate a significant project impact.

SOURCE: ESA, 2013.



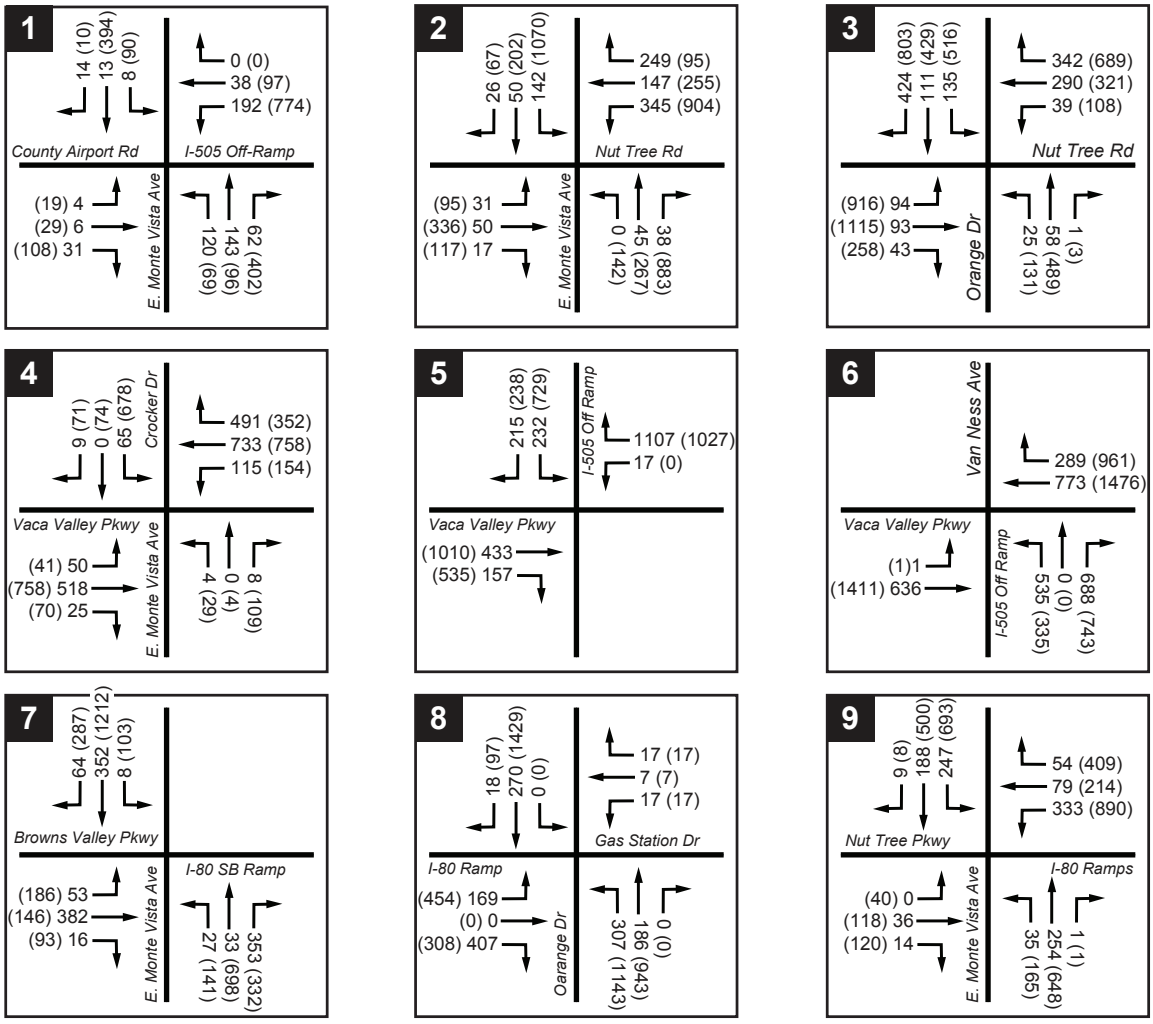


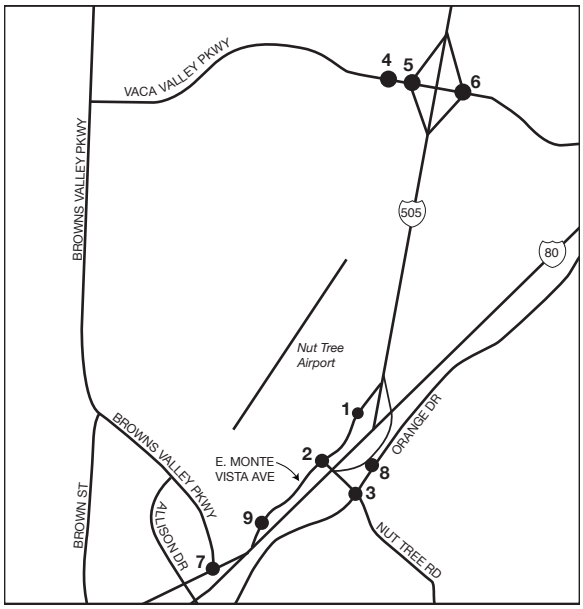
SOURCE: ESA

Nut Tree Airport Master Plan EIR . 120526

Figure 3.12-10

Cumulative (2035) AM/PM Peak Hour Intersection Volumes





SOURCE: ESA

Nut Tree Airport Master Plan EIR . 120526

Figure 3.12-11

Cumulative+Project AM/PM Peak Hour Intersection Volumes

TABLE 3.12-11
ROADWAY SEGMENT LEVEL OF SERVICE – PEAK FLOW DIRECTION
CUMULATIVE (2035) AND CUMULATIVE PLUS PROJECT

				Directional Capacity[a]		Cumulative (2035)		Cumulative plus Project		Change[c]	
Roadway	**From**	**To**	**Classification**	**LOS C**	**LOS D**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
East Monte Vista Avenue	County Airport Rd	Vaca Valley Parkway	2-Lane Arterial	900	1,013	143	879	147	889	4	10
						0.16	*0.98*	*0.16*	*0.99*	*0.00*	*0.01*
	Nut Tree Rd	County Airport Rd	4-Lane Arterial	1,500	1,688	246	1,252	325	1,266	79	14
						0.15	*0.74*	*0.19*	*0.75*	*0.05*	*0.01*
Vaca Valley Parkway	East Monte Vista Ave	I-505 SB Ramps	4-Lane Arterial[b]	1,500	1,688	1,213	1,539	1,332	1,545	109	6
						0.72	*0.91*	*0.78*	*0.92*	*0.06*	*0.01*
	I-505 SB Ramps	I-505 NB Ramps	4-Lane Arterial[b]	1,500	1,688	1,301	**2,135**	1,308	**2,140**	7	5
						0.77	***1.26***	*0.77*	***1.27***	*0.00*	*0.01*

a Calculated LOS C Directional Capacity based on assumed splits: 60%/40% Local Streets; 55%/45% Freeway. Calculated Directional Capacity = LOS C/0.8 and Calculated LOS D Capacity = Directional Capacity/0.9.
b Vaca Valley Parkway to be expanded to a 4-Lane Arterial under Cumulative (2035) conditions.
c Represents the change in volumes and volume-to-capacity ratio relative to Cumulative conditions.

SOURCE: ESA, 2013.

Mitigation Measures

Measure 3.12-1: Pay Traffic Impact Fee towards traffic signal installation at East Monte Vista Avenue and County Airport Road and I-505 Southbound Off-Ramp / I-80 Eastbound On-Ramp.

A traffic signal warrant analysis has been completed to determine whether the unsignalized study intersection may require or benefit from the installation of a traffic signal. The term "signal warrant" refers to any of the eight established methods used by Caltrans to quantify the need for a traffic signal at an unsignalized intersection, described in the latest edition of the *California Manual on Uniform Traffic Control Devices* (MUTCD) (Caltrans, 2012b). The California MUTCD indicates that the installation of a traffic signal should be considered only if one or more of the eight signal warrants are met. Based on MUTCD's peak-hour Warrant #3 criteria, this intersection would qualify for signalization with the projected Cumulative (Year 2035) and Cumulative plus Project traffic volumes during the p.m. peak hour. The City of Vacaville would continue monitoring operations at this intersection (to determine the timing of the signal installation) and would provide for signalization as part of the Traffic Impact Mitigation portion of Development Impact Fee Program. The City's Traffic Impact Fee provides for a number of traffic signals that are warranted as a result of cumulative conditions.

Per Chapter 11.01 (Development Impact Fees) of the City Municipal Code, the purpose of a Traffic Impact Fee is to provide for costs of street widening and reconstruction, traffic signals, transit facilities, bike paths, bridge widenings, and freeway interchange improvements related to new development in accordance with the development forecast under the General Plan. The demand for the identified transportation improvements has been based on the development forecast and accepted traffic analysis methodology from the previously referenced documents. Without funding-identified capital improvements, there will be an unacceptable level of traffic congestion, delays, accidents and generally reduced public safety throughout the city. Based on the development potential of the General Plan as analyzed through the development forecast, engineering consultants and the city staff have utilized traffic studies including trip generation and intersection analysis models to indicate the impact of new development in terms of roadway capacities, signalization standards, and interchange requirements to develop the transportation capital improvements projects. The projects were refined to apportion the impacts and resulting share of improvements between various land uses in accordance with prior Major Streets and Interchange fee studies. The County would pay a Development Impact Fee as their fair share contribution (to be negotiated between the City of Vacaville and the Lead Agency) to mitigate their share of the need for a traffic signal at this intersection.

With installation of traffic signal, the intersection would operate at LOS D (acceptable) during the p.m. peak hour.

However, installation of a traffic signal at this intersection would require coordination with, and approval by, Caltrans. Because the mitigation measure is not in the control of the City to implement, the cumulative impact is considered to remain significant and unavoidable. However, in the event that Mitigation Measure 3.12-2 could be implemented, the impact would be less than significant.

Impact Significance after Mitigation: Payment of a traffic impact fee by the County would contribute to the future signalization of East Monte Vista Avenue and County Airport Road and I-505 Southbound Off-Ramp / I-80 Eastbound On-Ramp intersection. Payment of this fee would ensure that the County's contributes its fair share of the costs associated in installing a signal in order to restore the LOS to an acceptable level. As described above, however, because the installation of a signal requires Caltrans approval, and thus is out of the control of the City or Lead Agency, the impact remains significant and unavoidable.

Measure 3.12-2: Limit development of office space on 1.3-acre non-aviation use site to no more than 21,000 square feet.

As described on page 3.12-17 (Table 3.12-6), the 25,000 square feet of office space on the planned 1.3-acre parcel for non-aviation development, used to estimate vehicle trip generation, was approximated from data in SANDAG Trip Generation Manual. By reducing the development capacity of office use to 21,000 square feet, the project (at full buildout) would result in fewer number of weekday and peak hour trips (i.e., 44 fewer daily trips, and eight and seven fewer trips during the a.m. and p.m. peak hours, respectively).

Impact Significance after Mitigation: As a result of this mitigation, which would reduce the number of vehicle trips to and from the project site, the signalized intersection of Orange Drive and I-505 Northbound On-Ramp / I-80 Eastbound Off-Ramp would continue to operate at LOS F, but the project would cause the v/c ratio to increase by 0.01 (i.e., lower than the threshold of significance). Based on the significance criteria, this increase would be considered less than significant.

Appendix K includes LOS calculations of the intersections with applied mitigation.

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