FEHR PEERS

MEMORANDUM

Date: April 20, 2018

To: David Morrison, Napa County Planning, Building & Environmental Services Department

From: Julie Morgan, Fehr & Peers

Subject: Updated Transportation Impact Study Guidelines (DRAFT—For Discussion Purposes)

SF15-0841

As part of the update to the Circulation Element, the Transportation Impact Study (TIS) Guidelines for Napa County will be updated to complement the circulation element changes. These Guidelines establish a protocol for evaluating transportation impacts. These updated Guidelines are the result of our review of the County's existing TIS Guidelines and our preparation of a revised Circulation Element. The purpose of the Guidelines is to provide a clear and consistent technical approach to transportation impact analysis for projects within Napa County's jurisdiction.

This document is intended to be a resource applied in concert with professional judgment. The following major issues are addressed in this document:

- Situations and thresholds that commonly trigger the need for a TIS
- Scope and extent of the required study
- Transportation impact analysis methods
- Criteria to determine if the transportation-related impacts of a proposed project are significant under the California Environmental Quality Act (CEQA)
- Mitigation recommendations
- Guidelines for documentation of the findings, conclusions, and recommendations

Napa County will facilitate preparation of transportation studies and reports, based primarily on the Guidelines presented in this document. However, each project is unique, and TIS Guidelines are not

intended to be prescriptive beyond practical. Not all criteria and analyses described in this document will apply to every project. Early and consistent communication with the Planning and Public Works Departments is encouraged to confirm the type and level of analysis required on a case-by-case basis. A scoping meeting should be conducted before the start of any impact study.

TRANSPORTATION IMPACT STUDY TRIGGERS

Unless explicitly waived by the County, a TIS is required when any one of the following conditions is met:

- The project exceeds the County's screening criteria for net new vehicle trips resulting from a project;
- The project has the potential to create a significant environmental impact under CEQA;
- The project requires a permit application, which is subject to discretionary approval;
- The project will substantially alter physical or operational conditions on a County roadway, bikeway, sidewalk, or other transportation facility.

In general, a TIS is applicable for two years. After two or more years of inactivity, a TIS should be updated. In some instances, a master TIS may be prepared for a larger development. If the master TIS fully addresses development phasing and the phase or project is consistent with the intent of the larger development, specific phases will generally not require supplemental transportation impact studies.

DEFINING THE PROJECT

The applicant shall provide a project description that, at a minimum, includes the following:

- Specific land uses intended for the site
- Size or intensity of the proposed development (e.g., square footage, acreage, dwelling units, tonnage, gallons per year of production, or other relevant metrics)
- Documentation to inform the County about the anticipated trip generation, detailed in the following section
- Documentation to inform the County whether the project will affect off-site transportation facilities or services including transit, rail crossings, roadways, bikeways, and sidewalks

An accurate project description will help determine if a TIS is required based on potential significant environmental impacts or trip generation.

As the TIS must include discussion of General Plan consistency, applicants are encouraged to review the Circulation Element of the General Plan and address how they believe their project complies with those policies.

TRIP GENERATION

All applicants are required to submit a preliminary trip generation analysis that identifies the number of new daily and peak hour vehicle trips anticipated to be added by the proposed project. The estimation of new trips generated by the proposed project may include credit for trips associated with existing uses on the site. Existing uses are those actively present on the project site at the time data is gathered for the traffic impact study. The trip generation estimation for all new or proposed development projects shall include the summation of all trips to and from the site, including primary trips (trips for which the site is the primary destination/origin) and diverted linked trips (trips that enter/exit the site en route to another primary destination).

The final estimate of new daily and peak-hour trips associated with a proposed project should represent the net contribution of the proposed project. The County will review the trip generation analysis, determine if additional analysis is required, and confirm reasonableness of the estimates or adjust them, as appropriate.

In general, trip generation analyses should be primarily based on trip generation rates derived from local empirical data to the greatest extent possible. For winery uses, the County currently provides a worksheet to aid in estimating trip generation (this worksheet is attached to the end of this document as **Attachment A**). However, trip generation rates can also be determined from similar facilities nearby (including the existing facility, if the Project modifies an existing land use).

The project trip generation rate should not be based solely on one nearby or similar facility. The sample used for non-standard trip generation rates shall include at least three similar facilities in Napa County or neighboring jurisdictions with similar environmental settings and operational characteristics. If the study involves comparable sites located in other communities, the applicant must demonstrate to the satisfaction of the County that the sites and uses studied are reasonably equivalent to the site and use proposed within the County.

Recognizing that this is not always possible, applicants may use the most recent version of the Institute of Transportation Engineers (ITE) Trip Generation and recommendations provided in the Trip Generation Handbook. If multiple sources exist, the study shall provide a comparison and use the rates that best reflect local conditions and applicable regulatory constraints.

SCOPE OF STUDY

The contents and extent of a transportation impact study depend on the location and size of the proposed development, the prevailing conditions in the surrounding area, and the technical questions being asked by decision makers and the public.

DEFINING THE STUDY AREA

Defining a study area needs to be done through a process that results in substantial evidence (facts, analytical results, etc.) that supports the study area delineation. The boundary should extend as far as any potential CEQA impact might occur, including across jurisdictional boundaries. The County must approve the study area definition before traffic data collection and analysis commences. Careful consideration of all modes and facilities (i.e., transit, pedestrian, bicycle, vehicle, rail crossings, etc.) is required when selecting the study area boundary. The study area should be viewed as the "area of influence" of a specific project.

Additional facilities may be studied based on circumstances unique to the site. Transportation consultants should confer with the County early regarding study locations based on local or site-specific issues, especially those related to agricultural vehicles, pedestrians, bicycles, rail crossings, and transit.

TRANSPORTATION ANALYSIS SCENARIOS

Existing Conditions

Existing Conditions reflects conditions for all travel modes in the study area based on recent field observations. Traffic volumes for roadway analysis should be based on recent count data (within the most recent two years). For CEQA compliance, the transportation impact analysis must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced, from both a local and regional perspective.

Existing Plus Project Conditions reflects project changes to existing conditions for all travel modes in the study area. Traffic volume forecasts for roadway analysis should reflect existing conditions plus traffic generated by the proposed project. For re-use or conversion projects, the analyst should calculate the net new trips associated with the proposed project, accounting for any existing use of the site that will remain or will be discontinued.

Near-Term Conditions

Existing Plus Approved Projects Conditions reflects changes to existing conditions for all travel modes in the study area resulting from the completion of approved projects. Traffic volume forecasts for roadway analysis should reflect existing conditions plus growth due to approved development. The list of approved but not yet constructed projects within the area of influence of the project shall be obtained from the Department of Planning, Building & Environmental Services (PBES). This scenario may be omitted if the study area has no approved developments.

Existing Plus Approved Projects Plus Project Conditions reflects Existing Plus Approved Projects Conditions plus changes to these conditions caused by the proposed project. This scenario may be omitted if the study area has no approved developments.

Cumulative Conditions

Cumulative No Project Conditions reflects conditions for all travel modes in the study area reflecting all approved projects plus pending projects or expected development of other areas of the County designated for growth. Cumulative conditions shall be determined by use of traffic forecasts from the approved Napa Valley Transportation Authority (NVTA) travel demand model, where available. Information on current model availability and data files for those models may be obtained from the NVTA. In situations where appropriate to the scale of the proposed development and where approved by the County, a 20-year growth factor determined from historic volume trends or from a review of buildout of the General Plan may be used in lieu of applying the NVTA model.

Cumulative Plus Project Conditions reflects Cumulative Conditions plus changes to these conditions caused by the proposed project.

Additional analysis scenarios may be required in the TIS depending on project conditions and setting. For example, other scenarios may be needed to test phasing or other interim conditions, at the discretion of the County.

TRANSPORTATION ANALYSIS TIME PERIODS

The determination of analysis time periods will depend on the travel modes being evaluated and the time periods that are most applicable to the uses proposed in the project. For most uses, the analysis may include daily, peak period, and/or peak hour conditions. Final determination shall be made in consultation with County staff. For recreational or other uses that do not coincide with typical weekday peak hours, consideration will be given to analyzing weekday afternoon, weekday late evening, or weekend time periods.

Based on the land use of the proposed project and upon consultation with County, the study shall analyze traffic operations during the peak hour of the following time periods:

- Weekday morning peak (7:00 – 9:00 AM)
- Weekday evening peak (4:00 – 6:00 PM)

For some projects, the County may substitute or require additional peak hour analysis for the following time periods:

- Weekday afternoon peak (2:00 – 4:00 PM)
- Friday evening peak (5:00 – 7:00 PM)
- Weekend midday peak (11:00 AM – 1:00 PM)
- Weekend evening peak (4:00 – 7:30 PM)

The determination of study time periods should be made separately for each proposed project based upon the peaking characteristics of project-generated traffic and peaking characteristics of the adjacent street system and land uses. The time period(s) that should be analyzed are those that exhibit the maximum combined level of project-generated traffic and adjacent street traffic.

CONSULTATION WITH OTHER JURISDICTIONS

If the study area overlaps with other jurisdictions, the other jurisdictions must be consulted to verify study locations and to specify the impact significance criteria that should be used in the TIS for these locations. Section 15086 of the CEQA Guidelines shall be followed as the basis for satisfying consultation requirements. In most cases, overlap will occur for roadway system analysis. Transportation metrics and policy thresholds specified by Caltrans and incorporated cities in Napa County should be followed for roadways in those jurisdictions. Roadway crossings of rail lines are

another overlap area that requires coordination with the California Public Utilities Commission (PUC). The focus of any analysis related to rail crossings should be on whether the current crossing complies with current design standards.

MAJOR COMPONENTS OF THE STUDY

The extent and complexity of a TIS can vary greatly. **Table 1** summarizes basic transportation and circulation elements that should be acknowledged in every project requiring a TIS. Later sections identify specific analysis methodologies and significance criteria for each of the listed elements.

Communicating the study results is as important as the analysis itself. Effective graphics, charts, and simulations are often necessary to successfully communicate analysis results to decision makers and the public.

TABLE 1: TRANSPORTATION AND CIRCULATION ELEMENTS ADDRESSED IN AN IMPACT STUDY

Elements	Evaluation
On-site Circulation	Review and evaluate site access locations, driveway throat depths, size of major circulation features with respect to operations and safety, turning movement volumes at site access points, queuing at site access driveways, dimensions of truck loading areas, and emergency access. Address and accommodate pedestrian and bicycle access. Examine warrants for left-turn and right-turn deceleration and storage distance. Review collision data in vicinity of project access.
Off-Site Traffic Operations	Study all roadway facilities using methods and procedures contained in the latest version of the *Highway Capacity Manual* (HCM). Review collision data throughout study area. Examine potential changes to queuing as a result of the project. Evaluate the need for a new or extended left-turn lane to access the project site.
Bicycle Facilities	Identify any existing or planned bicycle facilities that may be affected by the project. Focus on maintaining or enhancing connectivity and completing network gaps.
Pedestrian Facilities and Title 24 Accessibility compliance	Identify any existing or planned pedestrian facilities that may be affected by the project. Focus on maintaining or enhancing connectivity, completing network gaps, and removing barriers. Disclose evaluation and documentation of project features (e.g., road widening) with likely disparate impact on pedestrians (e.g., longer crossing time).
Parking	Compare the project parking plan with County standards and projected demand. Review site plan for appropriate parking design.
Trucks (or other heavy vehicles)	For agricultural projects, mining projects, or other projects related to goods or materials movement, identify the number of truck trips that would be generated, and design facilities necessary to accommodate truck traffic. This will generally require evaluation of the Traffic Index for existing roadways serving the project and an assessment of whether roadways meet current County design standards.

Elements	Evaluation
Transit	Identify any existing or planned transit facilities that may be affected by the project. Focus on maintaining or enhancing connectivity, completing network gaps, and ensuring access to transit in accordance with the Americans with Disabilities Act (ADA). For system planning, use crush load as capacity, not seated capacity.
Intersection Traffic Control	Evaluate unsignalized intersections located within the study area to determine appropriate traffic control with or without the project. Evaluate signal warrants appropriate to the study location, as determined in consultation with County staff.
General Plan Consistency	Evaluate the project against goals, polices, and actions set forth in the General Plan.
Other Subject Areas	Consider other subject areas on a case-by-case basis.
Other Jurisdictional Requirements	In situations where several agencies must approve a development or are responsible for affected roadways, the applicant must contact lead and responsible agencies to determine issues to be addressed, scope of study, etc. In general, the applicant will be responsible for analyzing project impacts against appropriate jurisdictional thresholds; however, the analysis methodology will be determined by the County in compliance with CEQA and the impacts will be mitigated consistent with County standards.

RELEVANT POLICIES

An important aspect of a TIS is to provide sufficient information for the County to determine that a project is consistent with the General Plan and other applicable County plans. As such, the TIS shall include an analysis of the individual project in light of relevant policies contained in the General Plan or other plans such as the Congestion Management Plan.

VEHICLE LEVEL OF SERVICE

Typically, vehicle level of service (LOS) thresholds have been the prevailing criteria applied to transportation impact analysis in Napa County. Napa County recognizes that vehicle LOS is one performance measure that needs to be carefully weighed against other County objectives to balance the preservation of community and rural values with a safe and efficient circulation system. The County's vehicle LOS standard is presented in the Circulation Element of the General Plan as Policy CIR-37 and is summarized below:

> *The County seeks to maintain operations of roads and intersections in the unincorporated county area that minimize travel delays. Operational analysis shall be conducted according to the latest version of the Highway Capacity Manual and as described in the current version of the County's Transportation Impact Study Guidelines. In general, the County seeks to maintain Level of Service*

(LOS) D on arterial roadways and at signalized intersections, as the service level that best aligns with the County's desire to balance its rural character with the needs of supporting economic vitality and growth.

In situations where the County determines that achieving LOS D would cause an unacceptable conflict with other goals and objectives, minimizing collisions and the adequacy of local access will be the County's priorities. Mitigating operational impacts should first focus on reducing the project's vehicular trips through modifying the project definition and/or applying TDM strategies, and then secondarily should consider physical infrastructure changes. Proposed mitigations will be evaluated for their effect on collisions and local access, and for their effectiveness in achieving the maximum potential reduction in the project's operational impacts (see the County's Transportation Impact Study Guidelines for a list of potential mitigation measures).

The following roadway segments are exceptions to the LOS D standard described above:

- *State Route 29 in the unincorporated areas between Yountville and Calistoga: LOS F is acceptable.*
- *Silverado Trail between State Route 128 and Yountville Cross Road: LOS E is acceptable.*
- *State Route 12/121 between the Napa/Sonoma county line and Carneros Junction: LOS F is acceptable.*
- *American Canyon Road from I-80 to American Canyon City Limit: LOS E is acceptable.*

If the TIS study area extends into an adjacent jurisdiction that defines a LOS threshold, that threshold shall be used for the impact significance criteria for analysis locations in that jurisdiction. The TIS shall analyze project impacts against appropriate jurisdictional standards; however, impacts will be mitigated consistent with County standards and the County General Plan.

ANALYSIS METHODOLOGY

This section provides data collection and analysis procedures for conducting transportation impact studies in Napa County. The County is committed to equal levels of analysis for all modes of travel.

The methodology presented in this section includes robust data collection and analysis techniques for pedestrian, bicycle, and transit networks, in addition to automobile circulation.

DATA COLLECTION

Accurate data is essential to achieve a high level of confidence in transportation analysis results. Existing traffic conditions data shall be collected using the guidelines set forth in **Table 2**.

TABLE 2: EXISTING CONDITIONS DATA COLLECTION PROTOCOL

Data Set	Procedure
Peak period turning movement counts	Collect data for all study intersections on a Tuesday, Wednesday, or Thursday during weeks when the study area does not experience holidays, large special events, heavy construction, or unusual agricultural activity (i.e., harvest season). If the selected Transportation Analysis Time Periods include a time period on a weekend day, weekend data shall be collected on a Saturday. Fall or Spring days without rain and when school is in session are preferred. • Care should be taken to collect data on days when schools are in session. • Consult with the County to determine if adjustments are necessary to account for seasonal variation in traffic volumes. • Traffic counts shall not be used if more than two years old at study initiation. If available, County counts may be used but the traffic counts must be adjusted to reflect current year traffic volumes and patterns. • Bicycles, pedestrians, and heavy vehicles should be included in all counts. Some projects may require vehicle classification or occupancy counts. Consult with the County on a case-by-case basis.
Daily traffic counts	Collect data for all study roadway segments using the parameters described above for peak period turning movement counts with the exception of collecting bicycle and pedestrian data.
Roadway geometrics	Establish existing geometrics from a combination of aerial photography, as-built plans, and site visits.
Travel time and speed	Only as necessary; collect data using a floating car survey, or use GPS-based travel speed data if available for the study area.
Signal timing	Request timing from the County and other operating agencies such as Caltrans. Verify timing in the field.
Collision data	Obtain Statewide Integrated Traffic Records System (SWITRS) through the local California Highway Patrol or through the following Web site: www.chp.ca.gov/switrs.
Mode split	Only as necessary; summarize daily and peak hour mode split in study area or communities adjacent to study area. Data sources could include the Census journey-to-work survey, household travel surveys, or other available surveys.
Transit routes and use	Map existing transit routes and stops serving the study area and identify service hours and levels of use. Document amenities (benches, shelters, bicycle parking, etc.) available at transit stops and centers within ¼-mile of non-residential projects and ½-mile of residential projects.

Data Set	Procedure
Bicycle and pedestrian facilities	Map existing bicycle and pedestrian facilities within the study area (include sidewalks, crosswalks, signal heads, push buttons, related signing and striping). Document barriers, deficiencies and high-pedestrian demand land uses including schools, parking, senior housing facilities, and transit stops or centers.

TRAFFIC OPERATIONS ANALYSIS

Traffic impacts shall be analyzed using standard or state-of-the-practice professional procedures for trip generation, trip distribution, and traffic assignment, which can generally be found through organizations such as Institute of Transportation Engineers (ITE), Caltrans, Federal Highway Administration (FHWA), and American Planning Associating (APA).

LOS definitions and calculation methods should be consistent with the latest edition of the *Highway Capacity Manual* (HCM). The HCM is published by the Transportation Research Board. The current version was published in 2010.

Analysis Parameters

Analysis parameters (e.g., signal phasing, conflicting pedestrian volumes, etc.) for Existing and Existing Plus Project conditions shall be based on field measurements taken during traffic count collection or field observation. This typically applies to Existing Plus Approved Projects and Existing Plus Approved Projects Plus Project scenarios.

For new study intersections and/or for analysis of Cumulative conditions, **Table 3** provides guidance on state-of-the-practice procedures. Consult with the County regarding other analysis parameters not listed in Table 3.

TABLE 3: ANALYSIS PARAMETER RECOMMENDATIONS

Parameter	Recommendation
Peak hour factor (PHF)	Use measured PHF obtained through traffic data collection. For cumulative scenarios and existing conditions where peak hour factors are not available, refer to the HCM and maintain consistency through analysis scenarios and peak hours. If a simulation model is used for analysis, the PHF should be applied over more than a 15-minute period.
Saturation flow rate	A field measurement of the saturation flow rate is recommended in accordance with procedure in the HCM, Chapter 16, Appendix H, for use in the Existing Conditions analysis. For cumulative conditions, use the value recommended in the most recent HCM unless physical conditions and traffic controls warrant a change.
Yellow phase	4 seconds per phase (if traffic signal is present under existing conditions, use existing yellow phase).
All red phase	1 second per phase (if traffic signal is present under existing conditions, use existing red phase). Red phase may be greater on high-speed roadways.
Conflicting pedestrians for signalized intersections and roundabouts	Primarily based on existing pedestrian counts or observations. Otherwise, refer to the most current version of the HCM to determine the amount of pedestrian activations per cycle into appropriate categories. The following three categories are included in the 2010 HCM. • Low pedestrian activity (near freeway interchanges/community commercial sites) – 10% of the cycles are expected to have pedestrian activations • Medium pedestrian activity (near community commercial sites) – 25% of the cycles are expected to have pedestrian activations • High pedestrian activity (in and around downtown) – 50% of the cycles are expected to have pedestrian activations To determine conflicting pedestrians, assume one pedestrian per activation. Pedestrian activity must also be considered at roundabout intersections.
Traffic signal cycle lengths	Replicate existing cycle length and phasing (e.g., leading left turns) when possible. For new signalized locations, segment the cycle lengths into the following three categories unless other cycle lengths can be justified through the traffic operations analysis. • In and around downtown – limit signal cycle lengths to less than 60 seconds • In and around suburban areas – limit signal cycle lengths to less than 90 seconds • Near freeway interchanges/regional commercial – limit signal cycle lengths to less than 120 seconds Ensure that minimum pedestrian times are satisfied.
Heavy truck percentages	Based on the existing heavy truck percentage and adjusted to account for future planned development. In general, heavy truck percentages should be greater on truck routes and main thoroughfares than on local streets. Minimum recommended value is 2%.
Lane utilization factor	If applicable, adjust lane utilization factors based on field observations.

Analysis Tools and Methods

Traffic operations analysis for state highways and local roadways shall be conducted using tools and methods approved by Napa County. Other tools or methods may be used upon receiving approval from the County Engineer. Special conditions related to congested conditions, freeway facilities, and roundabouts are discussed in more detail below.

Congested Conditions

Analysts should note that the HCM recommends the use of simulation models to analyze congested conditions. Since simulation tools can simultaneously evaluate vehicle interactions across a complete network (including the interaction of multiple modes), they can provide a more complete understanding of traffic operating conditions during peak congested periods and what may happen when a specific bottleneck is modified or eliminated.

Freeway Analysis

There are no freeways in Napa County, beyond a small segment of I-80 in the far southeastern portion of the County. If a project's study area includes freeway segments, HCM methods should be used for basic freeway segments, ramp junctions, and ramp terminal intersections. Note that Caltrans has alternative analysis methods for weaving sections as defined in the Caltrans *Highway Design Manual* (HDM Section 504.7). The Caltrans District 4 traffic operations branch should be consulted before beginning any weaving analysis. Analyzing ramp terminal intersections should consider that these intersections are closely spaced in most cases and operate as an integrated set versus as isolated locations.

Roundabout Analysis

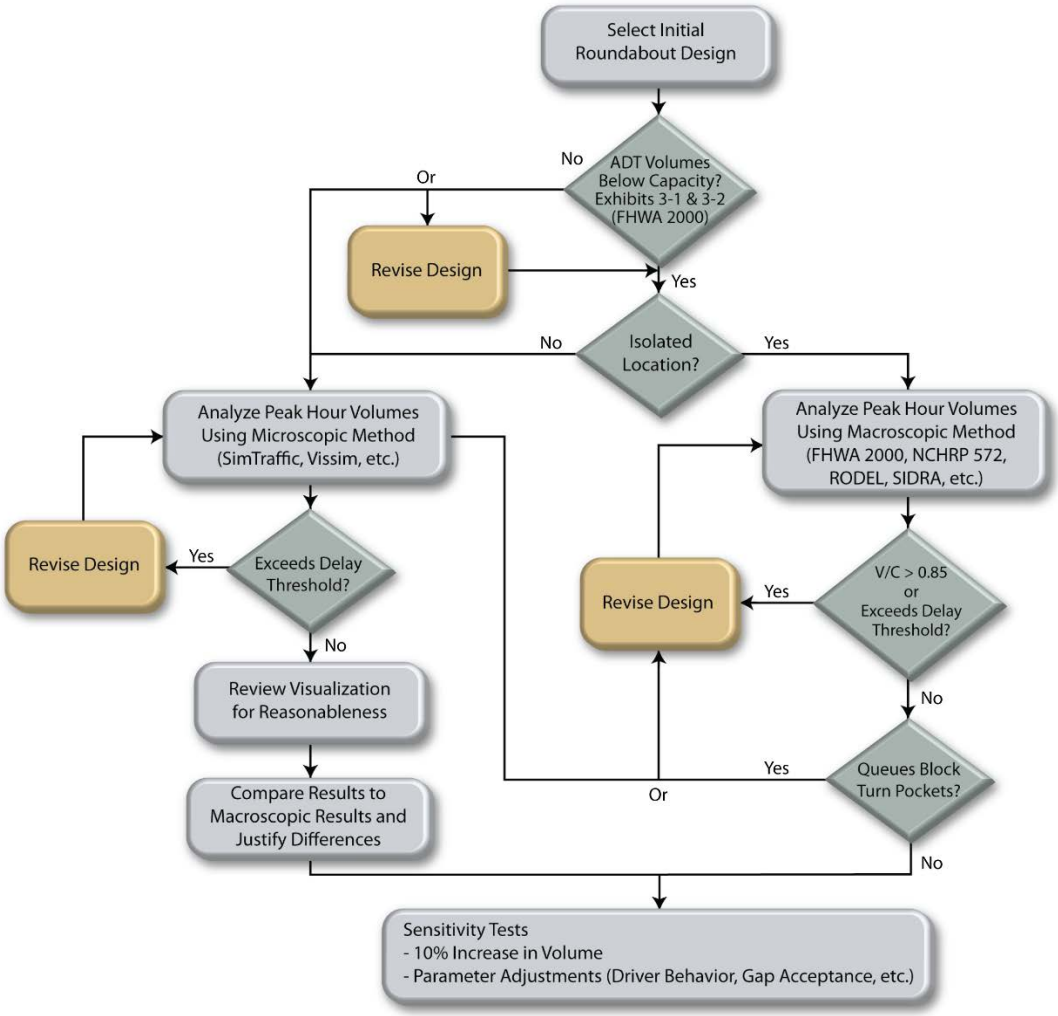
The 2010 HCM procedures do not provide complete guidance on how to evaluate roundabouts. Roundabout analysis is critical when the intersection is projected to operate at or near capacity. The flowchart on the next page provides a framework for roundabout analysis within Napa County.

The framework utilized the FHWA publication, *Roundabouts: An Informational Guide*. Specifically, the forecast daily volumes should be compared against the thresholds shown in Exhibits 3-1 and 3-2 of the FHWA document to identify if a roundabout is a feasible intersection treatment. If the initial check indicates that the roundabout would be near or at capacity, simulation should be used, or the roundabout should be redesigned to provide additional capacity. If the daily volumes

are below the threshold and the intersection is isolated, then a macroscopic analysis may be sufficient.

Queue lengths should be reviewed to ensure that they do not spill beyond available storage and interfere with overall operations. If vehicles have sufficient storage, then volume-to-capacity (V/C) ratios should be reviewed to verify that they are less than 0.85. If the V/C ratios are less than 0.85, proceed with sensitivity testing to provide a level of confidence if traffic volumes increase or decrease beyond what was forecasted.

When comparing roundabout versus signal control at a given location, long-term maintenance costs should be calculated and considered in the evaluation.



ON-SITE TRANSPORTATION REVIEW

A detailed site review is required for every project. Consideration should be given to the following qualitative and quantitative reviews and summarized in the TIS:

- Existence of any current traffic problems in the local area such as a high-collision location, non-standard intersection or roadway, or location experiencing high levels of traffic congestion
- Applicability of context-sensitive design practices compatible with adjacent neighborhoods or other areas that may be impacted by the project traffic
- Close proximity of proposed site driveway(s) to other driveways or intersections
- Adequacy of vehicle parking relative to both the anticipated project demand and zoning code requirements
- Adequacy of the project site design to fully and safely accommodate demand for truck loading and for passenger pick-up and drop-off activities
- Adequacy of the project site design to provide at least the minimum required throat depth at project driveways
- Adequacy of on-site vehicle, bicycle, and pedestrian circulation and provision of safe pedestrian paths from residential areas to school sites, public streets to commercial and residential areas, and the project site to nearby transit facilities
- Adequacy of the project site design to accommodate emergency vehicles and allow for timely emergency access

TRAFFIC FORECASTS AND VMT ANALYSIS

A fundamental requirement for establishing transportation analysis is to follow state-of-the-practice or best practice methodology. This ensures that the analysis meets environmental regulatory conditions and provides a high level of confidence in the results. For traffic volume and vehicle miles of travel (VMT) forecasts, this means that the forecasting models being used should meet the following criteria.

- **The scale of the model should match that of the project**. Most studies will cover local projects, meaning that they involve specific intersections, roadways, or corridors. Therefore, locally valid travel demand models should be used to develop traffic volume

forecasts. Using regional travel demand models without modification to address the scale of the project is not appropriate.

- **The model should be calibrated and validated within the study area**. The model's validation in the study area should be verified for each time period being forecast (i.e., daily, AM peak hour, PM peak hour, etc.) and for each mode being analyzed.
- **The model validation should include static and dynamic tests**. Static validation tests should include those specified in *2010 California Regional Transportation Plan Guidelines* (California Transportation Commission, January 2011). Dynamic tests can be used to verify that the model contains an appropriate level of sensitivity related to the types of transportation network or land use changes associated with the project.
- **The model forecasts should be adjusted to account for base year model error**. Raw model volume forecasts need to be adjusted to account for differences between base year model volume estimates and base year traffic counts. The specific methodology should be based on *National Cooperative Highway Research Project 255, Highway Traffic Data for Urbanized Area Project Planning and Design,* Transportation Research Board, December 1982.
- **The model's land use or socioeconomic forecasts should be tested for reasonableness**. Models are used to forecast travel demand for a specific horizon year (e.g., 20 years). The land use and socioeconomic forecasts need to match the horizon year and be based on reasonable market conditions that reflect past and future development trends for the specific study area.

The model may be in the form of a spreadsheet, a conventional four-step travel demand model, or an activity based model that has demonstrated sensitivity to the variables relevant to each particular project. In some cases, particularly when the proposed project is large and has the potential to affect regional travel patterns, the most current version of the Napa-Solano travel demand model will be an appropriate modeling tool. In other cases, when the proposed project is relatively small or is expected to have more localized effects, it may be more appropriate to use a spreadsheet model or to extract basic information (such as average traffic volume growth rates) from the Napa-Solano travel demand model and apply that to the subject project. The method for developing future traffic forecasts shall be selected in consultation with the County before proceeding with the TIS.

As described in policy CIR-39, all proposed projects must evaluate the VMT generated by the project. The components of calculating VMT involve a project's vehicular trip generation and the

length (in miles) of those trips. Methods for estimating a project's vehicular trip generation are described earlier in this document under the section Trip Generation. Estimates of the trip lengths associated with a project can be drawn from several potential sources:

- A calibrated trip-based or tour-based travel demand model, such as the Napa-Solano model or the MTC model
- A quick-response or spreadsheet model, such as CalEEMod or MXD+
- Data from travel surveys of similar land uses in similar settings
- "Big Data" obtained from mobile devices representing a sample of travelers to similar land uses

For projects involving only conventional land use types, such as residential or office, the analyst may use any of the above sources for trip length data that are available and appropriate for the particular project being studied. Consultation with the County is necessary before finalizing the VMT calculations.

Projects involving wineries or other viticulture-related uses are a special case, because they are not typically well-represented in travel demand models or quick-response models. Napa County will be developing additional resources for trip length data related to winery uses. In the interim, analysts are encouraged to gather data on trip lengths from other similar uses in the vicinity, and to document such data thoroughly for presentation in the TIS.

IMPACT ASSESSMENT

The main intent of the TIS is to determine potential transportation impacts of proposed projects. This information is essential for decision makers and the public when evaluating individual projects. This section explains what operating conditions shall be used when determining an impact. These guidelines also establish criteria for when a project impact is considered significant.

SCENARIO EVALUATION

Transportation impact determination for a proposed development project shall be based upon the comparison of the following scenarios using the significance criteria cited below.

- Existing Conditions vs. Existing Plus Project Conditions
- Existing Plus Approved Projects Conditions vs. Existing Plus Approved Projects Plus Project Conditions

- Cumulative No Project Conditions vs. Cumulative Plus Project Conditions

SIGNIFICANCE CRITERIA

A project impact is considered significant when it meets the criteria listed in **Table 5**. Further details on the application of the significance criteria related to off-site traffic operations are attached to this document as **Attachment B**.

TABLE 5: SIGNIFICANCE CRITERIA

Elements	Significant Impact Determination
On-site Circulation	• Site design for on-site circulation, access, and/or parking areas fail to meet County or industry standard design guidelines. • A project fails to provide adequate and safe accessibility for service and delivery trucks on-site (including access to truck loading areas) or for passenger drop off and pick up areas.
Off-Site Traffic Operations	• A roadway segment or intersection operates acceptably according to Policy CIR-37 under a no project scenario, and the addition of project trips causes overall traffic operations on the facility to operate unacceptably. • A roadway segment or intersection operates unacceptably according to Policy CIR-37 under a no project scenario and the project adds a certain amount of traffic (see Attachment B). • Project-generated VMT exceeds the standards described in Policy CIR-39.
Intersection Traffic Control	• The addition of project traffic causes an all-way stop-controlled or side street stop-controlled intersection to meet Caltrans signal warrant criteria. All such intersections shall first be evaluated with roundabout intersection control.
Bicycle Facilities	• A project disrupts existing or planned bicycle facilities or conflicts with adopted County plans, guidelines, policies, or standards regarding active transportation modes. • The project adds trips to an existing active transportation facility or service (e.g., bike path) that does not meet current design standards.
Pedestrian Facilities and Title 24 Accessibility compliance	• A project fails to provide accessible and safe pedestrian connections between buildings and to adjacent streets and transit facilities. • A project disrupts existing or planned pedestrian facilities or conflicts with adopted County plans, guidelines, policies, or standards regarding active transportation modes. • The project adds trips to an existing active transportation facility or service (e.g., sidewalk) that does not meet current design standards.
Parking	• A project increases off-site parking demand above that which is desired according to the County in the immediate project area.
Trucks (or other heavy vehicles)	• A project fails to provide safe accommodation of forecast truck traffic or temporary construction-related truck traffic.
Transit	• A project creates demand for public transit services above the crush load capacity that is provided or planned. • A project disrupts existing or planned transit facilities and services or conflicts with federal accessibility requirements (ADA) or adopted County plans, guidelines, policies, or standards regarding transit.

Elements	Significant Impact Determination
General Plan Consistency	• A project conflicts or creates inconsistencies with General Plan policies.
Other Subject Areas	• The construction of a project creates a temporary but prolonged impact due to lane closures, need for temporary signals, emergency vehicles access, traffic hazards to bikes/pedestrians, damage to roadbed, truck traffic on roadways not designated as truck routes, etc.
Other Jurisdictional Requirements	• The project exceeds established significance criteria thresholds for locations under the jurisdiction of other agencies.

CUMULATIVE IMPACTS

Cumulative impact analysis should comply with the California Environmental Quality Act (CEQA). Land use development and infrastructure projects that are consistent with the General Plan are expected to rely on the General Plan cumulative traffic analysis and EIR conclusions. The cumulative scenario is required per CEQA Guidelines Section 15130. The general definition of cumulative as a scenario is that it represents past, present, and reasonably foreseeable actions regarding land use development and the transportation network (see CEQA Guidelines Section 15355).

The General Plan Environmental Impact Report (EIR) was based on a full build out of the County's land use designations and will generally cover the cumulative traffic effects of consistent development projects. However, over time, it is likely that general plan amendments or regional growth will influence background traffic volumes. If the County Engineer determines that this is the case, individual projects may be required to conduct a project-specific cumulative analysis instead of generating forecasts from previously conducted model runs.

MITIGATION MEASURES

All significant project impacts should be mitigated consistent with the policies of the Napa County General Plan. Where impacts are identified, the consultant shall confer with the County Engineer to identify mitigation measures that achieve overall County objectives.

After coordinating with the County to identify feasible mitigation measures, the applicant will need to provide a detailed review of each mitigation measure to assess the resulting impacts. This may include additional operations analysis. **Table 6** provides a list of mitigation measures that may be applicable to a proposed project. As described in the General Plan, the County strongly supports the application of transportation demand management (TDM) and other techniques that reduce a

project's trip generation and trip length, and places the highest priority on mitigation measures that achieve those objectives.

TABLE 6: EXAMPLE MITIGATION MEASURES

Elements	Potential Mitigation Measures
Transportation Demand Management (TDM)	• Participate in a neighborhood or employer-sponsored shuttle program • Offer subsidized transit passes or other incentives for transit use • Offer on-site accommodations for bicyclists • Institute alternative work schedules or telecommuting • Institute preferential parking for carpools and other financial incentives for carpool usage • Participate in a subsidized car share or rideshare program • Establish a Transportation Management Association (TMA) and offer information and incentives for transportation alternatives
Land Use Changes	• Alter density or diversity of uses on-site to achieve reduced vehicle trip generation
Pedestrian and Bicycle Facilities	• Provide for access to, from, and through the development for pedestrians and bicyclists, particularly for access to nearby destinations or transit stops • Implement relevant elements of the Countywide Bicycle Plan and/or Countywide Pedestrian Plan
Transit Facilities	• Provide bus turn-outs, bus shelters, additional bus stops, and park-and-ride lots • Fund increases in transit service
Parking Facilities	• Implement shared parking among complementary land uses
Traffic Control Modifications (warrants must be met)	• Consider installation of roundabouts • Provide coordination/synchronization of traffic signals along a corridor • Provide turn-lane channelization through raised islands • Restrict certain turn movements
Roadway Capacity	• Optimize location of access driveway(s) • Provide additional through traffic lane(s), right-turn lane(s), and left-turn lane(s) if they meet County objectives and do not adversely impact other modes • Improve sight distances at intersections and driveways to meet relevant standards • Increase turn pocket storage length

RECOMMENDED PROCESS AND DOCUMENTATION

A professional traffic engineer shall conduct the transportation impact analysis under contract with the County and at the applicant's cost. It is recommended that the consultant conduct the work in the following phased manner and seek County acceptance before initiating the next task. In some cases, review by other affected jurisdictions will be required. The recommended process includes:

- **Transportation Study Scope of Work** detailing project description, site location, analysis method, area-wide assumptions, study intersections and/or roadways, peak hours for analysis, and traffic data collection
- **Transportation Scoping Meeting** to review proposed scope and agree on any assumptions needed for technical analysis, including trip generation approach
- **Project Trip Generation and Trip Distribution** documenting all key technical assumptions, data sources, and references
- **Administrative Draft Transportation Study Report** prepared according to the Scope of Work, Project Trip Generation, and Trip Distribution approved by the County.
    - The format of this report may need to be discussed with the EIR consultant (if relevant) to determine if an independent transportation study report is required or if the consultant should prepare a transportation and circulation section for incorporation into the EIR or Mitigated Negative Declaration.
- **Draft Transportation Study Report** addressing the County's comments on the Administrative Draft Report.
- **Final Transportation Study Report / Response to Public Comments** addressing comments from the County, Caltrans, neighboring cities, etc.
    - The format of this report may need to be discussed with the EIR consultant. It may be a final report incorporating the comments or written responses to public comment.

TIS REPORT FORMAT OUTLINE

To encourage consistency between project applications and impact studies, documentation should follow the outline below. Changes to the outline should be included in the scope of work and agreed to during the scoping meeting. If sections are missing that have not been confirmed in the scope of work, the County may reject the impact study and require that the consultant complete the missing sections in their entirety.

Introductory Items

- Front Cover/Title Page – signed and sealed by a registered California Civil or Traffic Engineer
- Table of Contents, List of Figures, and List of Tables
- Executive Summary

Introduction/Background

- Project description
- Project sponsor/contact info
- Type and size of development
- Site plan (include proposed driveways, roadways, traffic control, parking facilities, emergency vehicle access, and internal circulation for vehicles, bicyclists, and pedestrians)
- Location map (include major streets, study intersections, and neighboring zoning and land uses)

Existing Conditions

- Existing roadway system within project site and surrounding area
- Location and routes of nearest public transit system serving the project
- Location and routes of nearest pedestrian and bicycle facilities serving the project
- Figure of study intersections with peak hour turning movement counts, lane geometries, and traffic control
- Map of study area showing ADT of study roadways
- Table of existing peak hour average vehicle delay and LOS
- Collision analysis and summary

Existing Plus Project Conditions

- Table of trip generation for project
- Figure/map of trip distribution (in percent)
- Calculation of project-generated VMT
- Maps of study area with applicable peak hour turning movements (Project Only and Existing Plus Project)
- Table of Existing and Existing Plus Project intersection peak hour average vehicle delay and LOS
- Traffic signal and other warrants
- Findings of project impacts
- Mitigation measures for project impacts (include a map showing physical mitigation)
- Scheduling and implementation responsibility of mitigation measures
- Impacts of mitigation measures

Existing Plus Approved Projects Conditions

- Table of trip generation for approved project(s)
- Figure and/or table of approved projects trip distribution (in percent)
- Map of study area with applicable peak hour turning movements (Approved Projects Only and Existing Plus Approved)
- Table of intersection peak hour average vehicle delay and LOS
- Traffic signal and other warrants

Existing Plus Approved Projects Plus Project Conditions

- Similar content to Existing Plus Project Conditions

Cumulative and Cumulative Plus Project Conditions

- Map of study area with Cumulative No Project peak hour turning movements
- Map of study area with Cumulative Plus Project peak hour turning movements
- Table of Cumulative and Cumulative Plus Project intersection peak hour average vehicle delay and LOS
- Traffic signal and other warrants
- Findings of project impacts
- Mitigation measures for project impacts (include a map showing physical mitigation)
- Scheduling and implementation responsibility of mitigation measures
- Impacts of mitigation measures

Site Plan Review

- Adequacy of facilities for pedestrians; potential conflicts
- Adequacy of facilities for bicyclists; potential conflicts
- Adequacy of facilities for transit riders, including pedestrian connections to/from project; potential conflicts
- Access driveway review; sight distance considerations
- Parking supply and code assessment
- Mitigation measures for project impacts (include a map showing physical mitigation)
- Scheduling and implementation responsibility of mitigation measures
- Impacts of mitigation measures

Construction Impacts
Phasing Impacts (for large projects only)
Appendices

- List of references
- List of authors
- Traffic counts
- Technical calculations for all analyses – signed and sealed by a registered California Civil or Traffic Engineer

Attachments

Attachment A – Napa County Winery Traffic Information / Trip Generation Sheet

Attachment B – Guidelines for Application of Updated General Plan Circulation Policies on Significance Criteria Related to Vehicle Level of Service (April 20, 2018)

Winery Traffic Information / Trip Generation Sheet

Traffic during a Typical Weekday

Number of FT employees: _____ x 3.05 one-way trips per employee = _____daily trips.

Number of PT employees: _____ x 1.90 one-way trips per employee = _____daily trips.

Average number of weekday visitors: _____ / 2.6 visitors per vehicle x 2 one-way trips = _____daily trips.

Gallons of production: _____ / 1,000 x .009 truck trips daily[3] x 2 one-way trips = _____daily trips.

Total = _____**daily trips.**

Number of total weekday trips x .38 = _____**PM peak trips.**

Traffic during a Typical Saturday

Number of FT employees (on Saturdays): _____ x 3.05 one-way trips per employee = _____daily trips.

Number of PT employees (on Saturdays): _____ x 1.90 one-way trips per employee = _____daily trips.

Average number of weekend visitors: _____ / 2.8 visitors per vehicle x 2 one-way trips = _____daily trips.

Total = _____**daily trips.**

Number of total Saturday trips x .57 = _____**PM peak trips.**

Traffic during a Crush Saturday

Number of FT employees (during crush): _____ x 3.05 one-way trips per employee = _____daily trips.

Number of PT employees (during crush): _____ x 1.90 one-way trips per employee = _____daily trips.

Average number of weekend visitors: _____ / 2.8 visitors per vehicle x 2 one-way trips = _____daily trips.

Gallons of production: _____ / 1,000 x .009 truck trips daily x 2 one-way trips = _____daily trips.

Avg. annual tons of grape on-haul: _____ x .11 truck trips daily [4]x 2 one-way trips = _____daily trips.

Total = _____**daily trips.**

Number of total Saturday trips x .57 = _____**PM peak trips.**

Largest Marketing Event- Additional Traffic

Number of event staff (largest event): _____ x 2 one-way trips per staff person = _____trips.

Number of visitors (largest event): _____ / 2.8 visitors per vehicle x 2 one-way trips = _____trips.

Number of special event truck trips (largest event): _____ x 2 one-way trips = _____trips.

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[3] Assumes 1.47 materials & supplies trips + 0.8 case goods trips per 1,000 gallons of production / 250 days per year (see *Traffic Information Sheet Addendum* for reference).

[4] Assumes 4 tons per trip / 36 crush days per year (see *Traffic Information Sheet Addendum* for reference).

Information for Caltrans Review

Application should include:

Project Location

- Site Plan showing all driveway location(s)
- Show detail of Caltrans right-of-way
- Aerial photo at a readable scale

Trip Generation Estimate

- Please provide separate **Winery Traffic Information / Trip Generation Sheets** for existing and proposed operations.

Napa County Winery Traffic Generation Characteristics

Employees

Half-hour lunch: All - 2 trips/day (1 during weekday PM peak)

Hour lunch: Permanent Full-Time – 3.2 trips/day (1 during weekday PM peak)
Permanent Part-Time – 2 trips/day (1 during weekday PM peak)

Seasonal: 2 trips/day (0 during weekday PM peak)—crush
see full time above—bottling

Auto Occupancy: 1.05 employees/auto

Visitors

Auto occupancy:

Weekday = 2.6 visitors/auto
Weekend = 2.8 visitors/auto

Peaking Factors:

Peak Month:	1.65 x average month
Average Weekend:	0.22 x average month
Average Saturday:	0.53 x average weekend
Peak Saturday:	1.65 x average Saturday
Average Sunday:	0.8 x average Saturday
Peak Sunday:	2.0 x average Sunday

Peak Weekend Hour: Winery (3-4 PM) - 0.57 x total for weekend day involved

Average 5-Day Week (Monday-Friday) - 1.3 x average weekend

Average Weekday: 0.2 x average 5-day week

Peak Weekday Hour: Winery (3-4 PM) - 0.57 x total for weekday involved
Roadway PM Peak(4-5 PM?) - 0.38 x total for weekday involved

Service Vehicles

Grapes (36 days (6weeks)/season): 1.52 trips/1000 gals/season (4 ton loads assumed)
Materials/Supplies (250 days/yr): 1.47 trips/1000 gals/yr
Case Goods (250 days/yr): 0.8 trips/1000 gal/yr

Attachment B

FEHR PEERS

MEMORANDUM

Date: April 20, 2018

To: David Morrison, Napa County Planning, Building & Environmental Servies Department

From: Julie Morgan, Fehr & Peers

Subject: Guidelines for Application of Updated General Plan Circulation Policies on Significance Criteria Related to Vehicle Level of Service

SF15-0841

As part of the update of the Napa County General Plan Circulation Element, some new policies have been incorporated related to defining significant transportation impacts. This memorandum offers details on how to apply the significance criteria presented in the updated General Plan Circulation Element, particularly as it relates to vehicular Level of Service (LOS).

SIGNIFICANCE CRITERIA

The following sections present an interpretation of the General Plan significance criteria both for project-specific conditions and for cumulative conditions, which we have developed through collaboration with County staff. We look forward to review and discussion of these suggested guidelines with staff.

PROJECT CONDITIONS

For the evaluation of project-specific impacts, and as further described in the Napa County Transportation Impact Study Guidelines, the determination of the study scope should include selecting which Transportation Analysis Time Periods will be evaluated against these criteria.

Arterial LOS

Policy CIR-37 in the updated General Plan Circulation Element contains the following statement:

In general, the County seeks to maintain Level of Service (LOS) D on arterial roadways and at signalized intersections, as the service level that best aligns with the County's desire to balance its rural character with the needs of supporting economic vitality and growth.

The recommended interpretation of this policy for evaluating project conditions is as follows:

A project would cause a significant impact requiring mitigation if, within the selected Transportation Analysis Time Periods:

1. An arterial segment operates at LOS A, B, C or D during one or more peak hours without Project trips, and deteriorates to LOS E or F with the addition of Project trips; *or*

2. An arterial segment operates at LOS E or F during one or more peak hours without Project trips, and the addition of Project trips increases the total segment volume by one percent or more.[1]

For the second criteria, the following equation should be used if the arterial segment operates at LOS E or F without the Project:

Project Contribution % = Project Trips ÷ Existing Volumes

Example: An arterial operates at LOS F in the northbound direction during a peak hour without the Project. The existing northbound volume is 1,000 vehicles during that peak hour. A Project is anticipated to add 25 vehicles to the arterial in the northbound direction during that peak hour. Therefore, the Project contribution percentage would be:

25 trips ÷ 1,000 existing volume = 2.5% Project Contribution

Since the Project contribution is more than one percent, a **significant impact** would be identified.

[1] A change of one percent in vehicular volume is well within the range of daily traffic variation, as well as being within the range of expected accuracy of travel forecasts, and is not likely to be noticeable to drivers if the road is operating under capacity. However, an arterial segment operating at LOS E or F would be operating at or over capacity; vehicle traffic flows break down quickly as the volume approaches capacity, which would be a perceptible change to drivers.

Signalized Intersections

LOS for signalized intersections is defined as an average of the delay at all approaches. The recommended interpretation of this policy regarding signalized intersection significance criteria is as follows:

> A project would cause a significant impact requiring mitigation if, within the selected Transportation Analysis Time Periods:
>
> 1. A signalized intersection operates at LOS A, B, C or D during one or more peak hours without Project trips, and deteriorates to LOS E or F with the addition of Project trips; *or*
>
> 2. A signalized intersection operates at LOS E or F during one or more peak hours without Project trips, and the addition of Project trips increases the total entering volume by one percent or more.

For the second criteria, the following equation should be used if the signalized intersection operates at LOS E or F without the Project:

Project Contribution % = Project Trips ÷ Existing Volumes

Example: A signalized intersection operates at LOS E during a peak hour without the Project. The existing volume is 2,500 vehicles during that peak hour. A Project is anticipated to add 15 vehicles to the signalized intersection during that peak hour. Therefore, the Project contribution percentage would be:

15 trips ÷ 2,500 existing volume = 0.6% Project Contribution

Since the Project contribution is less than one percent, the impact on the signalized intersection due to the Project would be **less than significant.**

Maintaining LOS D or better at all signalized intersections would sometimes require expanding the physical footprint of an intersection. In some locations around the County, expanding physical transportation infrastructure could be in direct conflict with the County's goals of preserving the area's rural character, improving safety, and sustaining the agricultural industry, making these potential improvements infeasible.

Transportation studies should individually consider the feasibility of potential mitigation measures with respect to right-of-way acquisition, and present potential alternative mitigation measures that do not require right-of-way acquisition, including changes to the Project to reduce its trip generation. County staff would then review that information and make the decision about the feasibility of the identified potential mitigations.

Unsignalized Intersections

No specific level of service standard is specified for unsignalized intersections, which should be evaluated on a case-by-case basis.

LOS for all-way stop controlled intersections is defined as an average of the delay at all approaches. LOS for side-street stop controlled intersections is defined by the delay and LOS for the worst-case approach. The recommended approach regarding unsignalized intersection significance criteria is as follows:

A project would cause a significant impact requiring mitigation if, within the selected Transportation Analysis Time Periods:

1. An unsignalized intersection operates at LOS A, B, C or D during one or more peak hours without Project trips, and the LOS deteriorates to LOS E or F with the addition of Project traffic; the peak hour traffic signal warrants should also be evaluated; *or*

2. An unsignalized intersection operates at LOS E or F during one or more peak hours without Project trips, and the project contributes either:

    a. one percent or more of the total entering traffic for all-way stop-controlled intersections, or

    b. ten percent or more of the traffic on a side-street approach for side-street stop-controlled intersections.

    Both (a) and (b) should be evaluated in the study, and the peak hour traffic signal warrants should also be evaluated.

All-Way Stop-Controlled Intersections

For the second criteria at an all-way stop-controlled intersection, the following equation should be used if the all-way stop-controlled intersection operates at LOS E or F without the Project:

Project Contribution % = Project Trips ÷ Existing Volumes

Example: An all-way stop-controlled intersection operates at LOS E during a peak hour without the Project. The existing volume is 1,500 vehicles during that peak hour. A Project is anticipated to add 30 vehicles to the all-way stop-controlled intersection during that peak hour. Therefore, the Project contribution percentage would be:

30 trips ÷ 1,500 existing volume = 2.0% Project Contribution

Since the Project contribution is more than one percent, a **significant impact** would be identified.

Side-Street Stop-Controlled Intersections

For the second criteria at a side-street stop-controlled intersection, the following equation should be used if the side-street stop-controlled intersection operates at LOS E or F without the Project:

Project Contribution % = Project Trips ÷ Existing Volumes

Both of those volumes are for the stop-controlled approaches only. Each stop-controlled approach that operates at LOS E or F should be analyzed individually.

Example: The side-street stop-controlled eastbound approach at an intersection operates at LOS F during a peak hour without the Project. The existing volume on that approach is 200 vehicles during that peak hour. A Project is anticipated to add 10 vehicles to the stop-controlled approach during that peak hour. Therefore, the Project contribution percentage would be:

10 trips ÷ 200 existing volume = 5.0% Project Contribution

At the same intersection during the same peak hour, the side-street stop-controlled westbound approach at an intersection operates at LOS E during a peak hour without the Project. The existing volume on that approach is 100 vehicles during that peak hour. A Project is anticipated to add 15 vehicles to the stop-controlled approach during that peak hour. Therefore, the Project contribution percentage would be:

15 trips ÷ 100 existing volume = 15.0% Project Contribution

Because the Project contribution is more than ten percent on the westbound approach, a **significant impact** would be identified. The impact to the eastbound approach would be **less than significant.**

Potential mitigations may include geometric modifications to the intersection configuration, changes to the Project to reduce its trip generation, and/or considering conversion of the intersection to a roundabout per Policy CIR-28:

> *While not suitable for all intersections, roundabouts have a wide variety of applications, and Napa County will consider them as an alternative for intersection improvements (see the current version of the County's Transportation Impact Study Guidelines for more information).*

In some cases, there may be a significant impact at an unsignalized intersection at which no physical changes are appropriate. For example, an intersection at a private driveway may not be an appropriate location for either a signal or a roundabout if queue lengths are short on the County road. As is true with any mitigation, the County will ultimately determine the feasibility and appropriateness of the potential mitigation measure. As with all situations involving significant traffic impacts, demand management strategies shall be evaluated for their potential to mitigate the identified impacts, and there shall be an evaluation of effects on safety and local access.

CUMULATIVE CONDITIONS

In addition to evaluating project-specific impacts, transportation studies typically also address cumulative conditions, in which the Project is part of the overall amount of growth expected in the County during the planning horizon. A significant cumulative impact would be identified if the overall amount of expected growth caused conditions to deteriorate such that any of the significance criteria described above are met.

The question then becomes whether the Project's contribution to that cumulative impact is considerable, in which case the Project would be required to contribute to the mitigation of that impact. A Project's contribution to a cumulative condition would be calculated as the Project's percentage contribution to the total growth in traffic.

A project would cause a significant impact requiring mitigation if:

1. The Project's contribution to a significant cumulative impact would be considerable if it is equal to or greater than five percent. The following equation should be used to evaluate significance:

   Project Contribution % = *Project Trips* ÷ (*Cumulative Volumes – Existing Volumes*)

This calculation applies to arterials, signalized intersections, and unsignalized intersections.

Example (Signalized Intersection): A signalized intersection operates at LOS E during a peak hour with the Project under Cumulative Conditions. The existing volume is 2,500 vehicles during that peak hour. A Project is anticipated to add 15 vehicles to the signalized intersection during that peak hour. The forecasted Cumulative volumes at the intersection is 2,750 vehicles during that peak hour, including the Project. Therefore, the Project contribution percentage would be:

15 trips ÷ (2,750 cumulative volume - 2,500 existing volume) = 3.0% Project Contribution

15 trips ÷ 250 volume growth = 3.0% Project Contribution

Since the Project contribution to the growth is less than five percent, the impact on the signalized intersection due to the Project under Cumulative Conditions would be **less than significant.**