3.1 Database Research and Literature Review

Species occurrences from the CDFW California Natural Diversity Database (CNDDB) RareFind 5 (CDFW 2017) and the California Native Plant Society (CNPS) Online Inventory of Rare and Endangered Plants (CNPS 2017) were queried for records near the project. The U.S. Geological Survey (USGS) 7.5-minute quadrangles (quads) containing the project served as the center of a nine-quad query within CNPS databases to determine which special-status plant species may have required assessment within the survey area (Table 1). These quads included 1) Visalia, 2) Monson, 3) Ivanhoe, 4) Exeter, 5) Cairns Corner, 6) Tulare, 7) Paige, 8) Goshen, and 9) Traver.

Information regarding the biological resources in the vicinity of the project study area was obtained by reviewing available data from a number of resources. The data review included a search of existing databases, inventories, lists, and collections that contain information regarding the occurrence of special- status species. Resources used in this review included the following:

- California Natural Diversity Database (CNDDB) for records of sensitive plants, animals, and vegetation communities.
- California Native Plant Society (CNPS) online inventory of rare and endangered plants of California.
- Consortium of California Herbaria (available on-line at http://ucjeps.berkeley.edu/consortium/).
- Special Vascular Plants, Bryophytes, and Lichens List. CDFW, Natural Diversity Database.
- Special Animals List. CDFW, Natural Diversity Database.
- USFWS online Critical Habitat Portal.
- California Wildlife Habitat Relationships (CWHR) life history and range maps.
- Aerial photographs on Google Earth, (Google Earth, Inc 2017).
- USFWS National Wetlands Inventory (NWI) database (available online at: http://www.fws.gov/wetlands).
- USGS 7.5-minute topographic quadrangle maps for Visalia, Monson, Ivanhoe, Exeter, Cairns Corner, Tulare, Paige, Goshen, and Traver.
- Natural Resources Conservation Services: Web Soil Survey page (NRCS, 2017)
- The Corps of Engineers Wetlands Delineation Manual (USACE 1987);
- Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0) (USACE 2008);
- A Field Guide to the Identification of the Ordinary High-Water Mark (OHWM) in the Arid West Region of the Western United States (Lichvar and McColley 2008);
- Hydric Soils List of California, 2017 (Natural Resources Conservation Service 2017)

3.1.1 Previous Local Biological Assessments and Documents

Environmental Document No. 2008-48 (ED #2008-48) City of Visalia Community Development: Proposed Mitigated Negative Declaration (MND). Document prepared by the City of Visalia dated April 10, 2009. A previous proposed bridge design had begun with the processing of an initial study completed in 2008 by Quad Knopf Inc. and the issuance of the ED #2008-48. An MND was prepared for the project but prior to approval of the MND the developers postponed the project due to market conditions of the time.

The initial study of the previous bridge development was not available to AEC at the time of this report. General information regarding previous biological investigations was gleaned from the MND.

3.1.2 Definition of Sensitive Biological Resources

For the purposes of this study, sensitive plants and animals were defined to include species, subspecies, varieties, and populations recognized by CDFW or USFWS, and which have been classified into one or more of the following categories:

- Species, subspecies, and populations listed or proposed for listing as threatened or endangered pursuant to the federal Endangered Species Act (ESA), and species that are candidates for such listing.
- Species and subspecies listed or proposed for listing by the State of California as threatened or endangered pursuant to the California Endangered Species Act (CESA).
- Plants included in the California Vascular Plants, Bryophytes, and Lichens List.
- Plants assigned California Rare Plant Ranks (CRPR) by the California Native Plant Society (CNPS).
- Animals listed as species of special concern, fully protected, or watchlist on the California Special Animals List, and for invertebrates, all species on the California Special Animals List regardless of the reason for inclusion.
- Plants and animals identified by CDFW and/or USFWS in letters, emails, or in-person communications regarding the project.

In addition, natural communities recognized by CDFW as being of special concern were considered sensitive, along with riparian habitats and water bodies under the jurisdiction of CDFW, USACE, and/or RWQCB.

Throughout this document, species, subspecies, varieties, and populations are broadly referred to as "species," a term which is used here to encompass whichever pertinent taxonomic level is recognized by the state and federal authorities with jurisdiction over plants and animals.

The information obtained from the literature and database searches were reviewed to identify a list of sensitive biological resources with the potential to occur at the project property.

3.1.3 Agency Coordination

On October 5, 2017 AEC Senior Biologist Mr. Yancey Bissonnette met with CDFW Environmental Scientist Carrie Swanberg at the proposed project site. The meeting was initiated by AEC as an informal on-site review so that CDFW could help provide comment and direction with regards to their concerns or needs for permitting of the project. Ms. Swanberg indicated that the trees planted along the outer upland terrace of the creek bed within the shopping center property were potentially jurisdictional riparian habitat that would need to be addressed in the 1602 permit application. She also agreed with AEC that pond turtles that had been identified in the 2009 MND were not of concern and were highly unlikely to occur within the creek due to flow restrictions and maintenance activities associated with the creek. She also indicated that she would like an assessment

of Swainson's Hawk to be addressed as the trees on the north side of the site were of sufficient height to potentially provide nesting habitat for raptors of this type.

To date AEC has also had three informal calls with the Sacramento Office ACOE representative Ms. Kate Dadey to discuss any potential Corps concerns and to verify that they have jurisdiction of this water feature as it is an acknowledged water of the United States. Ms. Dadey has been helpful in providing information regarding Nation Wide Permit(NWP) information and the conditions under which the project could apply for this type of permit. It is understood that as long the project impacts to the jurisdictional portions of the creek are less than 0.10 an acre then a NWP-14 could potentially be applied for by the project. The project proponents have been informed of these conditions and are working with the engineers to try and meet the necessary NWP 14 conditions.

AEC has also had phone conversations with City of Visalia, Kaweah Delta Water Conservation District (KDWCD), and the Tulare Irrigation District (TID) regarding water management flows and maintenance of the creek within the sections of the reach in this part of the City of Visalia. It is understood that KDWCD and TID jointly control flow of the water through the entirety of the creek as needed for flood control and irrigation distribution. TID generally has control through the portion intersecting the project. They have an Memorandum of Understanding (MOU) with the City of Visalia that allows the City to provide maintenance of the channel within the City of Visalia and specifically within the section of the creek crossing through the project. On March 7 and 8, 2018 the creek channel was cleared and rough graded according to normal maintenance activities (figures 7, 8 and 9). All vegetation within the creek channel and banks (at this general location) was cleared while reestablishing bank and channel contours to a trapezoid shape (see Figures 4 -9).

3.2 Field Surveys

The project site has been visited on seven separate occasions over the last 19 months to document conditions of Packwood Creek at the proposed bridge location. As the project site location has not changed and the proposed project footprint is assumed to be restricted in its final design parameters, survey and observations of the site are relatively easy and accessible. AEC senior biologist Mr. Yancey Bissonnette conducted a formal survey of the site on October 22, 2017. This survey consisted of walking the entire proposed development areas, and along and within the creek bed up to 500 feet to either side (east and west) of the proposed bridge location (Plate 6). Mr. Bissonnette visually surveyed the site with the naked eye and with the use of binoculars. Plants and wildlife readily observable and identifiable were documented at the time of observation. Habitat, topography, and general site characteristics were documented during the formal survey. Otherwise each visit to the site noted observable site and creek / channel conditions. Which allowed for updating observable wildlife and fauna occurring at the site at the time.

4 Site Survey

4.1 Habitat

For this report, habitat is defined by the physical area characterized by an assemblage of botanical species, substrate features, or aquatic environment. Habitat types comprised of botanical assemblages illustrate a community typically associated or classified by the dominant vegetation type present in the locale where the survey is being conducted. Habitat may be utilized by organisms that may occupy the area and may provide some subset of essential or preferred ecological and biological needs for those species that may be found in a described habitat. Habitat types are utilized to classify elements of nature associated with the physical, biological, and ecological conditions in an area. These habitat characteristics may be utilized as indicators of the potential for special-status species and or plant communities to occur, to be associated with, or may be affected by a project. The following paragraph(s) describe the major vegetation alliances identified for this project. Habitats were identified and characterized based on current excepted habitat descriptions. Habitat descriptions follow and or integrate types that have been described by Holland (Holland R. F., 1986), Sawyer Keeler-Wolfe (Keeler-Wolfe & Sawyer, 2007, 2008), Holland (Holland & Keil, 1989), and or by derived descriptions that best characterize the general habitat as it was observed during the survey.

AEC characterized the habitat for this project as **Urban Riparian / Urban Riverine.** This is not an official naming convention as recognized or utilized by the standard habitat references identified by Holland or Keeler-Wolf et al. This type of habitat can best be described as anthropomorphic in its use and classification. The creek at this locale has been altered from its original course and is now a managed water course with controlled flow occurring intermittently throughout the year at the discretion of the TID and KDWCD.

The site and immediate surroundings along the creek bed and channel are comprised of landscaped and managed vegetation. Three tree species dominate the upland terrace areas while annual weedy riparian grasses and forbs occur along the banks and bed of the creek in between maintenance clearing periods. The dominant trees were identified as Sycamore (*Platanus racemosa*), Fremont Cottonwood (*Populus fremontii*), and Valley Oak (*Quercus lobata*). Plants (generally considered weedy species) occurring along the banks and channel bottoms in between maintenance periods include grass species such as Bearded Spangletop (*Leptochloa fusca*) and Johnson Grass (*Sorghum halapense*). These grasses are the dominant species and occur over most surfaces of the creek bed and banks when allowed to grow. Vegetation maintenance within the jurisdictional bounds of the creek is managed by the City of Visalia and occurs annually to semi-annually as needed. General maintenance usually clear cuts all vegetation within the creek channel and banks while reestablishing bank and channel contours to a trapezoid shape (Figures 1 -9).

4.1.1 Trees

Valley Oaks, Sycamore, and Cottonwood trees were observed within the proposed project footprint and along the north upland terrace of the creek extending east and west for hundreds of feet either direction. Valley Oaks dominate along the south upland terrace side of the creek lining the bike trail. One heritage tree exists approximately 370 feet east along the bike trail on the south side of the creek.

Trees within the project footprint will require removal for bridge development. The trees expected to need removal or relocation were measured at breast height using a Ben Meadows forester's measuring tape designed to measure tree DBH.

4.2 Jurisdictional Waters and Wetlands

Review of GIS has identified that Packwood Creek is a recognized jurisdictional water feature by the USACE, CDFW and RWQCB. Communications with USACE representative Kate Dadey (Sacramento Office) confirmed that the Corps has jurisdictional authority of Packwood Creek. AEC also confirmed with CDFW representative Carrie Swanberg (Fresno Office) that CDFW also has discretionary authority of Packwood Creek and will require a Streambed Alteration Agreement (SAA) for project development. A 401-certification issued by the Regional Water Quality Control Board will also be required.

The USFWS National Wetlands Inventory classifies the Packwood Creek as R4SBCx (Plate 5). The following codes define the designations associated with this classification system for Packwood Creek. It should be noted that while the map in Plate 5 shows Packwood Creek as having two diverging and converging courses near the project site, it should be understood that the creeks path was altered by the owner of the land prior to the development of the current shopping center. It is our understanding that the land was originally agricultural in nature and that the last farmer owner had moved the creek course on his own accord. The current configuration of the creek and its bed and banks does not reflect the map data represented by USFWS, ACOE, and CNDDB data base sources utilized for this report in plates 1, 2, 4, and 5. The current configuration is best realized when viewed with current aerial imagery form Google Earth or ESRI GIS downloadable imagery which are utilized in plates 3, 6, and 7 and figures 1 - 9. With that noted the NWI classification does provide an accurate written description for jurisdictional review purposes of the creek.

[R] Riverine, [4] Intermittent, [SB] Streambed, [C] Seasonally Flooded, [x] Excavated

> ***[R] Riverine*** *- The Riverine System includes all wetlands and deepwater habitats contained in natural or artificial channels periodically or continuously containing flowing water or which forms a connecting link between the two bodies of standing water. Upland islands or Palustrine wetlands may occur in the channel, but they are not part of the Riverine System.*
>
> *Limits:*

The Riverine System is bounded on the landward side by upland, by the channel bank (including natural and man-made levees), or by wetlands dominated by trees, shrubs, persistent emergents, mosses, or lichens. In braided streams, the system is bounded by the banks forming the outer limits of the depression within which the braiding occurs.

The Riverine System terminates at the downstream end where the concentration of ocean-derived salts in the water exceeds 0.5 ppt during the period of annual average low flow, or where the channel enters a lake. It terminates at the upstream end where tributary streams originate, or where the channel leaves a lake. Springs discharging into a channel are considered part of the Riverine System. Where a river enters a lake, the extension of the Lacustrine shoreline across the mouth of the river forms the Riverine /Lacustrine break. Oxbow lakes are placed in the Palustrine or Lacustrine Systems unless they are connected to a Riverine System by an open channel at both ends permanently or intermittently. Run-of-the-river dams should be handled in the same manner as described above, with the Lacustrine System extending upstream to the contour approximating the normal spillway or pool elevation. The USGS maps or USGS Water Resources Data (stream gauge data) are used as the primary data source in determining if the riverine channel is a perennial or intermittent stream.

***(4) Intermittent** - This Subsystem includes channels that contain flowing water only part of the year but may contain isolated pools when the flow stops.*

Class:

Class describes the general appearance of the habitat in terms of the dominant life form of the vegetation or the physiography and composition of the substrate. life form (e.g. trees, shrubs, and emergents) are used to define classes because they are easily recognizable, resist redistribution, and have traditionally been used to classify wetlands. Other forms of vegetation such as submerged or floating-leaved vascular plants are more difficult to detect. Substrates reflect regional and local variations in geology and the influence of wind, waves, and currents on erosion and deposition of substrate materials.

***[SB]** Streambed - Includes all wetlands contained within the Intermittent Subsystem of the Riverine System and all channels of the Estuarine System or of the Tidal Subsystem of the Riverine System that are completely dewatered at low tide. Water regimes include the following: seasonally flooded, temporarily flooded, intermittently flooded, irregularly exposed, and regularly flooded, irregularly flooded, seasonal-tidal, and temporary-tidal.*

Water Regime: Freshwater Non-Tidal areas (L, P, and R systems)

Though not influenced by oceanic tides, nontidal water regimes may be affected by wind or seiches in lakes. Water regimes are defined in terms of the growing season, which we equate to the frost-free period. The rest of the year is defined

as the dormant season, a time when even extended periods of flooding may have little influence on the development of plant communities.

***[C] Seasonally Flooded** - Surface water is present for extended periods especially early in the growing season but is absent by the end of the growing season in most years. The water table after flooding ceases is variable, extending from saturated to the surface to a water table well below the ground surface.*

Special Modifiers:

Special modifiers are used to indicate wetlands and deepwater habitats modified or created by man or beaver. When used in combination, the letters should be listed in alphabetical order (e.g. PUBHhs).

***[x] Excavated** - Lies within a basin or channel excavated by man.*

4.2.1 Areas Subject to CDFW (SAA), ACOE, and RWQCB jurisdiction

Approximately 50-60 linear feet of the creek bed is anticipated to be permanently impacted. This is estimated to be about 2500 to 3000 square feet (0.057 to 0.061-acres) of permanent impacts. Approximately 150 linear feet of each bank will be impacted for the construction of wing wall flow diverters. Volumes and exact amounts of impacts (both temporary and permanent) will be determined once the final bridge designs have been approved. Anticipated Impacts may include but are not limited to removal of planted riparian trees along the northern upland terrace landscape area and adventitious stem suckers along the north bank. Routine maintenance of the channel and banks by the City will remove native and non-native grasses and forbs during maintenance activities that will occur prior to ground disturbance of the project (as represented by figures 1 – 9). While this vegetation removal within the creek occurs within the bounds of the project the project proponents have no control or authority regarding activities related to this maintenance and or creek integrity and therefore vegetation within the areas of the channel and banks are not considered impacts by the project.

Vegetation along the north upland terrace and north bank areas of the creek have been identified by CDFW as potential riparian habitat and thus will need to be considered during permitting and planning development. The Corps and RWQCB is not expected to have or want jurisdiction of these areas.

4.3 Soils

Soils were reviewed and categorized by the NRCS on line websoil survey mapping tool and ESRI GIS. Soils of the site are best described as a "fine sandy loam". The NRCS characterization of this type of soil for the project is described as follows.

Tulare County, Western Part, California

137—Tagus loam, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: hp58
Elevation: 230 to 400 feet
Mean annual precipitation: 9 to 12 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 250 to 300 days
Farmland classification: Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition
Tagus and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.
Description of Tagus Setting
Landform: Fan remnants
Landform position (two-dimensional): Shoulder *Landform position (three-dimensional):* Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granitic rock sources
Typical profile
Ap - 0 to 17 inches: loam *Bk1 - 17 to 40 inches:* loam *Bk2 - 40 to 63 inches:* loam
Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat):
Moderately high to high (0.60 to 2.00 in/hr) *Depth to water table:* More than 80 inches *Frequency of flooding:* Very rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: Moderate (about 8.4 inches)
Interpretive groups
Land capability classification (irrigated): 1 *Land capability classification (nonirrigated):* 4c
Hydrologic Soil Group: B
Hydric soil rating: No
Minor Components Tujunga
Percent of map unit: 5 percent
Landform: Flood plains
Hydric soil rating: No
Hanford
Percent of map unit: 5 percent *Landform:* Flood plains, alluvial fans *Hydric soil rating:* No

Grangeville
Percent of map unit: 3 percent *Landform:* Flood plains, alluvial fans *Hydric soil rating:* No

Colpien
Percent of map unit: 2 percent *Landform:* Fan remnants *Hydric soil rating:* No

Data Source Information Soil Survey Area: Tulare County, Western Part, California Survey Area Data: Version 11, Sep 8, 2017

4.4 Plants and Wildlife

4.4.1 Listed Plants

Table 1 of the Appendices provides a list of plants identified by the CNPS with the potential to occur within a nine-quad area of the site (see section 3.1 for a list of all quads). The center quad is that of the project site and identified as Visalia. Most of the plants listed for the project for the purposes of this report are not expected to occur at the site or within the immediate vicinity of the site. Three of the plants listed in the table have a low likelihood of occurring at the site. California Satintail, Hoover's spurge, and Spiny-sepaled Button Celery have a marginally low chance of occurring within the vicinity of the project site with emphasis on the occurrence probability within the creek bed and or banks of the creek where supporting soils, soil saturation levels, and water occurrence are more likely to support these species. None of these species were observed during site visits or formal surveys.

The CNDDB database review of the site (Plate 4) identified an additional plant not listed with the CNPS nine-quad data. This plant was identified as Sanford's Arrowhead (*Sagittaria sanfordii*) a CNPS list 1B.2 plant. No State or Federal listing was identified. The occurrence data represents a polygon about 3.0 miles northeast of the site. This plant was not observed at the site and is not expected to occur within the site or immediate vicinity. No other plants were identified as special status for this project area or vicinity.

4.4.2 Observed Plants

Table 2 of the Appendices provides a list of plant species observed at the site during site visits and the formal habitat assessment survey. The dominant species observed included three tree species and two grasses. As indicated before, Cottonwoods, Sycamores and Valley Oak are abundant on both upland terrace sides of the creek. All but one of these trees was planted as part of development and or public improvements. The only tree that is a natural resident is a Valley Oak located about 370 feet to the east of the project on the south side of the creek. The tree is assumed to be a heritage tree and was likely preserved as a permit requirement when the bike path was planned and developed. All the other trees on both public and private lands of the project and immediate vicinity are landscape plantings for either of the previous projects (shopping center and bike path).

The two dominant grass species observed are Johnson grass and Bearded Sprangletop grass (Sprangletop). Both are common species frequently found throughout the State. Johnson grass is known as a forage and crop grass for livestock. Spangletop occurs abundantly in wet ditches, water courses, and wet areas throughout California and the west. Both species were observed within the confines of the creek and mostly within the bed and lower banks. These species are both easily abundant where they occur and when not managed can become a nuisance. The maintenance activity associated with the creek by the City generally keeps these species under control during most years.

4.4.3 Listed Wildlife

USFWS and CDFW database searches identified special status species that have been documented within the vicinity or have the potential to occur within the site or project vicinity (Table 3, Appendix 3, and Plate 4). CNDDB GIS mapping (Plate 4) identifies locations of special status plant and animal species within a 5-mile radius of the site. In addition to the species listed in table 3, and CNDDB GIS data; CDFW representative Carrie Swanberg requested that potential Swainson's Hawk habitat be assessed for the project.

A documented occurrence of the San Joaquin Kit Fox (*Vulpes macrotis mutica*, SJKF, Kit Fox) was identified in the CNDDB GIS data set approximately 3.0 miles east of the site. The siting observation was of an individual occurring in 1975 and was further referenced as being a road kill observation. No other documented occurrences were noted for the area.

The San Joaquin kit fox (*Vulpes macrotis mutica)* is listed as an endangered species by the U.S. Fish and Wildlife Services (U.S. Fish and Wildlife Service, 1967 Federal Register 32), and is listed as threatened by the state of California, (Endangered Species Protection Program 2010). The San Joaquin kit fox is believed or known to inhabit the following California counties: Alameda, Calaveras, Contra Costa, Fresno, Kern, Kings, Los Angeles, Madera, Mariposa, Merced, Monterey, Sacramento, San Benito, San Joaquin, San Luis Obispo, Santa Barbara, Santa Clara, Santa Cruz, Solano, Stanislaus, Tulare, Tuolumne, and Ventura, (U.S. Fish and Wildlife Service, 2017).

The average kit fox is approximately 32 in. in total length (nose to tail), 12 in. tall, 5 lbs., and has a recognizable foot pad the size of 1.2 in. x 1 in., (Endangered Species Protection Program 2010). The kit fox's habitat consists of dens in open shrubby areas with loose textured soils, and may use other resources such as old artifacts and materials if needed, (U.S. Fish and Wildlife Service, 2017). Kit foxes are primarily carnivorous preferring to feed on rodents and birds, but will also feed on insects, reptiles, vegetation, or trash if necessary, (Ahlborn, 2000).

CNDDB GIS data identified 9 known Swainson's Hawk locations to the west and west-northwest of Visalia and the project site. Two of the observations were from a 2008 survey and were more than 12.5 miles away within open agricultural areas. The other seven observations were from surveys conducted for Caltrans in 2012 for the highway 198 widening project. The closest of these observations was more than 7.8 miles west of the project site and most of these siting's occurred within open agricultural areas.

Swainson's hawk (*Buteo swainsoni*) is listed as threatened by California Fish and Game Commission, (California Department of Fish and Wildlife, 2017). The Swainson's hawk is a migratory raptor and the central valley population winters south in Mexico and/or Columbia, (U.S. Fish and Wildlife, 2017). Most Central Valley Swainson's hawks return to the valley by April to their traditional nesting territory where nest repair and development will take place almost immediately, (California Department of Fish and Wildlife, 2017).

Swainson's hawks are medium-sized hawks ranging from 48–56 cm in length with long pointed wings, an average weight of 25–35 oz., a square tail, and polymorphic plumage (U.S. Fish and Wildlife Service). The Swainson's hawk is the only raptor that has distinctive light primaries and dark flight feathers when observed from below and they are distinguishable from other hawks based on their narrow body and wings, (Bechard et al. 2010). Within the central valley, Swainson's hawks nest next to riparian areas and in large lone trees from 58-82 ft. tall, or groves of trees in or near agricultural fields; large trees of valley oak, cottonwoods, willows, black walnut, and eucalyptus species are utilized for nesting purposes, (U.S. Department of Agriculture Forest Service, 2017). The Swainson's hawk needs open agricultural land of alfalfa, hay crops, grazed pastures, and/or open grassland in which they will prey on insects, reptiles, small snakes, rodents, and mammals, (California Department of Fish and Wildlife, 2017).

Special status species listed in Table 3, and or Appendix 3 that lack documented occurrence data, or their habitat requirements do not exist or are unlikely to occur at the project site, will not be discussed in detail within the body of this report. The table identifies general habitat requirements and the species listing designation as well as a brief assessment of the potential for these species to occur within the project area. Additional assessment is not believed to be necessary at this time based on the current site conditions.

4.4.4 Observed Wildlife

During site visits and formal survey periods, very little wildlife diversity was observed within the project and survey area (Plate 6). California Ground Squirrel *(Spermophilus beecheyi)* burrows and sign were observed and occasional gopher (*Thomomys bottae*) burrows. No other mammal sign was detected during any site visits or surveys. No observations of mammals were made during site visits. The occasional ant mound, grasshopper, and dragonfly were seen during site visits. Ravens and Yellow-rumped Warbler (*Dendroica coronata*) were seen frequently during visits to the site in November and December. Most of these siting occurred within the trees along the bank upland terrace and shopping center parking lot trees areas. Both are common species of the region. White Crowned Sparrows (*Zonotrichia leucophrys*), Grackles (*Quiscalus quiscula*), Brewer's Blackbirds (*Euphagus cyancephalus*), Junco's (*Junco hyemalis*) and House Sparrows (*Passer domesticus*) were also observed near the site during visits occurring from January through March of 2018. As expected very little wildlife beyond common bird species are expected to frequent the site or the immediate vicinity as most of the area is paved or developed for commercial development or arterial traffic conveyance.

5 Results – Evaluation / Assessment

5.1 Habitat

The site habitat is characterized by its dominant feature which is an urban riparian / urban riverine water course identified as Packwood Creek. The ACOE and CDFW have both identified this water feature as jurisdictional and will require permitting for bridge

development to proceed. CDFW has further identified trees that are planted along the upland terrace banks as riparian species of concern with regards to wildlife habitat. The trees along both upland terrace banks are planted native species that were not naturally occurring individuals of the site. Trees were planted as a result of project development by the City of Visalia and the shopping center when originally built. Based on the current tentative bridge design a total of nine trees along the upland terrace banks of the north will need to be removed and mitigated for impacts (Plate 7).

Other vegetation (not trees) within the creek bed at the time of the CDFW visit and during some of AEC's additional visits consisted mostly of common annual species that generally occur throughout the central valley and its creeks and irrigation canals (Table 2). However, this vegetation is only present during intermittent periods of the year when maintenance activity has not yet cleared the creek of vegetation (see figures 1 – 9). It is the opinion of AEC that this vegetation be excluded from the impact assessments related to project development. As stated before this vegetation usually only exists temporarily throughout any given year and is frequently either cleared by the City for water flow or is not persistent long enough during any period to provide more than temporary forage for some bird species. The following figures demonstrate conditions of the Creek and it's successional maintenance during a 19 month period starting in July of 2016 and culminating with the most recent photos taken in March of 2018.

FIGURE 1 : TYPICAL CREEK CONDITIONS AFTER REGULAR MAINTENANCE. VIEW LOOKING EAST. CAMERON AVE. TO THE RIGHT. (PHOTO TAKEN JULY 23, 2016)

FIGURE 2 : TYPICAL CREEK CONDITIONS AFTER REGULAR MAINTENANCE. VIEW CLOSE TO PROPOSED BRIDGE CROSSING. (PHOTO TAKEN JULY 23, 2016)

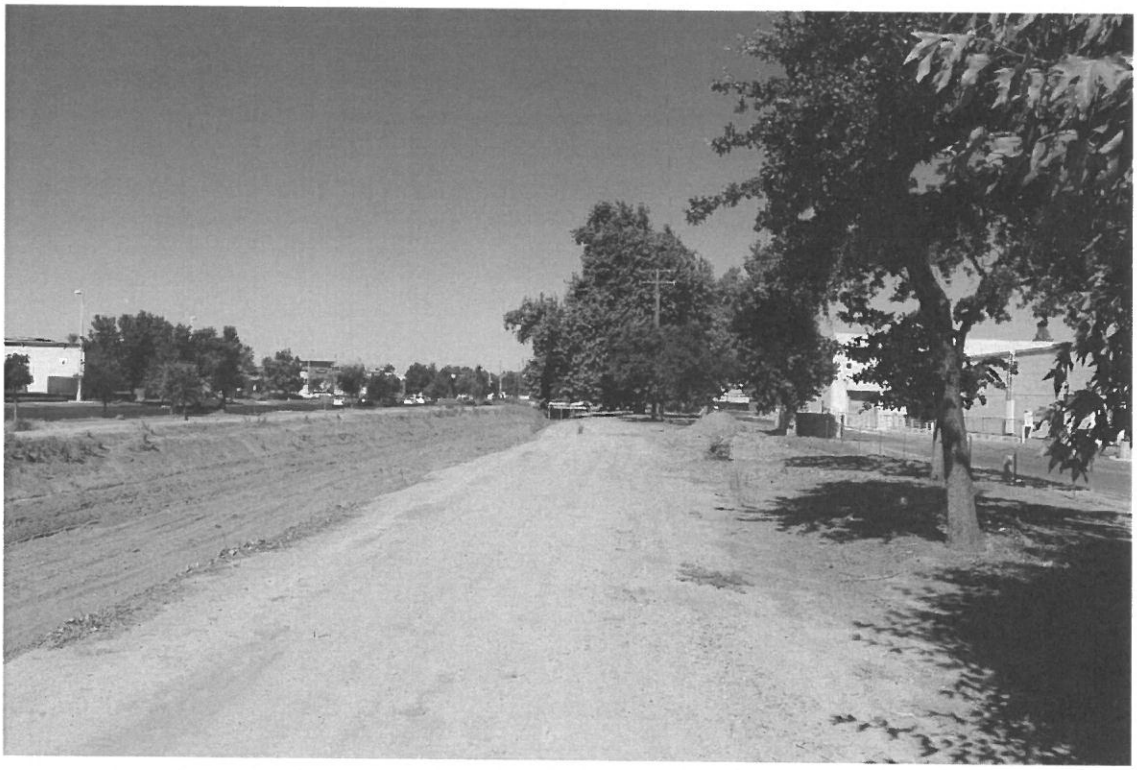

FIGURE 3 : TYPICAL CREEK CONDITIONS AFTER REGULAR MAINTENANCE. VIEW LOOKING WEST TOWARDS MOONEY BLVD. (PHOTO TAKEN JULY 23, 2016)

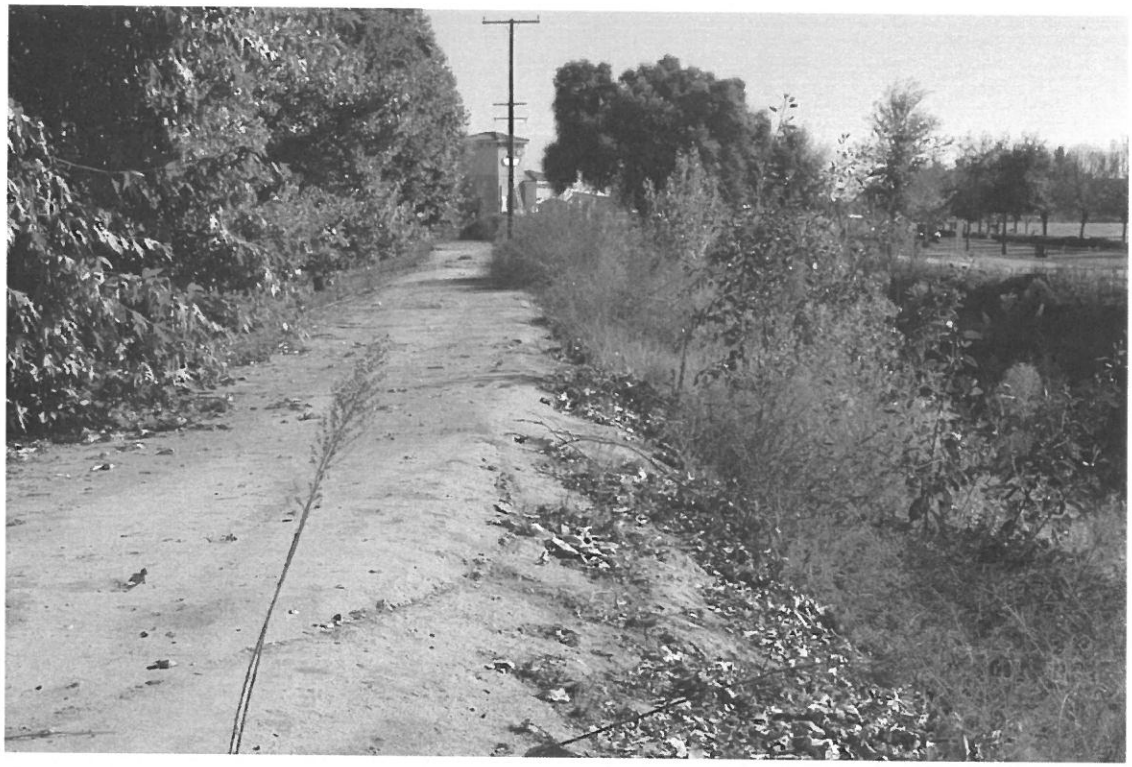

FIGURE 4 : CREEK WITH VEGETATION IN BETWEEN MAINTENANCE PERIOD. VIEW LOOKING EAST. (PHOTO TAKEN OCTOBER 22, 2017)

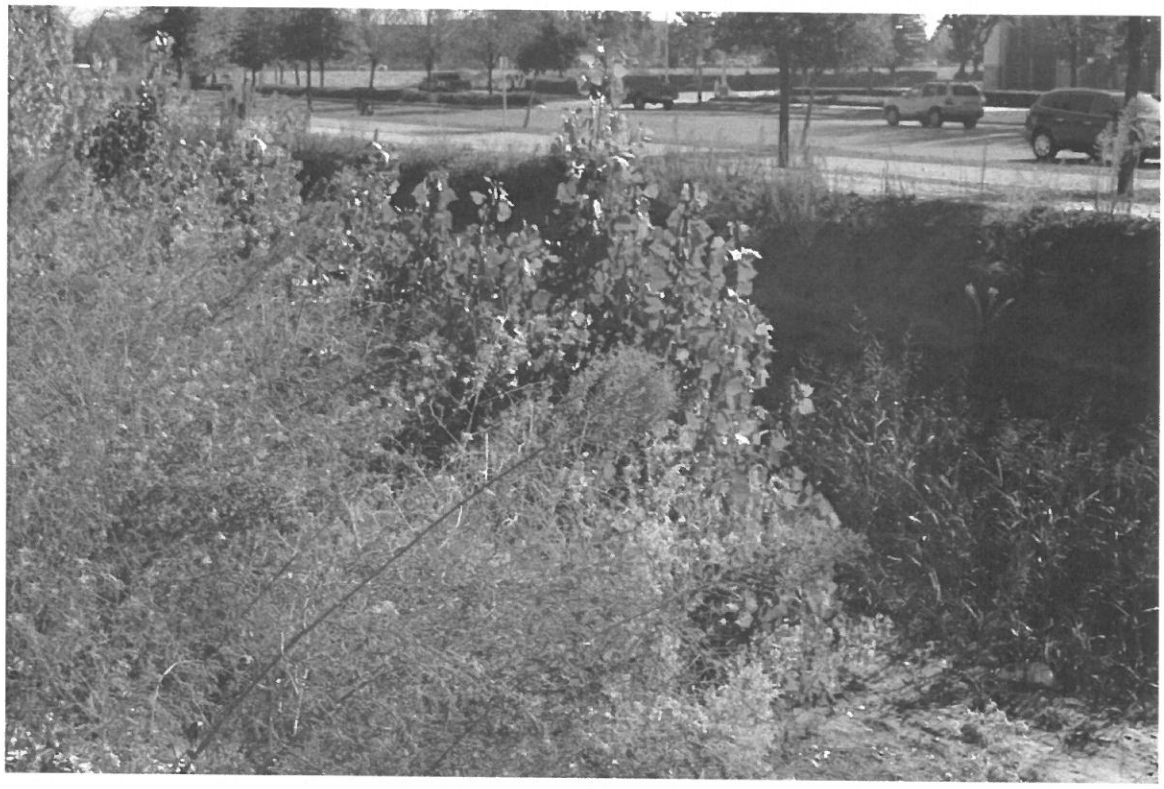

FIGURE 5 : CREEK IN BETWEEN MAINT. PERIOD WITH COTTONWOOD SUCKERS. VIEW JUST EAST OF PROPOSED BRIDGE CROSSING. (PHOTO TAKEN OCTOBER 22, 2017)

FIGURE 6 : CREEK WITH VEGETATION IN BETWEEN MAINT. PERIOD. VIEW LOOKING WEST TOWARDS MOONEY BLVD. (PHOTO TAKEN OCTOBER 22, 2017)

FIGURE 7 : VIEW LOOKING EAST NEAR PROPOSED BRIDGE LOCATION. (PHOTO TAKEN MARCH 9, 2018)

FIGURE 8 : VIEW LOOKING WEST TOWARDS MOONEY BLVD. NEAR PROPOSED BRIDGE LOCATION. (PHOTO TAKEN MARCH 9, 2018)

FIGURE 9 : VIEW LOOKING WEST WITHIN THE CREEK BOTTOM NEAR PROPOSED BRIDGE LOCATION. (PHOTO TAKEN MARCH 9, 2018)

5.2 Jurisdictional Waters and Wetlands

The Project is proposing the development of a small bridge crossing across a recognized jurisdictional water feature known as Packwood Creek. It is understood that the creek in the proposed bridge crossing location is an altered and maintained water course. The creek channel prior to the original shopping center development had been redirected and no longer exhibits any of its original creek bed, bank, contour or habitat structure. Regardless of the current conditions both the ACOE and CDFW will require permits for the development of the bridge. CDFW will require a 1602 permit and the RWQCB will require a 401 certification as bed and bank will experience permanent and temporary impacts. AEC anticipates that a Corps NWP-14 permit is likely to be accepted for this project. However, final bridge design and type will dictate the final decision of the need for a NWP-14 or a 404 permit.

5.3 Sensitive Plants

Listed sensitive plants with potential to occur in the site vicinity or surrounding areas have been identified in Table 1, and the CNDDB GIS map review (Plate 4). AEC's senior biologist is also a botanist and familiar with the species listed for this area. During the course of the site visits and the formal survey, Mr. Bissonnette did not observe any of the special status species listed in the database review. AEC acknowledges that a formal botanical survey was not conducted of the site survey area, however, based on the experience of the surveyor, the conditions and location of the site, and the fact that regular maintenance occurs within most areas of the survey area, it is the opinion of AEC that the site does not support the conditions or habitat normally needed for the special status species to occur within the project area. No further surveys or review are recommended for special status botanical species for this project.

5.4 Sensitive Wildlife

No special status wildlife was observed at the site during site visits or formal survey periods. Habitat for most species listed as special status for this project location is not present or so poor in quality that it is unlikely that the species are not likely to occur at the site (Table 3).

5.4.1 Kit Fox

The CNDDB GIS review identified an occurrence of SJKF within 3.0 miles of the site. The occurrence data was from a roadkill siting in 1975. No other database data indicated SJKF within 5. Miles of the site beyond this date. During surveys and site visits of the site no burrows, scat, sign, or indications of SJKF or their typically excepted food source were observed at the site or within the immediate vicinity. While it is excepted that there is an urban population of SJKF within the city limits of Bakersfield, no other populations of SJKF have been identified to persist outside this city. While SJKF have historically been documented within the City of Visalia and surrounding urban interface areas, the current urbanization and growth have excluded the species from the city locations and or there have been no documented occurrence data that would support the presence of the species within the area.

5.4.2 Swainson's Hawk

Occurrence data represented in the CNDDB GIS review indicated Swainson's Hawk nest locations within 7.8 miles and beyond within the project vicinity. 7of these occurrence dates are from a 2012 survey. In 2008 two other nests were documented and occurred more than 12.0 miles from the site. Swainson's Hawks typically utilize tall (~55 feet or larger), large trees of Valley Oak, Cottonwoods, Willows, Black -Walnut, and Eucalyptus that generally occur along open fields and or agricultural lands. The site location has Valley Oaks, Cottonwoods, and Sycamore trees. The trees of the site have been planted as a landscape pallet and are generally juvenile Valley Oaks to semi mature Cottonwood and Sycamore trees. The Cottonwood and Sycamores of the site are about 20 to 30 feet tall. Survey and site visits did not detect any nests of any raptor species within the trees of the site. While the trees themselves could provide potential nesting habitat for this species, there is limited foraging habitat that exists within the immediate vicinity. The closest potential foraging habitat is a little less than half a mile to the south in fragmented open space ag lands. The best foraging habitat exists more than 4.2 miles to the west. While not a significant distance for a large raptor to traverse its not a likely distance a nesting pair of Swainson's Hawks is likely to operate from as a main forage source. In addition to the lack of immediately available open space for foraging, the trees of the site are located within the southern confines of the City of Visalia where urban activity acts as a deterrent. While nest trees along Highway 198 and 99 have documented nest pairs these trees tend to be located near large open ag lands and the only deterrent is highway traffic noise and not the urban interface of buildings, power lines, garbage, and lack of space. It is the opinion of AEC that the site trees provide marginal and species type nesting trees the location and lack of observable evidential use suggests the trees of the site provide little potential for supporting nesting Swainson's hawks. However, for the purpose of mitigation development nesting raptor surveys should be implemented if work is to occur within the MBTA excepted nesting bird and raptor period. Breeding season can begin as early as February 1 of every year, with the official nesting bird season beginning March 1 of every year and extending through until August 31 of every year. Additional recommendation will be discussed in the recommendations section.

6 Recommendations

The following are recommendations that could be utilized to help offset biological impacts during permitting development and prior and or during construction activities.

1. **Preconstruction surveys**

   The following should be implemented prior to tree removal and or ground disturbance activities.

   a. A general nesting bird survey should be conducted prior to tree removal or ground disturbance activities if these activities occur within the MBTA nesting bird season.
   b. A general nesting raptor survey could be implemented if requested by agency regulators to help assess potential nesting raptors of the area during construction or tree removal at any time of the normal raptor nesting season. Agency coordination could be utilized to help identify specific timing and surveys if needed.

c. General animal and plant preconstruction surveys should occur prior to ground disturbance activities regardless of the time of year. If any special status species is detected than the project biologist would be notified, and an assessment of the siting would be implemented. Agency notification would be implemented if needed, depending upon the species observed and identified.

2. Monitoring

a. A qualified biological monitor should be utilized during initial ground disturbance and tree removal activities. If special status species are detected than the biological monitor would have the authority to halt activities until the project biologist could be notified to assess the observation and or the animal has left the site of its own accord. Work could potentially continue depending upon the status of the species observed and the location. Agency notification would occur if needed.
b. If nesting birds are observed / detected after construction activities have begun and or during construction activities, buffers of the nests could be implemented but area and duration would need to be assessed based on the species. Some species of birds are adapted to noise and urban activities and therefore may not be affected by construction. Agency notification and coordination could be implanted to help offset buffer restrictions.
c. Special Status species monitoring should occur only if special status species are observed within the site or the immediate area of the creek. Monitoring would be implemented with the coordination of the responsible agency.
d. Intermittent inspection monitoring could be utilized on a weekly to bi-weekly basis to insure construction activities are in compliance with permitting requirements.

3. Reporting and Documentation

a. Brief preconstruction reports and or monitoring reports should be developed after the completion of each survey and or monitoring task to help properly documentation biological compliance measures.

7 Limitations

The site survey is conducted with consideration for current existing environmental laws, regulations, and policies for the time that the survey was conducted. The results provided represent observations of the site at a particular point in time. The habitat(s), topography, resources, and conditions on-site can exhibit seasonal and permanent changes after the survey has been completed. Therefore, the survey report can only represent the site as it was observed during the survey period. No warranty is expressed or implied.

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9 Appendices

1. Maps/Plates

1. Site Region
2. Site Vicinity
3. Site Soils
4. Site Natural Resources (CNDDB within 5.0 miles)
5. Site National Wetlands Inventory
6. Site Survey Area
7. Site Project Tree Locations

2. Tables

1. CNPS Nine-Quad Species List
2. Observed Flora (Botanical)
3. Special Status Species (Project Specific)

3. USFWS Special Status Species List (project specific)

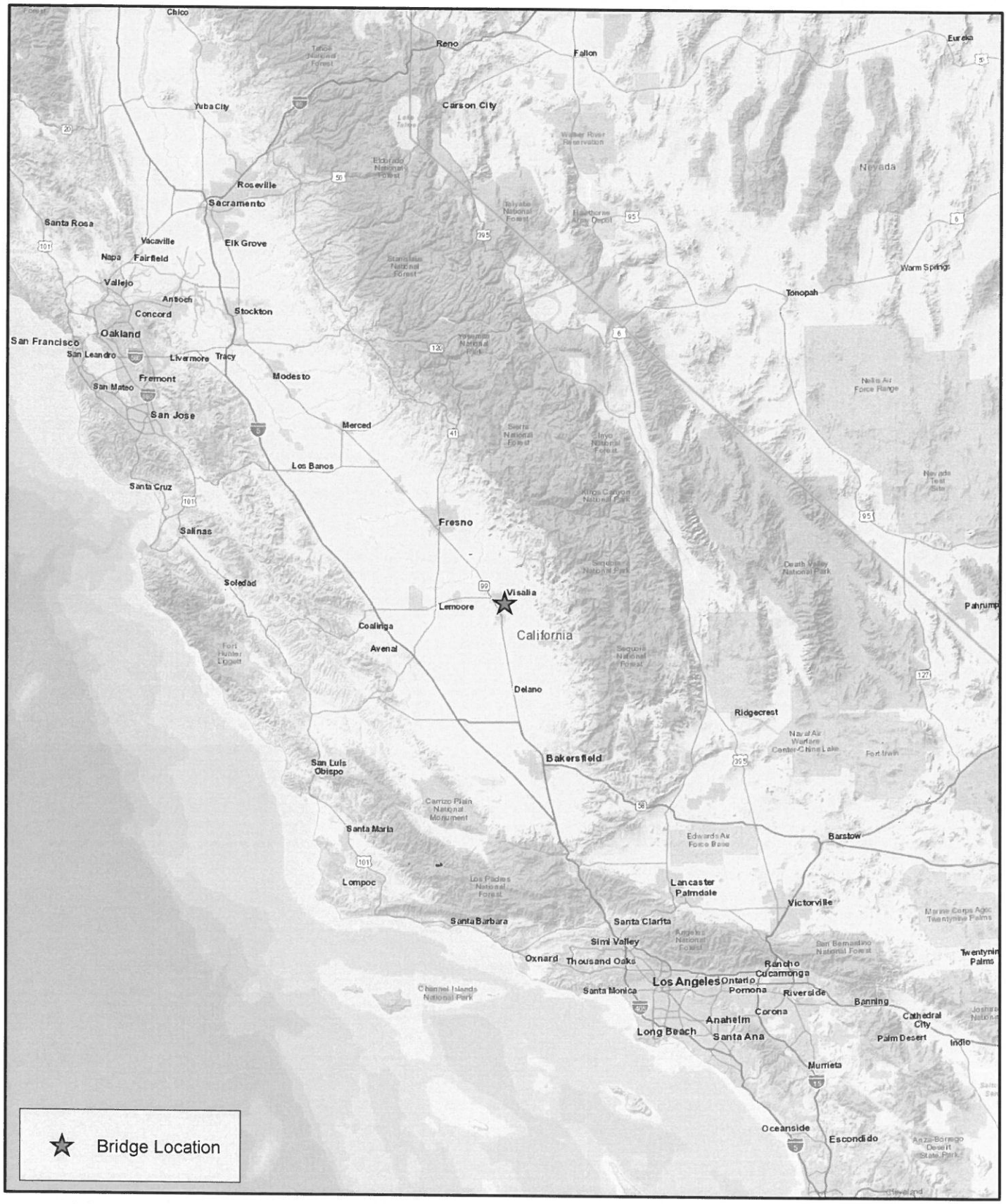

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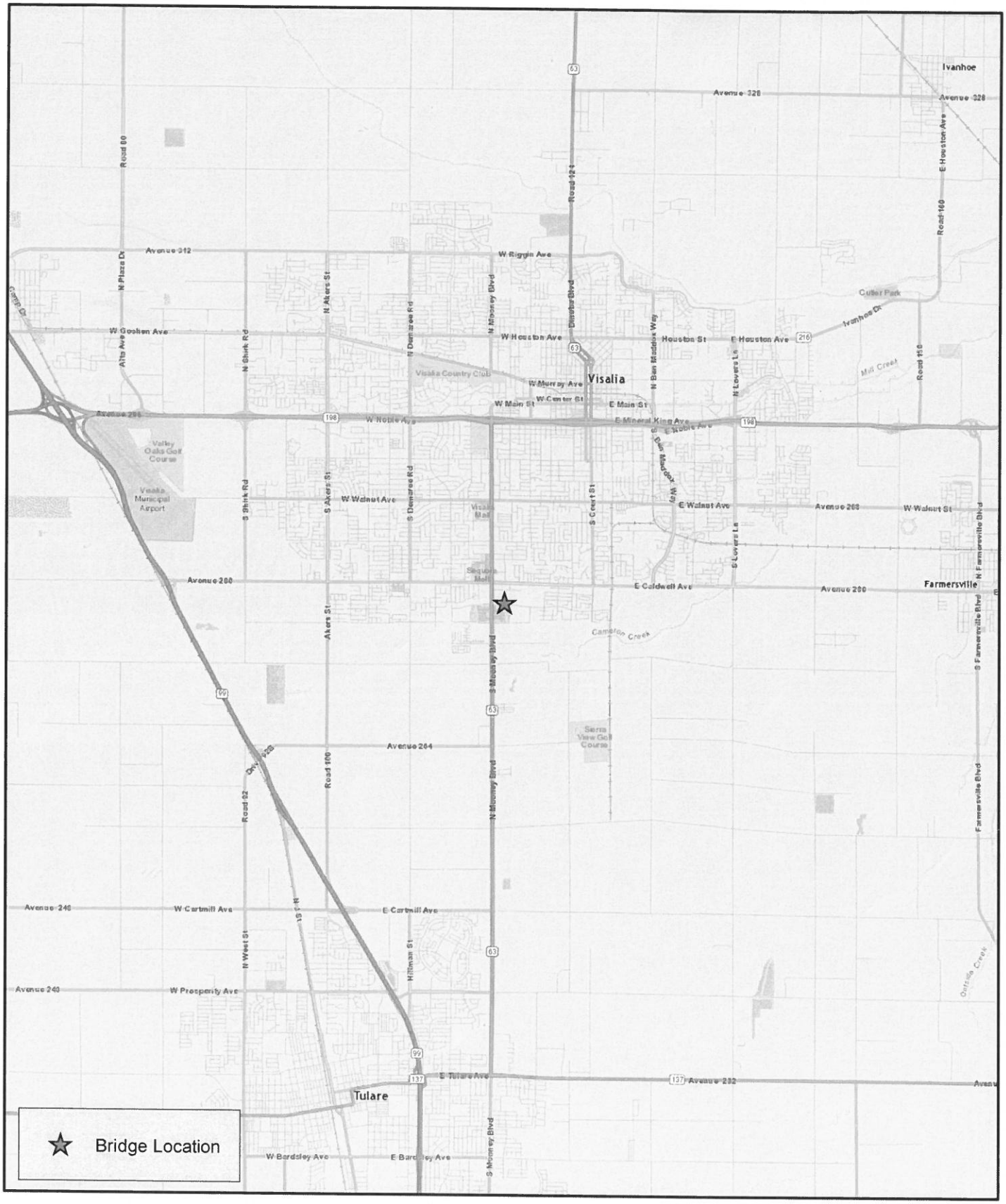
PLATE 1
Regional Map

DATE: December 07, 2017
COORDINATE SYSTEM: NAD 1983 California Teale Albers
SOURCE: ESRI World Street Map

Proposed Packwood Creek Bridge



AlphabiotA
BIOLOGICAL CONSULTING

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PLATE 2
Vicinity Map

DATE: December 07, 2017
COORDINATE SYSTEM: NAD 1983 State Plane Zone IV (feet)
SOURCE: ESRI World Street Map

Proposed Packwood Creek Bridge

PAYNTER

REALTY & INVESTMENTS, INC.

CELEBRATING 30 YEARS

June 7, 2019

Paul Scheibel
City Planner
City of Visalia
315 E. Acequia Ave
Visalia, CA 93291

RE: Revised Traffic Impact Study
SPR17-166: Sequoia Plaza Packwood Creek Bridge

Dear Paul,

With regard to the above referenced project and the memo prepared by Leslie Blair dated July 20, 2018, enclosed please find a Revised Traffic Analyses dated June 4, 2019 prepared by Peters Engineering Group, Inc.

In response to the conditions within the memo (a copy of which is enclosed for reference), we are pleased to know a full median opening on Cameron will be allowed and we agree to build out the rest of the center median on Cameron so long as we all agree on what the scope of work entails. Additionally, we agree to provide conduit for future signalization and accommodate safe crossing for bicyclists and pedestrians on the trail as a condition of design of the project. The remainder of the conditions within the memo our specifically addressed within the Revised Traffic Analyses.

Should anything further be needed, of course please do not hesitate to let me know. If there are no further comments or conditions regarding traffic analyses, then please contact me so that we can begin the environmental and construction drawing design processes.

Thanks as always for the city's time and effort on this project. We look forward to moving this project forward.

Sincerely,

James S. Sanders
Vice President of Development

CC: Leslie Blair, Jason Huckleberry, Paul Bernal, Devon Jones, John Rowland, David H. Paynter

Corporate Office: 195 South C. Street, Suite 200, Tustin, CA 92780 (714) 731-8892 FAX: (714) 731-8993
8483 N. Millbrook, Suite 104, Fresno, CA 93720 (559) 432-8892 FAX: (559) 432-8993
3303 South Mooney Blvd., Visalia CA 93277 (559) 732-5681 FAX: (559) 732-1639

City of Visalia

Memo

To: Paul Scheibel, Planning Department

From: Leslie Blair, Traffic Safety

Date: July 20, 2018

Re: Traffic Analysis
Proposed Sequoia Shopping Center Driveway

Traffic Engineering has reviewed the Traffic Analysis for the proposed Sequoia Plaza Shopping Center driveway. A full median opening on Cameron at this location would be acceptable with the following conditions:

1. Full median opening on Cameron will be allowed aligning the bridge crossing and the easterly drive in front of Lowes. With access at this location, project will be required to include build out of rest of center median on Cameron.
2. If project does not meet signal warrants at time of installation, then require to provide conduit for future signalization.
3. Project needs to address and accommodate the safe crossing of bicyclists and pedestrians on the trail with the new driveway.
4. Per COV Procedures for Traffic Impact Analysis (TIA), page 9-10, a deceleration lane may be required. With the projected traffic volumes of 15, 20, & 30%, there are at least 40 vehicles projected to be making right turns into the new driveway in both the AM and PM peak hours.
5. Traffic exiting the most westerly driveway of the Lowes shopping center on the south side of Cameron needs to be reassigned in the study and added to the trip volume at the Lowes driveway directly opposite of the new bridge crossing (Lowe's most easterly driveway). The extension of the center median will change traffic patterns, and needs to be addressed in the study.
6. The City uses Warrant 1, 8-Hour Vehicular Volume, not the Peak Hour, in determining whether or not an intersection should be considered for signalization.
7. 7.0 LANE CONFIGUARATIONS AND INTERSECTION CONTROL – Last sentence of paragraph states, "The proposed lane configurations with the new driveway are also presented in Figure 4." However, Figure 4 only shows the existing lane configurations, not the proposed.
8. Tables 7 & 8 - The intersection of Mooney and Cameron is already signalized; therefore, it would not be a mitigation measure. Tables 9 & 10 show EBL exceeds the intersection queuing. Report should list the recommended mitigation measures as this is not clearly stated in report.

Please feel free to contact me should you have any questions.

Revised Traffic Analyses

Proposed Sequoia Plaza Shopping Center Driveway

North Side of Cameron Avenue East of Mooney Boulevard
Visalia, California

Prepared For:

Sequoia Plaza Associates, L.P.
17671 Irvine Boulevard, Suite 204
Tustin, California 92780

Date:

June 4, 2019

Job No.:

17-046.01

PETERS ENGINEERING GROUP
A CALIFORNIA CORPORATION

PETERS ENGINEERING GROUP
A CALIFORNIA CORPORATION

Mr. James S. Sanders
Sequoia Plaza Associates, L.P.
17671 Irvine Boulevard, Suite 204
Tustin, California 92780

June 4, 2019

Subject: Revised Traffic Analyses
Proposed Sequoia Plaza Shopping Center Driveway
North Side of Cameron Avenue East of Mooney Boulevard
Visalia, California

Dear Mr. Sanders:

1.0 INTRODUCTION

This report presents the results of traffic analyses for the subject project in Visalia, California. The analysis focuses on the redistribution of existing trips at the shopping center and the operations of the intersection that would result from construction of the new driveway on Cameron Avenue. The study was performed in accordance with the City of Visalia *Procedures for Traffic Analysis (TIA)* updated October 2014 (City Procedures) to the extent applicable. This report supersedes a previous traffic analyses report dated May 11, 2018 and addresses comments provided by the City of Visalia in a memo dated July 20, 2018.

2.0 PROJECT DESCRIPTION

The existing Sequoia Plaza Shopping Center is located northeast of the intersection of Mooney Boulevard (State Route 63) and Cameron Avenue in Visalia, California. Packwood Creek runs along the north side of Cameron Avenue and separates the shopping center from Cameron Avenue. The shopping center has access points connecting directly to Mooney Boulevard and also has connectivity to Caldwell Avenue to the north.

A proposed bridge will establish a project access driveway over Packwood Creek connecting to Cameron Avenue. The proposed driveway will be aligned with an existing Lowe's driveway on the south side of Cameron Avenue, approximately 800 feet east of Mooney Boulevard. The City of Visalia has indicated that the proposed Project, if approved, would be required to construct a median along Cameron Avenue west of the proposed driveway. The new median would match the existing median that extends to Mooney Boulevard and would prevent left turns at the existing driveway on the south side of Cameron Boulevard approximately 400 feet east of Mooney Boulevard.

The location of the site is presented in the attached Figure 1, Site Vicinity Map, following the text of this report. The site plan is presented in Figure 2, Site Plan.

3.0 STUDY AREA AND TIME PERIOD

The study locations were determined in consultation with City of Visalia staff. Traffic counts were performed at the following intersections:

1. Mooney Boulevard / Southernmost Driveway
2. Mooney Boulevard / Chubby's Driveway
3. Mooney Boulevard / Main Driveway (north of BevMo)
4. Mooney Boulevard / James Avenue Alignment Driveway
5. Fairway Street Alignment / James Avenue Alignment intersection
6. Lowe's East Driveway / Cameron Avenue
7. Mooney Boulevard / Cameron Avenue
8. Mooney Boulevard / Caldwell Avenue
9. Stonebrook Street / Cameron Avenue
10. Lowe's West Driveway / Cameron Avenue

The study time periods include the weekday a.m. and p.m. peak hours determined between 7:00 and 9:00 a.m. and between 4:00 and 6:00 p.m.

The intersection resulting from construction of the proposed driveway will be analyzed based on the anticipated opening-year traffic volumes and year 2040 traffic volumes.

4.0 LEVEL OF SERVICE

The Transportation Research Board *Highway Capacity Manual*, 2010, (HCM2010) defines level of service (LOS) as, "A quantitative stratification of a performance measure or measures that represent quality of service, measured on an A-F scale, with LOS A representing the best operating conditions from the traveler's perspective and LOS F the worst." LOS is typically utilized as a measure of effectiveness (MOE) for the operation of transportation facilities. Automobile mode LOS characteristics for both unsignalized and signalized intersections are presented in Tables 1 and 2.

Table 1
Level of Service Characteristics for Unsignalized Intersections

Level of Service	Average Vehicle Delay (seconds)
A	0-10
B	>10-15
C	>15-25
D	>25-35
E	>35-50
F	>50

Reference: *Highway Capacity Manual,* Transportation Research Board, 2010

Table 2
Level of Service Characteristics for Signalized Intersections

Level of Service	Description	Average Vehicle Delay (seconds)
A	Volume-to-capacity ratio is low. Progression is exceptionally favorable or the cycle length is very short.	<10
B	Volume-to-capacity ratio is low. Progression is highly favorable or the cycle length is very short.	>10-20
C	Volume-to-capacity ratio is no greater than 1.0. Progression is favorable or cycle length is moderate.	>20-35
D	Volume-to-capacity ratio is high but no greater than 1.0. Progression is ineffective or cycle length is long. Many vehicles stop and individual cycle failures are noticeable.	>35-55
E	Volume-to-capacity ratio is high but no greater than 1.0. Progression is unfavorable and cycle length is long. Individual cycle failures are frequent.	>55-80
F	Volume-to-capacity ratio is greater than 1.0. Progression is very poor and cycle length is long. Most cycles fail to clear the queue.	>80

Reference: *Highway Capacity Manual,* Transportation Research Board, 2010

5.0 SIGNIFICANCE CRITERIA

5.1 Level of Service

The Visalia General Plan and the City Procedures indicate that LOS D is the minimum acceptable LOS standard on city roadways. Therefore, the intersection resulting from construction of the proposed driveway will be required to operate at LOS D or better.

5.2 Intersection Queuing Criteria

The City Procedures require an analysis of queuing for turn lanes. The intersection resulting from construction of the proposed driveway should be designed with storage lanes that accommodate the calculated 95th-percentile queue lengths.

6.0 EXISTING TRAFFIC VOLUMES

Existing peak-hour traffic volumes at driveways providing access to the Sequoia Plaza Shopping Center were determined by performing manual turning-movement counts between 7:00 and 9:00 a.m. and between 4:00 and 6:00 p.m. on a weekday. Traffic counts were also performed at nearby intersections to provide an understanding of the regional distribution of traffic. The data sheets are presented in Appendix A and indicate the dates the counts were performed. The existing peak-hour turning movement volumes are presented in Figure 3, Existing Peak-Hour Traffic Volumes.

7.0 LANE CONFIGURATIONS AND INTERSECTION CONTROL

The existing and proposed lane configurations and intersection control at the intersection of Cameron Avenue and the Lowe's driveway (opposite the proposed Sequoia Plaza driveway) are presented in Figure 4, Lane Configurations and Intersection Control.

8.0 TRIP GENERATION

The proposed driveway is not anticipated to generate new trips to the Sequoia Plaza Shopping Center. Instead, existing trips are expected to redistribute as some visitors will find access to be more convenient via the new driveway. Driveways providing access to the Sequoia Plaza Shopping Center were counted to determine the total number of trips accessing the shopping center during the peak hours on a typical weekday. Table 3 presents the totals obtained from the traffic counts.

Table 3
Sequoia Plaza - Existing Peak Hour Trips

Time Period	Trips Entering Site	Trips Exiting Site	Total Trips
Weekday A.M. Peak Hour	251	143	394
Weekday P.M. Peak Hour	571	626	1,197

The actual number of trips expected to be redistributed to the new driveway cannot be determined with certainty. However, it is our opinion that the redistributed volume is likely to be between 10 percent and 30 percent of the total number of trips presented in Table 3. Therefore, Table 4 presents an estimate of the volume of trips likely to utilize the proposed driveway.

Table 4
Sequoia Plaza - Estimated Trips at Proposed Driveway

Time Period	Percentage of Total	Trips Entering Driveway	Trips Exiting Driveway	Total Driveway Trips
Weekday A.M. Peak Hour	10	25	15	40
	15	38	22	60
	20	50	29	79
	30	76	43	119
Weekday P.M. Peak Hour	10	57	63	120
	15	86	94	180
	20	115	125	240
	30	172	188	360

The distribution of Project trips at the new driveway was estimated based on the existing traffic volumes. The peak-hour Project traffic volumes at the proposed driveway for each scenario in Table 4 are presented in Figure 5, Peak Hour Project Traffic Volumes.

9.0 EXISTING-PLUS-PROJECT TRAFFIC VOLUMES

The existing-plus-Project peak-hour turning movement volumes for each scenario in Table 4 are presented in Figure 6, Existing-Plus-Project Peak-Hour Traffic Volumes. Trips making

left turns at the western Lowe's driveway were redistributed to account for the required median on Cameron Avenue.

10.0 YEAR 2040 CUMULATIVE TRAFFIC VOLUMES

The Tulare County Association of Governments (TCAG) maintains a travel model that is typically used to forecast future traffic volumes. An increment method was utilized to forecast traffic volumes for future conditions by determining the growth projected by the model between the base year and the analysis year. This growth is added to the existing traffic volumes and the result is the predicted future traffic volume. The TCAG travel model data output is included in Appendix B.

Forecasts of future turning movements were based on the methods presented in Chapter 8 of the Transportation Research Board National Cooperative Highway Research Program Report 255 entitled *"Highway Traffic Data for Urbanized Area Project Planning and Design."*

The year 2040 cumulative traffic volumes at the proposed driveway for each scenario in Table 4 are presented in Figure 7, 2040 Cumulative With-Project Traffic Volumes.

11.0 INTERSECTION ANALYSES

11.1 Operational Analysis

The levels of service at the study intersections along Cameron Avenue were determined using the computer program Synchro 9, which is based on the HCM2010 procedures for calculating levels of service. The intersection analysis sheets are included in Appendix C.

Table 5 presents the results of the intersection analyses at the study intersections on Cameron Avenue for the existing conditions. Substandard levels of service and delays are presented in bold type.

Table 5
Intersection LOS Summary – Existing Conditions

Intersection	Control	A.M. Peak Hour		P.M. Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
Mooney / Cameron	Traffic Signals	15.2	B	23.7	C
Lowe's / Cameron	One-way stop	10.6	B	12.6	B
Stonebrook / Cameron	One-way stop	**48.5**	**E***	**39.3**	**E***

* LOS E is for the northbound-to-westbound left turn. Traffic volume is 1 vehicle during the a.m. peak hour and 9 vehicles during the p.m. peak hour. All other movements operate at LOS B or better.

Table 6 presents the results of the intersection analyses for existing-plus-Project conditions at the proposed driveway for each of the trip-generation conditions presented in Table 4. The analyses include the assumption that two-way stop control would be installed. Substandard levels of service and delays are presented in bold type.

Table 6
Intersection LOS Summary – Existing-Plus-Project Conditions

Intersection	Control	A.M. Peak Hour		P.M. Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
Lowe's / Cameron / New Driveway (10%)	Two-way stop	17.9	C	37.7	**E**
Lowe's / Cameron / New Driveway (15%)	Two-way stop	18.6	C	43.6	**E**
Lowe's / Cameron / New Driveway (20%)	Two-way stop	19.3	C	**50.7**	**F**
Lowe's / Cameron / New Driveway (30%)	Two-way stop	21.0	C	**105.5**	**F**

For each scenario presented in Table 6, the worst-case LOS occurs on either the northbound or the southbound approach exiting the driveways. The LOS on the eastbound and westbound left-turn approaches of Cameron Avenue is A for all scenarios.

11.2 Traffic Signal Warrants

The California State Transportation Agency and California Department of Transportation *California Manual on Uniform Traffic Control Devices, 2014 Edition (Including Revision 3)* (CMUTCD) presents various criteria (warrants) for determining the need for traffic signals. The CMUTCD states that an engineering study of traffic conditions, pedestrian characteristics, and physical characteristics of the location shall be performed to determine whether installation of a traffic control signal is justified at a particular location. The investigation of the need for a traffic control signal shall include an analysis of the applicable factors contained in the following traffic signal warrants:

Warrant 1, Eight-Hour Vehicular Volume.
Warrant 2, Four-Hour Vehicular Volume.
Warrant 3, Peak Hour.
Warrant 4, Pedestrian Volume.
Warrant 5, School Crossing.
Warrant 6, Coordinated Signal System.
Warrant 7, Crash Experience.
Warrant 8, Roadway Network.
Warrant 9, Intersection Near a Grade Crossing

If one or more of the signal warrants is met, signalization of the intersection may be appropriate. However, a signal likely should not be installed if none or few of the warrants are met since the installation of signals may increase delays on the previously uncontrolled major street and may contribute to an increase in accidents.

The CMUTCD indicates that the engineering study should consider the effects of the right-turn vehicles from the minor-street approaches, and that engineering judgment should be used to determine what, if any, portion of the right-turn traffic is subtracted from the minor-street traffic count when evaluating the count against the signal warrants.

The installation of a traffic signal can serve as mitigation when a significant impact is identified at an unsignalized intersection and traffic signal warrants are satisfied. If warrants are not satisfied, traffic signals would not be considered as a feasible mitigation.

Although the City typically utilizes Warrant 1, Eight-Hour Vehicular Volume, to determine the need for traffic signals, the use of Warrant 1 in this case is highly speculative because it involves redistribution of traffic from many different driveways at the Sequoia Plaza plus redistribution from one Lowe's driveway as a result of the new median on Cameron Avenue over many different hours of the day. Therefore, the use of peak hour volumes for purposes of this report is considered applicable to provide a general sense of the need for traffic signals.

A review of peak-hour traffic signal warrants (included in Appendix D), considering that the need for signals is primarily a function of left turns from the driveways, suggests that traffic signals may be warranted at the intersection of Cameron Avenue and the proposed driveway, including the Lowe's driveway, if more than 20 percent of the existing Sequoia Plaza trips redistribute to the new driveway.

11.3 Deceleration Lane

The City Procedures indicate that a deceleration lane is required if at least 40 vehicles are expected to make right turns into a driveway for a one-hour period. It is anticipated that the right-turn volume would exceed 40 vehicles per hour if approximately 15 percent or more of the existing Sequoia Plaza trips redistribute to the new driveway.

11.4 Discussion and Mitigation Measures

The results of the intersection analyses suggest that the intersection with the new driveway on Cameron Avenue is expected to operate at LOS E or F as a two-way stop-controlled intersection during the weekday p.m. peak hour if as little as 10 percent of the Sequoia Plaza Shopping Center trips redistribute to the new driveway. However, traffic signals would likely not be warranted at the proposed driveway unless more than 20 percent of the existing shopping center traffic redistributes to the new driveway. Traffic signals should not be installed unless warranted based on actual traffic volumes because they could cause unnecessary delays to the eastbound and westbound approaches (which are not expected to experience excessive delays with two-way stop control). Since traffic signals should only be installed if warranted, it is recommended that installation of traffic signals be deferred until the new driveway has opened and a complete set of traffic signal warrants, including Warrant 1, Eight-Hour Vehicular Volume, per the City Procedures, can be analyzed based on observed volumes.

Tables 7 and 8 present intersection analyses for the mitigated conditions along the Cameron Avenue corridor assuming signalization of the new driveway intersection with 30 percent shopping center trips. The analyses for the year 2040 include the assumption that the intersection of Stonebrook Street and Cameron Avenue will be signalized.

Table 7
Intersection LOS Summary – Mitigated Existing-Plus-Project Conditions

Intersection	Control	A.M. Peak Hour		P.M. Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
Lowe's / Cameron / New Driveway (30%)	Traffic Signals	10.3	B	11.7	B

Table 8
Intersection LOS Summary – Mitigated Year 2040 With-Project Conditions

Intersection	Control	A.M. Peak Hour		P.M. Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
Lowe's / Cameron / New Driveway (30%)	Traffic Signals	10.3	B	12.5	B

The results of the intersection operational analyses include an estimate of the 95th-percentile queue lengths at the study intersections. The storage capacity and the calculated 95th-percentile queue lengths are presented in Tables 9 and 10. Queue lengths that exceed the existing storage capacity are indicated in bold type.

Notes and abbreviations for Tables 9 and 10:

EB: Eastbound WB: Westbound NB: Northbound SB: Southbound
L: Left-turn lane T: Through lane R: Right-turn lane
S: Shared with through lane OS: On site
All lengths are reported in feet.

Table 9
Intersection Queuing Summary – Mitigated Existing-Plus-Project Conditions

Intersection		Storage and Queue Length (feet)											
		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lowe's / Cameron / New Driveway	Storage	+	700	S	+	*	S	S	OS	S	OS	OS	S
	A.M.	29	43	-	34	65	-	-	21	-	19	14	-
	P.M.	60	116	-	62	90	-	-	52	-	59	29	-

* Greater than 1,000 feet to next major intersection.
\+ To be designed based on Year 2040 conditions