

COUNTY OF TULARE  
RESOURCE MANAGEMENT AGENCY



5961 South Mooney Boulevard  
Visalia, CA 93277

Initial Study and Mitigated Negative Declaration

Ivanhoe Community Plan 2019

GPA 17-006 (Community Plan)

PZC 18-008 (Zoning District Map)

PZC 18-006 (Section 18.9 Zoning Ordinance - Mixed Use)

PZC 18-007 (Section 16 Zoning Ordinance - By Right)

May 2019

Prepared by  
County of Tulare Resource Management Agency  
Economic Development and Planning Branch  
Environmental Planning Division

## INITIAL STUDY CHECKLIST

1. **Project Title:** Draft Ivanhoe Community Plan 2019 Update
2. **Lead Agency:** County of Tulare  
Resource Management Agency  
5961 S. Mooney Blvd.  
Visalia, CA 93277
3. **Contact Persons:** Jessica Willis, Planner IV (Project Planner) – 559-624-7122  
Hector Guerra, Chief, Environmental Planning Division – 559-624-7121
4. **Project Location** Ivanhoe (see **Figure 1**) is a census-designated place located in the northwest portion of Tulare County, northeast of Visalia. Ivanhoe is bounded by Avenue 320 in the south, Avenue 336 in the north, Road 152 in the west, and Road 164 in the east and encompasses 2 square miles of land. SR 216 traverses the southeastern portion of the Community and provides access to SR 198 in Visalia (approximately ten miles southwest of Ivanhoe). SR 99 is located approximately 13 miles west of Ivanhoe. The community is generally rectangular in shape and is bisected in a northwest-southeasterly direction by the San Joaquin Valley Railroad tracks. North-south railroad crossings exist along Road 156, Road 159, and Road 160 (Depot Drive). East-west railroad crossing exist along Avenue 332, Avenue 330, and SR 216 (Avenue 328). Ivanhoe is located in Sections 1, 2, 11 & 12, Township 18 South, Range 25 East MDB&M, and can be found within the Ivanhoe and Exeter Quads, United States Geological Survey 7.5 minute topographic quadrangles. Ivanhoe is located at an elevation of 285 feet above sea level.
5. **Latitude, Longitude:** Latitude: 36° 26' 16" N and Longitude: 119° 23' 9" W
6. **Applicant:** County of Tulare  
Resource Management Agency  
5961 S. Mooney Blvd.  
Visalia, CA 93277
7. **General Plan Designation:** General Plan Amendment
8. **Zoning:** AE-20; C-1; C-2; C-2-SR; C-3; M-1; M-1-SR; R-1; R-2; R-3; R-A; Z; Rights-of-Way
9. **Description of Project (Describe the whole action involved, including but not limited to later phases of the project, and any secondary, support, or off-site features necessary for its implementation. Attach additional sheets if necessary.)**

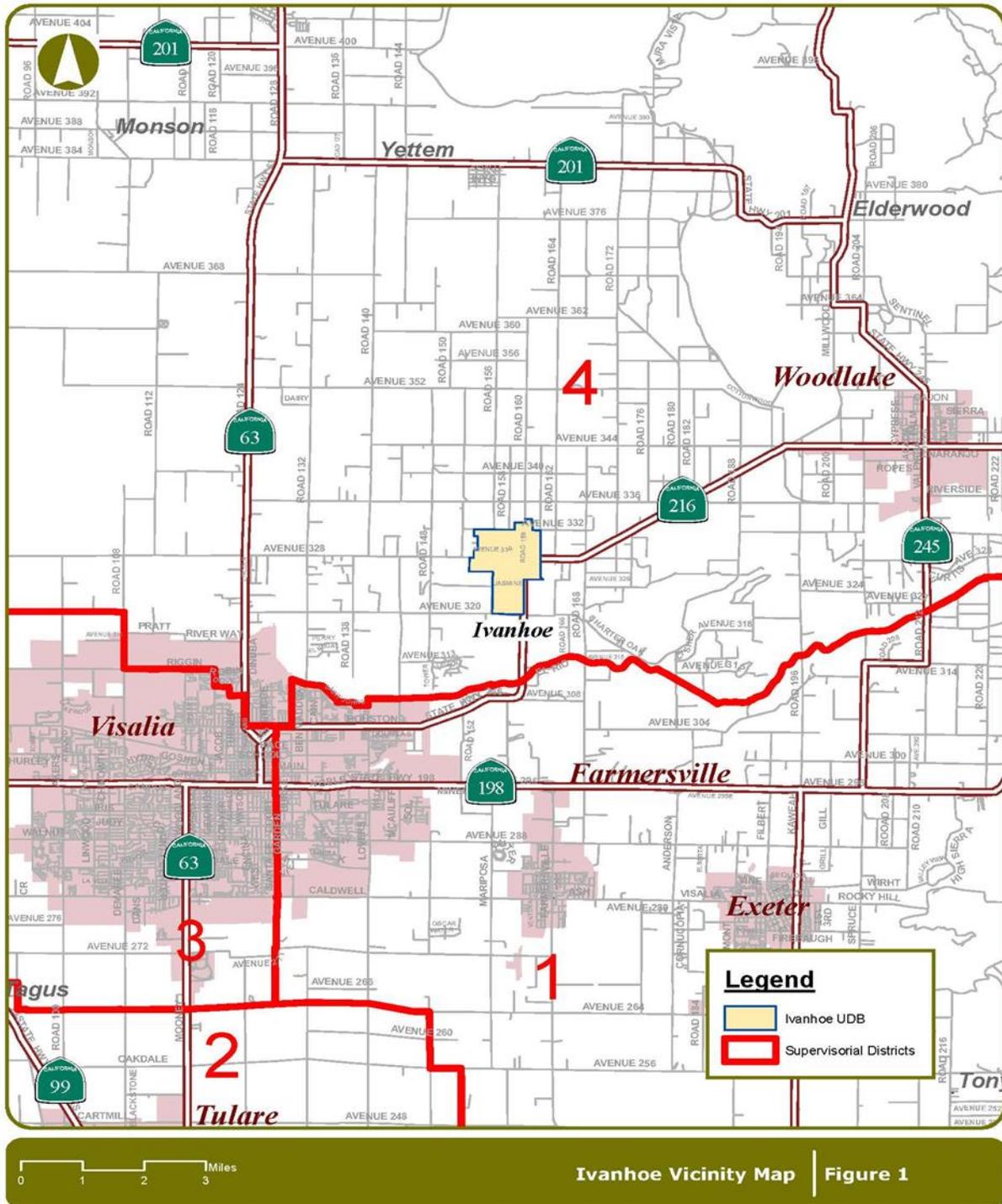
The objective in the preparation of the Ivanhoe Community Plan Update is to develop a plan, which can accurately reflect the needs and priorities of the unincorporated community of Ivanhoe. In addition, the County has prepared an Initial Study/Mitigated Negative Declaration (MND). The MND addresses the potential environmental effects of the proposed plan, assists in fostering future economic development opportunities and grants, which can tier off the General Plan's Environmental Impact Report (EIR) and the Community Plan MND.

Ivanhoe is currently designated an Unincorporated Community in the 2030 Tulare County General Plan (2012). It has become apparent that a more precise plan is needed to increase the availability of infrastructure funding (such as drinking water system improvements: wells, water distribution piping, storage tanks, curbs, gutters, and sidewalks, etc.) and to stimulate economic development within the community.

As with any community plan, the contents of this document are not intended to be absolute. Planning is a continuous process and, to be effective, requires periodic re-evaluation and revision to reflect changing needs and priorities. This Plan, therefore, should be reviewed on a periodic basis with the assistance and participation of local citizens, groups, and agencies.

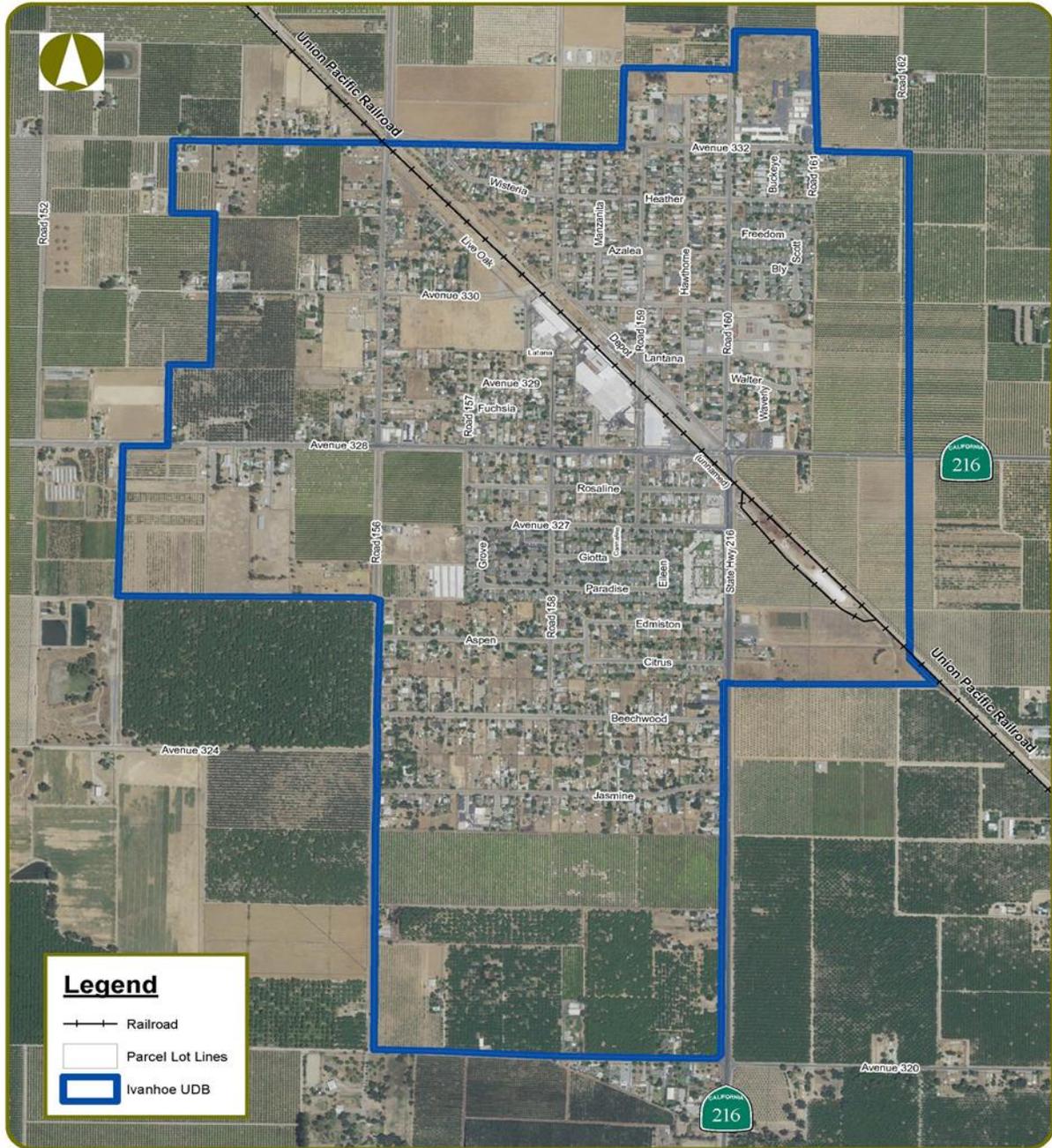
10. **Surrounding land uses and setting (Brief description):** Ivanhoe (see Figure 2) is an agriculturally oriented service community surrounded on all sides by lands in agricultural production, scattered rural residential uses and vacant land. Cities and communities surrounding Ivanhoe include Visalia to the southwest, Woodlake to the northeast, and the unincorporated communities of Yettlem and Seville to the north.
11. **Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement):** None.
12. **Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so, has consultation begun?** Pursuant to AB 52 and SB 18, a Sacred Land File request was submitted to the Native American Heritage Commission on October 4, 2018 and was returned with negative results. On October 25, 2018, tribal consultation notices were sent to tribal contacts representing six (6) Native American tribes. The County received no responses from the tribes within the 30-day response time. Mitigation measures have been included in the project to reduce potential impacts on tribal cultural resources in the event that any are unearthed during construction-related activities.

**Figure 1  
Vicinity Map**



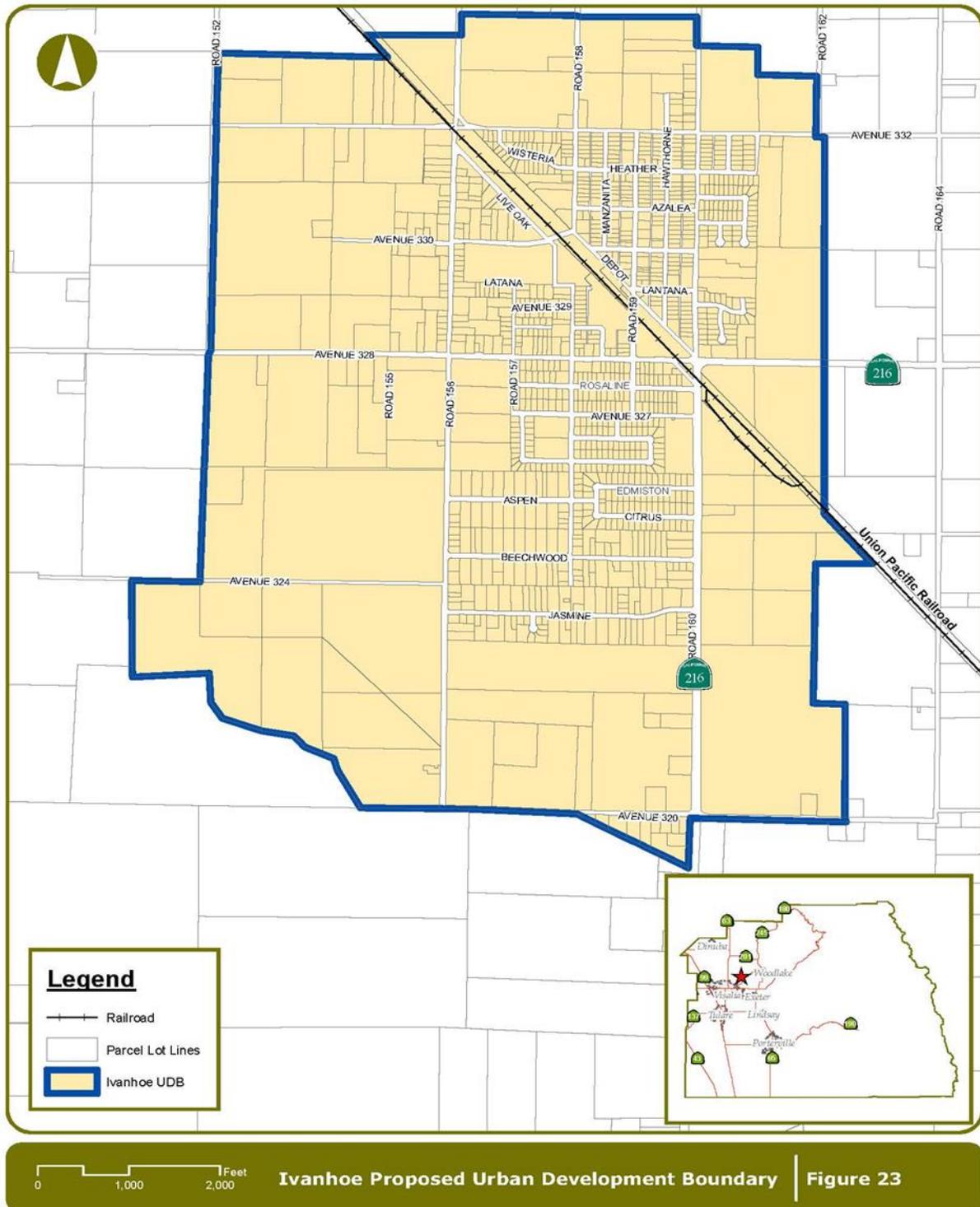
**Ivanhoe Vicinity Map | Figure 1**

## Figure 2 Aerial Map

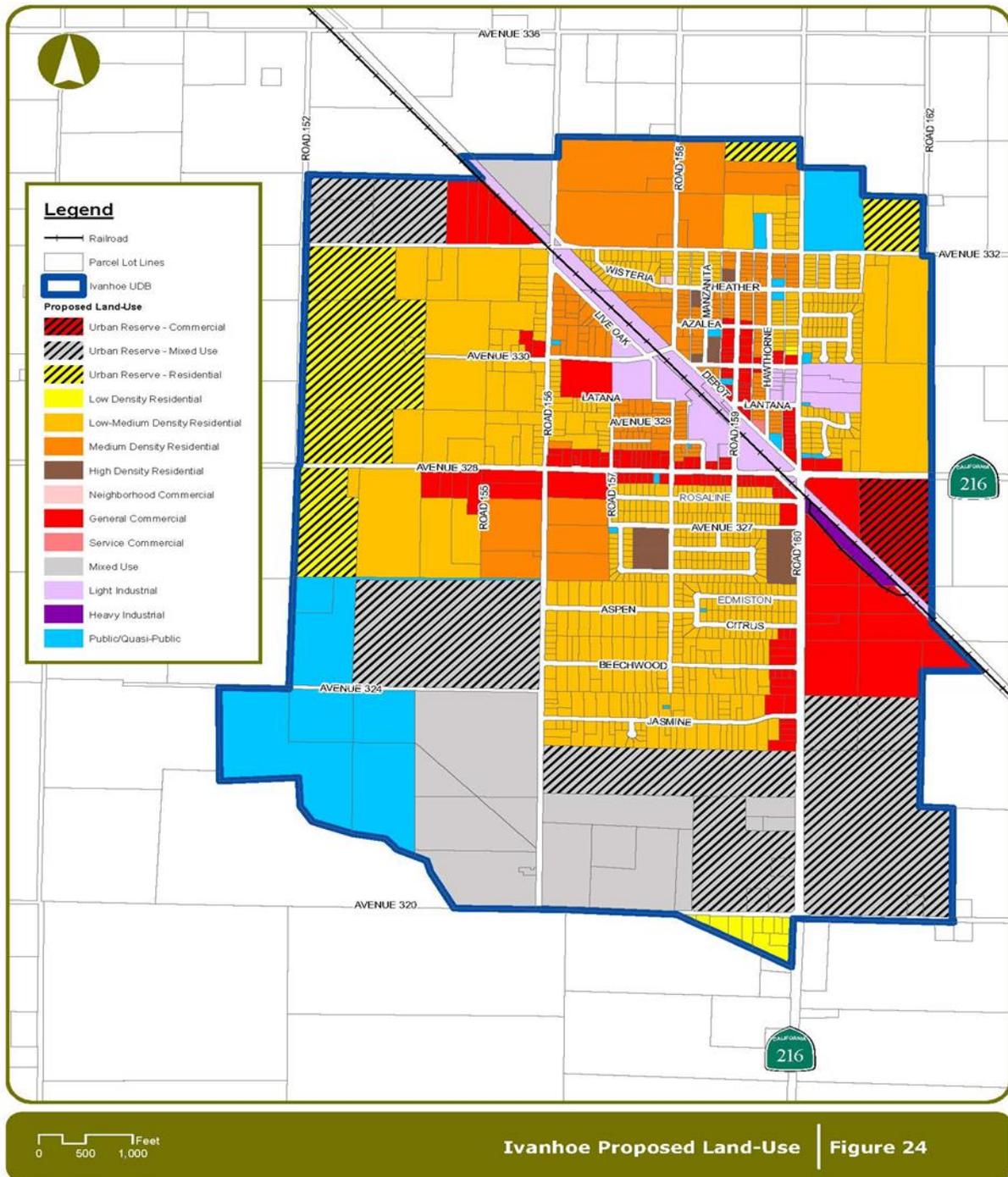


Ivanhoe Aerial Map | Figure 2

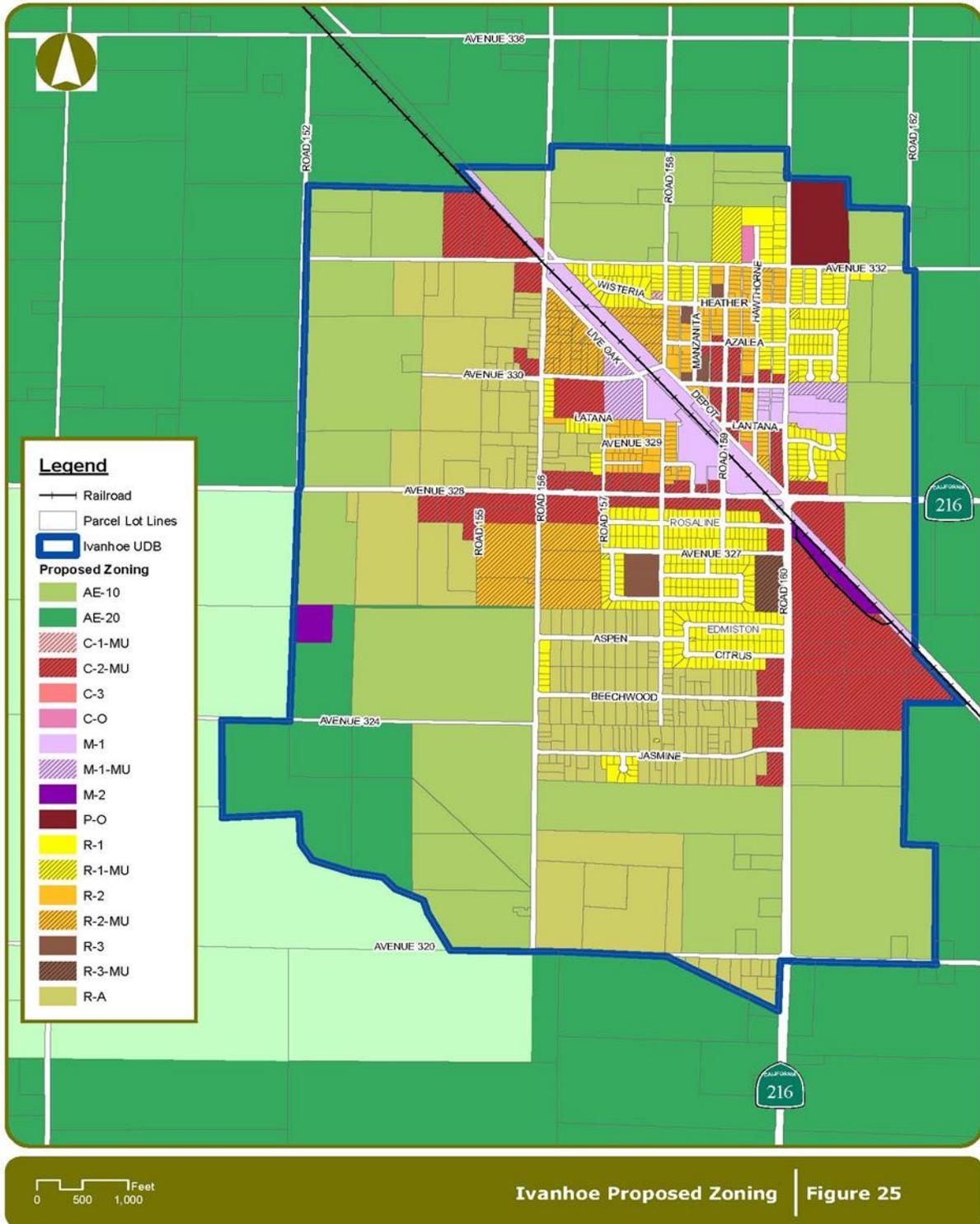
**Figure 3  
Proposed Urban Development Boundary**



**Figure 4  
Ivanhoe Proposed Land Use Plan**



**Figure 5  
Ivanhoe Proposed Zoning District Map**



**ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:**

**A.** The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a “Potentially Significant Impact” “unless mitigated” as indicated by the checklist on the following pages.

- |  |   |  |
|--|---|--|
| <input type="checkbox"/> Aesthetics                          | <input type="checkbox"/> Agriculture and Forestry Resources   | <input type="checkbox"/> Air Quality                 |
| <input checked="" type="checkbox"/> Biological Resources     | <input checked="" type="checkbox"/> Cultural Resources        | <input type="checkbox"/> Geology / Soils             |
| <input type="checkbox"/> Greenhouse Gases                    | <input type="checkbox"/> Hazards and Hazardous Materials      | <input type="checkbox"/> Hydrology / Water Quality   |
| <input type="checkbox"/> Land Use / Planning                 | <input type="checkbox"/> Mineral Resources                    | <input type="checkbox"/> Noise                       |
| <input type="checkbox"/> Population / Housing                | <input type="checkbox"/> Public Services                      | <input type="checkbox"/> Recreation                  |
| <input checked="" type="checkbox"/> Transportation / Traffic | <input checked="" type="checkbox"/> Tribal Cultural Resources | <input type="checkbox"/> Utilities / Service Systems |
| <input type="checkbox"/> Mandatory Findings of Significance  |   |  |

**B. DETERMINATION:**

On the basis of this initial evaluation:

- I find that the proposed project **COULD NOT** have a significant effect on the environment, and a **NEGATIVE DECLARATION** will be prepared.
- I find that although the proposed project could have a significant effect on the environment, there **WILL NOT** be a significant effect in this case because revisions in the project have been made or agreed to by the project proponent. A **MITIGATED NEGATIVE DECLARATION** will be prepared.
- I find that the proposed project **MAY** have a significant effect on the environment, and an **ENVIRONMENTAL IMPACT REPORT** is required.
- I find that the proposed project **MAY** have a “potentially significant impact” or “potentially significant unless mitigated” impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An **ENVIRONMENTAL IMPACT REPORT** is required, but it must analyze only the effects that remain to be addressed.
- I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier **EIR** or **NEGATIVE DECLARATION** pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier **EIR** or **NEGATIVE DECLARATION**, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature: \_\_\_\_\_

Hector Guerra  
Printed Name

Date: \_\_\_\_\_

Chief Environmental Planner  
Title

Signature: \_\_\_\_\_

Reed Schenke, P.E.  
Printed Name

Date: \_\_\_\_\_

Environmental Assessment Officer  
Title

## C. EVALUATION OF ENVIRONMENTAL IMPACTS:

- 1) A brief explanation is required for all answers except “No Impact” answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A “No Impact” answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A “No Impact” answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
- 2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
- 3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. “Potentially Significant Impact” is appropriate if there is substantial evidence that an effect may be significant. If there are one or more “Potentially Significant Impact” entries when the determination is made, an EIR is required.
- 4) “Negative Declaration: Less Than Significant With Mitigation Incorporated” applies where the incorporation of mitigation measures has reduced an effect from “Potentially Significant Impact” to a “Less Than Significant Impact.” The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from “Earlier Analyses,” as described in (5) below, may be cross-referenced).
- 5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:
  - a) Earlier Analysis Used. Identify and state where they are available for review.
  - b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
  - c) Mitigation Measures. For effects that are “Less than Significant with Mitigation Measures Incorporated,” describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.
- 6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.
- 7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.
- 8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project’s environmental effects in whatever format is selected.
- 9) The explanation of each issue should identify:
  - a) the significance criteria or threshold, if any, used to evaluate each question; and
  - b) the mitigation measure identified, if any, to reduce the impact to less than significance.

|           |   | SIGNIFICANT IMPACT       | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT        | NO IMPACT                           |
|-----------|---|--------------------------|--|-------------------------------------|-------------------------------------|
| <b>1.</b> | <b>AESTHETICS</b>   |                          |  |                                     |                                     |
|           | Would the project:  |                          |  |                                     |                                     |
| a)        | Have a substantial adverse effect on a scenic vista?  | <input type="checkbox"/> | <input type="checkbox"/>                     | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| b)        | Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway? | <input type="checkbox"/> | <input type="checkbox"/>                     | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| c)        | Substantially degrade the existing visual character or quality of the site and its surroundings?  | <input type="checkbox"/> | <input type="checkbox"/>                     | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| d)        | Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?                                    | <input type="checkbox"/> | <input type="checkbox"/>                     | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Analysis:

The following Tulare County General Plan 2030 Update policies for this resource apply to this Project:

The Ivanhoe Urban Development Boundary (UDB) contains approximately 812 acres (including Rights-of-way); the proposed amendment will increase the UDB by approximately 582.20 acres, for a total of approximately 1,394.20 acres.<sup>1</sup> No proposed development projects are part of this proposed amendment. However, over time, the proposed 582-acre expansion and ultimate planned development within the Planning Area could impact the area's aesthetic character as future development replaces existing agricultural lands and rural open spaces. At the time of development, existing General Plan policies and proposed Community Plan policies will be implemented to avoid and/or minimize any potentially adverse impacts to scenic views (for example, *ERM-1.15 Minimize Lighting Impacts* and *ERM-5.18 Night Sky Protection*).

SR 216 (Avenue 328) west of SR 63 traverses through Ivanhoe as it continues easterly toward the City of Woodlake and is designated a County Scenic Road<sup>2</sup>. As with much of Tulare County, the Sierra Nevada mountains are visible when conditions (such as haze, fog, or air quality) do not interfere with visibility. Implementation of General Plan policies (for example, *SL-1.1 Natural Landscapes* and *SL-2.1 Designated Scenic Routes and Highways*) are intended to minimize impacts to views of landscapes. Future development design will be required to consider potential visual impacts to the surrounding areas, and set-back requirements and building height limitations contained in the Tulare County Zone Ordinance will also prevent adverse impacts to a scenic vista.

a) **No Impact** - The proposed Project is a Community Plan Update and contains no plans for development or construction projects. The Project will not adversely affect any scenic vista; as such, it will not include any structures which may substantially impact a scenic vista. As such, there will be no impact to this resource.

b) **No Impact** - The proposed Project area includes a mix of uses such as single-family residential, commercial, light industrial, and public use (elementary and middle schools). The community is completely surrounded by agriculturally

<sup>1</sup> Draft Ivanhoe Community Plan 2019 Update. Pages 24, 25, 162.

<sup>2</sup> Tulare County General Plan 2030 Update, Part I, Figure 7-1. Page 7-5. Accessed May 2019 at: <http://generalplan.co.tulare.ca.us/documents/GeneralPlan2010/GeneralPlan2030Update.pdf>

|  |   | <b>SIGNIFICANT IMPACT</b> | <b>LESS THAN SIGNIFICANT IMPACT WITH MITIGATION</b> | <b>LESS THAN SIGNIFICANT IMPACT</b> | <b>NO IMPACT</b> |
|--|---|---------------------------|---|-------------------------------------|------------------|
|  | productive lands (such as orchards and row crops). As such, the proposed Community Plan Update will not impact scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state or county designated scenic highway or county designated scenic road. Therefore, there will be no impact to this resource.  |                           |   |                                     |                  |
|  | c) <b>No Impact</b> - The Community Plan Update will ultimately expand the existing UDB from 915 acres to 1,585 acres. The Update does not include any plans for construction or development. As noted earlier, future development design will be required to consider potential visual impacts to the surrounding areas, and set-back and building height limitations contained in the Tulare County Zone Ordinance will also prevent any adverse impacts to a scenic vista. The predominantly agricultural scenery surrounding the Community will remain unchanged as a result of the proposed update. As such, there will be no impact to this resource.   |                           |   |                                     |                  |
|  | d) <b>No Impact</b> - The proposed Community Plan Update will not result in the creation of a new source of substantial light or glare which would adversely affect day or nighttime views in the area. Over the course to the planning horizon, the Plan acknowledges that additional development and growth will likely occur in the planning area that could lead to future impacts from light or glare. Various General Plan Policies are anticipated to minimize impacts from light or glare sources. Evening hour lighting for safety and security purposes cannot be determined until specific locations and development proposals are received. However, there are several General Plan Policies (such as <i>ERM-1.15</i> Minimize Lighting Impacts, <i>LU-4.5</i> Commercial Building Design, <i>LU-7.19</i> Minimize Lighting Impacts, and <i>SL-1.2</i> Working Landscapes) that require new development to minimize lighting impacts. Therefore, the Project will result in no impact to this resource. |                           |   |                                     |                  |

**2. AGRICULTURAL AND FOREST RESOURCES**

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the Rural Valley Lands Plan point evaluation system prepared by the County of Tulare as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state’s inventory of forest land, including the Forest and Range Assessment project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:

|    |   |                          |                          |                          |                                     |
|----|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) | Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b) | Conflict with existing zoning for agriculture use, or a Williamson Act contract?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| c) | Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources code 12220(g), timberland (as defined in Public Resource Code section  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

|    |  | SIGNIFICANT IMPACT       | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT                           |
|----|--|--------------------------|--|------------------------------|-------------------------------------|
|    | 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?   |                          |  |                              |                                     |
| d) | Result in the loss of forest land or conversion of forest land to non-forest use?  | <input type="checkbox"/> | <input type="checkbox"/>                     | <input type="checkbox"/>     | <input checked="" type="checkbox"/> |
| e) | Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use? | <input type="checkbox"/> | <input type="checkbox"/>                     | <input type="checkbox"/>     | <input checked="" type="checkbox"/> |

Analysis:

a) - e) **No Impact** - Existing uses include a mix of single-family residences, highway and general commercial, light manufacturing, public (school), and agricultural uses. As noted earlier, the Project does not include any development projects/proposals; however, future development is anticipated to occur within the proposed UDB area over time. Development within the Planning Area would, over time, affect the area's agricultural lands and rural open spaces as future urban development occurs. The Ivanhoe UDB expansion would result in the addition of approximately 582 acres to the existing UDB area. The overall land use pattern will remain as currently defined; however, those areas within the proposed UDB expansion area could ultimately result in new residential, institutional, commercial, and light industrial uses as depicted in Table 42 (Proposed Land Use Plan) of the Community Plan<sup>3</sup>.

The Project will likely result in the ultimate conversion (i.e., cancellation or non-renewal) of parcels containing Williamson Act (WA) Preserves. Over time, parcels classified as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) are planned for development to non-agricultural uses. The area within the existing 812 acre UDB is designated in the 2018 FMMP map (see Figure 7 of the Community Plan). Of these, approximately 369.1 acres are designated Urban and Built-up Land, approximately 320.5 acres are designated Prime Farmland, approximately 109 acres are designated Vacant or Disturbed land, with approximately 56 acres designated Farmland of Statewide Importance, approximately 29 acres are designated as Farmland of Local Importance (which includes the area of the proposed new high school), approximately 12 acres are designated Confined Animal Agriculture, and approximately 12 acres are designated Rural Residential Land. As specific future development proposals are considered, each will be evaluated on its own merits and the appropriate environmental evaluation will determine the level of mitigation measures, if necessary/applicable.

As the Project does not include any development proposals, updating the Community Plan will not result in the conversion of any prime agricultural land as defined in Section 51201(C) of the Govt. Code to non-agricultural use. It will not conflict with existing zoning for agriculture use, or a Williamson Act contract; it will not conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources code 12220(g) or timberland (as defined in Public Resource Code section 4526); it will not result in the loss of forest land or conversion of forest land to non-forest use, nor will it involve other changes in the existing environment which, due to their location or nature, could result in conversion of forest land to non-forest use. The Project, over time and at full build-out, would likely result in conversion of farmland to future non-agricultural use (residential, commercial, or industrial) which will be addressed when project-specific proposals are considered. However, as no development proposals are included as part of this Community Plan Update, there will be no

<sup>3</sup> Ibid. Table 42. 168.

|  |  | <b>SIGNIFICANT IMPACT</b> | <b>LESS THAN SIGNIFICANT IMPACT WITH MITIGATION</b> | <b>LESS THAN SIGNIFICANT IMPACT</b> | <b>NO IMPACT</b> |
|--|--|---------------------------|---|-------------------------------------|------------------|
|--|--|---------------------------|---|-------------------------------------|------------------|

impact to these resources a) – e).

**3. AIR QUALITY**

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

|    |  |                          |                          |                                     |                          |
|----|--|--------------------------|--------------------------|-------------------------------------|--------------------------|
| a) | Conflict with or obstruct implementation of the applicable air quality plan?   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b) | Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| c) | Expose sensitive receptors to substantial pollutant concentrations?  | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| d) | Result in other emissions (such as those leading to odors adversely affecting a substantial number of people)?   | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

**Analysis:**

As noted previously, the Project is an update to the Ivanhoe Community Plan and no development proposals are being considered at this time. The update is being prepared to accommodate a growth rate of 1.3% (consistent with the Tulare County General Plan). Also, the Project includes proposed expansion of the Urban Development Boundary (UDB) from its existing 812 acres to approximately 1,394 acres (and increase of 582 acres).

The proposed Project is located in the San Joaquin Valley Air Basin (SJVAB), a continuous inter-mountain air basin. The Sierra Nevada Range forms the eastern boundary; the Coast Range forms the western boundary; and the Tehachapi Mountains form the southern boundary. These topographic features restrict air movement through and beyond the SJVAB. The SJVAB is comprised of San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, and Tulare Counties and the valley portion of Kern County; it is approximately 25,000 square miles in area. Tulare County lies within the southern portion of the SJVAB. The SJVAB is managed by the San Joaquin Valley Air Pollution Control District (SJVAPCD or Air District).

Both the federal government (through the United State Environmental Protection Agency (EPA)) and the State of California (through the California Air Resources Board (CARB)) have established health-based ambient air quality standards (AAQS) for six air pollutants, commonly referred to as “criteria pollutants.” The six criteria pollutants are: carbon monoxide (CO), ozone (O<sub>3</sub>), sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), and lead (Pb).

National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) have been established for each criteria pollutant to protect the public health and welfare. The federal and state standards were developed independently with differing purposes and methods, although both processes are intended to avoid health-related effects. As a result, the federal and state standards differ in some cases. In general, the California state standards are more stringent.

|  |  | <b>SIGNIFICANT IMPACT</b> | <b>LESS THAN SIGNIFICANT IMPACT WITH MITIGATION</b> | <b>LESS THAN SIGNIFICANT IMPACT</b> | <b>NO IMPACT</b> |
|--|--|---------------------------|---|-------------------------------------|------------------|
|--|--|---------------------------|---|-------------------------------------|------------------|

The Federal Clean Air Act requires EPA to set NAAQS for the six criteria pollutants, noted above, that occur throughout the United States. Of the six pollutants, particle pollution and ground-level ozone are the most widespread health threats. EPA regulates the criteria pollutants by developing human health-based and/or environmentally-based criteria (science-based guidelines) for setting permissible levels. The set of limits based on human health is called primary standards. Another set of limits intended to prevent environmental and property damage is called secondary standards.

EPA is required to designate areas as meeting (attainment) or not meeting (nonattainment) the air pollutant standards. The Federal Clean Air Act (CAA) further classifies nonattainment areas based on the severity of the nonattainment problem, with marginal, moderate, serious, severe, and extreme nonattainment classifications for ozone. Nonattainment classifications for PM range from marginal to serious. The Federal CAA requires areas with air quality violating the NAAQS to prepare an air quality control plan referred to as the State Implementation Plan (SIP). The SIP contains the strategies and control measures that states will use to attain the NAAQS. The Federal CAA amendments of 1990 require states containing areas that violate the NAAQS to revise their SIP to incorporate additional control measures to reduce air pollution. The SIP is periodically modified to reflect the latest emissions inventories, planning documents, rules, and regulations of Air Basins as reported by the agencies with jurisdiction over them. The EPA reviews SIPs to determine if they conform to the mandates of the Federal CAA amendments and will achieve air quality goals when implemented. If the EPA determines a SIP to be inadequate, it may prepare a Federal Implementation Plan (FIP) for the nonattainment area and impose additional control measures.

The SJVAB is designated non-attainment of state and federal health based air quality standards for ozone and respirable particulate matter (PM). The federal classification for the SJVAB is extreme non-attainment for the 8-hour ozone standard. To meet Federal Clean Air Act requirements, the District adopted the 2007 Ozone Plan on April 30, 2007. The ARB approved the Plan on June 14, 2007, while the EPA approved the Plan effective April 30, 2012. The Plan projects that the Valley will achieve the 8-hour ozone standard for all areas of the SJVAB no later than 2023. The District adopted the 2016 Plan for the 2008 8-Hour Ozone Standard in June 2016. This plan satisfies Clean Air Act requirements and ensures expeditious attainment of the 75 parts per billion 8-hour ozone standard. The federal PM<sub>10</sub> standard has been achieved and the US EPA re-classified the SJVAB as in attainment on September 25, 2008. Even after achieving the PM<sub>10</sub> standard, the SJVAB is currently a PM<sub>10</sub> Maintenance Area and all rules and regulations are still in effect. The SJVAB is designated non-attainment for state and federal PM<sub>2.5</sub> (particulate matter less than 2.5 micrometers in diameter) annual standards. The Air District adopted the 2008 PM<sub>2.5</sub> Plan in April 2008 to address EPA's annual PM<sub>2.5</sub> standard of 15 µg/m<sup>3</sup>, which was established by EPA in 1997. The Air District adopted the 2012 PM<sub>2.5</sub> Plan to address EPA's 2006 revised 24-hour standard (35 µg/m<sup>3</sup>) in December 2012. On April 16, 2015, the Air District adopted the 2015 Plan for the 1997 PM<sub>2.5</sub> Standard which addresses both the annual (35 µg/m<sup>3</sup>) and 24-hour (35 µg/m<sup>3</sup>) standards established by EPA in 1997. The District adopted the 2015 Plan for the 1997 PM<sub>2.5</sub> Standard on April 16, 2015. This plan addresses EPA's annual PM<sub>2.5</sub> standard of 15 µg/m<sup>3</sup> and 24-hour PM<sub>2.5</sub> standard of 65 µg/m<sup>3</sup>, established in 1997. The Air District adopted the 2016 Moderate Area Plan for the 2012 PM<sub>2.5</sub> Standard on September 15, 2016. This plan addresses the EPA federal annual PM<sub>2.5</sub> standard of 12 µg/m<sup>3</sup>, established in 2012. This plan includes an attainment impracticability demonstration and request for reclassification of the Valley from Moderate nonattainment to Serious nonattainment. The District adopted the 2018 Plan for the 1997, 2006, and 2012 PM<sub>2.5</sub> Standards on November 15, 2018. This plan addresses the EPA federal 1997 annual PM<sub>2.5</sub> standard of 15 µg/m<sup>3</sup> and 24-hour PM<sub>2.5</sub> standard of 65 µg/m<sup>3</sup>; the 2006 24-hour PM<sub>2.5</sub> standard of 35 µg/m<sup>3</sup>; and the 2012 annual PM<sub>2.5</sub> standard of 12 µg/m<sup>3</sup>. Measures contained in the 2007 PM<sub>10</sub> Maintenance Plan will also help reduce PM<sub>2.5</sub> levels and will provide progress toward attainment until new measures are implemented for the PM<sub>2.5</sub> Plan, if needed. The State does not have an attainment deadline for the ozone standards; however, it does require implementation of all feasible measures to achieve attainment at the earliest date possible. State PM<sub>10</sub> and PM<sub>2.5</sub> standards have no attainment planning requirements, but must demonstrate that all measures feasible for the area have been adopted.

In addition to consistency with Air District attainment plans, the Tulare County General Plan has a number of policies that

|  |  | SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|--|--|--------------------|--|------------------------------|-----------|
|--|--|--------------------|--|------------------------------|-----------|

apply to projects within County of Tulare. For example, General Plan policies that would apply to future development in the Project area include *AQ-1.1 Cooperation with Other Agencies*; *AQ-1.2 Cooperation with Local Jurisdictions*; *AQ-1.3 Cumulative Air Quality Impacts*; *AQ-1.4 Air Quality Land Use Compatibility*; *AQ-1.5 California Environmental Quality Act (CEQA) Compliance*; *AQ-3.6 Mixed Land Uses*; and *AQ-4.2 Dust Suppression Measures*. Among General Plan policies regarding land uses which benefit air quality are *LU-1.1: Smart Growth and Healthy Communities*; *LU-1.4: Compact Development*; *LU-1.8: Encourage Infill Development*; *LU-3.2: Cluster Development*; *LU-3.3*; and *High-Density Residential Locations*.

The Technical Memorandum “Air Quality Assessment for the Ivanhoe Community Plan Update” (AQ Memo) was completed by RMA Staff (Jessica Willis, Planner IV) in May 2019 to analyze potential air quality emissions (See Attachment “A”). As indicated in the AQ Memo, the following air quality analysis was “...prepared to evaluate whether the estimated air pollutant emissions generated from implementation of the Project (i.e., future development projects) would cause significant impacts to air quality and health risks to nearby receptors. The air quality assessment was conducted within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000, et seq.). The assessment is intended to provide the County of Tulare (County) with sufficient detail regarding potential impacts of Project implementation and to identify mitigation measures, if necessary, to reduce potentially significant impacts. The estimated emissions are compared to federal and state ambient air quality standards (AAQS) and the thresholds of significance established by the San Joaquin Valley Unified Air Pollution Control District (Air District). The methodology for the air quality assessment follows the Air District recommendation for quantification of emissions and evaluations of potential impacts on air resources as provided in the *Guidance for Assessing and Mitigating Air Quality Impacts* (GAMAQI) adopted by the Air District Governing Board on March 19, 2015.”<sup>4</sup>

“There are no specific development projects proposed with the Ivanhoe Community Plan Update; however, the Plan does include updates to land use designations that could increase the buildout potential of the planning area. Population and residential unit growth through planning horizon year 2030 was estimated by applying a 1.3% annual growth rate, consistent with the Tulare County 2030 General Plan, to the 2017 baseline population and housing data, as provided in the United States Census Bureau 2017 American Community Survey (ACS). Non-residential growth was estimated through planning horizon year 2030 for a worst-case emissions scenario by applying a 1.3% annual growth rate to the existing uses based on existing zoning and assuming all parcels have been improved with structures at a floor to area ratio of 0.20. Using these assumptions for baseline conditions provides a conservative (larger) overall growth estimate.”<sup>5</sup>

In addition to criteria pollutants, the AQ Memo also assessed potential health impacts (particularly the potential exposure to toxic air contaminant (TAC) emissions, valley fever, and naturally occurring asbestos) and nuisance odor impacts on nearby receptors as compared to health risk assessment and odor screening thresholds. As noted in the AQA Memo, “There are no specific development projects (such as residential, commercial, or industrial uses) associated with the Community Plan Update that would be a source of TAC or HAP emissions, and the location of future development projects in close proximity to sensitive receptors cannot be determined until future projects are identified. To ensure that development within the Project planning area does not expose sensitive receptors to significant impacts from TAC emissions, the County will review individual projects on a project-by-project basis to determine if ARB’s Air Quality Land Use Handbook screening criteria presented in Table 6 [of the AQ Memo] are exceeded. Projects that exceed the screening criteria will be subject to analysis using screening models or may require dispersion modeling and a health risk assessment. Tulare County will also consult with the Air District during the CEQA process for guidance on the appropriate screening tools and modeling protocols for future development projects within the Plan Update area.”<sup>6</sup> The primary existing sources of concern in Ivanhoe are Avenue 328 and Road 160 due to its traffic volume and large percentage of diesel trucks associated with freight hauling to, from, or

<sup>4</sup> County of Tulare. 2019. Technical Memorandum: Air Quality Assessment for the Ivanhoe Community Plan Update. Page 1.

<sup>5</sup> Ibid, 2-3.

<sup>6</sup> Op. Cit. 17.

|  |  | SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|--|--|--------------------|--|------------------------------|-----------|
| <p>through the Ivanhoe community. However, these truck trips already exist and would impact the Community even without the Community Plan Update.</p> <p>In regards to odor, the AQ Memo notes that "...as the Community Plan is built out, dependent upon the location and nature of operations, potential exists for odor impacts to occur resulting from existing and/or new agricultural, commercial and industrial land uses.<sup>7</sup> "To ensure potential nuisance odor impacts are addressed, if proposed developments were to result in sensitive receptors being located closer than the recommended distances to any odor generator identified in Table 7 [of the AQ Memo], a more detailed analysis, is recommended. The detailed analysis would involve contacting the Air District's Compliance Division for information regarding odor complaints"<sup>8</sup></p> <p>a) <b>Less Than Significant Impact</b> - Air quality plans (also known as attainment plans) and subsequent rules are used to bring the applicable air basin into attainment with federal ambient air quality standards designed to protect the health and safety of residents within that air basin.. The Air District's Air Quality Plans (AQPs) contains a number of control measures, which are enforceable requirements through the adoption of rules and regulations. As indicated in the AQ Memo, "The Air District has determined that projects with emissions below the thresholds of significance for criteria pollutants would "Not conflict or obstruct implementation of the District's air quality plan." There are no specific development projects (such as residential, commercial, or industrial uses) associated with the Community Plan Update. However, the Plan does include updates to land use designations that could increase the buildout potential of the planning area. As such, projected growth estimates for population, housing, and non-residential land uses are based on the 1.3% annual growth rate projected for the County in the Tulare County 2030 General Plan. To assess a worst-case growth scenario, the 1.3% growth rate was applied to the existing 2017 base year population and housing data (as provided in the United States Census Bureau 2017 American Community Survey) and the existing non-residential zoning within the community (assuming that all properties have been improved with structures at a floor-to-area ratio of 0.2) to determine the amount of development that could occur by 2030. The projected growth is presented in Table 1 [of the AQ Memo]."<sup>9</sup></p> <p>"The future buildout of the Project would result in short-term, temporary, and intermittent construction-related and long-term operations-related criteria air pollutant emissions. It is not necessary to calculate air quality emissions as, by analogy, the emission from this Project compared to similar projects within Tulare County would not exceed Air District thresholds of significance. The unincorporated communities of Pixley, Earlimart, and Poplar/Cotton Center have growth projections similar to that of Ivanhoe. As such, the emissions analyses for these three communities serve as the basis for this qualitative analysis.</p> <p>Table 8 [of the AQ Memo] provides a comparison of the Pixley, Earlimart and Poplar/Cotton Center Community Plan growth projections and the criteria pollutant emissions associated with the projected growth."<sup>10</sup></p> |  |                    |  |                              |           |

<sup>7</sup> Op. Cit. 18-19.

<sup>8</sup> Op. Cit. 19.

<sup>9</sup> Op. Cit. 11-12.

<sup>10</sup> Op. Cit. 12.

|  |  | <b>SIGNIFICANT IMPACT</b> | <b>LESS THAN SIGNIFICANT IMPACT WITH MITIGATION</b> | <b>LESS THAN SIGNIFICANT IMPACT</b> | <b>NO IMPACT</b> |
|--|--|---------------------------|---|-------------------------------------|------------------|
|--|--|---------------------------|---|-------------------------------------|------------------|

| <b>Table 8. Comparison of Growth Projections<br/>Pixley, Earlimart, Poplar/Cotton Center, and Ivanhoe</b> |         |         |            |                      |
|---|---------|---------|------------|----------------------|
|   | Ivanhoe | Pixley  | Earlimart* | Poplar/Cotton Center |
| <b>Growth Projections</b>   |         |         |            |                      |
| Population  | 695     | 740     | 1,947      | 596                  |
| Residential (dwelling units)  | 212     | 259     | 461        | 161                  |
| Commercial/Retail/Other (square feet)   | 107,197 | 82,440  | 155,880    | 99,912               |
| Industrial (square feet)  | 61,642  | 129,160 | 53,472     | 63,356               |
| Total Non-Residential (square feet)   | 168,839 | 211,600 | 212,324    | 163,268              |
| <b>Average Annual Construction</b>  |         |         |            |                      |
| ROG   |         | 0.60    | 1.64       | 0.68                 |
| NOx   |         | 1.91    | 7.20       | 2.43                 |
| CO  |         | 1.58    | 5.29       | 2.33                 |
| SOx   |         | 0.002   | 0.01       | 0.006                |
| PM10  |         | 0.22    | 0.69       | 0.44                 |
| PM2.5   |         | 0.15    | 0.46       | 0.18                 |
| <b>Annual Operations at 2030 Buildout</b>   |         |         |            |                      |
| ROG   |         | 6.15    | 7.63       | 1.20                 |
| NOx   |         | 5.53    | 14.34      | 6.90                 |
| CO  |         | 28.34   | 32.72      | 7.08                 |
| SOx   |         | 0.07    | 0.09       | 0.02                 |
| PM10  |         | 5.05    | 7.08       | 1.06                 |
| PM2.5   |         | 1.45    | 2.40       | 0.30                 |

“As presented in Table 8, criteria pollutant emissions for all three communities are below the Air District’s thresholds of significance, with the exception for NOx emissions in Earlimart. Although total non-residential development in Earlimart is similar to that in Pixley, Earlimart has higher commercial/retail/other growth and lower industrial growth than Pixley, while the residential and housing growth in Earlimart is higher than that of Pixley. The Earlimart emissions also included project-specific analysis for the proposed high school, as well as the emissions resulting from the 1.3% annual growth.”<sup>11</sup>

“Table 9 identifies the Project size as a percentage of the growth projections for the Pixley, Earlimart and Poplar/Cotton Center communities.

| <b>Table 9. Project Size in Comparison to Similar Projects<br/>(as a percentage of previous analysis)</b> |          |             |                        |
|---|----------|-------------|------------------------|
|   | % Pixley | % Earlimart | % Poplar/Cotton Center |
| Population  | 94       | 36          | 117                    |
| Residential   | 82       | 46          | 132                    |
| Total Non-Residential   | 80       | 81          | 103                    |
| Commercial/Retail/Other   | 130      | 69          | 107                    |
| Industrial  | 48       | 115         | 97                     |

<sup>11</sup> Op. Cit. 13.

|   |  | SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|---|--|--------------------|--|------------------------------|-----------|
| <p>As demonstrated in the table, Project-related residential land use is approximately 82% the size of Pixley, 46% the size of Earlimart, and 132% the size of Poplar/Cotton Center, while Project-related non-residential land use is approximately 80% the size of Pixley, 81% the size of Earlimart, and 103% the size of Poplar/Cotton Center. As such, Project residential (population and housing) growth is similar to Pixley while non-residential (commercial/retail/other and industrial) growth is similar to Poplar/Cotton Center. Therefore, the information provided for Earlimart is informational only and provided as a reference to how project size and land uses affects the emissions analysis.”<sup>12</sup></p>  |  |                    |  |                              |           |
| <p>“As previously noted, there are no specific development projects associated with the Community Plan Update that would result in emissions exceeding Air District thresholds. Because future development is unknown and dependent upon the timing that actual developments are proposed and their project-specific details, there is potential for annual emissions to exceed the emissions thresholds presented in Table 8. However, as the Project is similar in size to the projected growth in Pixley and Poplar/Cotton Center, and emissions from the buildout of these two communities are below the Air District’s significance thresholds, it is reasonable to conclude that Project-related emissions would also fall below the significance thresholds. Furthermore, future developments will be subject to additional CEQA review and project-specific emissions will be evaluated at the time of submittal. The County will consult with the Air District on a project-by-project basis as new developments are proposed to evaluate project-specific impacts based on project-specific details and to determine whether a localized pollutant analysis (such as an Ambient Air Quality Analysis or Health Risk Assessment) would be required. Future developments will comply with all applicable Air District rules and regulations including, but not limited to, Regulation VIII (Fugitive PM10 Prohibition, Rule 2201 (New and Modified Stationary Source Review, and Rule 9510 (Indirect Source Review). Furthermore, as indicated in the Earlimart Community Plan EIR, the Air District has used an average annual growth rate for Tulare County ranging from 1.44% to 1.94%. The 1.3% annual growth rate applied in the Ivanhoe Community Plan Update is lower than the growth rates applied in the applicable Air Quality Plans (AQPs). As such, Project-related emissions would be included in the AQPs emissions inventories. Therefore, the Project would not conflict with or obstruct implementation of the applicable Air Quality Plans. The Project will have a Less Than Significant Project-specific Impact related to this Checklist Item.”<sup>13</sup></p> |  |                    |  |                              |           |
| <p>b) <b>Less Than Significant Impact</b> - As development occurs within the Project planning area each project will be evaluated to ensure that emission control techniques are implemented consistent with Air District rules and regulations. For example, compliance with Air District Rule 9510 (Indirect Source Review) will ensure that cumulative growth does not result in an overall increase in emissions in the air basin and would not jeopardize attainment plan deadlines. As indicated in the AQ Memo, “The Project would be considered to have a significant cumulative impact on air quality if project-specific impacts are determined to be significant. As previously noted, the emissions analysis confirms that Project-specific emissions are below the Air District’s thresholds of significance at a project-specific level, and that the Project will not cause or contribute to an existing air quality violation. Furthermore, the County will consult with the Air District on a project-by-project basis to ensure that future developments are implemented consistent with Air District rules and regulations, including but not limited to Regulation VIII (Fugitive PM10 Prohibition), Rule 2201 (New and Modified Stationary Source Review, and Rule 9510 (Indirect Source Review). The Project will be required to implement all applicable General Plan policies and to comply with all applicable Air District rules and regulations. Therefore, because the Project would have Less Than Significant Project-specific Impacts, the Project will have a Less Than Significant Cumulative Impact on air quality.”<sup>14</sup></p>   |  |                    |  |                              |           |
| <p>c) <b>Less Than Significant Impact</b> - The Project would not expose sensitive receptors to substantial pollutant concentrations. Consistent with the Valley Air District’s definition of “sensitive receptors”, the AQ Memo contains analyses of criteria pollutants and projected potential impacts on sensitive receptors. “Sensitive receptors are those individuals who are sensitive to air pollution and include children, the elderly, and persons with pre-existing respiratory or cardiovascular illness. The Air</p>   |  |                    |  |                              |           |

<sup>12</sup> Op. Cit. 13.

<sup>13</sup> Op. Cit. 13-14.

<sup>14</sup> Op. Cit.14-15.

|   |  | SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|---|--|--------------------|--|------------------------------|-----------|
| <p>District considers a sensitive receptor to be a location that houses or attracts children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants. Examples of sensitive receptors include schools, parks and playgrounds, daycare centers, nursing homes, hospitals, and residential dwelling units.”<sup>15</sup></p> <p>The AQ Memo analyzed and concluded the following:</p> <p>“<i>Construction Equipment TACs/HAPs</i>: Particulate emissions from diesel powered construction equipment are considered a TAC by the California Air Resources Board. There are no specific development projects (such as residential, commercial, or industrial uses) associated with the Community Plan Update. However, future development projects have the potential to temporarily expose receptors to increased pollutant emission concentrations from diesel powered construction equipment during the short-term construction phase. However, construction emissions are temporary and would cease upon completion of construction activities. The short-term nature of construction-related emissions would not expose nearby receptors to substantial TAC concentrations. Less Than Significant Project-specific Impacts related to this Checklist Item will occur.”<sup>16</sup></p> <p>“<i>Dust-borne TACs/HAPs</i>: There are no specific development projects (such as residential, commercial, or industrial uses) associated with the Community Plan Update. However, future development projects have the potential to temporarily expose nearby receptors to fugitive particulate (dust) emissions during the short-term construction phase or from landscaping activities once the development project is operational. As of May 15, 2019, there were no listings within the Project planning area in the California Department of Toxic Substances Control (DTSC) Hazardous Waste and Substances Site List. A query performed on the DTSC Envirostor indicated that there are no superfund, state response, voluntary cleanup, school cleanup or corrective actions within four (4) miles of the Project planning area. A query of the State Water Resources Control Board (WRCB) GeoTracker Site and Facilities mapping programs revealed three (3) permitted underground storage tank (UST) sites within the Project planning area; however, none of these sites are designated for cleanup. A query performed on the U.S. Environmental Protection Agency (EPA) Superfund Enterprise Management System (SEMS) website found that there are no listed polluted sites within the Project planning area. Therefore, fugitive dust emissions resulting from earthmoving activities during construction or landscaping activities during operations, would not expose future residents or nearby receptors to substantial pollutant concentrations. Less Than Significant Project-specific Impacts related to this Checklist Item will occur.”<sup>17</sup></p> <p>“<i>Valley Fever</i>: Valley fever, or coccidioidomycosis, is an infection caused by inhalation of the spores of the fungus, <i>Coccidioides immitis</i> (<i>C. immitis</i>). According to the Centers for Disease Control (CDC), the San Joaquin Valley is considered an endemic area for valley fever. “People can get Valley fever by breathing in the microscopic fungal spores from the air, although most people who breathe in the spores don’t get sick. Usually, people who get sick with Valley fever will get better on their own within weeks to months, but some people will need antifungal medication.” Construction-related activities generate fugitive dust that could potentially contain <i>C. immitis</i> spores. The Project will be required to implement General Plan Policy AQ-4.2 (Dust Suppression Measures), which was specifically designed to address impacts from the generation of dust emitted into the air. The Project will be required to comply with Air District Regulation VIII (Fugitive PM10 Prohibitions) requirements, including submittal of construction notification and/or dust control plan(s), which minimize the generation of fugitive dust during construction-related activities. Therefore, implementation of General Plan policies and compliance with Air District rules and regulations would reduce the chance of exposure to valley fever during construction-related activities. Less Than Significant Project-specific Impacts related to this Checklist Item will occur.”<sup>18</sup></p> |  |                    |  |                              |           |

<sup>15</sup> Op. Cit. 15.

<sup>16</sup> Op. Cit. 15.

<sup>17</sup> Op. Cit. 15-16.

<sup>18</sup> Op. Cit. 16-17.

|  |  | SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|--|--|--------------------|--|------------------------------|-----------|
| <p>“<i>Naturally Occurring Asbestos:</i> In areas containing naturally occurring asbestos, earthmoving construction-related activities, such as grading and trenching, could expose receptors to windblown asbestos. According to a United States Geological Soil Survey map of areas where naturally occurring asbestos in California are likely to occur, the Project is not located in an area known to contain naturally occurring asbestos. The Project planning area and the immediate vicinity has been previously disturbed by agricultural operations and by residential development. Future development projects will be required to implement General Plan Policy AQ-4.2 (Dust Suppression Measures) to comply with Air District Regulation VIII (Fugitive PM10 Prohibitions) requirements, thereby reducing the chance of exposure to valley fever during construction-related activities. Therefore, Less Than Significant Project-specific Impacts related to this Checklist Item will occur.”<sup>19</sup></p> <p>“<i>Operations from Future Development:</i> There are no specific development projects (such as residential, commercial, or industrial uses) associated with the Community Plan Update that would be a source of TAC or HAP emissions. However, construction- and operation-related activities associated with future development projects may require the transport and use of hazardous materials Consumer products and gasoline are regulated by the State and use of these products would not pose a significant risk to residents or nearby receptors. Medium- and Heavy-duty diesel trucks would be a source of diesel particulate matter, which is considered to be a TAC. The County will work with the Air District on a project-by-project basis to determine whether health risk assessments would be required for projects generating diesel truck trips travelling through the Project planning area, and for other equipment that may require Air District permits. Furthermore, future applicants will be required to comply with all local, state, and federal policies related to emission of TACs/HAPs in the event such pollutants require control efforts to minimize their impacts. Tulare County Environmental Health Division will require a Hazardous Waste Business Plan if materials exceed 55 gallons (liquids), 500 pounds (solids), or 200 cubic feet (compressed gas) handled or stored on site. As such, the Project will not expose sensitive receptors to substantial pollutant concentrations. Less Than Significant Project-specific Impacts related to this Checklist Item will occur.”<sup>20</sup></p> <p>“<i>Existing Sources:</i> There are no specific development projects (such as residential, commercial, or industrial uses) associated with the Community Plan Update that would be a source of TAC or HAP emissions, and the location of future development projects in close proximity to sensitive receptors cannot be determined until future projects are identified. To ensure that development within the Project planning area does not expose sensitive receptors to significant impacts from TAC emissions, the County will review individual projects on a project-by-project basis to determine if ARB’s Air Quality Land Use Handbook screening criteria presented in Table 6 [of the AQ Memo] are exceeded. Projects that exceed the screening criteria will be subject to analysis using screening models or may require dispersion modeling and a health risk assessment. Tulare County will also consult with the Air District during the CEQA process for guidance on the appropriate screening tools and modeling protocols for future development projects within the Plan Update area. Therefore, existing sources of TAC/HAP emissions would not expose receptors to substantial pollutant concentrations. Less Than Significant Project-specific Impacts related to this Checklist Item will occur.”<sup>21</sup></p> <p>“<i>Existing Agricultural Operations:</i> The Project planning area is located in a rural area with urban built up land as well as active agricultural operations. Agricultural operations typically include the use of chemicals on crops for activities such as pest control, damage control, weed abatement, etc. However, these chemicals are regulated by the State and would not pose a significant risk to the existing and future residents within the Project planning area. Furthermore, the Tulare County General Plan includes Policy AG-1.14 Right-to-Farm Noticing which requires new property owners to acknowledge and accept the inconveniences associated with normal farming activities. Future development projects adjacent to agricultural</p> |  |                    |  |                              |           |

<sup>19</sup> Op. Cit. 17.

<sup>20</sup> Op. Cit. 17.

<sup>21</sup> Op. Cit. 18.

|   |   | SIGNIFICANT IMPACT       | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT                |
|---|---|--------------------------|--|------------------------------|--------------------------|
| <p>lands will be required to sign a “Right to Farm” notice. Less Than Significant Project-specific Impacts related to this Checklist Item will occur.”<sup>22</sup></p> <p>d) <b>Less Than Significant Impact</b> - The Project would not create objectionable odors affecting a substantial number of people. Consistent with the Air District’s definition of “sensitive receptors” the AQ Memo contains analyses of odor sources and projected potential impacts on sensitive receptors. “Two situations create a potential for odor impact. The first occurs when a new odor source is located near an existing sensitive receptor. The second occurs when a new sensitive receptor locates near an existing source of odor. There are no specific development projects (such as residential, commercial, or industrial uses) associated with the Community Plan Update that would be a source of nuisance odors. However, as the Community Plan is built out, dependent upon the location and nature of operations, potential exists for odor impacts to occur resulting from existing and/or new agricultural, commercial, and industrial land uses.”<sup>23</sup></p> <p>“As presented in Table 7 [of the AQ Memo], the Air District has determined the common land use types that are known to produce odors in the San Joaquin Valley Air Basin. As previously noted, there are no specific development projects associated with the Community Plan Update. However, the existing wastewater treatment facility located southwest of the community and agricultural uses in the vicinity of the community could be a source of nuisance odors. All projects, with the exception of agricultural operations, are subject to Air District Rule 4102 (Nuisance). Therefore, odors from agriculture-related operations would not be subject to complaint reporting. There is potential for these agricultural operations to generate objectionable odors; however, these odors would be temporary or seasonal. Furthermore, the Tulare County General Plan includes Policy <i>AG-1.14 Right-to-Farm Noticing</i> which requires new property owners to acknowledge and accept the inconveniences associated with normal farming activities. If future developments are proposed adjacent to active agricultural uses, future residents will be required to sign a “Right to Farm” notice. To ensure potential impacts are addressed, if proposed developments were to result in sensitive receptors being located closer than the recommended distances to any odor generator identified in Table 7 [of the AQ Memo], a more detailed analysis, is recommended. The detailed analysis would involve contacting the Air District’s Compliance Division for information regarding odor complaints Implementation of the applicable General Plan policies and compliance with applicable Air District rules and regulations specifically designed to address air quality and odor impacts, would reduce potential odor impacts. Therefore, the Project would not create or expose existing residents to objectionable odors. Less Than Significant Project-specific Impacts related to this Checklist Item will occur.”<sup>24</sup></p> <p>It should be noted that agricultural operations are exempt from the Air District’s nuisance rule. Therefore, odors from animal operations, such as dairies, feedlots, and poultry farms, and in field composting operations would not be subject to complaint reporting. However, the Tulare County General Plan Recirculated Environmental Impact Report (REIR) indicated that General Plan Policies <i>AQ-3.1</i> through <i>AQ-3.6</i>, <i>LU-1.1</i> through <i>LU-1.4</i>, and <i>LU-1.8</i> would help to minimize this impact by avoiding inappropriate siting of sensitive land uses near other incompatible uses. Air District regulations on dairy and feedlot operations would also help to reduce this potential impact. Therefore, there would be a less than significant impact as a result of the Project.</p> |   |                          |  |                              |                          |
| <b>4.</b>   | <b>BIOLOGICAL RESOURCES</b>   |                          |  |                              |                          |
|   | Would the project:  |                          |  |                              |                          |
| a)  | Have a substantial adverse effect, either directly or through habitat modifications, on any species | <input type="checkbox"/> | <input checked="" type="checkbox"/>          | <input type="checkbox"/>     | <input type="checkbox"/> |

<sup>22</sup> Op. Cit. 18.

<sup>23</sup> Op. Cit. 19.

<sup>24</sup> Op. Cit. 20.

|    |   | <b>SIGNIFICANT IMPACT</b> | <b>LESS THAN SIGNIFICANT IMPACT WITH MITIGATION</b> | <b>LESS THAN SIGNIFICANT IMPACT</b> | <b>NO IMPACT</b>                    |
|----|---|---------------------------|---|-------------------------------------|-------------------------------------|
|    | identified as a candidate, sensitive, or special status species in local or regional plans, policies or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?  |                           |   |                                     |                                     |
| b) | Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service? | <input type="checkbox"/>  | <input type="checkbox"/>                            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| c) | Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?                       | <input type="checkbox"/>  | <input type="checkbox"/>                            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| d) | Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?                 | <input type="checkbox"/>  | <input type="checkbox"/>                            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| e) | Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?  | <input type="checkbox"/>  | <input type="checkbox"/>                            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| f) | Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?   | <input type="checkbox"/>  | <input type="checkbox"/>                            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

**Analysis:**

As noted previously, the Project is an update to the Ivanhoe Community Plan and no development proposals are being considered at this time. The update is being prepared to accommodate a growth rate of 1.3% (consistent with the Tulare County General Plan). The Project includes expansion of the Urban Development Boundary (UDB); as such, a case-by-case evaluation will be conducted when development proposals are received for both the existing UDB and future UDB area. However, as this Project is merely an update to the Community Plan, there is no possibility of changes to biological resources within the already established UDB area.

|  |  |                           |   |                                     |                  |
|--|--|---------------------------|---|-------------------------------------|------------------|
|  |  | <b>SIGNIFICANT IMPACT</b> | <b>LESS THAN SIGNIFICANT IMPACT WITH MITIGATION</b> | <b>LESS THAN SIGNIFICANT IMPACT</b> | <b>NO IMPACT</b> |
|--|--|---------------------------|---|-------------------------------------|------------------|

The proposed UDB is located within the Ivanhoe and Exeter Quadrangles. Based on the information in the CNDDDB and BIOS 9-Quad results, there are forty two (42) special status species (state or federally listed as threatened, endangered, proposed endangered, proposed threatened, candidate threatened, candidate endangered, rare; or ranked by the California Native Plant Society) and five (5) natural plant communities of special concern within the 9-quadrangle project area (Ivanhoe, Exeter, Stokes Mountain, Auckland, Woodlake, Rocky Hill, Visalia, Monson, and Orange Cove South quadrangles) (see Figures 3, 5 and 7 in Attachment “B”). No special status plant or animal species have been recorded within the Project’s existing Urban Development Boundary (UDB) or within the proposed UDB expansion area. However, there is a possibility that migratory birds and raptors may be present within the Project site, or that currently undeveloped areas within the UDB could provide habitat or foraging areas for special status species such as bats, kit fox, and badgers. Therefore, future development projects within the UDB subject to subsequent CEQA analysis may be required to implement mitigation measure(s) to reduce potential impacts on special status species to less than significant.

Also, the Tulare County General Plan has a number of policies that apply to projects within County of Tulare. For example, General Plan policies that would apply to future development in the Project area include *ERM-1.1 Protection of Rare and Endangered Species*; *ERM-1.17 Conservation Plan Coordination*; and *ERM-2.7 Minimize Adverse Impacts*. And, as indicated earlier, proposed development(s) will be evaluated on a case-by-case basis regarding impacts to the biological resource.

a) **Less Than Significant Impact With Mitigation** - The updated Ivanhoe Community Plan Urban Development Boundary (UDB) is proposed to be increased by approximately 582 acres to an area of approximately 1,394 acres. The following section assumes that special status species within the UDB may be impacted by future development, which will be evaluated on a case-by-case basis, as development occurs.

As noted earlier, based on the information in the CNDDDB and BIOS 9-Quad results, there are forty two (42) special status species (state or federally listed as threatened, endangered, proposed endangered, proposed threatened, candidate threatened, candidate endangered, rare; or ranked by the California Native Plant Society) and five (5) natural plant communities of special concern within the 9-quadrangle project area (Ivanhoe, Exeter, Stokes Mountain, Auckland, Woodlake, Rocky Hill, Visalia, Monson, and Orange Cove South quadrangles) (see Figures 3, 5 and 7 in Attachment “B”). No special status plant or animal species have been recorded within the Project’s existing Urban Development Boundary (UDB) or within the proposed UDB expansion area. However, there is a possibility that migratory birds and raptors may be present within the Project site, or that currently undeveloped areas within the UDB could provide habitat or foraging areas for special status species such as bats, kit fox, and badgers.

Therefore, future development projects within the UDB subject to subsequent CEQA analysis may be required to implement **Mitigation Measures BIO-1** through **BIO 20** would reduce potential impacts on special status species to less than significant. **Table BIO-1** summarizes **Mitigation Measures BIO-1** through **BIO-20** which can be found in their entirety in Attachment “B” of this IS/MND.

| <b>TABLE BIO-1</b>  |                            |   |
|---|----------------------------|---|
| <b>Summary of Mitigation Measures BIO-1 through BIO-20</b>  |                            |   |
| <b>MITIGATION</b>   | <b>TYPE OF MITIGATION</b>  | <b>SUMMARIZED DESCRIPTION</b>   |
| <b>Measures for Special Status Plant Species</b>  |                            |   |
| BIO-1   | Pre-construction Survey    | Qualified biologist/botanist conducts pre-construction surveys for special status plant species |
| <b>Measures for Special Status Animal Species</b>   |                            |   |
| BIO-2   | Pre-construction Survey    | Qualified biologist conducts pre-construction surveys for special status animal species.        |
| <b>Measures for Special Status Plant and Animal Species Identified in Pre-construction Surveys.</b> |                            |   |
| BIO-3   | Employee Education Program | Qualified biologist conducts tailgate meeting to train construction staff on                    |

|   |                               | <b>SIGNIFICANT IMPACT</b> | <b>LESS THAN SIGNIFICANT IMPACT WITH MITIGATION</b>   | <b>LESS THAN SIGNIFICANT IMPACT</b> | <b>NO IMPACT</b>   |
|---|-------------------------------|---------------------------|---|-------------------------------------|--|
|   |                               |                           |   |                                     | special status species that occur/may occur on the project site. |
| <b>Measures for Nesting Raptors and Migratory Birds</b> |                               |                           |   |                                     |  |
| BIO-4   | Avoidance                     |                           | Where possible, Project will be constructed outside the nesting season (between September 1st and January 31st).  |                                     |  |
| BIO-5   | Pre-construction Survey       |                           | If Project activities occur during the nesting season (February 1-August 31), a qualified biologist will conduct preconstruction surveys per the <i>Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley (2000)</i> .  |                                     |  |
| BIO-6   | Pre-construction Survey       |                           | A qualified biologist will conduct pre-construction surveys per the <i>Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley (2000)</i> .   |                                     |  |
| BIO-7   | Buffers                       |                           | Upon active nest discovery, the biologist determines appropriate construction setback distances and a behavioral baseline using applicable CDFW guidelines and/or the biology of the affected species.  |                                     |  |
| <b>Measures for San Joaquin Kit Fox</b>                 |                               |                           |   |                                     |  |
| BIO-8   | Pre-construction Survey       |                           | Qualified biologist will conduct pre-construction surveys in accordance with USFWS <i>Standard Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance (2011)</i> .  |                                     |  |
| BIO-9   | Avoidance                     |                           | If active or potential den is detected in or adjacent to work area during pre-construction survey, the den shall not be disturbed or destroyed. Compliance with USFWS <i>Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance (2011)</i> required. USFW and CDFW will be immediately contacted to determine best course of action   |                                     |  |
| BIO-10  | Minimization                  |                           | Construction activities shall be carried out in a manner that minimizes disturbance to kit foxes.   |                                     |  |
| BIO-11  | Mortality Reporting           |                           | USFWS and CDFW will be contacted immediately by phone and notified in writing within three working days in case of the accidental death or injury of a SJ kit fox during construction-related activities.   |                                     |  |
| <b>Measures for American Badger</b>                     |                               |                           |   |                                     |  |
| BIO-12  | Pre-Construction Survey       |                           | A pre-construction survey for American badgers will be conducted by a qualified biologist within 30 days of the onset of Project-related activities involving ground disturbance or heavy equipment use.  |                                     |  |
| BIO-13  | Avoidance                     |                           | Should an active natal den be identified during the pre-construction survey, a qualified biologist shall supervise the establishment of a disturbance-free buffer around the den. Such disturbance-free area shall be maintained until the cubs have dispersed or the den has been abandoned. If it is not a natal den, the badger will be left to leave of its own accord or be passively relocated with methods developed by a qualified biologist. |                                     |  |
| <b>Measures for Roosting Bats</b>                       |                               |                           |   |                                     |  |
| BIO-14  | Temporal Avoidance            |                           | To avoid potential impacts to maternity bat roosts, removal of buildings and trees should occur outside of the period between April 1 and September 30.   |                                     |  |
| BIO-15  | Pre-construction Surveys      |                           | If removal of buildings or trees is to occur between April 1 and September 30 (general maternity bat roost season), then within 30 days prior to these activities, a qualified biologist will survey affected buildings and trees for the presence of bats. The biologist will utilize bat detection techniques to determine presence of bats.  |                                     |  |
| BIO-16  | Minimization                  |                           | If a non-breeding bat colony is detected during preconstruction surveys, a biologist shall supervise removal of bats and/or installation of bat exclusion devices to ensure no harm or take of bats occur.  |                                     |  |
| BIO-17  | Avoidance of Maternity Roosts |                           | If a maternity colony is detected during preconstruction surveys, a qualified biologist will supervise establishment of a disturbance-free buffer around the colony and remain in place until a qualified biologist deems that the nursery is no longer active.   |                                     |  |
| <b>Measures for Burrowing Owl</b>                       |                               |                           |   |                                     |  |
| BIO-18  | Pre-Construction Survey       |                           | A qualified biologist shall conduct a pre-construction survey for burrowing owls as outlined in <i>Burrowing Owl Survey Protocol and Mitigation Guidelines (CBOC 1997)</i> , within 30 days of the onset of Project-related activities involving  |                                     |  |

|        |                                     | SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION  | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|--------|-------------------------------------|--------------------|---|------------------------------|-----------|
|        |                                     |                    | ground disturbance or heavy equipment use. The survey area will include all suitable habitat on and within 500 feet of Project impact areas, where accessible.  |                              |           |
| BIO-19 | Buffers                             |                    | If active nest burrows are located within or near Project impact areas during breeding season, a 250-foot construction setback will be established around active owl nests, or alternate avoidance measures will be implemented in consultation with CDFW. The buffer areas will be enclosed with temporary fencing to prevent intrusion during duration of the breeding season. After breeding season, passive relocation of remaining owls may be allowed as described in BIO-20. |                              |           |
| BIO-20 | Passive Relocation of Resident Owls |                    | During the non-breeding season, resident owls occupying burrows in Project impact areas may be passively relocated to alternative habitat in accordance with a relocation plan prepared by a qualified biologist.   |                              |           |

Implementation of **Mitigation Measures BIO-1 through BIO-20** would reduce potential impacts to less than significant with mitigation and ensure that future development activities within the UDB remain compliant with state and federal laws protecting these species.

b) **No Impact** - As noted in Item a., above, the proposed Project area is within the historic sites of various species of concern. However, the San Joaquin kit fox is the only species documented as occurring in the CNDDDB Occurrence List within the existing and proposed Ivanhoe UDB. Riparian habitat is absent from the impact areas of the proposed Project. Existing urban uses and agriculturally productive lands constitute the majority of the types of habitat within the existing and proposed UDB and, as such, are not considered habitats of special concern. Because riparian and other habitats of special concern are absent, the Project and future development proposals will have no impact on these habitats.

c) **No Impact** – There are no waterways present within the existing or proposed UDB of Project. As noted in memorandum included in Attachment “B”, based on the information in the BIOS map, Wutchumna Ditch is located approximately 0.5-1.5 miles east, Matthews Ditch is located approximately 0.5-1.5 miles west, and the Saint John’s River is located approximately 1.25 miles south of the Project site. However, based on the BIOS map, streams and lakes of the State are absent from the site Project area itself (see Figure 8). Therefore, the Project will result in no impact to any riparian habitats or other protected wetlands. Therefore, mitigation measures that would reduce impacts have not been proposed, nor would any measures be warranted.

d) **Less Than Significant Impact** - Wildlife movement corridors usually occur where there are relatively large areas of open space composed of undeveloped habitat, ideally native habitat. The majority of the existing UDB is already developed to urban type uses and agriculturally productive land, and it is surrounded by more agricultural land. The areas within the proposed UDB expansion are predominantly agriculturally productive lands. While agricultural land may be attractive to wildlife as movement corridor in otherwise urban, developed landscapes, there is nothing within the existing UDB that would make it more attractive as a wildlife movement corridor than adjacent parcels. It is noted, however, neither the existing nor proposed UDB of the Project were identified in the Environmental Resources Management Element as being a migration corridor or wildlife nursery for any wildlife species. Therefore, a less than significant impact could occur as a result of the Project.

e) **No Impact** - The proposed Project will not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinances. Therefore, the Project will result in no impact to this resource.

f) **No Impact** - There are two habitat conservation plans that could apply in Tulare County. The Kern Water Habitat Conservation Plan only applies to an area in Allensworth (located approximately 36 miles southwest of the Project area) and does not apply this Project. The Recovery Plan for Upland Species in the San Joaquin Valley outlines a number of species that are important to the San Joaquin Valley; however, only one species (the SJKF) has been documented to occur

|   |   | <b>SIGNIFICANT IMPACT</b> | <b>LESS THAN SIGNIFICANT IMPACT WITH MITIGATION</b> | <b>LESS THAN SIGNIFICANT IMPACT</b> | <b>NO IMPACT</b>         |
|---|---|---------------------------|---|-------------------------------------|--------------------------|
| and its historical range is identified within the proposed Project area. <sup>25</sup> As the Project is merely an amendment to an existing community plan and there are no development or other proposed projects as part of the update, the Project would not conflict with local policies or habitat conservation plans. Further, in the event of future development (e.g., residential, commercial, infrastructure, etc.), Mitigation Measures BIO-1 through BIO-20 would be implemented, as applicable. As such, the Proposed amendment will result in no impact to this resource.   |   |                           |   |                                     |                          |
| <b>5.</b>   | <b>CULTURAL RESOURCES</b>   |                           |   |                                     |                          |
|   | Would the project:  |                           |   |                                     |                          |
| a)  | Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?    | <input type="checkbox"/>  | <input checked="" type="checkbox"/>                 | <input type="checkbox"/>            | <input type="checkbox"/> |
| b)  | Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5? | <input type="checkbox"/>  | <input checked="" type="checkbox"/>                 | <input type="checkbox"/>            | <input type="checkbox"/> |
| c)  | Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?              | <input type="checkbox"/>  | <input type="checkbox"/>                            | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| d)  | Disturb any human remains, including those interred outside of formal cemeteries?                                 | <input type="checkbox"/>  | <input checked="" type="checkbox"/>                 | <input type="checkbox"/>            | <input type="checkbox"/> |
| e)  | Disturb unique architectural features or the character of surrounding buildings?                                  | <input type="checkbox"/>  | <input type="checkbox"/>                            | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| <p>Analysis:</p> <p>As noted previously, the Project is an update to the Ivanhoe Community Plan and no development proposals are being considered at this time. The update is being prepared to accommodate a growth rate of 1.3% (consistent with the Tulare County General Plan). Limited changes to the Urban Development Boundary (UDB) will occur and such changes would incorporate areas that have historically been under heavy agricultural production; as such, there is no possibility of changes to cultural resources outside of the already established UDB area.</p> <p>The Southern San Joaquin Valley Information Center, Bakersfield (SSJVIC or Center) conducted a cultural resources records search at the request of RMA Planning Branch staff. The Center records search (dated October 15, 2018 is included in see Attachment “C” of this document) included historic sites listed on the National Register of Historic Places, Historic Property Directory, California State Historical Landmarks, California Register of Historical Resources, California Inventory of Historic Resources, and California Points of Historical Interest. According to the California Historical Resources Information System, there is one (1) recorded cultural resource within the planning area and one within a one-half mile radius of the planning area. There are no recorded cultural resources within the project area or radius that are listed in the National Register of Historic Places, the California Register of Historical Resources, the California Points of Historical Interest, California Inventory of Historic Resources, or the California State Historic Landmarks in or near Ivanhoe.</p> |   |                           |   |                                     |                          |

<sup>25</sup> Recovery Plan for Upland Species in the San Joaquin Valley. 1998. Pages 122-136. Prepared by Region 1 U.S. fish and Wildlife Service, Portland, Oregon. Accessed in May 2019 at: [https://ecos.fws.gov/docs/recovery\\_plan/980930a.pdf](https://ecos.fws.gov/docs/recovery_plan/980930a.pdf)

|  |  | SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|--|--|--------------------|--|------------------------------|-----------|
|--|--|--------------------|--|------------------------------|-----------|

According to the information provided by the SSJVIC, there have been 6 previous cultural resource studies conducted within the project area, TU-00515, 00582, 00610, 01014, 01242, and 01498. There have been six additional studies conducted within the one-half mile radius, TU-01395, 01499, 01512, 01514, 01611, and 01612. However, until the specific location of a development proposal occurs, the locations and nature of the resources will remain confidential and will only be shared with an applicant and remain confidential until otherwise determined by the courts.

The following Native American tribes were contacted on October 26, 2018, in order to solicit their interest regarding tribal consultation: Kern Valley Indian Council; Santa Rosa Rancheria Tachi Yokut Tribe, Torres-Martinez Desert Cahuilla Indians; Tubatulabals of Kern County; Tule River Indian Tribe; and Wuksache Indian Tribe. No responses have been received to date. The Native American Heritage Commission (NAHC) was also contacted on October 4, 2018, with a request that they conduct a sacred lands files (SLF) search. The SLF records search was completed with negative results.

The SSJVIC acknowledges that the Project essentially consists of a General Plan Update for the Ivanhoe Community. They further acknowledge that no immediate ground disturbance will take place as a result of this update and conclude that no further cultural resource investigation is recommended at this time. However, prior to any future ground disturbance project activities, the SSJVIC recommends that a new record search be conducted so their office can then make project specific recommendations for further cultural resources study, if needed. Once specific projects are proposed, location specific studies can be conducted to determine the appropriateness of avoiding or minimizing impacts to cultural resources as applicable.

The Tulare County General Plan has a number of policies that relate to the proposed Project area including *ERM-6.1 Evaluation of Cultural and Archaeological Resources*; *ERM-6.2 Protection of Resources with Potential State or Federal*; *ERM-6.4 Mitigation*; *ERM-6.10 Grading Cultural Resources Sites*; and *ERM-6.9 Confidentiality of Archaeological Sites* which allows the County to (within its authority) maintain confidentiality regarding the locations of archaeological sites in order to preserve and protect these resources from vandalism and the unauthorized removal of artifacts.

a), b) and d) ***Less Than Significant Impact With Mitigation*** - As noted above, a CHRIS records search was conducted by the SSJVIC. One previously recorded historic-period sites have been recorded within the study area and one historic-period site identified within one-half mile of the study area. These resources consist of an historic era railroad, and a junction box. The records search included an examination of the National Register of Historic Places, the California Register of Historical Resources, the California Points of Historic Interest, the California Inventory of Historic Resources, or the California State Historic Landmarks (see Attachment "C"). Also, as noted earlier, six previous cultural resources studies have been completed within the project area and six additional studies have been conducted within the one-half mile radius. The planning area consists of existing agricultural, commercial, light industrial, and residential uses. Until an actual development project is initiated, it remains unknown if subsurface historic resources would be encountered.

While the proposed Community Plan Update contains no plans for development or construction, over the planning horizon, future development within the UDB may result in the eventual construction of residences, and establishment of commercial and industrial use, and streets (and other infrastructure such as curbs, gutters, sidewalks, sewer and water collection/distribution systems, etc.). Such future activity could cause a substantial adverse change in the significance of a historical resource were any such resources to be located within the planning area. The proposed Project would not result in a substantial adverse change in the significance of an historical or archaeological resource as defined in Section 15064.5 of the CEQA Guidelines. Although no cultural resources were identified in the records search, there will, nonetheless, be a potentially significant impact if historical resources were uncovered during proposed specific development project construction; however, implementation of the **Mitigation Measures CUL-1 and CUL-2** (and also contained in the Mitigation Monitoring and Reporting Program) are included as part of this Mitigated Negative Declaration to reduce potential impacts to historical or archaeological resources to less than significant with mitigation.

|  |  | SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|--|--|--------------------|--|------------------------------|-----------|
|--|--|--------------------|--|------------------------------|-----------|

**Mitigation Measure CUL-1.** If, in the course of construction or operation within the Project area, any archaeological, historical, or paleontological resources are uncovered, discovered, or otherwise detected or observed, activities within fifty (50) feet of the find shall be ceased. A qualified archaeologist/paleontologist shall be contacted and advise the County of the site’s significance. If the findings are deemed significant by the Tulare County Resources Management Agency, appropriate mitigation measures shall be required prior to any resumption of work in the affected area of the proposed Project. Where feasible, mitigation achieving preservation in place will be implemented. Preservation in place may be accomplished by, but is not limited to: planning construction to avoid archaeological/paleontological sites or covering archaeological/paleontological sites with a layer of chemically stable soil prior to building on the site. If significant resources are encountered, the feasibility of various methods of achieving preservation in place shall be considered, and an appropriate method of achieving preservation in place shall be selected and implemented, if feasible. If preservation in place is not feasible, other mitigation shall be implemented to minimize impacts to the site, such as data recovery efforts that will adequately recover scientifically consequential information from and about the site. Mitigation shall be consistent with CEQA Guidelines section 15126.4(b)(3).

**Mitigation Measure CUL-2.** If cultural/archeological/paleontological resources are encountered during project-specific construction or land modification activities, work shall stop and the County shall be notified at once to assess the nature, extent, and potential significance of any cultural resources. If such resources are determined to be significant, appropriate actions shall be determined. Depending upon the nature of the find, mitigation could involve avoidance, documentation, or other appropriate actions to be determined by a qualified archaeologist. For example, activities within 50 feet of the find shall be ceased.

No formal cemeteries or other places of human internment are known to exist within the Project site; however, in accordance with State Health and Safety Code Section 7050.5 and Public Resource Code Section 5097.98, if human remains are unearthed during project-specific construction as development occurs, no further disturbance shall occur until the County Coroner has made the necessary findings as to the origin and disposition of such remains. If the remains are determined to be Native American, the Coroner must notify the Native American Heritage Commission (NAHC) within 48 hours of the Coroner’s determination. The NAHC will then identify the person(s) thought to be the most likely descendent of the deceased Native American, who will then assist in determining what course of action shall be taken in handling the remains. Impacts to this checklist item will be less than significant with mitigation.

c) **Less Than Significant** - No paleontological resources are known to exist within the proposed Project area, nor are there any known geologic features in the proposed Project area. As there is no project-specific construction anticipated or contemplated, the Project will not disturb any paleontological resources not previously disturbed; however, the measures discussed in item a., will ensure proper investigation and handling of any discovery were to occur in future projects. If, in the course of specific-project construction or operation, any archaeological or historical resources are uncovered, discovered, or otherwise detected or observed, activities within fifty (50) feet of the find shall immediately cease. A qualified archaeologist shall be contacted and advise the County of Tulare of the site’s significance. If the findings are deemed significant by the Tulare County Resources Management Agency, appropriate measures shall be required prior to any resumption of work in the affected area of the proposed Project area. As such, the Project would result in a less than significant impact to this resource.

e) **Less Than Significant Impact** - The proposed Project will not disturb unique architectural features or the character of surrounding buildings. Individual site-specific development proposals will be required to undergo individual assessments on a case-by-case basis. As indicated in the CHRIS results (see Attachment “C”), no resources were identified within the Ivanhoe planning area. Implementing the General Plan policies will result in a less than significant to this resource.

|  |   | <b>SIGNIFICANT IMPACT</b> | <b>LESS THAN SIGNIFICANT IMPACT WITH MITIGATION</b> | <b>LESS THAN SIGNIFICANT IMPACT</b> | <b>NO IMPACT</b>                    |
|--|---|---------------------------|---|-------------------------------------|-------------------------------------|
|  |   | <b>SIGNIFICANT IMPACT</b> | <b>LESS THAN SIGNIFICANT IMPACT WITH MITIGATION</b> | <b>LESS THAN SIGNIFICANT IMPACT</b> | <b>NO IMPACT</b>                    |
| <b>6.</b>  | <b>Energy</b>   |                           |   |                                     |                                     |
|  | Would the project:  |                           |   |                                     |                                     |
| a)   | Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?  | <input type="checkbox"/>  | <input type="checkbox"/>                            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| b)   | Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?  | <input type="checkbox"/>  | <input type="checkbox"/>                            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| <p>Analysis:</p> <p>As noted previously, the Project is an update to the Ivanhoe Community Plan and no development proposals are being considered at this time. The update is being prepared to accommodate a growth rate of 1.3% (consistent with the Tulare County General Plan). The Project includes expansion of the Urban Development Boundary (UDB); as such, a case-by-case evaluation will be conducted when development proposals are received for both the existing UDB and future UDB area. However, as this Project is merely an update to the Community Plan, there is no possibility of changes to energy resources within the already established UDB area.</p> <p>a) <b>No Impact</b> - The proposed Project is a Community Plan Update and contains no plans for development or construction projects. Thus, the Project will not result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources.</p> <p>b) <b>No Impact</b> - The proposed Project is a Community Plan Update and contains no plans for development or construction projects. Therefore, there are no conflicts or obstructions with state or local plan for energy consumption.</p> |   |                           |   |                                     |                                     |
| <b>7.</b>  | <b>GEOLOGY/SOILS</b>  |                           |   |                                     |                                     |
|  | Would the project:  |                           |   |                                     |                                     |
| a)   | Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:   |                           |   |                                     |                                     |
| i)   | Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of | <input type="checkbox"/>  | <input type="checkbox"/>                            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

|      |   | SIGNIFICANT IMPACT       | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT        | NO IMPACT                           |
|------|---|--------------------------|--|-------------------------------------|-------------------------------------|
|      | Mines and Geology Special Publication No. 42.   |                          |  |                                     |                                     |
| ii)  | Strong seismic ground shaking?  | <input type="checkbox"/> | <input type="checkbox"/>                     | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| iii) | Seismic-related ground failure, including liquefaction?   | <input type="checkbox"/> | <input type="checkbox"/>                     | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| iv)  | Landslides?   | <input type="checkbox"/> | <input type="checkbox"/>                     | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| b)   | Result in substantial soil erosion or the loss of topsoil?  | <input type="checkbox"/> | <input type="checkbox"/>                     | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| c)   | Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse? | <input type="checkbox"/> | <input type="checkbox"/>                     | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| d)   | Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?   | <input type="checkbox"/> | <input type="checkbox"/>                     | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| e)   | Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?   | <input type="checkbox"/> | <input type="checkbox"/>                     | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |

Analysis:

Seismicity:

As noted previously, the Project is an update to the Ivanhoe Community Plan and no development proposals are being considered at this time. The Update is being prepared to accommodate a growth rate of 1.3% (consistent with the Tulare County General Plan). As changes to the Urban Development Boundary (UDB) are proposed, there is a possibility of changes to geology or soil analysis as areas outside of the already established UDB area may become incorporated into the planning area.

The official maps of earthquake fault zones delineated by the California Geological Survey (CGS), State of California Department of Conservation (2010), in accordance with the Alquist-Priolo Earthquake Fault Zoning Act, indicate that several faults are known to occur in Tulare County. According to the CGS Fault Activity Map, a fault is approximately located or inferred cutting through the west and southern portions of the planning area.<sup>26</sup> The quaternary period began approximately 1.8 million years ago.<sup>27</sup> “Geologists focus their studies on Quaternary-active faults, faults that have ruptured in Quaternary time. Faults that have not broken in the last 1.8 million years are probably abandoned, or at least they cause an earthquake so infrequently as to be less important.”<sup>28</sup>

<sup>26</sup> California Department of Conservation, Fault Activity Map of California (2010), <http://maps.conservation.ca.gov/cgs/fam/>, accessed April 11, 2019.

<sup>27</sup> US Geological Survey, 2018. What is Quaternary? [https://geomaps.wr.usgs.gov/sfgeo/quaternary/stories/what\\_is.html](https://geomaps.wr.usgs.gov/sfgeo/quaternary/stories/what_is.html)

<sup>28</sup> US Geological Survey, 2018. Do All Faults Cause Earthquakes? [https://geomaps.wr.usgs.gov/sfgeo/quaternary/stories/all\\_faults.html](https://geomaps.wr.usgs.gov/sfgeo/quaternary/stories/all_faults.html)

|   |  | SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|---|--|--------------------|--|------------------------------|-----------|
| <p>Additional faults with the potential to affect the proposed Project area are the San Andreas Fault approximately 40 miles west of the Tulare County boundary, the Owens Valley Fault (approximately 65 miles to the northeast), and the Clovis Fault, approximately six miles south of the Madera County boundary in Fresno County (or approximately 44 miles northeast of Ivanhoe).<sup>29</sup></p> <p>“In 1973, five counties within the Southern San Joaquin Valley undertook the preparation of the Five County Seismic Safety Element to assess seismic hazards. The Element identifies areas of potential seismic activity, including Doyle Springs and most of the Moorehouse subareas, as being in the Sierra 1 (S1) Zone (eastern Sierra Nevada). All of the subareas east of and including Sequoia Crest, Pierpoint, and Roger’s Camp lie within the Sierra 2 (S2) Zone (eastern Sierra Nevada, south of Owens Valley fault). In general, zones C1, S1, and V1 (V-1) are safer than zones C2, S2, and V2.”<sup>30</sup></p> <p>According to the Tulare County General Plan, the planning area lies in the V-1 seismic study area.<sup>31</sup></p> <p>“Seismic Zone “V-I” includes the most of the eastern San Joaquin Valley, and is characterized by a relatively thin section of sedimentary rock overlying a granitic basement. Amplification of shaking that would affect low to medium-rise structure is relatively high, but the distance to either the San Andreas or Owens Valley faults (the expected sources of shaking) is sufficiently great that the effects should be minimal. Adherence to the requirements of the Uniform Building Code applicable to the Planning Area should be adequate to protect new structures from earthquake damage.”<sup>32</sup></p> <p><u>Soils:</u></p> <p>According to the Ivanhoe CPU, the soils that characterize the Ivanhoe area originated from granitic rocks of the Sierra Nevada and contain quantities of mica, quartz, feldspars and granitic sand.<sup>33</sup> The predominant soil types in the Ivanhoe area are described as follows:</p> <p><u>Cajon Sandy Loam</u> – Class I - a deep permeable soil on gently sloping alluvial fans and flood plains with a Class II agricultural capability (good agricultural land). There are slight limitations for septic systems. The soil is extremely easy to till and is not sticky when wet. The major portion of the soil is free of salts but with a comparatively low organic-matter content, the soil is of good quality and suitable for most crops.</p> <p><u>Madera Loam or Clay Loam</u> (Class III) – consists of moderately deep to hardpan, well or moderately well drained soils that formed in old alluvium derived from granitic rock sources, very slow permeability. Madera soils are on hummocky, gently sloping to undulating terraces. Used mainly for irrigated cropland such as alfalfa, almonds, grapes, oranges, rice, and tomatoes.</p> <p><u>San Joaquin Loam or Sandy</u> (Class III) - is moderately deep to a hardpan, well drained and nearly level. This soil is suitable for orchards, vineyards, and cultivated crops but is somewhat limited by the presence of hardpan which restricts root growth. This problem can be alleviated by ripping and shattering the hardpan. The soil is poorly suited to urban</p> |  |                    |  |                              |           |

<sup>29</sup> Background Report Tulare County General Plan, page 8-6, <http://generalplan.co.tulare.ca.us/documents/GeneralPlan2010/BackgroundReport.pdf>, accessed April 11, 2019.

<sup>30</sup> Ibid.

<sup>31</sup> Tulare County General Plan 2030 Update. August 2012. Seismic/Geologic Hazards and Microzone. Figure 10-5. Page 10-31.

<http://generalplan.co.tulare.ca.us/documents/GP/001Adopted%20Tulare%20County%20General%20Plan%20Materials/000General%20Plan%202030%20Part%20I%20a%20Part%20II/GENERAL%20PLAN%202012.pdf>

<sup>32</sup> Tulare County, 2019, page 53. Draft Ivanhoe Community Plan 2019 Update.

<sup>33</sup> Ibid.

|  |  | SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|--|--|--------------------|--|------------------------------|-----------|
| <p>uses because of a high clay content, very slow permeability and a cemented hardpan. Septic tank filter fields are severely limited for these reasons.</p> <p>Greenfield Sandy Loam (Class II, Shallow Phase) – consists of deep, well drained soils that formed in moderately coarse and coarse textured alluvium derived from granitic and mixed rock sources. Used for the productions of a wide variety of irrigated field, forage, fruit crops, and growing dryland grain and pasture.</p> <p>Exeter Clay Loam (Class III) – consists of moderately deep to a duripan, moderately well drained soils that formed in alluvium mainly from granitic sources. Used mainly for irrigated cropland growing oranges, olives, and deciduous orchards, vineyards, and row crops.</p> <p>The following Tulare County General Plan 2030 Update policies for this resource apply to this Project:</p> <p>a) <b>No Impact</b> - According to the Tulare County General Plan, the planning area lies in the V1 seismic study area, characterized by a relatively thin section of sedimentary rock overlying a granitic basement (see precious text).</p> <p>The V-1 seismic zone, which is characterized by a relatively thick section of sedimentary rock overlying a granitic basement, has “low” risks for shaking hazards, “minimal” risk for landslides, “low to moderate” risk for subsidence, “low” risks for liquefaction and “minimal” risk for seiching.<sup>34</sup></p> <p>The distance to area faults i.e. the Clovis Group, Pond - Poso, and San Andreas, expected sources of significant shaking, is sufficiently great that shaking effects should be minimal.</p> <p>i) <b>Fault Rupture:</b> An analysis prepared by the Tulare County Environmental Planning Department based on information provided by the State of California and the Five County Seismic Safety Element indicates that the Project site is not located within the Alquist-Priolo Earthquake Fault Zone. No active or potentially active fault traces are known to traverse the site.<sup>35</sup> In addition, the California Department of Conservation’s CGS Information Warehouse indicates that the planning area is not located in a “fault zone,” i.e. in an area where hazards exist that are associated with surface fault rupture.<sup>36,37</sup> The Project does not include specific development projects (such as residential, commercial, or industrial uses). Any future developments would be evaluated on a project-by-project basis and will be constructed in accordance with all applicable building codes. As such, risk to persons or structures caused by rupture of known earthquake faults are minimal. As such, there will be no impact as a result of the Project.</p> <p>ii) <b>Ground Shaking:</b> As previously discussed, the Project is located in the V-1 seismic zone and located above a geological formation that is not conducive to ground shaking events. The release of energy caused by an earthquake is a direct result of fault rupture at depth, and when that rupture extends to the ground surface it manifests as displacements expressed as fractures, fissures, tectonic deformation and ground shaking.<sup>38</sup> Based on the information discussed in checklist sub-item i), it is unlikely that ground shaking will affect the planning area. As such, there will be no impact as a result of the Project.</p> |  |                    |  |                              |           |

<sup>34</sup> Envicom Corporation, 1974. Summary of Seismic Hazards & Safety Recommendations. Five County Seismic Safety Element Fresno, Kings, Madera, Mariposa & Tulare Counties.

<sup>35</sup> California Department of Conservation, 2018. Fault Activity Map of California (2010). <http://maps.conservation.ca.gov/cgs/fam/>.

<sup>36</sup> California Department of Conservation, 2019. CGS Warehouse: Regulatory Maps. <http://maps.conservation.ca.gov/cgs/informationwarehouse/index.html?map=regulatorymaps>.

<sup>37</sup> California Department of Conservation, 2018. Special Publication 42 Revised 2018 Earthquake Fault Zones. A Guide for Government Agencies, Property Owners / Developers, and Geoscience Practitioners for Assessing Fault Rupture Hazards in California. Page 1. <ftp://ftp.consrv.ca.gov/pub/dmg/pubs/sp/Sp42.pdf>.

<sup>38</sup> Ibid. 6.

|  |   | SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|--|---|--------------------|--|------------------------------|-----------|
|  | <p>iii) <i>Ground Failure and Liquefaction:</i> As previously discussed, the Project is located in the V-1 zone. According to the Five County Seismic Safety Element, the V-1 zone has a low risk of liquefaction.<sup>39</sup> The California Department of Conservation’s CGS Information Warehouse indicates that the planning area is not located in a “liquefaction zone.”<sup>40</sup> The Project does not include specific development projects (such as residential, commercial, or industrial uses). Any future developments would be evaluated on a project-by-project basis and will be constructed in accordance with all applicable building codes. As such, risk to persons or structures due to liquefaction is minimal. There will be no impact as a result of the Project.</p> <p>iv) <i>Landslides:</i> As previously discussed, the Project is located in the V-1 zone. According to the Five County Seismic Safety Element the V-1 zone has “minimal” risk of landslide activity. The Project does not include specific development projects (such as residential, commercial, or industrial uses). The California Department of Conservation’s CGS Information Warehouse indicates that the planning area is not located in an area prone to landslides.<sup>41</sup> The Project does not include specific development projects (such as residential, commercial, or industrial uses). Any future developments would be evaluated on a project-by-project basis and will be constructed in accordance with all applicable building codes. As such, risk to persons or structures due to subsidence is minimal. There will be a no impact as a result of the Project.</p> |                    |  |                              |           |
|  | <p>b) <i>No Impact</i> - The proposed Project is a Community Plan Update and contains no plans for development or construction. As future development occurs, site construction activities would involve earthmoving activities to shape land, trenching for sewer and potable water distribution systems, pouring concrete for sidewalks, curbs, and gutters, and other typical construction-related activities. These activities could expose soils to erosion processes. The extent of erosion would vary depending on slope steepness/stability, vegetation/cover, concentration of runoff, and weather conditions.</p> <p>To prevent water and wind erosion during the construction-related activities, a Storm Water Pollution Prevention Plan (SWPPP) will be developed for projects within the planning area which disturb more than one acre in size. As part of the SWPPP, applicants would be required to provide erosion control measures to protect the topsoil. Any stockpiled soils would be watered and/or covered to prevent loss due to wind erosion as part of the SWPPP during construction. As a result of these efforts, loss of topsoil and substantial soil erosion during the construction period are not anticipated. Therefore, the Project would result in no impact.</p>   |                    |  |                              |           |
|  | <p>c) <i>No Impact</i> - As discussed in subsections a) i – v, the Project site is located in a V-1 seismic zone with minimal and low-to- moderate risks for landslide, lateral spreading, subsidence, liquefaction or collapse. The Project does not include specific development projects (such as residential, commercial, or industrial uses). Any future developments would be evaluated on a project-by-project basis and will be constructed in accordance with all applicable building codes. A substantial grade change would not occur in the area topography to the point where the developments within the proposed Project area would expose people or structures to potential substantial adverse effects from on or off-site landslides. Furthermore, as previously discussed in this chapter, lateral spreading, liquefaction or collapse are unlikely to occur as area soils, substrate and seismology are not conducive to such phenomena. Therefore, the Project will result in no impact.</p>   |                    |  |                              |           |
|  | <p>d) <i>No Impact</i> - As identified in the analysis section of this chapter, the planning area contains at least five soil types, all of which exhibit “moderately” or “well” drained as identified by the USDA’s Soil Survey Map.<sup>42</sup> The California</p>   |                    |  |                              |           |

<sup>39</sup> Envicom Corporation, 1974. Summary of Seismic Hazards & Safety Recommendations. Five County Seismic Safety Element Fresno, Kings, Madera, Mariposa & Tulare Counties.

<sup>40</sup> California Department of Conservation, 2019. CGS Warehouse: Regulatory Maps. <http://maps.conservation.ca.gov/cgs/informationwarehouse/index.html?map=regulatorymaps>.

<sup>41</sup> Ibid.

<sup>42</sup> Tulare County, 2019, pages 53-54. Draft Ivanhoe Community Plan 2019 Update.

|  |                                 | <b>SIGNIFICANT IMPACT</b> | <b>LESS THAN SIGNIFICANT IMPACT WITH MITIGATION</b> | <b>LESS THAN SIGNIFICANT IMPACT</b> | <b>NO IMPACT</b> |
|--|---------------------------------|---------------------------|---|-------------------------------------|------------------|
| <p>Department of Parks and Recreation has defined expansive soils as clay-based soils that tend to expand (increase in volume) as they absorb water and shrink (lessen in volume) as water is drawn away, resulting in damage to structures, slabs, pavements, and retaining walls if wetting and drying of the soil does not occur uniformly across the entire area.<sup>43</sup> The 1994 Uniform Building Code requires that when expansive soils are present, the building official may require that special provisions be made in the foundation design and construction to safeguard against damage due to this expansiveness, requiring a special investigation and report to provide design and construction criteria.<sup>44</sup> The proposed Project is a Community Plan Update contains no plans for development or construction; however, it does anticipate that across the planning horizon that the Ivanhoe communities will continue to grow at a 1.3% rate, consistent with the Tulare County General Plan.</p> <p>As future development occurs, construction of residential or commercial structures would be evaluated on a case-by-case basis. Based on the analysis performed in this chapter, it is anticipated that the area's low frequency of seismological activity, combined with soil types of moderately to well drained, the use of building and construction standards would result in a low risk thresholds with regard to life or property. Because no development or any project is planned as part of this Update, the Project will result in no impact.</p> <p>e) <i>Less Than Significant Impact</i> - The Ivanhoe Community Plan Update serves to outline community goals regarding the physical development of these respective communities in addition to the promotion of the general welfare of each community. As the proposed Project is a Community Plan Update and contains no plans for development or construction, the Plan in and of itself will not require or lead to the introduction or installation of septic tanks or alternative waste water disposal systems into area soils.</p> <p>The Ivanhoe Public Utilities District (PUD) is responsible for providing sanitary sewer service to residents within the District's boundary.<sup>45</sup> According to the Ivanhoe PUD, there are approximately 1,200 connections to the District's sewer system.<sup>46</sup> The PUD operates a Wastewater Treatment Facility (WWTF) located southwest of the community.<sup>47</sup> The average dry weather flow at the WWTF is approximately 0.36 million gallons per day (mgd) i.e. 360,000 gallons of effluent per day.<sup>48</sup></p> <p>According to the Draft Community Plan Update, Ivanhoe's current storm drainage system is inadequate and improvements are required.<sup>49</sup></p> <p>Future development within the proposed UDB would be required to connect to the existing wastewater treatment system provided by the Ivanhoe PUD.</p> <p>As noted previously, because no development or any project is planned as part of this Update, the Project will result in no impact.</p> |                                 |                           |   |                                     |                  |
| <b>8.</b>  | <b>GREENHOUSE GAS EMISSIONS</b> |                           |   |                                     |                  |
|  | Would the project:              |                           |   |                                     |                  |

<sup>43</sup> California Department of Parks and Recreation, 2010, Page 3.5-3. Los Angeles State Historic Park Master Development Plan Final EIR. [https://www.parks.ca.gov/pages/22272/files/r3\\_5\\_geology\\_soils.pdf](https://www.parks.ca.gov/pages/22272/files/r3_5_geology_soils.pdf)

<sup>44</sup> International Conference of Building Officials, 1994. Page 2-49. Uniform Building Code. Volume 2. Structural Engineering Design Provisions.1804.4 Expansive Soils. [http://digitalassets.lib.berkeley.edu/ubc/UBC\\_1994\\_v2.pdf](http://digitalassets.lib.berkeley.edu/ubc/UBC_1994_v2.pdf).

<sup>45</sup> Draft Ivanhoe Community Plan Update. Page 63.

<sup>46</sup> Ibid.

<sup>47</sup> Op. Cit. 68.

<sup>48</sup> Op. Cit.

<sup>49</sup> Op. Cit. 154.

|    |  | <b>SIGNIFICANT IMPACT</b> | <b>LESS THAN SIGNIFICANT IMPACT WITH MITIGATION</b> | <b>LESS THAN SIGNIFICANT IMPACT</b> | <b>NO IMPACT</b>         |
|----|--|---------------------------|---|-------------------------------------|--------------------------|
| a) | Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?       | <input type="checkbox"/>  | <input type="checkbox"/>                            | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b) | Conflict with any applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases? | <input type="checkbox"/>  | <input type="checkbox"/>                            | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

**Analysis:**

As noted previously, the Project is an update to the Ivanhoe Community Plan and no development proposals are being considered at this time. The Community Plan Update is being prepared to accommodate a growth rate of 1.3% (consistent with the Tulare County General Plan). The Project includes expansion of the Urban Development Boundary (UDB) by approximately 582 acres resulting in a total UDB area of approximately 1,394 acres. There are no specific development projects included in the proposed update that would contribute to an increase of greenhouse gases ; as such, there is no possibility of the Project resulting in changes of greenhouse gas emissions outside of the already established UDB. However, future developments within the proposed UDB would generate greenhouse gases and are evaluated in this analysis.

This Initial Study/Mitigated Negative Declaration is relying on the guidance and expertise of the San Joaquin Valley Air Pollution Control District (District, Air District, or SJVAPCD) in addressing greenhouse gas (GHG) emissions. The following is an excerpt contained in the Air District’s *Guidance for Assessing and Mitigating Air Quality Impacts* (GAMAQI) adopted by the Air District Governing Board on March 19, 2015:

“On December 17, 2009, the District’s Governing Board adopted the District Policy: *Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency*. The District’s Governing Board also approved the guidance document: *Guidance for Valley Land-Use Agencies in Addressing GHG Emission Impacts for New Projects Under CEQA*. In support of the policy and guidance document, District staff prepared a staff report: *Addressing Greenhouse Gas Emissions Under the California Environmental Quality Act*. These documents adopted in December of 2009 continue to be the relevant policies to address GHG emissions under CEQA. As these documents may be modified under a separate process, the latest versions should be referenced to determine the District’s current guidance at the time of analyzing a particular project. These documents and the supporting staff reports are available at the District’s website: [www.valleyair.org/Programs/CCAP/CCAP\\_idx.htm](http://www.valleyair.org/Programs/CCAP/CCAP_idx.htm).”<sup>50</sup>

“By enacting SB 97 in 2007, California’s lawmakers expressly recognized the need to analyze greenhouse gas emissions as a part of the CEQA process. SB 97 required OPR [Office of Planning and Research] to develop, and the Natural Resources Agency to adopt, amendments to the CEQA Guidelines addressing the analysis and mitigation of greenhouse gas emissions. ...It is widely recognized that no single project could generate enough GHG emissions to noticeably change the global climate temperature. However, the combination of GHG emissions from past, present and future projects could contribute substantially to global climate change. Thus, project specific GHG emissions should be evaluated in terms of whether or not they would result in a cumulatively significant impact on global climate change.”<sup>51</sup>

“In summary, the staff report evaluates different approaches for assessing significance of GHG emission impacts. As presented in the report, District staff reviewed the relevant scientific information and concluded that the existing science is inadequate to support quantification of the extent to which project specific GHG emissions would impact global climate

<sup>50</sup> San Joaquin Valley Air Pollution Control District, *Guidance for Assessing and Mitigating Air Quality Impacts*. Page 110.

<sup>51</sup> *Ibid.* 110-111.

|  |  | <b>SIGNIFICANT IMPACT</b> | <b>LESS THAN SIGNIFICANT IMPACT WITH MITIGATION</b> | <b>LESS THAN SIGNIFICANT IMPACT</b> | <b>NO IMPACT</b> |
|--|--|---------------------------|---|-------------------------------------|------------------|
| <p>features such as average air temperature, average rainfall, or average annual snow pack. In other words, the District was not able to determine a specific quantitative level of GHG emissions increase, above which a project would have a significant impact on the environment, and below which would have an insignificant impact. This is readily understood, when one considers that global climate change is the result of the sum total of GHG emissions, both manmade and natural that occurred in the past; that is occurring now; and will occur in the future.”<sup>52</sup></p> <p>“In the absence of scientific evidence supporting establishment of a numerical threshold, the District policy applies performance based standards to assess project-specific GHG emission impacts on global climate change. The determination is founded on the principal that projects whose emissions have been reduced or mitigated consistent with the California Global Warming Solutions Act of 2006, commonly referred to as “AB 32”, should be considered to have a less than significant impact on global climate change. For a detailed discussion of the District’s establishment of thresholds of significance for GHG emissions, and the District’s application of said thresholds, the reader is referred to the above referenced staff report, District Policy, and District Guidance documents.”<sup>53</sup></p> <p>“As presented in Figure 6 (Process of Determining Significance of Greenhouse Gas Emissions) [of the GAMAQI], the policy provides for a tiered approach in assessing significance of project specific GHG emission increases.</p> <ul style="list-style-type: none"> <li>• Projects complying with an approved GHG emission reduction plan or GHG mitigation program which avoids or substantially reduces GHG emissions within the geographic area in which the project is located would be determined to have a less than significant individual and cumulative impact for GHG emissions. Such plans or programs must be specified in law or approved by the Lead Agency with jurisdiction over the affected resource and supported by a CEQA compliant environmental review document adopted by the Lead Agency. Projects complying with an approved GHG emission reduction plan or GHG mitigation program would not be required to implement Best Performance Standards (BPS).</li> <li>• Projects implementing BPS would not require quantification of project specific GHG emissions. Consistent with CEQA Guideline, such projects would be determined to have a less than significant individual and cumulative impact for GHG emissions.</li> <li>• Projects not implementing BPS would require quantification of project specific GHG emissions and demonstration that project specific GHG emissions would be reduced or mitigated by at least 29%, compared to Business as Usual (BAU), including GHG emission reductions achieved since the 2002-2004 baseline period, consistent with GHG emission reduction targets established in ARB’s AB 32 Scoping Plan. Projects achieving at least a 29% GHG emission reduction compared to BAU would be determined to have a less than significant individual and cumulative impact for GHG.)”<sup>54</sup></li> </ul> <p>In addition to consistency with Air District GHG Guidance, the Tulare County General Plan has a number of policies that apply to projects within County of Tulare regarding GHG emissions. For example, General Plan policies that would apply to future development in the Project area include <i>AQ-1.7 Support Statewide Climate Change Solutions</i>; <i>AQ-1.9 Support Off-Site Measures to Reduce Greenhouse Gas Emissions</i>; <i>AQ-3.5 Alternative Energy Design</i>; and <i>LU-1.1 Smart Growth and Healthy Communities wherein the County shall promote the principles of smart growth and healthy communities in UDBs and HDBs, including LU-1.1.-3. (creating a strong sense of place), LU-1.1.-4. (mixing land uses), and LU-1.1.-9. (preserving open space).</i></p> <p>There are no specific development projects (such as residential, commercial, or industrial uses) associated with the Community Plan Update. As such, the proposed Project will not result in GHG emissions until specific development occurs. The Technical Memo “Greenhouse Gas Assessment for the Ivanhoe Community Plan Update” (GHG Memo) was</p> |  |                           |   |                                     |                  |

<sup>52</sup> Op. Cit. Ibid. 111.

<sup>53</sup> Op. Cit. 111-112.

<sup>54</sup> Op. Cit. 112.

|   |   | SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|---|---|--------------------|--|------------------------------|-----------|
| <p>completed by RMA Staff (Jessica Willis, Planner IV) in May 2019 to assess potential GHG impacts (See Attachment “D”). As indicated in the GHG Memo, the following GHG analysis was “...prepared to evaluate whether the estimated GHG emissions generated from the implementation of the Project (i.e., future development projects) would cause significant impacts on global climate change. The assessment was conducted within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000, et seq.). The methodology follows Air District recommendations for quantification of GHG emissions and evaluation of potential impacts on global climate change as provided in their guidance documents...”<sup>55</sup></p> <p>a) and b) <b>Less Than Significant Impact</b> - The Air District has established a menu of performance standards, some of which depend on the existence of an adopted climate action plan or the establishment of Best Performance Standards. The County has an adopted Climate Action Plan (CAP), which is used in this analysis to determine significance for this impact.</p> <p>The CAP states, “The County has already approved a substantial number of lots for development. Development of some of these lots will be limited by various factors such as water supply, sewer/septic capability, road capacity, etc. that cannot be addressed during the planning horizon due to lack of resources. This means that the County expects that new development proposals will be received that are more likely to develop before existing lots are developed because the rural community, landowner, or developer has the resources to provide all improvements and services required for the site. As a rough estimate, this analysis assumes that 40 percent of the development will occur on existing lots and 60 percent will occur in new developments. Development occurring on existing lots will be subject to existing conditions of the approved subdivision and zoning standards. Development occurring in new subdivisions and projects [after 2012] would be subject to additional measures required to mitigate significant impacts. The County will encourage developers of existing lots [established prior to 2012] to implement measures that reduce greenhouse gas emissions, but it has no authority to require additional reductions beyond those required by State regulation, the building code, and local ordinance.”<sup>56</sup></p> <p>The CAP also states,“ Commercial and industrial development in Tulare County during the 2020 and 2030 planning timeframes will comply with increasingly stringent State energy efficiency regulations in most projects. For industrial projects where the SJVAPCD is a Responsible Agency, the project will be expected to implement Best Performance Standards included in the SJVAPCD Guidelines for Addressing Greenhouse Gas Emissions on the processes and stationary equipment that emit greenhouse gases to levels that meet or exceed State targets and may be subject to Cap-and-Trade Program requirements.”<sup>57</sup></p> <p>As previously stated, there are no specific development projects (such as residential, commercial, or industrial uses) associated with the Community Plan Update. As such, the proposed Project will not result in GHG emissions until specific development occurs. The Project will provide a GHG emission reduction benefit as future buildout of the community will supply residents within the Ivanhoe UDB and immediate vicinity with greater shopping and employment opportunities, thereby reducing vehicle miles traveled from travelling to larger communities/cities for such opportunities. Future development projects will be required to comply with the County’s 2030 General Plan Update, the Ivanhoe Community Plan Update, and the Tulare County Climate Action Plan. Per the Air District recommendations above, because the Project is consistent with the reductions in ARB’s Scoping Plan and the County’s adopted CAP, the Project is determined to have a less than significant individual and cumulative impact for GHG emissions. Therefore, there will be a less than significant impact as a result of the Project.</p> |   |                    |  |                              |           |
| <b>9.</b>   | <b>HAZARDS AND HAZARDOUS MATERIALS:</b> |                    |  |                              |           |

<sup>55</sup> Tulare County RMA. Technical Memorandum: *Greenhouse Gas Assessment for the Ivanhoe Community Plan Update*. May 2019. Page 1.

<sup>56</sup> Ibid. 7-8.

<sup>57</sup> Op. Cit 8

|                    |  | <b>SIGNIFICANT IMPACT</b> | <b>LESS THAN SIGNIFICANT IMPACT WITH MITIGATION</b> | <b>LESS THAN SIGNIFICANT IMPACT</b> | <b>NO IMPACT</b>                    |
|--------------------|--|---------------------------|---|-------------------------------------|-------------------------------------|
| Would the project: |  |                           |   |                                     |                                     |
| a)                 | Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?   | <input type="checkbox"/>  | <input type="checkbox"/>                            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| b)                 | Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?   | <input type="checkbox"/>  | <input type="checkbox"/>                            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| c)                 | Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?   | <input type="checkbox"/>  | <input type="checkbox"/>                            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| d)                 | Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?  | <input type="checkbox"/>  | <input type="checkbox"/>                            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| e)                 | For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area? | <input type="checkbox"/>  | <input type="checkbox"/>                            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| f)                 | Impair implementation of, or physically interfere with an adopted emergency response plan or emergency evacuation plan?  | <input type="checkbox"/>  | <input type="checkbox"/>                            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| g)                 | Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.   | <input type="checkbox"/>  | <input type="checkbox"/>                            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

**Analysis:**

As noted previously, the Project is an update to the Ivanhoe Community Plan and no development proposals are being considered at this time. The update is being prepared to accommodate a growth rate of 1.3% (consistent with the Tulare County General Plan). Expansion of the Urban Development Boundary (UDB) may result in the discovery of, or over time, proposed businesses that handle hazards and hazardous materials.

The Community Plan Update does not include any specific development projects (such as residential, commercial, or

|   |  | SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|---|--|--------------------|--|------------------------------|-----------|
| <p>industrial uses) and will not involve any hazards or hazardous materials. Future development projects will be evaluated on a case-by-case basis and, in the event a specific project may include the use of potentially hazardous materials, said project will be required to comply with all rules/regulations of the Tulare County Environmental Health Department, California Department of Toxic Substances Control, San Joaquin Valley Air Pollution Control District, and any other regulatory agency's rules and regulations.</p>   |  |                    |  |                              |           |
| <p>The following Tulare County General Plan 2030 Update policies for this resource apply to this Project:</p>   |  |                    |  |                              |           |
| <p>The General Plan has a number of policies that apply to projects within Tulare County. General Plan policies that relate to the proposed Project include: <i>HS-4.1 Hazardous Materials</i>; <i>HS-4.3 Incompatible Land Uses</i>; and <i>HS-4.4 Contamination Prevention</i>.</p>   |  |                    |  |                              |           |
| <p>a) <b>No Impact</b> - The Community Plan Update does not include any specific development projects (such as residential, commercial, or industrial uses) and as such, will not, in and of itself, create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. The proposed Project is a Community Plan Update and the update contains no plans for development or construction; however, it does anticipate that across the planning horizon, the Ivanhoe community will continue to grow at a 1.3% rate, consistent with the Tulare County General Plan's forecast growth rate for its unincorporated communities. Future development projects, anticipated to meet this 1.3% growth rate, will be evaluated on a case-by-case basis and construction-related activities may involve the use and transport of hazardous materials. These materials may include fuels, oils, mechanical fluids, and other chemicals used during construction-related activities. Construction-related activities would also be required to comply with the California fire code to reduce the risk of potential fire hazards. The Tulare County Environmental Health Services Division (TCEHSD) requires submittal of a Hazardous Materials Business Plan, if the site ever handles or stores quantities of hazardous materials in excess of 55 gallons of a liquid, 500 pounds of a solid, or 200 cubic feet of a compressed gas or any amount of a hazardous waste. Compliance with local, state and federal regulations would be adequate such that any future projects would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. Therefore, this Community Plan Update would result in no impact to this checklist item.</p> |  |                    |  |                              |           |
| <p>b) <b>No Impact</b> - As discussed in the previous checklist item, the Community Plan Update does not include any specific development projects (such as residential, commercial, or industrial uses) and as such, will not, in and of itself, create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. Over the planning horizon, it is anticipated that residential, commercial and/or municipal infrastructure projects may require and/or generate hazardous materials as part of the construction process. Furthermore, long-term storage of hazardous materials (i.e., agricultural compounds, building supplies, etc.,) may occur on residential premises or commercial supply yards upon buildout of the proposed UDB and will be evaluated on a case-by-case basis. Long-term construction, operational and storage-related activities involving hazardous materials would be required to comply with the California fire code to reduce the risk of potential fire hazards. The TCEHSD requires submittal of a Hazardous Materials Business Plan, if the site ever handles or stores quantities of hazardous materials in excess of 55 gallons of a liquid, 500 pounds of a solid, or 200 cubic feet of a compressed gas or any amount of a hazardous waste. Compliance with local, state and federal regulations would be adequate such that any future projects would not, upon buildout, create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. Therefore, the Project would result in a no impact to this Checklist item.</p>  |  |                    |  |                              |           |

|  |  | SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|--|--|--------------------|--|------------------------------|-----------|
| <p>c) <b>No Impact</b> – “The Ivanhoe Community Plan Area is within the Visalia Unified School District with one (1) school located within its boundaries. Ivanhoe Elementary School is located on a 14.96-acre campus at the 16030 Avenue 332, Ivanhoe, California.”<sup>58</sup></p> <p>The Community Plan Update does not include any specific development projects (such as residential, commercial, or industrial uses) and will not, in and of itself, involve any hazards or hazardous materials. Future development projects will be evaluated on a case-by-case basis and, in the event a specific future project, may include the use of potentially hazardous materials, the project will be required to comply with all rules/regulations of the Tulare County Environmental Health Department, California Department of Toxic Substances Control, San Joaquin Valley Air Pollution Control District, the California Department of Education and all applicable local, state and federal regulations with regards to hazardous emissions, materials, substances, or waste within one-quarter mile of an existing or proposed school. Based on this analysis, there will no impact as a result of the Community Plan Update.</p> <p>d) <b>No Impact</b> - According to the State of California Department of Toxic Substances Control <i>EnviroStor</i> database map and <i>Hazardous Waste and Substance Sites List</i>, the planning area does not contain and is not proximate to a listed hazardous site, pursuant to Government Code Section 65962.5.<sup>59</sup> A search of the United States Environmental Protection Agency’s <i>Superfund</i> database indicates that the planning area does not contain and is not near a listed hazardous site, pursuant to 26 U.S. Code § 9507.<sup>60</sup> Based on this information, it is not anticipated that the planning area will be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. The Community Plan Update will not create a significant hazard to the public or the environment and as such, no impact will result from this update.</p> <p>e) <b>No Impact</b> - According to a search in County’s GIS, the nearest airport is Woodlake Airport located greater than six (6) miles east of the Ivanhoe UDB. It is anticipated that across the planning horizon (including the proposed UDB expansion area), future growth within Ivanhoe will continue to lie outside of the Woodlake airport land use plan and beyond a two-mile radius of Woodlake airport. The CPU will not result in a safety hazard for people residing or working in the project area and as such, there will be no impact related to this Checklist item.</p> <p>f) <b>No Impact</b> - The Community Plan Update will comply with policies contained in the Tulare County General Plan 2030 Update such as <i>HS – 1.1 Maintaining Emergency Services</i>, <i>HS -1.9 Emergency Access</i>, and <i>HS – 1.10 Emergency Services Near Assisted Living Housing</i>, in addition to the Multi-Jurisdictional Local Hazard Mitigation Plan. “The Multi-Jurisdictional Local Hazard Mitigation Plan (MJLHMP) to assess the natural, technological, and human-caused risks to County communities, to reduce the potential impact of the hazards by creating mitigation strategies. The 2017 MJLHMP represents the County’s commitment to create a safer, more resilient community by taking actions to reduce risk and by committing resources to lessen the effects of hazards on the people and property of the County.”<sup>61</sup> Therefore, the Community Plan Update will not impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan. As such there will be no impact as a result of this project.</p> |  |                    |  |                              |           |

<sup>58</sup> Draft Ivanhoe Community Plan 2019 Update

<sup>59</sup> California Department of Toxic Substances Control, 2019. Hazardous Waste and Substances Site List (Cortese). [https://www.envirostor.dtsc.ca.gov/public/search.asp?PAGE=8&CMD=search&ocieerp=&business\\_name=&main\\_street\\_number=&main\\_street\\_name=&city=&zip=&county=&branch=&status=ACT%2CBKLG%2CCOM%2CCOLUR&site\\_type=CSITES%2COPEN%2CFUDS%2CCLOSE&cleanup\\_type=&npl=&funding=&reporttype=CORTESE&reporttitle=HAZARDOUS+WASTE+AND+SUBSTANCES+SITE+LIST+%28CORTESE%29&federal\\_superfund=&state\\_response=&voluntary\\_cleanup=&school\\_cleanup=&operating=&post\\_closure=&non\\_operating=&corrective\\_action=&tiered\\_permit=&evaluation=&spec\\_prog=&national\\_priority\\_list=&senate=&congress=&assembly=&critical\\_pol=&business\\_type=&case\\_type=&display\\_results=&school\\_district=&pub=&hwmp=False&permitted=&pc\\_permitted=&inspections=&complaints=&censtract=&cesdecile=&ORDERBY=county&next=Next+50](https://www.envirostor.dtsc.ca.gov/public/search.asp?PAGE=8&CMD=search&ocieerp=&business_name=&main_street_number=&main_street_name=&city=&zip=&county=&branch=&status=ACT%2CBKLG%2CCOM%2CCOLUR&site_type=CSITES%2COPEN%2CFUDS%2CCLOSE&cleanup_type=&npl=&funding=&reporttype=CORTESE&reporttitle=HAZARDOUS+WASTE+AND+SUBSTANCES+SITE+LIST+%28CORTESE%29&federal_superfund=&state_response=&voluntary_cleanup=&school_cleanup=&operating=&post_closure=&non_operating=&corrective_action=&tiered_permit=&evaluation=&spec_prog=&national_priority_list=&senate=&congress=&assembly=&critical_pol=&business_type=&case_type=&display_results=&school_district=&pub=&hwmp=False&permitted=&pc_permitted=&inspections=&complaints=&censtract=&cesdecile=&ORDERBY=county&next=Next+50)

<sup>60</sup> United States Environmental Protection Agency, 2019. Superfund. <https://www.epa.gov/superfund/search-superfund-sites-where-you-live>.

<sup>61</sup> Draft Ivanhoe Community Plan 2019 Update. Page 92.

|   |                                    | <b>SIGNIFICANT IMPACT</b>   | <b>LESS THAN SIGNIFICANT IMPACT WITH MITIGATION</b> | <b>LESS THAN SIGNIFICANT IMPACT</b> | <b>NO IMPACT</b>         |                                     |
|---|------------------------------------|---|---|-------------------------------------|--------------------------|-------------------------------------|
| g) <b>No Impact</b> - The planning area is located outside of a Calfire-designated wildland fire hazard zone. <sup>62</sup> “Fire protection and emergency medical services are provided by the Tulare County Fire Department. The community of Ivanhoe is served by Tulare County Fire Department Station # 8 located at 32868 Hawthorne Road in Ivanhoe, and includes one (1) Battalion; Patrol 8 & Engine 8 are assigned to this location.” <sup>63</sup> As such, the Community Plan Update will not result in any exposure to people or structures to a significant risk of loss, injury or death from wildland fires. There will be no impact related to this Checklist item. |                                    |   |   |                                     |                          |                                     |
| <b>10.</b>  | <b>HYDROLOGY AND WATER QUALITY</b> |   |   |                                     |                          |                                     |
|   | Would the project:                 |   |   |                                     |                          |                                     |
|   | a)                                 | Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?  | <input type="checkbox"/>                            | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|   | b)                                 | Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?  | <input type="checkbox"/>                            | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|   | c)                                 | Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or through the addition of impervious surfaces, in a manner which would:<br><br>i) result in substantial erosion or siltation on-or off-site;<br>ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on-or offsite;<br>iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;<br>or | <input type="checkbox"/>                            | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|   | d)                                 | In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?  | <input type="checkbox"/>                            | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

<sup>62</sup> Calfire FHSZ Viewer <http://egis.fire.ca.gov/FHSZ/>, accessed April 15, 2019.

<sup>63</sup> Draft Ivanhoe Community Plan 2019 Update. Page 74.

|    |  | <b>SIGNIFICANT IMPACT</b> | <b>LESS THAN SIGNIFICANT IMPACT WITH MITIGATION</b> | <b>LESS THAN SIGNIFICANT IMPACT</b> | <b>NO IMPACT</b>                    |
|----|--|---------------------------|---|-------------------------------------|-------------------------------------|
| e) | Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan? | <input type="checkbox"/>  | <input type="checkbox"/>                            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Analysis:

Water Quality/Quantity

As noted previously, the Ivanhoe Community Plan Update is an update to the existing community plan and no development proposals are being considered at this time. The update is being prepared to accommodate a growth rate of 1.3% (consistent with the Tulare County General Plan). As development occurs with the proposed Urban Development Boundary (UDB), hydrology and water quality outside of the already established UDB area may, be impacted and will therefore be evaluated on a case-by-case basis.

“Domestic water and sanitary sewer service in Ivanhoe is provided by the Ivanhoe Public Utilities District (PUD), which was formed in October 1951. **Table 23** shows the number of existing water and sewer connections, the capacity of each system, and the number of additional connections the systems can accommodate for new development (Housing Element, May 2012 and Municipal Service Review, March 2006). **Figure 13** graphically displays the approximate location of water wells and water lines.”<sup>64</sup>

**Table 1: Existing Infrastructure**

Source: Draft Ivanhoe Community Plan 2019 Update.

| <b>Drinking Water</b>              |                 |                  | <b>Waste Water*</b>                |                 |                  |
|------------------------------------|-----------------|------------------|------------------------------------|-----------------|------------------|
| <b>No. of Existing Connections</b> | <b>Capacity</b> | <b>Available</b> | <b>No. of Existing Connections</b> | <b>Capacity</b> | <b>Available</b> |
| 1,200                              | 2,400           | 1,200            | 1,200                              | 1,850           | 650              |

“The PUD operates a Wastewater Treatment Facility (WWTF) that provides secondary treatment of wastewater and is located southwest of the community. The WWTF is operated under the provisions of Order No. 98-090 issued by the California Regional Water Quality Control Board (RWQCB), which prescribes that the monthly average daily discharge shall not exceed 0.56 MGD. Treated effluent from the WWTF is recycled on 61.2 acres of pasture land south of the plant, which is leased by the PUD for grazing of non-milking cattle.

The average dry weather flow at the WWTF is approximately 0.36 MGD resulting in an excess capacity of approximately 200,000 GPD. Based upon the available capacity at the WWTF (200,000 GPD), it is estimated that approximately 650 additional connections (EDUs) to the system could be supported.”<sup>65</sup>

“A review of the Ivanhoe Irrigation District Water Conservation Plan (1998) confirm that the Ivanhoe Irrigation District uses groundwater recharge areas when the U.S. Bureau of Reclamation make non-storable water available. The Ivanhoe Public Utility District is located adjacent to the Ivanhoe Irrigation District and therefore benefits from said groundwater recharge activities.”<sup>66</sup>

<sup>64</sup> Draft Ivanhoe Community 2019 Update. Page 63.

<sup>65</sup> Ibid. 68.

<sup>66</sup> Op. Cit. 65.

|  |  | SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|--|--|--------------------|--|------------------------------|-----------|
| <p>“The County and East Kaweah Groundwater Sustainability Agency work collaboratively under the Tulare County General Plan to assist the Ivanhoe PUD in establishing conservation measures and credits in order to sustainably grow water and sewer infrastructure consistent with the Projected Growth Rates considered in the General Plan of Tulare County.”<sup>67</sup> According to its Community Plan Update, Ivanhoe encourages thoughtful localized conservation measures, funding, and credits for storm water retention/groundwater reclamation than can be utilized by the School District and PUD’s in order to meet the demands of the East Kaweah GSA and the Management Area.</p>      |  |                    |  |                              |           |
| <p><u>Storm Drainage</u></p>   |  |                    |  |                              |           |
| <p>Storm drainage systems should be designed so they have adequate capacity to accommodate runoff that enters the system for the design frequency and should also be designed considering future development. An inadequate roadway drainage system could result in the following:</p>   |  |                    |  |                              |           |
| <ul style="list-style-type: none"> <li>✓ Water overflowing the curb and entering adjacent property leading to damage</li> <li>✓ Accelerated roadway deterioration and public safety concerns may occur due to excessive water accumulation on roadways</li> <li>✓ Over saturation of the roadway structural section due to immersion will lead to pavement deterioration”<sup>68</sup></li> </ul>  |  |                    |  |                              |           |
| <p><u>Flooding</u></p>   |  |                    |  |                              |           |
| <p>“Flooding is a natural occurrence in the Central Valley because it is a natural drainage basin for thousands of watershed acres of Sierra Nevada and Coast Range foothills and mountains. Two kinds of flooding can occur in the Central Valley: general rainfall floods occurring in the late fall and winter in the foothills and on the valley floor; and snowmelt floods occurring in the late spring and early summer. Most floods are produced by extended periods of precipitation during the winter months. Floods can also occur when large amounts of water (due to snowmelt) enter storage reservoirs, causing an increase in the amount of water that is released.”<sup>69</sup></p>    |  |                    |  |                              |           |
| <p>“Official floodplain maps are maintained by the Federal Emergency Management Agency (FEMA). FEMA determines areas subject to flood hazards and designates these areas by relative risk of flooding on a map for each community, known as the Flood Insurance Rate Map (FIRM). A 100-year flood is considered for purposes of land use planning and protection of property and human safety. The boundaries of the 100-year floodplain are delineated by FEMA on the basis of hydrology, topography, and modeling of flow during predicted rainstorms.”<sup>70</sup></p>   |  |                    |  |                              |           |
| <p>The following Tulare County General Plan 2030 Update policies for this resource apply to this Project: There are several General Plan policies which will be implemented to avoid and/or minimize any potentially adverse impacts to hydrology/water quality such as: <i>HS-4.4 Contamination Prevention; WR-2.1 Protect Water Quality; WR-2.2 National Pollutant Discharge Elimination System (NPDES) Enforcement; WR-2.3 Best Management Practices (BMPs); WR-2.4 Construction Site Sediment Control; WR-3.3 Adequate Water Availability; WR-3.6 Water Use Efficiency; HS-5.1 Development Compliance with Federal, State, and Local Agencies; and HS-5.2 Development in Floodplain Zones.</i></p> |  |                    |  |                              |           |
| <p>a) <b>No Impact</b> - The proposed planning area contains a variety of uses such as residential, commercial, light industrial, public use (e.g., schools), and agricultural activity. Much of the Ivanhoe community is surrounded by agriculturally productive lands (refer to Agricultural and Forestry Resources Section for different types of farmland). The Community</p>  |  |                    |  |                              |           |

<sup>67</sup> Op. Cit. 132.

<sup>68</sup> Op. Cit. 4-2 to 4-3

<sup>69</sup> Background Report Tulare County General Plan . February 2010. Page 8-13. <http://generalplan.co.tulare.ca.us/documents/GeneralPlan2010/BackgroundReport.pdf>

<sup>70</sup> Ibid. 8-14.

|   |  | SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|---|--|--------------------|--|------------------------------|-----------|
| <p>Plan Update does not contain specific development projects, however, over time, the Community Plan Update would allow for the future development of non-urban lands to urban-type uses. The expansion of the existing UDB, as proposed in the Community Plan Update, would add approximately 582 acres to the Project area. The land uses proposed in the rezone planning area are compatible with the land uses within the existing community.</p> <p>“The PUD operates a Wastewater Treatment Facility (WWTF) that provides secondary treatment of wastewater and is located southwest of the community. The WWTF is operated under the provisions of Order No. 98-090 issued by the California Regional Water Quality Control Board (RWQCB), which prescribes that the monthly average daily discharge shall not exceed 0.56 MGD. Treated effluent from the WWTF is recycled on 61.2 acres of pasture land south of the plant, which is leased by the PUD for grazing of non-milking cattle.</p> <p>The average dry weather flow at the WWTF is approximately 0.36 MGD resulting in an excess capacity of approximately 200,000 GPD. Based upon the available capacity at the WWTF (200,000 GPD), it is estimated that approximately 650 additional connections (EDUs) to the system could be supported.”</p> <p>To reiterate, this Project is limited to amending the Urban Development Boundary, amending General Plan Land Use designations, and re-zoning consistent with land use designations. As such, there are no specific developments proposed as part of this project; however, future developments within the UDB area will be evaluated on a case-by-case basis to ensure the PUD can accommodate proposed developments or if the developer must pay for future capacity improvements. Therefore, the action to amend the Urban Development Boundary, amend General Plan Land Use designations, and re-zone would result in no impact to this resource.</p> <p>b) <b>No Impact</b> - As indicated earlier, this project is limited to amending the Urban Development Boundary, amending General Plan Land Use designations, and re-zoning consistent with land use designations. As such, there are no specific developments proposed as part of this project; however, future developments within the UDB area will be evaluated on a case-by-case basis to ensure the PUD can accommodate proposed developments or if the developer must pay for future capacity improvements. Therefore, the Community Plan Update would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted). As such, the Project would result in no impact to this resource.</p> <p>c) <b>No Impact</b> - As noted earlier, this project is limited to amending the Urban Development Boundary, amending General Plan Land Use designations, and re-zoning consistent with land use designations. As such, there are no specific developments proposed as part of this project; therefore, the Project would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or through the addition of impervious surfaces. Therefore, the Project would result in no impact to this resource (i-iii).</p> <p>d) <b>No Impact</b> - This project is limited to amending the Urban Development Boundary, amending General Plan Land Use designations, and re-zoning consistent with land use designations. As such, there are no specific developments proposed as part of this project; therefore, the Project would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course or stream or river, or through addition of impervious surfaces. Therefore, the Project would result in no impact to this resource.</p> <p>e) <b>No Impact</b> - As indicated earlier, this project is limited to amending the Urban Development Boundary, amending General Plan Land Use designations, and re-zoning consistent with land use designations. As such, there are no specific</p> |  |                    |  |                              |           |

|  |  | SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|--|--|--------------------|--|------------------------------|-----------|
|--|--|--------------------|--|------------------------------|-----------|

developments proposed as part of this Project; therefore, the Project would not otherwise obstruct or conflict with surface or groundwater quality control or management plans. Therefore, the Project would result in no impact to this resource.

**11. LAND USE AND PLANNING**

Would the project:

|    |  |                          |                          |                                     |                                     |
|----|--|--------------------------|--------------------------|-------------------------------------|-------------------------------------|
| a) | Physically divide an established community?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| b) | Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| c) | Conflict with any applicable habitat conservation plan or natural community conservation plan?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Analysis:

“Ivanhoe is a census-designated place located in the northwest portion of Tulare County, northeast of Visalia. Ivanhoe is bound by Avenue 320 in the south, Avenue 336 in the north, Road 152 in the west, and Road 164 in the east and encompasses approximately two (2) square miles of land. SR 216 (Avenue 328) traverses the southeastern portion of the Community and provides access to SR 198 in Visalia (approximately ten miles southwest of Ivanhoe). SR 99 is located approximately 13 miles west of Ivanhoe.”<sup>71</sup>

The existing Urban Development Boundary contains approximately 812 acres (including Rights-of-way).<sup>72</sup> The Community Plan Update proposes approximately 582-acre expansion for a total UDB area of approximately 1394.2 acres (see **Figure 4**).<sup>73</sup>

“One of the most important purposes of the Ivanhoe Community Plan is to establish land use patterns and development policies and standards for the community for the planning period, through the year 2030. The general intent of the land use plan for Ivanhoe is to identify the most appropriate types and distribution of land uses for the community, based on environmental, circulation, infrastructure, services, opportunities and constraints, urban development boundary suitability analysis and other economic capacities and concerns discussed in the chapters of this Plan.”<sup>74</sup>

“The County of Tulare, through existing policies, has encouraged both incorporated and unincorporated communities to establish urban development and land use patterns, which are compact and contiguous. This policy position has reduced so-called “leap frog” development throughout the County, helping preserve agricultural lands, and minimize land use conflicts between urban and agricultural areas.”<sup>75</sup>

<sup>71</sup> Draft Ivanhoe Community Plan 2019 Update. Page 20.

<sup>72</sup> Ibid. 24.

<sup>73</sup> Op. Cit. 162

<sup>74</sup> Op. Cit. 27.

<sup>75</sup> Op. Cit.

|   |                          | SIGNIFICANT IMPACT   | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT                |                                     |
|---|--------------------------|--|--|------------------------------|--------------------------|-------------------------------------|
| <p>“The “Residential” classification is intended to allow the development of single family and multi-family residential uses, to be implemented with zoning at locations appropriate for densities ranging from one (1) dwelling unit per acre to not more than twenty-eight (28) dwelling units per acre.” The Residential land use designation is subdivided into three categories – Low Density Residential, Medium Density Residential and High Density Residential. In addition, the plan sets aside a certain amount of area as “Residential Reserve.”<sup>76</sup></p> <p>The following Tulare County General Plan 2030 Update policies for this resource apply to this Project: <i>LU-1.2 Innovative Development; LU-1.8 Encourage Infill Development; PF-1.3 Land Uses in UDBs/HDBs; PF-2.4 Community Plans; PF-2.6 Land Use Consistency; PF-2.7 Improvement Standards in Communities; and AQ-3.6 Mixed Land Uses.</i></p> <p>In addition to Tulare County General Plan policies, Ivanhoe Community Plan Update includes policies specific to the community. See the Policy Plan discussion of the Ivanhoe Community Plan Update.</p> <p>a) <b>No Impact</b> - The Community Plan Update anticipates a 1.3% annual growth rate and the implementation of the Complete Streets over the course of the 2030 planning horizon. While the community may see the expansion of its existing UDB, no development projects are proposed with this project. Growth of the community anticipated by this Project will be encouraged within the UDB boundaries. As future development will likely occur along the expansion areas of the communities’ core, such growth will not physically divide the established community. Therefore, the Project would have no impact related to this Checklist item.</p> <p>b) <b>Less Than Significant Impact</b> - The Community Plan Update anticipates a 1.3% annual growth rate and the implementation of the Complete Streets Program over the course of the 2030 planning horizon. Any improvements, developments and/or improvements made as part of the Update would be required to comply with applicable land use plans, policies, or regulations of agencies with jurisdiction over the project (such as the Tulare County General Plan, Zoning Ordinance, Valley Air District, Regional Water Quality Control Board, etc.). Therefore, the Project would result in a less than significant related to this Checklist Item will occur.</p> <p>c) <b>No Impact</b> - See Checklist item4. Biological Resources, item f), No known habitat conservation plan (HCP) or natural community conservation plan (NCCP) are in effect for the Community Plan Update planning area. As such, the Community Plan Update is not expected to conflict with local policies or any state or federal habitat conservation plans; there will be no impact to this resource.</p> |                          |  |  |                              |                          |                                     |
| <b>12.</b>  | <b>MINERAL RESOURCES</b> |  |  |                              |                          |                                     |
|   | Would the project:       |  |  |                              |                          |                                     |
|   | a)                       | Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?                                | <input type="checkbox"/>                     | <input type="checkbox"/>     | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|   | b)                       | Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan? | <input type="checkbox"/>                     | <input type="checkbox"/>     | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

<sup>76</sup> Op. Cit.

|   |                              | SIGNIFICANT IMPACT   | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT                |                                     |
|---|------------------------------|--|--|------------------------------|--------------------------|-------------------------------------|
| <p>Analysis:</p> <p>The Tulare County General Plan Background Report indicates that Mineral Resource Zones (MRZ) have been documented by the California State Geologist as existing in Tulare County.<sup>77</sup> Generally these sites are deposited along the foothill corridor of the Sierra Nevada Mountains. The Tulare County General Plan 2030 Update defines mineral resources as naturally occurring materials in the earth that can be utilized for commercial purposes.<sup>78</sup> The Background Report states that the most important minerals extracted in Tulare County are sand, gravel, crushed rock and natural gas.<sup>79</sup> According to the California Department of Conservation, the Ivanhoe planning area lies north of designated MRZ-3 and west of MRZ-2 zones.<sup>80</sup> MRZ-3 is described by the Department of Conservation as an area containing mineral deposits, the significance of which cannot be evaluated from available data, and MRZ-2 is described as an area with adequate information where mineral deposits are highly likely to exist.<sup>81</sup></p> <p>As noted previously, the Ivanhoe Community Plan Update is an update to the existing community plan and no development proposals are being considered at this time. The update is being prepared to accommodate an unincorporated community growth rate of 1.3% and is consistent with the Tulare County General Plan. As part of the plan update, it is anticipated that expansion of the Urban Development Boundary (UDB) will occur; however, it is not anticipated that the expansion would impact mineral resources as the expansion generally would move away from zones MRZ-2 and MRZ-3.</p> <p>The following Tulare County General Plan 2030 Update policies for this resource that apply to this Project: <i>ERM-2.1 Conserve Mineral Deposits; ERM-2.2 Recognize Mineral Deposits; ERM-2.3 Future Resource Development</i> and; <i>ERM-2.7 Minimize Adverse Impacts.</i></p> <p>a) <b>No Impact</b> - The Community Plan Update contemplates a wide variety of potential end uses, including residential, urban and open space and Update would not lead to a loss of availability of a known mineral resource as the CPU does not contain projects, proposed developments or construction activity that would currently, or upon build-out, fall inside of a Mineral Resource Zone. Accounting for the County’s unincorporated 1.3 percent population growth rate, the planning area would remain confined to the proposed UDB outside of, MRZ-2 and MRZ-3. As such, no impact related to this Checklist Item will occur.</p> <p>b) <b>No Impact</b> - As noted earlier, the Community Plan Update contemplates a wide variety of potential land uses, including residential, urban and open space over the course of the 2030 planning horizon and is not located in a known MRZ. As such, no impact related to this Checklist Item will occur.</p> |                              |  |  |                              |                          |                                     |
| <b>13.</b>  | <b>NOISE</b>                 |  |  |                              |                          |                                     |
|   | Would the project result in: |  |  |                              |                          |                                     |
|   | a)                           | Generation of a substantial temporary or permanent increase in | <input type="checkbox"/>                     | <input type="checkbox"/>     | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

<sup>77</sup> Tulare County General Plan Background Report. Figure 10-1 Mineral Resources. Page 10-19.

<http://generalplan.co.tulare.ca.us/documents/GeneralPlan2010/BackgroundReport.pdf>

<sup>78</sup> Tulare County General Plan 2030 Update, Seismic/Geologic Hazards and Microzone. Figure 10-5. Page 8-2.

<http://generalplan.co.tulare.ca.us/documents/GP/001Adopted%20Tulare%20County%20General%20Plan%20Materials/000General%20Plan%202030%20Part%20I%20a%20Part%20II/GENERAL%20PLAN%202012.pdf>.

<sup>79</sup> Tulare County General Plan Background Report. Page 10-17. <http://generalplan.co.tulare.ca.us/documents/GeneralPlan2010/BackgroundReport.pdf>.

<sup>80</sup> California Department of Conservation, 1997. Active Aggregate Producers in the Tulare County Production – Consumption Region. Plate 1 of 7 (Map).

[ftp://ftp.consrv.ca.gov/pub/dmg/pubs/ofr/OFR\\_97-01/OFR\\_97-01\\_Plate1.pdf](ftp://ftp.consrv.ca.gov/pub/dmg/pubs/ofr/OFR_97-01/OFR_97-01_Plate1.pdf).

<sup>81</sup> Ibid.

|  |    | <b>SIGNIFICANT IMPACT</b>  | <b>LESS THAN SIGNIFICANT IMPACT WITH MITIGATION</b> | <b>LESS THAN SIGNIFICANT IMPACT</b> | <b>NO IMPACT</b>         |                                     |
|--|----|--|---|-------------------------------------|--------------------------|-------------------------------------|
|  |    | ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?  |   |                                     |                          |                                     |
|  | b) | Generation of excessive ground-borne vibration or ground-borne noise levels?   | <input type="checkbox"/>                            | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|  | c) | For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels? | <input type="checkbox"/>                            | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

**Analysis:**

The State of California General Plan Guidelines identify rules for the Noise Elements of city and county General Plans, including a sound level/land-use compatibility chart that categorized, by land use, outdoor Ldn ranges in up to four categories (normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable). These guidelines provide the State’s recommendations for city and county General Plan Noise Elements (see Figure 12 of the Draft Ivanhoe Community Plan 2019 Update).<sup>82</sup>

The 2010 Recirculated Environmental Impact Report (RDEIR) prepared for the Tulare County General Plan Update included data regarding freeway and railroad noise. Baseline traffic noise contours for major roads in the County were developed using Sound 32 (Caltrans' computer implementation of the FHWA Traffic Noise Prediction Model).<sup>83</sup> Table 3.5-3 in the RDEIR summarized the daily traffic volumes, and the predicted Ldn noise level at 100 feet from the roadway centerline is approximately 79 feet, and the distance from the roadway centerline to the 60-, 65-, and 70-dB-Ldn contours are 82 feet, 1,813 feet, and 3,907 feet respectively.<sup>84</sup>

“Operations along the San Joaquin Valley Railroad (SJVR) line are another dominant source of noise in Ivanhoe. According to the Department of Transportation Federal Railroad Administration, there are two freight train operations per day along the SJVR line in Tulare County and may occur at any time of day or night. According to the Tulare County General Plan EIR, the Wyle methodology, the type and frequency of rail operation results in noise exposures of 65 and 60 dB Ldn at approximately 335 and 660 feet, respectively, from the center of the tracks for present operations, and at approximately 440 and 800 feet, respectively, from the center of the tracks for estimated future operations. The SJVR line is located between and parallel to Depot and Live Oak Drives. Noise levels are higher at grade crossings due to the warning horn. There are four areas at-grade crossings are located within the Planning Area.”<sup>85</sup>

1. The intersection of Avenue 323 and Road 160;
2. Road 330 between Depot and Live Oak Drives;

<sup>82</sup> Draft Ivanhoe Community Plan 2019 Update. Noise. Page 61.

<sup>83</sup> Ibid. 62.

<sup>84</sup> Op. Cit.

<sup>85</sup> Ibid. Page 63.

|  |  |                           |   |                                     |                  |
|--|--|---------------------------|---|-------------------------------------|------------------|
|  |  | <b>SIGNIFICANT IMPACT</b> | <b>LESS THAN SIGNIFICANT IMPACT WITH MITIGATION</b> | <b>LESS THAN SIGNIFICANT IMPACT</b> | <b>NO IMPACT</b> |
|--|--|---------------------------|---|-------------------------------------|------------------|

3. Avenue 328/Elm Street near the Visalia-Ivanhoe Highway/Road 160; and
4. The Visalia-Ivanhoe Highway/Road 160 near Avenue 328/Elm Street.

“The Noise Element includes performance standards for new residential or other noise-sensitive land uses which are to be located near noise-impacted areas. The Element indicates that these uses will not be permitted unless effective design measures can be integrated into the development to mitigate the impact of noise. Table 22 [of the Draft Ivanhoe Community Plan 2019 Update] summarizes the daily traffic volumes on Avenue 328 and SR 216.”<sup>86</sup>

As noted earlier, the Ivanhoe Community Plan 2019 Update is an update to the existing community plan and no development proposals are being considered at this time. As such, implementation of the Community Plan Update will not in and of itself create or induce impacts from noise in the planning area; however, buildout and urban infill over the course of the 2030 planning horizon may create the conditions wherein noise issues become a factor for sensitive receptors. As development proposals are received, they will be evaluated on a case-by-case basis to determine what, if any, noise impact they may have on the community and if mitigation to minimize noise impacts are necessary.

The following Tulare County General Plan 2030 Update policies for this resource apply to this Project: *HS-8.2 Noise Impacted Areas; HS-8.3 Noise Sensitive Land Uses; HS-8.5 State Noise Standards; HS-8.6 Noise Level Criteria; HS-8.7 - Inside Noise; HS-8.8 Adjacent Uses; HS-8.9 County Equipment; HS-8.11 Peak Noise Generators; and HS-8.13 Noise Analysis.*

a) **No Impact** - The proposed Project does not include any proposed development or construction-related activities, as such, it does not involve long- or short-term noise sources. During the construction phase of a development or activity, noise from construction activities (for example; earth-shaping activities, construction of roads, trenching to install water/sewer lines, etc.) would contribute to the noise environment in the immediate proposed Project vicinity. Activities involved in construction would generate maximum noise levels, as indicated in the table below, ranging from 79 to 91 dBA at a distance of 50 feet, without feasible noise control (e.g., mufflers, well maintained equipment, shielding noisier equipment parts, and/or time and activity constraints) and ranging from 75 to 80 dBA at a distance of 50 feet, with feasible noise control. Although the noise generated from earthmoving equipment may exceed the 65 dB Ldn during earthmoving operations, the impact is short-term, temporary, and will only occur during normal business hours, typically from 8:00 a.m-5:00 p.m. Existing General Plan policies and draft Community Plan policies will be implemented to minimize noise exposure. **Table 12-1** shows typical noise levels from various construction-related equipment. Therefore, the proposed Community Plan Update will result in no impact to this Checklist item.

| <b>Table 12-1<br/>Typical Construction Noise Levels</b> |                                       |  |
|---|---------------------------------------|--|
| <b>Type of Equipment</b>                                | <b>dBA at 50 feet</b>                 |  |
|   | <b>Without Feasible Noise Control</b> | <b>With Feasible Noise Control<sup>1</sup></b> |
| Dozer or Tractor  | 80                                    | 75   |
| Excavator   | 88                                    | 80   |
| Scraper   | 88                                    | 80   |
| Front End Loader  | 79                                    | 75   |
| Backhoe   | 85                                    | 75   |
| Grader  | 85                                    | 75   |

<sup>86</sup> Ibid.

|  |  |                           |   |                                     |                  |
|--|--|---------------------------|---|-------------------------------------|------------------|
|  |  | <b>SIGNIFICANT IMPACT</b> | <b>LESS THAN SIGNIFICANT IMPACT WITH MITIGATION</b> | <b>LESS THAN SIGNIFICANT IMPACT</b> | <b>NO IMPACT</b> |
|--|--|---------------------------|---|-------------------------------------|------------------|

|  |    |    |
|--|----|----|
| Truck  | 91 | 75 |
| Source: U.S. Department of Transportation, Federal Transit Administration. 2006.<br><sup>1</sup> Feasible noise control includes the use of intake mufflers, exhaust mufflers, and engine shrouds operating in accordance with manufacturers specifications. |    |    |

b) **No Impact** - Vibration is the periodic oscillation of a medium or object. Vibration sources may be continuous, such as factory machinery, or transient, such as explosions. Similar to airborne sound, ground borne vibrations may be described by amplitude and frequency. Vibration amplitudes are usually expressed in peak particle velocity (PPV) or root mean squared (RMS), as in RMS vibration velocity. The PPV and RMS (VbA) vibration velocity are normally described in inches per second (in/sec). PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal and is often used in monitoring of blasting vibration because it is related to the stresses that are experienced by buildings.<sup>87</sup>

Although PPV is appropriate for evaluating the potential for building damage, it is not always suitable for evaluating human response. As it takes some time for the human body to respond to vibration signals, it is more prudent to use vibration velocity when measuring human response. The vibration velocity level is reported in decibels relative to a level of 1x10<sup>-6</sup> inches per second and is denoted as VdB.<sup>88</sup> The typical background vibration-velocity level in residential areas is usually 50 VdB or lower.<sup>89</sup> Ground-borne vibration is normally perceptible to humans at approximately 65 VdB.<sup>90</sup> For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels (FTA 2006).<sup>91</sup>

Examples of outdoor sources of perceptible ground borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. Construction vibrations can be transient, random, or continuous. The approximate threshold of such vibration perception is 65 VdB, while 85 VdB is the vibration acceptable only if there are an infrequent number of events per day (FTA 2006).<sup>92</sup> **Table 12-2** describes the typical construction equipment vibration levels.

| <b>Table 12-2</b>   |                             |
|---|-----------------------------|
| <b>Typical Construction Vibration Levels</b>  |                             |
| Equipment   | VdB at 25 feet <sup>2</sup> |
| Small Bulldozer   | 58                          |
| Jackhammer  | 79                          |
| Source: U.S. Department of Transportation, Federal Transit Administration, Transit Noise and Vibration Impact Assessment. Page 12-12, Table 12-2, 2006. |                             |

The proposed Project does not include any construction-related activity; as such, it does not involve long- or short-term noise sources. Vibration from future construction-related activities will be evaluated on a case-by-case basis. As construction-related activity is short term and temporary, it is not anticipated to exceed the FTA threshold for the nearest potential receptors. Therefore, the Project would result in no impact of exposure of persons to, or generation of, excessive ground-borne vibration or ground-borne noise levels.

<sup>87</sup> Federal Transit Administration, 2006, page 7-3. Transit Noise and Vibration Impact Assessment. Chapter 7: Basic Ground-Borne Vibration Concepts. [https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/FTA\\_Noise\\_and\\_Vibration\\_Manual.pdf](https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/FTA_Noise_and_Vibration_Manual.pdf).

<sup>88</sup> Ibid.7-4.

<sup>89</sup> Op. Cit. 7-5.

<sup>90</sup> Op. Cit.

<sup>91</sup> Op. Cit. 7-8.

<sup>92</sup> Op. Cit.

|   |  | SIGNIFICANT IMPACT       | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT                           |
|---|--|--------------------------|--|------------------------------|-------------------------------------|
| c) <b>No Impact</b> - The proposed Project is not located within an airport land use plan or, within two miles of a public airport project nor is it within the vicinity of a private airstrip. There is no possibility of exposing people residing or working in the project area to excessive noise levels in or near an existing airport public or private airstrip. As noted earlier, the nearest airport is Woodlake Airport, approximately six miles east of Ivanhoe. As such, there will be no impact as a result of the Project.  |  |                          |  |                              |                                     |
| <b>14.</b>  | <b>POPULATION AND HOUSING</b>  |                          |  |                              |                                     |
|   | Would the project:   |                          |  |                              |                                     |
| a)  | Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)? | <input type="checkbox"/> | <input type="checkbox"/>                     | <input type="checkbox"/>     | <input checked="" type="checkbox"/> |
| b)  | Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?   | <input type="checkbox"/> | <input type="checkbox"/>                     | <input type="checkbox"/>     | <input checked="" type="checkbox"/> |
| c)  | Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?   | <input type="checkbox"/> | <input type="checkbox"/>                     | <input type="checkbox"/>     | <input checked="" type="checkbox"/> |
| Analysis:   |  |                          |  |                              |                                     |
| <p>As noted previously, the Project is an update to the Ivanhoe Community Plan and no development proposals are being considered at this time. The update is being prepared to accommodate a growth rate of 1.3% (consistent with the Tulare County General Plan). If approved, an expansion to the Urban Development Boundary (UDB) will be realized; as such, it is anticipated that changes to the landscape beyond the current UDB will occur. The proposed Project is intended to result in a comprehensive update to the Ivanhoe Community Plan and as such, will be consistent with the adopted/certified Tulare County Housing Element and the 2014 Regional Housing Needs Assessment (RHNA) prepared by the Tulare County Association of Governments (TCAG).</p> <p>The following Tulare County General Plan 2030 Update policies for this resource that apply to this Project: <i>General Plan Housing Element Housing Guiding Principle 1.1; Housing Policy 1.11; Housing Policy 1.12; Housing Policy 1.16; Housing Guiding Principle 1.3; Housing Policy 1.42; Housing Guiding Principle 1.6; Housing Policy 2.11; Housing Guiding Principle 2.2; Housing Policy 2.21; Housing Policy 2.22; Housing Policy 3.15; Housing Policy 3.21; Housing Policy 3.22; Housing Policy 3.23; and Housing Policy 4.12.</i></p> <p>a) <b>No Impact</b> - The Community Plan Update will update the land use designations within the existing UDB to be consistent with the General Plan, and will bring non-compliant properties into conformity with the Tulare County Zoning Ordinance. The communities' UDB at present anticipates potential future development based on the projections for the community's anticipated growth through the Year 2030 planning horizon. Potential growth and development is based on the existing land uses, census population data, and the projected 1.3% annual growth rate for unincorporated areas of Tulare County consistent with the County's General Plan. This project is intended to accommodate projected growth regardless of the Community Plan Update being approved and is consistent with the 2014-2023 Tulare County Regional Housing Needs Plan.</p> |  |                          |  |                              |                                     |

|  |  | SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|--|--|--------------------|--|------------------------------|-----------|
|--|--|--------------------|--|------------------------------|-----------|

The proposed Community Plan Update includes designating additional land for urban development beyond the existing UDB boundary. At full build-out, the proposed residential land use designations (see **Figure 5**) would be increased to 422.4 acres, commercial increased to 393.2 acres, industrial increased to 636.8 acres, and rights-of-way increased to 258.0 acres of the proposed UDB area (see Table 42 of the draft Community Plan Update).<sup>93</sup>

The population growth rate as identified by the County of Tulare is expected to remain at 1.3%; any land use change, rezoning, and/or UDB expansion is intended to provide more area to accommodate projected growth in Ivanhoe. Therefore, the Community Plan Update is intended to allow greater flexibility and availability of suitable developable lands while accommodating anticipated growth consistent with the Tulare County General Plan and Regional Housing Needs Plan. As such, the Community Plan Update will not result in substantial population growth in an area. Therefore, no impact related to this Checklist Item would occur as a result of adopting the Community Plan Update.

b) **No Impact** - As noted in Checklist Item 14 a), the Existing UDB Project intended to accommodate growth within the community at an annual growth rate of 1.3 percent (as well as proposed expansion of the existing UDB) over the course of the Year 2030 planning horizon; however, no specific developments are proposed within the existing UDB. As there is sufficient land within the existing UDB to accommodate anticipated growth, the Project is not anticipated to displace substantial numbers of existing housing or necessitate the construction of replacement housing. Furthermore, the project will bring non-compliant properties into conformity with the Tulare County Zoning Ordinance and improves upon pre-existing infrastructure (such as curbs, gutters, sidewalks, etc.) that would provide a benefit to housing in the project area. Therefore, the Project would result in no impact to this Checklist item.

c) **No Impact** - As previously discussed, the Project is intended to accommodate an annual growth rate of 1.3 percent, as well as an expansion of the existing UDB programs over the course of the Year 2030 planning horizon. No specific developments are proposed within the proposed Project area. As there is sufficient land within the existing UDB to accommodate anticipated growth, the Project is not anticipated to displace substantial numbers of people or necessitate the construction of replacement housing. Furthermore, the Project will bring non-compliant properties into conformity with the Tulare County Zoning Ordinance and improves upon pre-existing infrastructure that will be a benefit to housing in the project area. Therefore, the Project would result in no impact to this Checklist item.

**15. PUBLIC SERVICES**

Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

|    |                          |                          |                          |                          |                                     |
|----|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) | Fire protection?         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b) | Police protection?       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| c) | Schools?                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| d) | Parks?                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| e) | Other public facilities? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Analysis:  
 As noted earlier, the Project is an update to the Ivanhoe Community Plan and no development proposals are being considered at this time. The update is being prepared to accommodate a growth rate of 1.3 percent and is consistent with

<sup>93</sup> Draft Ivanhoe Community Plan Update, Table 42, Page 168; Figure 20, Page 100.

|  |  | SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|--|--|--------------------|--|------------------------------|-----------|
| <p>the Tulare County General Plan. If adopted as proposed, expansion to the Urban Development Boundary will occur and changes to public or utility services outside of the established UDB area will also occur accordingly. As the Project does not contain any development proposal, the need to expand public or utility services will be evaluated on a case-by-case basis as development occurs.</p> <p>“Fire protection and emergency medical services are provided by the Tulare County Fire Department. The community of Ivanhoe is served by the Tulare County Fire Department Station # 8 located at 32868 Hawthorne Road in Ivanhoe, and includes one (1) Battalion; Patrol 8 &amp; Engine 8 are assigned to this location. Currently no fire hydrants are found in Ivanhoe.”<sup>94</sup></p> <p>“Police protection in the Ivanhoe Planning Area is provided by the Tulare County Sheriff’s Department (patrol service only). The main Sheriff’s Office is located at 2404 W. Burrel Avenue, in Visalia, which serves the unincorporated areas of Tulare County.”<sup>95</sup></p> <p>“The Ivanhoe Community Plan Area is within the Visalia Unified School District with one (1) school located within its boundaries. Ivanhoe Elementary School is located on a 14.96-acre campus at the 16030 Avenue 332, Ivanhoe, California. It offers pre-Kindergarten through 8<sup>th</sup> grade education and has a 2016-2017 enrollment of 630 students. Students in high school are bussed to Golden West High School located at 1717 North McAuliff Street, Visalia, California (approximately 5.1 miles from Ivanhoe). The College of the Sequoias provides community college instruction for Ivanhoe residents at its Visalia and Tulare campuses.”<sup>96</sup></p> <p>“The nearest [County-operated] park is Cutler Park located southwest of Ivanhoe at 15520 Ivanhoe Dr. in Visalia, California.”<sup>97</sup></p> <p>The Tulare County Ivanhoe Branch Library was established on March 19, 1914. Throughout its early history, the Branch moved to different locations. Its current location is at 15964 Heather Ave. Ivanhoe, CA 93235.<sup>98</sup></p> <p>The following Tulare County General Plan 2030 Update policies for this resource apply to this Project: <i>PFS-7.1 Fire Protection; PFS-7.2 Fire Protection Standards; PFS-7.3 Visible Signage for Roads and Buildings; PFS-7.4 Interagency Fire Protection Cooperation; and PFS-7.5 Fire Staffing and Response Time Standards.</i></p> <p>In addition to fire protection services, the General Plan contains policies to ensure police services (provided by the Tulare County Sheriff’s Office) meets the needs of the affected community such as <i>PFS-7.8 Law Enforcement Staffing Ratios; PFS-7.9 Sheriff Response Time; PFS-7.10 Interagency Law Enforcement Protection Cooperation; and PFS-7.11 Locations of Fire and Sheriff Stations/Sub-stations</i> wherein the County shall strive to locate fire and sheriff sub-stations in areas that ensure the minimum response times to service calls.</p> <p>a) <b>No Impact</b> - As previously noted, the Tulare County Fire Department has a fire sub-station in Ivanhoe (Station 8), located at 32868 Hawthorne Road. The Tulare County Fire Department will be responsible for reviewing service provision for this community and ensuring maintenance of acceptable service ratios, response times or other performance objectives for any of the public services. The proposed Community Plan Update in and of itself will not significantly</p> |  |                    |  |                              |           |

<sup>94</sup> Draft Ivanhoe Community Plan 2019 Update. Page 74.

<sup>95</sup> Ibid 74.

<sup>96</sup> Op. Cit. 74.

<sup>97</sup> Op. Cit. 76.

<sup>98</sup> Op. Cit.75.

|  |   | SIGNIFICANT IMPACT       | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT                           |
|--|---|--------------------------|--|------------------------------|-------------------------------------|
| <p>impact the Fire Department’s response times. Therefore, the Project would result in no impact related to this Checklist Item.</p> <p>b) <b>No Impact</b> - The existing Community Plan Update is based on the General Plan’s 1.3 percent growth rate, and UDB expansion, over the course of the 2030 planning horizon. While no development projects are proposed as part of this Update, future growth is anticipated to occur within the proposed Urban Development Boundary over the planning horizon. Public safety components of the CPU and General Plan 2030 Update require that activities related to the Plan Update will comply with Tulare County’s General Plan policies and regulations. The Tulare County Sheriff’s Department will be responsible for law enforcement for this community and ensuring maintenance of acceptable service ratios, response times or other performance objectives for any of the public services. The proposed Community Plan Update in and of itself will not significantly impact the Sheriff Department’s response times. Therefore, no impact as a result of this Project related to this Checklist Item will occur.</p> <p>c) <b>No Impact</b> - As the proposed Project does not involve any development proposals that could contribute to the need for expanded school facilities. The estimated growth rate applied to this community is project at 1.3% per year. As such, even within the planning timeframe (Year 2030) it is not anticipated that the population growth of school-age children will exceed the capabilities of the Ivanhoe Elementary School to provide school facilities. As such, there will be no impact to this resource related to this Checklist item.</p> <p>d) <b>No Impact</b> - “The nearest [County-operated] park is Cutler Park located southwest of Ivanhoe at 15520 Ivanhoe Dr. in Visalia, California.”<sup>99</sup>. The proposed Project does not include plans for a future park within the community. As such, there will be no impact to this resource related to this Checklist item.</p> <p>e) <b>No Impact</b> - The proposed Project does not involve any development proposals that could contribute to the need for expanded electrical power, communications, natural gas services, or other public services causing an increase in consumer demand and/or subsequent service provision. Development proposals will be evaluated on a case-by-case basis and referred to the local electricity and gas service providers to determine the availability of the respective service. As such, the Project would result in no impact related to this Checklist item.</p> |   |                          |  |                              |                                     |
| <b>16.</b>   | <b>RECREATION</b>   |                          |  |                              |                                     |
| a)   | Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? | <input type="checkbox"/> | <input type="checkbox"/>                     | <input type="checkbox"/>     | <input checked="" type="checkbox"/> |
| b)   | Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?                        | <input type="checkbox"/> | <input type="checkbox"/>                     | <input type="checkbox"/>     | <input checked="" type="checkbox"/> |
| Analysis:  |   |                          |  |                              |                                     |

<sup>99</sup> Op. Cit. 76.

|   |  | SIGNIFICANT IMPACT       | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT                           |
|---|--|--------------------------|--|------------------------------|-------------------------------------|
| <p>As noted previously, the Project is an update to the Ivanhoe Community Plan and no development proposals are being considered at this time. The update is being prepared to accommodate a growth rate of 1.3% (consistent with the Tulare County General Plan). Changes to the UDB will occur; as such, it is likely that recreational opportunities/facilities outside of the existing UDB area will occur. Adoption of the Community Plan Update would result in no impact as future projects are viewed as “growth accommodating” rather than growth-inducing.</p> <p>The Community Plan Update contains no development proposals and will not result in the need for expanded or new recreational facilities. As development occurs within the expanded UDB the need for additional park or recreational facilities will be evaluated on a case-by-case basis, and as appropriate, a development proposal may result in the need for the project proponent to accommodate recreational needs. However, as this Project does not include any development proposals, the Project would result in no impact.</p> <p>Out of the approximately 30 acres designated by the Plan as public, “Only 16.0 acres (predominantly Ivanhoe Elementary School) can be considered as providing open space for active recreational uses during non-school hours.”<sup>100</sup></p> <p>a) and b) <b>No Impact</b> - The proposed Project does not include plans for a future park or other recreational facilities within the Planning area. The proposed Project will not result in an increase in the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility will occur or be accelerated; nor will it include recreational facilities which might have an adverse physical effect on the environment. There will be no impact to this resource as a result of this Project.</p> |  |                          |  |                              |                                     |
| <b>17.</b>  | <b>TRANSPORTATION</b>  |                          |  |                              |                                     |
|   | Would the project:   |                          |  |                              |                                     |
| a)  | Conflict with program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?             | <input type="checkbox"/> | <input checked="" type="checkbox"/>          | <input type="checkbox"/>     | <input type="checkbox"/>            |
| b)  | Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?   | <input type="checkbox"/> | <input type="checkbox"/>                     | <input type="checkbox"/>     | <input checked="" type="checkbox"/> |
| c)  | Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses, (e.g., farm equipment)? | <input type="checkbox"/> | <input type="checkbox"/>                     | <input type="checkbox"/>     | <input checked="" type="checkbox"/> |
| d)  | Result in inadequate emergency access?   | <input type="checkbox"/> | <input type="checkbox"/>                     | <input type="checkbox"/>     | <input checked="" type="checkbox"/> |
| <p>Analysis:</p> <p>As noted previously, the Project is an update to the Ivanhoe Community Plan and no development proposals are being considered at this time. The update is being prepared to accommodate a growth rate of 1.3% (consistent with the Tulare County General Plan). Changes to the UDB will occur; as such, there is the possibility of changes to circulation patterns</p>   |  |                          |  |                              |                                     |

<sup>100</sup> Draft Ivanhoe Community Plan 2019 Update. Page 30.

|  |  | SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|--|--|--------------------|--|------------------------------|-----------|
| <p>outside of the already established UDB area. However, future projects are viewed as “growth accommodating” rather than growth-inducing and as such, no impact will occur as a result of updating Community Plan.</p> <p>The most prominent route for traffic into and out of the community of Ivanhoe is State Route 216/Avenue 328.<sup>101</sup> There are two designated “Arterial” streets within the Planning Area (State Route 216/Avenue 328, and Road 156), seven designated collector roads (Roads 156, 158, 159, and 160, Avenues 330 and 332, and Depot Drive), and the balance of all streets circulation network are classified as “local streets”.<sup>102</sup></p> <p>“In recent years the concept of “Complete Streets” has evolved. Under this concept, while streets may still carry a primary functional classification, the design of streets aims to allow all modes and trip purposes to be safely accommodated to the extent feasible and as warranted by local needs and conditions.”<sup>103</sup></p> <p>“The ability of Tulare County to compete domestically and internationally on an economic basis requires an efficient and cost-effective method for distributing and receiving products. SR 216, serves as an important link to Ivanhoe and other eastside and foothill communities for commercial and industrial goods movement.</p> <p>Rail can be the most cost-effective mode for long-haul freight traveling to or from destinations beyond the Valley. The Union Pacific (UP) Railroad provides freight service, connecting Ivanhoe with major markets in northern and southern California and beyond. The short line San Joaquin Valley Railroad (SJVR) has an interchange with the Union Pacific Railroad at Ivanhoe Junction. The SJVR operates freight service from Ivanhoe Junction to Exeter in the east and to Huron in the west.</p> <p>Though Ivanhoe is an important rail junction, trucking is likely to be the predominant mode for freight movements within the County and Valley for the foreseeable future. Statewide, over three-quarters of all freight is shipped by truck. It is anticipated that the region’s truck volumes will grow faster than auto traffic through 2040.”<sup>104</sup> The Ivanhoe Complete Streets Program and Circulation Element has designated State Route 216 as the initial truck route.<sup>105</sup></p> <p>The level of service (LOS) for operating State highway facilities is based upon measures of effectiveness (MOEs). These MOEs describe the measures best suited for analyzing State highway facilities (i.e., freeway segments, signalized intersections, on- or off-ramps, etc.). Caltrans endeavors to maintain a target LOS at the transition between LOS “C” and LOS “D” on State highway facilities.<sup>106</sup></p> <p>Tulare County General Plan Policy <i>TC – 1.16 County Level of Service (LOS) Standards</i> states; “The County shall strive to develop and manage its roadway system (both segments and intersections) to meet a LOS of “D” or better in accordance with the LOS definitions established by the Highway Capacity Manual.”<sup>107</sup></p> <p>“LOS is categorized by two parameters, uninterrupted flow and interrupted flow. Uninterrupted flow facilities have no fixed elements, such as traffic signals, that cause interruptions in traffic flow (e.g., freeways, highways, and controlled access, some rural roads). Interrupted flow facilities have fixed elements that cause an interruption in the flow of traffic such as stop signs and signalized intersections.”<sup>108</sup></p> |  |                    |  |                              |           |

<sup>101</sup> Draft Ivanhoe Community Plan 2019 Update. Page 176.

<sup>102</sup> Ibid. 178.

<sup>103</sup> Op. Cit.

<sup>104</sup> Op. Cit. 174.

<sup>105</sup> Op. Cit.

<sup>106</sup> Caltrans. Guide for the Preparation of Traffic Impact Studies. Page 1. [http://www.dot.ca.gov/hq/tpp/offices/ocp/igr\\_ceqa\\_files/tisguide.pdf](http://www.dot.ca.gov/hq/tpp/offices/ocp/igr_ceqa_files/tisguide.pdf).

<sup>107</sup> Draft Ivanhoe Community Plan 2019 Update. Page 179.

<sup>108</sup> Ibid.

|  |  | SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|--|--|--------------------|--|------------------------------|-----------|
|--|--|--------------------|--|------------------------------|-----------|

The Community Plan Update also takes into account all modes of transportation including non-motorized travel and relevant components of the circulation system, including but not limited to, pedestrian and bicycle paths, and mass transit.

“A complete street is a transportation facility that is planned, designed, operated, and maintained to provide safe mobility for all users, including bicyclists, pedestrians, transit vehicles, truckers, and motorists, appropriate to the function and context of the facility. Every complete street looks different, according to its context, community preferences, the types of road users, and their needs.”<sup>109</sup>

The Tulare County Board of Supervisors approved the Complete Streets Program in December of 2016.<sup>110</sup> Integration of the Complete Streets Program in the Ivanhoe Community Circulation Element will aid to establish a comprehensive multi-modal transportation system that is efficient, environmentally and financially sound, and coordinated with the Land Use Element of the Tulare County General Plan.

The Ivanhoe Community Plan Update is intended to implement a multi-modal transportation system that will serve projected future travel demand, minimize congestion, and address future growth in Ivanhoe.

Consultant VRPA Technologies prepared a Traffic Impact Study (TIS, see Attachment “E”) for this proposed Project. In summary, the TIS concludes the following impacts:

“Intersections

Table E-1 shows the anticipated level of service conditions at study intersections for the Future Year 2040 scenarios. Results of the analysis show that two (2) of the study intersections will exceed level of service standards under the Future Year 2040 No Build and Future Year 2040 Build scenarios. The improvement projects listed in Section 4.0 will alleviate level of service deficiencies at study intersections for all Future Year 2040 scenarios. Results of the analysis show that all of the study intersections and roadway segments will meet Tulare County’s LOS “D” criteria and Caltrans’ LOS “C” criteria through the year 2040 with the development of specific roadway improvements.

Segments

Table E-2 shows the anticipated level of service conditions at study roadway segments for the Future Year 2040 scenarios. Results of the analysis show that all of the study roadway segments will meet the applicable level of service standards. As a result, no roadway segment improvements are warranted.”<sup>111</sup>

The following Tulare County General Plan 2030 Update policies for this resource apply to this Project: *AQ-3.3 Street Design; LU- 7.1 Friendly Streets; TC-1.2 Intermodal Connectivity; TC-4.7 Bicycle/Pedestrian Trail System; and TC-5.2 Consider Non-Motorized Modes in Planning and Development.*

a) **Less Than Significant With Mitigation** – As noted earlier, VRPA Technologies prepared a TIS (included in Attachment “E” of this MND) and provided the necessary analysis in assisting the RMA determine that the Project would result in less than significant impact with mitigation as follows:

“The proposed Ivanhoe Community Plan Update traffic analysis provides a policy framework to address potential

<sup>109</sup> Caltrans, Complete Streets Program. <http://www.dot.ca.gov/transplanning/ocp/complete-streets.html>, accessed April 17, 2019.

<sup>110</sup> Draft Ivanhoe Community Plan 2019 Update. Page 182.

<sup>111</sup> Ivanhoe Community Plan Update Traffic Impact Study May 2019. Page E-1. Prepared by VRPA Technologies, Inc. and included in Attachment “E” of this IS/MND.

|  |  |                           |   |                                     |                  |
|--|--|---------------------------|---|-------------------------------------|------------------|
|  |  | <b>SIGNIFICANT IMPACT</b> | <b>LESS THAN SIGNIFICANT IMPACT WITH MITIGATION</b> | <b>LESS THAN SIGNIFICANT IMPACT</b> | <b>NO IMPACT</b> |
|--|--|---------------------------|---|-------------------------------------|------------------|

traffic impacts encountered in the planning process. Results of the traffic analysis shows that the Ivanhoe Community Plan Update is in harmony with both the Tulare County General Plan and the TCAG Regional Transportation Plan. The General Plan currently calls for all intersections and roadway segments to be maintained at LOS “D” or better; this objective would be obtained given implementation of the Community Plan and the specific roadway improvements (mitigation measures) noted below. The Ivanhoe Community Plan also meets Caltrans’ acceptable level of service criteria in the study area with the development of specific roadway improvements noted below. As a result, the Ivanhoe Community Plan Update will not conflict with a program, plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.”<sup>112</sup>

Described below are Mitigation Measures TR-1 through TR -4 (labeled as MM TR-1 through MM TR-4 in the TIS) at study area intersections and segments for the Future Year 2040 scenarios that address future transportation and circulation issues in the Ivanhoe community. The improvements identified would result in acceptable levels of service as shown in Table E-3 [of the TIS].<sup>113</sup>

***Intersections***

✓ Future Year 2040 No Build Scenario

**TR-1:** Avenue 328 / Road 156

- Install Four-Way Stop

**TR-2:** Avenue 328 / Road 160

- Widen the southbound approach to 1 shared left-through lane and 1 right turn lane (adding 1 right turn lane)

✓ Future Year 2040 Build Scenario

**TR-3:** Avenue 328 / Road 156

- See TR-1

**TR-4:** Avenue 328 / Road 160

- Widen the southbound approach to 1 shared left-through lane and 1 right turn lane (adding 1 right turn lane)
- Widen the eastbound approach to 1 left turn lane and 1 through lane with a shared right (adding 1 left turn lane)”<sup>114</sup>

| <b>Table TR-1 [Table E-3 in the TIS]<sup>115</sup></b> |         |            |           |                           |                        |
|--|---------|------------|-----------|---------------------------|------------------------|
| <b>Intersection Operations with Improvements</b>       |         |            |           |                           |                        |
| Intersection   | Control | Target LOS | Peak Hour | Future Year 2040 No Build | Future Year 2040 Build |

<sup>112</sup> Ibid.

<sup>113</sup> Op. Cit. E-4 and E-5.

<sup>114</sup> Op. Cit. E-5 and E-6.

<sup>115</sup> Op. Cit. E-5.

|  |                    | SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |       |      |    |
|--|--------------------|--------------------|--|------------------------------|-----------|-------|------|----|
|  |                    |                    |  | Delay                        | LOS       | Delay | LOS  |    |
| Avenue 328 & Road 156  | Four-Way Stop Sign | D                  |  | AM                           | 13.6      | B     | 16.2 | C  |
|  |                    |                    |  | PM                           | 17.5      | C+    | 25.3 | D+ |
| Avenue 328 & Road 160  | Four-Way Stop Sign | C                  |  | AM                           | 20.7      | C+    | 22.4 | C+ |
|  |                    |                    |  | PM                           | 20.4      | C     | 22.6 | C+ |
| <p><i>DELAY is measured in seconds.</i><br/> <i>LOS = Level of Service / BOLD denotes LOST standard exceeded.</i><br/> <i>For all-way stop controlled intersections, delay results show the average for the entire intersection.</i><br/> <i>+ Meet Peak Hour Signal warrants.</i></p> |                    |                    |  |                              |           |       |      |    |

b) **Less Than Significant Impact** – VRPA Technologies provided the following analysis and conclusions for the proposed Project. The county of Tulare accepts the recommendations by VRPA Technologies and incorporates the results in their entirety herein. “In the fall of 2013, Senate Bill 743 (SB 743) was passed by the legislature and signed into law by the governor. For some parts of California (and possibly the entire state), this legislation will eventually change the way that transportation studies are conducted for environmental documents. In the areas where SB 743 is implemented, delay-based metrics such as roadway capacity and level of service will no longer be the performance measures used for the determination of the transportation impacts of projects in studies conducted under CEQA. Instead, new performance” measures such as vehicle miles travelled (VMT) or other similar measures will be used.

July 1, 2020 is the statewide implementation date and agencies may opt-in use of new metrics prior to that date. Therefore, the traffic analysis follows current practice regarding state and local guidance as of the date of preparation. The General Plan currently calls for all intersections and roadway segments to be maintained at LOS “D” or better; this objective would be obtained given implementation of the Community Plan and the specific roadway improvements (mitigation measures) noted in Section 4.1.1 above. As a result, the Project will not conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b). Therefore, no mitigation is needed”

Over the planning horizon it is anticipated that traffic in the Planning Area will increase along with area population; however, it is anticipated that the current street system will function adequately (and barring major unforeseen development in Ivanhoe) will continue to do so through the year 2030 planning horizon. New intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit will not be required by the Update as the CPU does not contain plans for development, construction or new transportation infrastructure. If future proposals are submitted that have the potential to conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system; and/or, inconsistent with CEQA Guidelines section 15064.3, subdivision (b), a new analysis may be warranted to identify potential impacts. As such, the Community Plan Update will result in no impact to this Checklist item.”<sup>116</sup>

c) **No Impact** – The Ivanhoe Community Plan 2019 Update will not substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses, e.g., farm equipment. As noted previously, the Project is an update to the Ivanhoe Community Plan and no development proposals are being considered at this time. The update is being prepared to accommodate a growth rate of 1.3% (consistent with the Tulare County General Plan). Changes to the Urban Development Boundary (UDB) will occur; however, any future growth will be required to comply with laws and regulations governing urban design/use and with County design standards. As such, the Project would result in no impact to this Checklist Item.

d) **No Impact** - The Tulare County General Plan Update contains policies and guidelines that mandate where feasible, road networks (public and private) will provide for safe and ready access for emergency equipment and evacuation

<sup>116</sup> Op. Cit. E-5 and E-6.

|   |  | <b>SIGNIFICANT IMPACT</b> | <b>LESS THAN SIGNIFICANT IMPACT WITH MITIGATION</b> | <b>LESS THAN SIGNIFICANT IMPACT</b> | <b>NO IMPACT</b>         |
|---|--|---------------------------|---|-------------------------------------|--------------------------|
| <p>routes.<sup>117</sup> The Update to the Ivanhoe Community Plan contains no development proposals and is being prepared to accommodate a growth rate of 1.3% (consistent with the Tulare County General Plan). Changes to the Urban Development Boundary (UDB) will occur; however, any future growth will be required to comply with all laws and regulations governing emergency response, both facilitating and enhancing emergency access. “The Ivanhoe Community Plan Update would not result in any degradation of emergency access within the community. Congestion at an intersection or along a roadway can adversely impact emergency access. Results of the traffic analysis shows that all of the study intersections and roadway segments will meet acceptable levels of service with the development of specific roadway improvements. As a result, the Project will not result in inadequate emergency access. Therefore, no mitigation is needed.”<sup>118</sup> There will be no impact related to this Checklist Item.</p>                              |  |                           |   |                                     |                          |
| <b>18.</b>  | <b>TRIBAL CULTURAL RESOURCES</b>   |                           |   |                                     |                          |
|   | <p>Would the Project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:</p> |                           |   |                                     |                          |
| a)  | Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k)?   | <input type="checkbox"/>  | <input checked="" type="checkbox"/>                 | <input type="checkbox"/>            | <input type="checkbox"/> |
| b)  | A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?   | <input type="checkbox"/>  | <input checked="" type="checkbox"/>                 | <input type="checkbox"/>            | <input type="checkbox"/> |
| <p>Analysis:</p> <p>As noted previously, the Project is an update to the Ivanhoe Community Plan and no development proposals are being considered at this time. The update is being prepared to accommodate a growth rate of 1.3% (consistent with the Tulare County General Plan). Limited changes to the Urban Development Boundary (UDB) will occur and such changes would incorporate areas that have historically been under heavy agricultural production; as such, there is no possibility of changes to cultural resources outside of the already established UDB area.</p> <p>The Southern San Joaquin Valley Information Center, Bakersfield (SSJVIC or Center) conducted a cultural resources records search at the request of RMA Planning Branch staff. The Center records search (dated October 15, 2018 is included in see Attachment “C” of this document) included historic sites listed on the National Register of Historic Places, Historic Property Directory, California State Historical Landmarks, California Register of Historical Resources,</p> |  |                           |   |                                     |                          |

<sup>117</sup> Tulare County General Plan 2030 Update. August 2012. Goals and Policy Report. (Part I) Page 10-20  
<http://generalplan.co.tulare.ca.us/documents/GP/001Adopted%20Tulare%20County%20General%20Plan%20Materials/000General%20Plan%202030%20Part%20I%20and%20Part%20II/GENERAL%20PLAN%202012.pdf>

<sup>118</sup> Ivanhoe Community Plan Update Traffic Impact Study May 2019. Page E-6. Prepared by VRPA Technologies, Inc. and included in Attachment “” of this IS/MND.

|  |  | SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|--|--|--------------------|--|------------------------------|-----------|
| <p>California Inventory of Historic Resources, and California Points of Historical Interest. According to the California Historical Resources Information System, there is one (1) recorded cultural resource within the planning area and one within a one-half mile radius of the planning area. There are no recorded cultural resources within the project area or radius that are listed in the National Register of Historic Places, the California Register of Historical Resources, the California Points of Historical Interest, California Inventory of Historic Resources, or the California State Historic Landmarks in or near Ivanhoe.</p>   |  |                    |  |                              |           |
| <p>According to the information provided by the SSJVIC, there have been 6 previous cultural resource studies conducted within the project area, TU-00515, 00582, 00610, 01014, 01242, and 01498. There have been six additional studies conducted within the one-half mile radius, TU-01395, 01499, 01512, 01514, 01611, and 01612. However, until the specific location of a development proposal occurs, the locations and nature of the resources will remain confidential and will only be shared with an applicant and remain confidential until otherwise determined by the courts.</p>  |  |                    |  |                              |           |
| <p>The following Native American tribes were contacted on October 26, 2018, in order to solicit their interest regarding tribal consultation: Kern Valley Indian Council; Santa Rosa Rancheria Tachi Yokut Tribe, Torres-Martinez Desert Cahuilla Indians; Tubatulabals of Kern County; Tule River Indian Tribe; and Wukache Indian Tribe. No responses have been received to date. The Native American Heritage Commission (NAHC) was also contacted on October 4, 2018, with a request that they conduct a sacred lands files (SLF) search. The SLF records search was completed resulting in negative results.</p>  |  |                    |  |                              |           |
| <p>The SSJVIC acknowledges that the Project essentially consists of a General Plan Update for the Ivanhoe Community. They further acknowledge that no immediate ground disturbance will take place as a result of this update and conclude that no further cultural resource investigation is recommended at this time. However, prior to any future ground disturbance project activities, the SSJVIC recommends that a new record search be conducted so their office can then make project specific recommendations for further cultural resources study, if needed. Once specific projects are proposed, location specific studies can be conducted to determine the appropriateness of avoiding or minimizing impacts to cultural resources as applicable.</p>  |  |                    |  |                              |           |
| <p>The Tulare County General Plan has a number of policies that relate to the proposed Project area including <i>ERM-6.1 Evaluation of Cultural and Archaeological Resources</i>; <i>ERM-6.2 Protection of Resources with Potential State or Federal</i>; <i>ERM-6.4 Mitigation</i>; <i>ERM-6.10 Grading Cultural Resources Sites</i>; and <i>ERM-6.9 Confidentiality of Archaeological Sites</i> which allows the County to (within its authority) maintain confidentiality regarding the locations of archaeological sites in order to preserve and protect these resources from vandalism and the unauthorized removal of artifacts.</p>  |  |                    |  |                              |           |
| <p>a) and b) <b><i>Less Than Significant Impact With Mitigation</i></b> - As noted in Checklist Item 5 <i>Cultural Resources</i>, a CHRIS records search was conducted by the SSJVIC. There is one recorded cultural resource within the study area and one recorded resource within one-half mile of the study area. These resources consist of one historic era railroad and one junction box. The records search included an examination of the National Register of Historic Places, Historic Property Directory, the California Register of Historical Resources, the California Points of Historical Interest, the California Inventory of Historic Resources, or the California State Historic Landmarks (see Attachment "C"). Also, as noted earlier, six previous cultural resources studies have been completed within the project area and six additional studies have been conducted within the one-half mile radius. The planning area consists of existing agricultural, commercial, light industrial, and residential uses. Until an actual development project is initiated, it remains unknown if subsurface tribal resources would be encountered.</p> |  |                    |  |                              |           |
| <p>While the proposed Community Plan Update contains no plans for development or construction, over the planning horizon, future development within the UDB may result in the eventual construction of residences, and establishment of</p>  |  |                    |  |                              |           |

|  |  | SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|--|--|--------------------|--|------------------------------|-----------|
|--|--|--------------------|--|------------------------------|-----------|

commercial and industrial use, and streets (and other infrastructure such as curbs, gutters, sidewalks, sewer and water collection/distribution systems, etc.). Such future activity could cause a substantial adverse change in the significance of a historical resource were any such resources to be located within the planning area. The proposed Project would not result in a substantial adverse change in the significance of an historical, archaeological, or paleontological resource as defined in Section 15064.5 of the CEQA Guidelines. Although no cultural resources were identified in the records search, there will, nonetheless, be a potentially significant impact if cultural resources were uncovered during proposed specific development project construction; however, implementation of the **Mitigation Measures CUL-1 and CUL-2** (and also contained in the Mitigation Monitoring and Reporting Program) are included as part of this Mitigated Negative Declaration to reduce potential impacts to historical, archaeological, or paleontological resources to less than significant with mitigation.

No formal cemeteries or other places of human internment are known to exist within the Project site; however, there will, nonetheless, be a potentially significant impact if human remains were uncovered during proposed specific development project construction. Implementation of **Mitigation Measure TCR-1** (and also contained in the Mitigation Monitoring and Reporting Program) is included as part of this Mitigated Negative Declaration to reduce potential impacts to this checklist item to a less than significant with mitigation.

**Mitigation Measure TCR-1.** Consistent with Section 7050.5 of the California Health and Safety Code and (CEQA Guidelines) Section 15064.5, if human remains of Native American origin are discovered during Project construction, it is necessary to comply with State laws relating to the disposition of Native American burials, which fall within the jurisdiction of the Native American Heritage Commission (Public Resources Code Sec. 5097). In the event of the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery, the following steps should be taken:

1. There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:
  - a. The Tulare County Coroner/Sheriff must be contacted to determine that no investigation of the cause of death is required; and
  - b. If the coroner determines the remains to be Native American:
    - i. The coroner shall contact the Native American Heritage Commission within 24 hours.
    - ii. The Native American Heritage Commission shall identify the person or persons it believes to be the most likely descended from the deceased Native American.
    - iii. The most likely descendent may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code section 5097.98, or
2. Where the following conditions occur, the landowner or his authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance.
  - a. The Native American Heritage Commission is unable to identify a most likely descendent or the most likely descendent failed to make a recommendation within 24 hours after being notified by the commission.
  - b. The descendant fails to make a recommendation; or
  - c. The landowner or his authorized representative rejects the recommendation of the descendent.

Implementation of **Mitigation Measures CUL-1, CUL-2, and TCR-1** will reduce potential Project impacts on tribal cultural resources to a less than significant level.

|  |                                      | SIGNIFICANT IMPACT  | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT                           |                                     |
|--|--------------------------------------|---|--|------------------------------|-------------------------------------|-------------------------------------|
| <b>19.</b>   | <b>UTILITIES AND SERVICE SYSTEMS</b> |   |  |                              |                                     |                                     |
|  | Would the project:                   |   |  |                              |                                     |                                     |
|  | a)                                   | Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects? | <input type="checkbox"/>                     | <input type="checkbox"/>     | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
|  | b)                                   | Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?   | <input type="checkbox"/>                     | <input type="checkbox"/>     | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
|  | c)                                   | Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?  | <input type="checkbox"/>                     | <input type="checkbox"/>     | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
|  | d)                                   | Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?  | <input type="checkbox"/>                     | <input type="checkbox"/>     | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
|  | e)                                   | Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?   | <input type="checkbox"/>                     | <input type="checkbox"/>     | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| <p>Analysis:</p> <p>“Domestic water and sanitary sewer service in Ivanhoe is provided by the Ivanhoe Public Utilities District (PUD), which was formed in October 1951. <b>Table 23</b> shows the number of existing water and sewer connections, the capacity of each system, and the number of additional connections the systems can accommodate for new development (Housing Element, May 2012 and Municipal Service Review, March 2006). <b>Figure 13</b> graphically displays the approximate location of water wells and water lines.”<sup>119</sup></p> <p>“The Ivanhoe PUD is responsible for providing domestic water service within the District’s Boundary. Ivanhoe’s water supply is derived from six deep underground wells that pump at a consistent water level between 250 and 350 feet. According to District staff, the five water supply requiring no chlorination or treatment. District staff indicated that the</p> |                                      |   |  |                              |                                     |                                     |

<sup>119</sup> Draft Ivanhoe Community Plan 2019 Update. Page 63.

|  |  | <b>SIGNIFICANT<br/>IMPACT</b> | <b>LESS THAN<br/>SIGNIFICANT<br/>IMPACT WITH<br/>MITIGATION</b> | <b>LESS THAN<br/>SIGNIFICANT<br/>IMPACT</b> | <b>NO<br/>IMPACT</b> |
|--|--|-------------------------------|---|---|----------------------|
| <p>production capacity of the wells ranges between 360 and 950 gallons per minute (gpm) and that the five wells have a total maximum production capacity of approximately 3,091 gpm. As previously indicated, only five of the eight wells are in operation, as Well No. 3 was lost in 1990 after DBCP contamination (from grape chemicals) was found. The loss of the well resulted in an \$800,000 settlement being awarded to the District. The District indicated that the community water system (as of August 2004) supports 1,114 single and multi-family residential connections. The District was unsure exactly how many commercial connections were on the system, but estimated that there is approximately 1,200 total connections to the system. The Ivanhoe PUD water system has been fully metered since 1991. Since then the District has billed customers based upon a metered usage. Water consumption data indicated that there was an immediate decrease in domestic water usage as a result of metering.”<sup>120</sup></p> <p>“Well production data indicates that three of the six wells had comparably lower productions indicating that they are used as needed to meet fire flow and/or peak flow demands. The PUD’s wells produced 287.611 million gallons in 2003, with a maximum monthly production of 38.181 million gallons occurring in June, corresponding to a maximum day demand of 1.28 million gallons per day (MGD).</p> <p>Assuming 1,200 equivalent dwelling units (EDUs), in order to meet Tulare County Improvement Standards the Ivanhoe PUD water system would need to be capable of delivering a combined flow rate (from all source and storage facilities) of 2,800 GPM (1,500 GPM fire flow, and 1,600 GPM domestic demand) for a period of two hours while maintaining a minimum pressure of 25 pounds per square inch (PSI) to each lot served. The PUD’s water system is capable of delivering a source flow of 3,600 GPM, and includes pneumatic pressure tanks for storage, indicating the system currently meets the requirements of the Tulare County Improvement Standards. Based upon a calculation performed in accordance with General Order 103, published by the California Public Utilities Commission, it is estimated that the PUD’s current water system could support approximately 1,200 additional EDUs.”<sup>121</sup></p> <p>“The Ivanhoe PUD is also responsible for providing sanitary sewer collection, treatment, and disposal services to residents within its Boundary. The District indicated that as of August 2004 there were 1,114 single and multi-family residential connections to the sewer system managed by the Ivanhoe PUD. District staff estimated that there are approximately 1,200 total connections to the system. Raw sewage is collected in a series of collection pipes ranging in size from four to fifteen (15) inches (including Vitrified Clay Pipe and Polyvinyl Chloride Pipe) and then transported to a WWTF that is owned and operated by the Ivanhoe PUD.</p> <p>The District operates a WWTF located southwest of the community, west of the Avenue 324/Road 156 intersection. The WWTF is operated under the provisions of Order No. 98-090 issued by the California Regional Water Quality Control Board (RWQCB). The District’s WWTF provides secondary treatment of wastewater via a clarigester, three stabilization ponds, and a sludge drying bed. Treated effluent from the third stabilization pond is recycled on 61.2 acres of pastureland south of the WWTF, which is leased by the District for grazing of non-milking cattle. Industrial developments discharging to the WWTF are primarily citrus packing plants. Order No. 98-090 prescribes that the monthly average daily discharge shall not exceed 0.56 MGD.</p> <p>Based upon information contained in the <i>Wastewater User Charge Survey Report FY 2004-05</i> (Cal EPA – State Water Resources Control Board, May 2005), the average dry weather flow at the WWTF is approximately 0.36 MGD. Based upon the available capacity at the WWTF (200,000 GPD), it is estimated that approximately 650 additional connections (EDUs) to the system could be supported.</p> |  |                               |   |   |                      |

<sup>120</sup> Ibid. 64.

<sup>121</sup> Op. Cit.

|   |  | SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|---|--|--------------------|--|------------------------------|-----------|
| <p>Based upon a review of monthly monitoring reports submitted to the RWQCB, the District’s wastewater inflows are typically higher during summer months than during winter months indicating that there is no significant inflow and infiltration into the collection system during the winter months. This is an indication that the collection system is in adequate operating condition.</p> <p>The above evaluations indicate that the District will need to increase the capacity of its WWTF to support projected growth through year 2025. Based upon information contained in the Wastewater User Charge Survey Report FY 2004-05 (Cal EPA – State Water Resources Control Board, May 2005), the District has not received any grants for the construction of wastewater facility improvements for at least the past thirty years. It is recommended that the District research State and Federal grants and/or loans that may be available to help finance improvements to the District’s WWTF. Potential grants and loans include US-EPA Clean Water Construction Grants (CWG), State Revolving Fund Loans (SRF), and State Small Community Grants (SCG).<sup>122</sup></p> <p>The following Tulare County General Plan 2030 Update policies for this resource apply to this Project: <i>PFS-1.1 Existing Development; PFS-1.2 Maintain Existing Levels of Services; PFS-1.3 Impact Mitigation; PFS-1.7 Coordination with Service Providers; PFS-2.1 Water Supply; PFS-2.2 Adequate Systems; PFS-2.4 Water Connections; PFS-3.2 Adequate Capacity; PFS-3.3 New Development Requirements; and PFS-3.7 Financing.</i></p> <p>In addition to Tulare County General Plan policies, the Ivanhoe Community Plan Update contains policies specific to infrastructure including water supply and water systems. See the “Community Development” discussion of the Ivanhoe Community Plan Update.</p> <p><i>Solid Waste Disposal</i></p> <p>The Tulare County General Plan has a number of policies that apply to existing development and future development projects regarding solid waste disposal within the County of Tulare. The nearest solid waste disposal facility, the Teapot Dome Landfill, is owned and operated by the County. The Teapot Dome has the capacity to accommodate solid waste refuse generated within the planning area through the year 2025.<sup>123</sup> According to Solid Waste Management Department’s Supervisor J. Treviño, the Teapot Dome landfill has a current net remaining capacity of 666,281 cubic yards or 11% of total capacity.<sup>124</sup> Per the Tulare County Solid Waste Department the Teapot Dome landfill is scheduled to close in 2025 and solid waste from the planning area will be disposed of in the Woodville landfill.<sup>125</sup> The Woodville landfill is currently under temporary closure and is not accepting waste, however the landfill is slated to open in 2022.<sup>126</sup> The Woodville landfill has a current net remaining capacity of 5,319,859 cubic yards or 64% of the landfill’s total capacity.<sup>127</sup></p> <p>The adopted 2030 General Plan contains policies that would apply to existing and future development in the Project area regarding solid waste such as: <i>PFS-5.3 Solid Waste Reduction; PFS-5.5 Private Use of Recycled Products; PFS-5.6 Ensure Capacity; and PFS-5.7 Provisions for Solid Waste Storage, Handling, and Collection.</i></p> <p>a) and b) <b>Less Than Significant Impact</b> - The Update to the Ivanhoe Community Plan contains no development proposals and is being prepared to accommodate a growth rate of 1.3% (consistent with the Tulare County General Plan). If adopted, the Urban Development Boundary (UDB) will be expanded to accommodate potential growth projections and will be consistent with the Tulare County General Plan. As mentioned earlier, based upon a calculation performed in accordance</p> |  |                    |  |                              |           |

<sup>122</sup> Ibid 68-69.

<sup>123</sup> This information was obtained from Tulare County Solid Waste Management Supervisor Jonah Treviño on April 16, 2019.

<sup>124</sup> Ibid.

<sup>125</sup> Op. Cit.

<sup>126</sup> Op. Cit.

<sup>127</sup> Op. Cit.

|   |          | SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|---|----------|--------------------|--|------------------------------|-----------|
| <p>with General Order 103, published by the California Public Utilities Commission, it is estimated that the PUD's current water system could support approximately 1,200 additional EDUs. However, as full build-out occurs over time, capacity availability and disposal elements in the collection system would be evaluated on a case-by-case basis with deficiencies being addressed by developers that wish to connect to the District's system.</p> <p>Based upon a review of monthly monitoring reports submitted to the RWQCB, the wastewater collection system is currently in adequate operating condition. However, it is indicated that the District will need to increase the capacity of its WWTF to support projected growth through year 2025. It is recommended that the District research State and Federal grants and/or loans that may be available to help finance improvements to the District's WWTF. As such, the Project would result in a less than significant impact.</p> <p>c) <b>Less Than Significant Impact</b> - The Update to the Ivanhoe Community Plan contains no development proposals and is being prepared to accommodate a growth rate of 1.3% (consistent with the Tulare County General Plan). If adopted, the Urban Development Boundary (UDB) will be expanded to accommodate potential growth projections and will be consistent with the Tulare County General Plan. As mentioned earlier, the wastewater collection system is currently in adequate operating condition. However, the Community Plan also indicate that the District will need to increase the capacity of its WWTF to support projected growth through year 2025 and the District research State and Federal grants and/or loans that may be available to help finance future improvements to the District's WWTF.</p> <p>d) <b>Less Than Significant Impact</b> - The Update to the Ivanhoe Community Plan contains no development proposals and is being prepared to accommodate a growth rate of 1.3% (consistent with the Tulare County General Plan). If adopted, the Urban Development Boundary (UDB) will be expanded to accommodate potential growth projections and will be consistent with the Tulare County General Plan are not anticipated to exceed permitted capacities of area landfills.</p> <p>Tulare County Operates the Teapot Dome Landfill Disposal Site located at 20801-21169 Teapot Dome Avenue, Porterville, CA. According to the Tulare County Solid Waste Department, the Teapot Dome facility has sufficient permitted capacity to accommodate the project's solid waste disposal needs until 2025, at which time it is anticipated that the Woodville landfill will become the primary solid waste disposal facility for the planning area.<sup>128</sup> Subsequently, the planning area will be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs. Therefore, the Project would result in a less than significant impact is anticipated to occur to this Checklist Item.</p> <p>e) <b>No Impact</b> - The update to the Ivanhoe Community Plan contains no development proposals and is being prepared to accommodate a growth rate of 1.3% consistent with the Tulare County General Plan. If adopted, the Urban Development Boundary (UDB) will be expanded to accommodate potential growth projections and will be consistent with the Tulare County General Plan. Upon any eventual buildout, all solid waste disposal will be required to comply with the requirements of the contracted waste hauler, which follows federal, state, and local statutes and regulations related to the collection and disposal of solid waste. As such, no impact related to this Checklist Item will occur.</p> |          |                    |  |                              |           |
|   |          | SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
| 20.   | Wildfire |                    |  |                              |           |

<sup>128</sup> Op. Cit.

|                    |   | SIGNIFICANT IMPACT       | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT                           |
|--------------------|---|--------------------------|--|------------------------------|-------------------------------------|
| Would the project: |   |                          |  |                              |                                     |
| a)                 | Substantially impair an adopted emergency response plan or emergency evacuation plan?   | <input type="checkbox"/> | <input type="checkbox"/>                     | <input type="checkbox"/>     | <input checked="" type="checkbox"/> |
| b)                 | Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?   | <input type="checkbox"/> | <input type="checkbox"/>                     | <input type="checkbox"/>     | <input checked="" type="checkbox"/> |
| c)                 | Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment? | <input type="checkbox"/> | <input type="checkbox"/>                     | <input type="checkbox"/>     | <input checked="" type="checkbox"/> |
| d)                 | Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?  | <input type="checkbox"/> | <input type="checkbox"/>                     | <input type="checkbox"/>     | <input checked="" type="checkbox"/> |

Analysis:

According to the State Responsibility Area (SRA) Viewer, the proposed Project site is not located in the SRA (see attachment “F”)<sup>129</sup>As noted previously, the Project is an update to the Ivanhoe Community Plan and no development proposals are being considered at this time. The update is being prepared to accommodate a growth rate of 1.3% (consistent with the Tulare County General Plan). The Project includes expansion of the Urban Development Boundary (UDB); as such, a case-by-case evaluation will be conducted when development proposals are received for both the existing UDB and future UDB area. However, as this Project is merely an update to the Community Plan, there is no possibility of impact to this checklist item within the already established UDB area.

a) **No Impact.** The Tulare County General Plan Update contains policies and guidelines that mandate where feasible, road networks (public and private) will provide for safe and ready access for emergency equipment and evacuation route.<sup>130</sup> As this is only an update to the Ivanhoe Community Plan, no development proposals are being considered at this time. A case-by-case evaluation will be conducted when development proposals are received for both the existing UDB and future UDB area. Any future growth will be required to comply with all laws and regulations governing emergency response, both facilitating and enhancing emergency access. Thus, there will be no impact related to this checklist item.

<sup>129</sup> CalFire, <http://www.fire.ca.gov/firepreventionfee/srviewer>, accessed April 18, 2019.

<sup>130</sup> Tulare County General Plan 2030 Update. August 2012. Goals and Policy Report. (Part I) Page 10-20 <http://generalplan.co.tulare.ca.us/documents/GP/001Adopted%20Tulare%20County%20General%20Plan%20Materials/000General%20Plan%202030%20Part%20I%20a%20nd%20Part%20II/GENERAL%20PLAN%202012.pdf>

|   |   | SIGNIFICANT IMPACT       | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT        | NO IMPACT                           |
|---|---|--------------------------|--|-------------------------------------|-------------------------------------|
| <p>b) <b>No Impact.</b> As noted previously, the Project is an update to the Ivanhoe Community Plan and no development proposals are being considered at this time. The entire Ivanhoe area is relatively flat, and this Project is merely an update to the Community Plan. Thus, there is no possibility of impact to this checklist item within the already established UDB area.</p> <p>c-d) <b>No Impact.</b> As noted previously, the Project is an update to the Ivanhoe Community Plan and no development proposals are being considered at this time. The update is being prepared to accommodate a growth rate of 1.3% (consistent with the Tulare County General Plan). The Project includes expansion of the Urban Development Boundary (UDB); as such, a case-by-case evaluation will be conducted when development proposals are received for both the existing UDB and future UDB area. However, as this Project is merely an update to the Community Plan, there is no possibility of impact to this checklist item within the already established UDB area.</p> |   |                          |  |                                     |                                     |
| <b>21.</b>  | <b>MANDATORY FINDINGS OF SIGNIFICANCE</b>   |                          |  |                                     |                                     |
| a)  | Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory? | <input type="checkbox"/> | <input checked="" type="checkbox"/>          | <input type="checkbox"/>            | <input type="checkbox"/>            |
| b)  | Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?   | <input type="checkbox"/> | <input type="checkbox"/>                     | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| c)  | Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?  | <input type="checkbox"/> | <input type="checkbox"/>                     | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Analysis:   |   |                          |  |                                     |                                     |

|   |  | SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|---|--|--------------------|--|------------------------------|-----------|
| <p>a) <b>Less Than Significant Impact With Mitigation</b> – As noted earlier, The update to the Ivanhoe Community Plan contains no development proposals and is being prepared to accommodate a growth rate of 1.3% consistent with the Tulare County General Plan. If adopted, the Urban Development Boundary (UDB) will be expanded to accommodate potential growth projections and will be consistent with the Tulare County General Plan.</p> <p>As discussed in Item 4 Biological Resources, impacts associated with future development of proposed Project planning area would be less than significant, as defined by the California Environmental Quality Act (CEQA), for special status plant species, wildlife movement corridors, downstream water quality, and sensitive habitats. Loss of habitat for special status animal species would also be considered less than significant under CEQA. <b>Mitigation Measures BIO 4-1 through BIO 4-20</b> contained in the Mitigation Monitoring and Reporting Program are included as part of this Mitigated Negative Declaration which are intended to prevent or minimize disturbance or accidental take of species of concern. In the unlikely event of discovery of a special species on the site, protocols established by the U.S. Fish and Wildlife Service (USFW) or California Department of Fish and Game (DFG) will be implemented before any future construction-related activities are allowed to commence. If discovery occurs during future construction-related activities, all activities will be immediately ceased until a qualified biologist determines which course of action to implement per USFW or DFG protocols.</p> <p>As noted in item 5. Cultural Resources and item 17. Tribal Cultural Resources, a CHRIS records search was conducted by the SSJVIC. Four previously recorded historic-period sites have been recorded within the study area and one historic-period site identified within one-half mile of the study area. These resources consist of two historic era ditches, an historic era transmission line, an historic era commercial building, and a prehistoric era lithic and bead scatter. The records search included an examination of the National Register of Historic Places, the California Register of Historical Resources, the California Points of Historic Interest, the California Inventory of Historic Resources, or the California State Historic Landmarks (see Attachment “C”). Also, as noted earlier, 15 previous cultural resources studies have been completed within the project area and two additional studies have been conducted within the one-half mile radius. The planning area consists of existing residential, commercial and light commercial uses. Future UDB expansion will encompass areas to the west and southwest of the existing UDB. These areas are currently under agricultural cultivation and as such, unlikely to contain surface. Until an actual development project is initiated, it remains unknown if subsurface historic resources would be encountered. While the proposed Community Plan Update contains no plans for development or construction, over the planning horizon, future development within the UDB may result in the eventual construction of residences, and establishment of commercial and industrial use, and streets (and other infrastructure such as curbs, gutters, sidewalks, sewer and water collection/distribution systems, etc.). Such future activity could cause a substantial adverse change in the significance of a historical resource were any such resources to be located within the planning area. The proposed Project would not result in a substantial adverse change in the significance of an historical or archaeological resource as defined in Section 15064.5 of the CEQA Guidelines. Although no cultural resources were identified in the records search, there will, nonetheless, be a potentially significant impact if historical resources were uncovered during proposed specific development project construction; however, implementation of the <b>Mitigation Measures CUL-1, CUL-2, and TCR-1</b> (and also contained in the Mitigation Monitoring and Reporting Program) are included as part of this Mitigated Negative Declaration to reduce potential impacts to historical or archaeological resources to less than significant with mitigation.</p> <p>Therefore, the proposed Project does not have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of an endangered, rare or threatened plant or animal species, or eliminate important examples of the major periods of California history or prehistory. Therefore, there will be a less than significant impact with mitigation to these resources.</p> |  |                    |  |                              |           |

|   |  | SIGNIFICANT IMPACT | LESS THAN SIGNIFICANT IMPACT WITH MITIGATION | LESS THAN SIGNIFICANT IMPACT | NO IMPACT |
|---|--|--------------------|--|------------------------------|-----------|
| <p>b) <b>Less Than Significant Impact</b> - As noted earlier, The update to the Ivanhoe Community Plan contains no development proposals and is being prepared to accommodate a growth rate of 1.3% consistent with the Tulare County General Plan. If adopted, the Urban Development Boundary (UDB) will be expanded to accommodate potential growth projections and will be consistent with the Tulare County General Plan Use and Zoning designation contained in the Community Plan. It is not growth inducing, however, development is anticipated to occur consistent with the policies contained in the Tulare County General Plan, the draft Ivanhoe Community Plan, and other agencies (for example, the Valley Air District and Regional Water Quality Control Board). As such, it will result in Less Than Significant Impacts to resources such as air quality, noise, Greenhouse Gas Emissions, hazard or hazardous materials, hydrology and water quality, population and housing, public services, transportation/traffic, or utilities and service systems. Therefore, the proposed Project will result in less than significant impacts.</p> <p>c) <b>No Impact</b> - The proposed Project is a comprehensive update to the Ivanhoe Community Plan. It is intended to accommodate projected growth and to provide a mechanism to stimulate economic development within the existing geographic area and consistent with current General Plan Land Use and Zoning designations contained in the Community Plan. The proposed Project will not result in environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly. There will be no adverse impact.</p> |  |                    |  |                              |           |

## REFERENCES

- Aries Consultants Ltd. (2012). Tulare County Comprehensive Airport Land Use Plan. Website: [http://tularecounty.ca.gov/rma/assets/File/RFP/TC%20CALUP%20Adopted%20Dec%202012%20\(1\).pdf](http://tularecounty.ca.gov/rma/assets/File/RFP/TC%20CALUP%20Adopted%20Dec%202012%20(1).pdf). Accessed September 2018.
- Calfire. (2018). FHSZ Viewer. Website: <http://egis.fire.ca.gov/FHSZ/>. Accessed September 2018.
- California Department of Conservation. (1997). Active Aggregate Producers in the Tulare County Production – Consumption Region. Plate 1 of 7 (Map). Website: [ftp://ftp.consrv.ca.gov/pub/dmg/pubs/ofr/OFR\\_97-01/OFR\\_97-01\\_Plate1.pdf](ftp://ftp.consrv.ca.gov/pub/dmg/pubs/ofr/OFR_97-01/OFR_97-01_Plate1.pdf). Accessed September 2018.
- California Department of Conservation. (2018). CGS Warehouse: Regulatory Maps. Website: <http://maps.conservation.ca.gov/cgs/informationwarehouse/index.html?map=regulatorymaps>. Accessed September 2018.
- California Department of Conservation. (2018). Fault Activity Map of California (2010). Website: <http://maps.conservation.ca.gov/cgs/fam/>. Accessed September 2018.
- California Department of Conservation. (2018). Special Publication 42 Revised 2018 Earthquake Fault Zones. A Guide for Government Agencies, Property Owners / Developers, and Geoscience Practitioners for Assessing Fault Rupture Hazards in California. Website: <ftp://ftp.consrv.ca.gov/pub/dmg/pubs/sp/Sp42.pdf>. Accessed September 2018.
- California Department of Parks and Recreation. (2010). Los Angeles State Historic Park Master Development Plan Final EIR. Website: [https://www.parks.ca.gov/pages/22272/files/r3\\_5\\_geology\\_soils.pdf](https://www.parks.ca.gov/pages/22272/files/r3_5_geology_soils.pdf). Accessed September 2018.
- California Department of Water Resources. (2013). California Water Plan, Update 2013. Tulare Lake Hydrologic Region. Volume 2 Regional Reports. Website accessed October 2018 at: [https://water.ca.gov/LegacyFiles/waterplan/docs/cwpu2013/Final/Vol2\\_TulareLakeRR.pdf](https://water.ca.gov/LegacyFiles/waterplan/docs/cwpu2013/Final/Vol2_TulareLakeRR.pdf).
- California Department of Toxic Substances Control (DTSC). (2018). Hazardous Waste and Substances Site List (Cortese). Website accessed September 2018 at: [https://www.envirostor.dtsc.ca.gov/public/search.asp?PAGE=8&CMD=search&ocieerp=&business\\_name=&main\\_street\\_number=&main\\_street\\_name=&city=&zip=&county=&branch=&status=ACT%20CBKLG%20CCOM%20CCOLUR&site\\_type=CSITES%20OPEN%20CFUDS%20CLOSE&cleanup\\_type=&npl=&funding=&reporttype=CO RTESE&reporttitle=HAZARDOUS+WASTE+AND+SUBSTANCES+SITE+LIST+%28CORTESE%29&federal\\_superfund=&state\\_response=&voluntary\\_cleanup=&school\\_cleanup=&operating=&post\\_closure=&non\\_operating=&corrective\\_action=&tiered\\_permit=&evaluation=&spec\\_prog=&national\\_priority\\_list=&senate=&congress=&assembly=&critical\\_pol=&business\\_type=&case\\_type=&display\\_results=&school\\_district=&pub=&hwmp=False&permitted=&pc\\_permitted=&inspections=&complaints=&censustract=&cesdecile=&ORDERBY=county&next=Next+50](https://www.envirostor.dtsc.ca.gov/public/search.asp?PAGE=8&CMD=search&ocieerp=&business_name=&main_street_number=&main_street_name=&city=&zip=&county=&branch=&status=ACT%20CBKLG%20CCOM%20CCOLUR&site_type=CSITES%20OPEN%20CFUDS%20CLOSE&cleanup_type=&npl=&funding=&reporttype=CO RTESE&reporttitle=HAZARDOUS+WASTE+AND+SUBSTANCES+SITE+LIST+%28CORTESE%29&federal_superfund=&state_response=&voluntary_cleanup=&school_cleanup=&operating=&post_closure=&non_operating=&corrective_action=&tiered_permit=&evaluation=&spec_prog=&national_priority_list=&senate=&congress=&assembly=&critical_pol=&business_type=&case_type=&display_results=&school_district=&pub=&hwmp=False&permitted=&pc_permitted=&inspections=&complaints=&censustract=&cesdecile=&ORDERBY=county&next=Next+50).
- Caltrans. (2002). Guide for the Preparation of Traffic Impact Studies. Website accessed September 2018: [http://www.dot.ca.gov/hq/tpp/offices/ocp/igr\\_ceqa\\_files/tisguide.pdf](http://www.dot.ca.gov/hq/tpp/offices/ocp/igr_ceqa_files/tisguide.pdf).
- Caltrans. (2018). Complete Streets Program. Website: <http://www.dot.ca.gov/transplanning/ocp/complete-streets.html>. Accessed September 2018.
- Envicom Corporation. (1974). Summary of Seismic Hazards & Safety Recommendations. Five County Seismic Safety Element Fresno, Kings, Madera, Mariposa & Tulare Counties.

Federal Emergency Management Agency. (2018). FEMA Flood Map Service Center: Search by Address. Website: <https://msc.fema.gov/portal/search>. Accessed October 2018.

Federal Emergency Management Agency. (2018). Flood Zones. Definition/Description. Website: <https://www.fema.gov/flood-zones>. Accessed October 2018.

Federal Emergency Management Agency. (2018). Mudflows And Mudslides? It Makes A Difference To Insurers. Website: <https://www.fema.gov/news-release/2004/06/28/mudflows-and-mudslides-it-makes-difference-insurers>. Accessed October 2018.

Federal Transit Administration. (2006). Transit Noise and Vibration Impact Assessment. Chapter 7: Basic Ground-Borne Vibration Concepts. Website accessed September 2018 at: [https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/FTA\\_Noise\\_and\\_Vibration\\_Manual.pdf](https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/FTA_Noise_and_Vibration_Manual.pdf).

Google Maps. (2018). Website: <https://www.google.com/maps/place/Mefford+Field+Airport/@36.1186077,-119.268752,37287m/data=!3m1!1e3!4m5!3m4!1s0x80ead4a712c5ac6f:0x410440c4893281ff!8m2!3d36.1560737!4d-119.3289822>. Accessed September 2018.

National Oceanic and Atmospheric Administration. (2018). What is a tsunami? Website: <https://oceanservice.noaa.gov/facts/tsunami.html>. Accessed October 2018.

International Conference of Building Officials. (1994). Page 2-49. Uniform Building Code. Volume 2. Structural Engineering Design Provisions. 1804.4 Expansive Soils. Website: [http://digitalassets.lib.berkeley.edu/ubc/UBC\\_1994\\_v2.pdf](http://digitalassets.lib.berkeley.edu/ubc/UBC_1994_v2.pdf). Accessed September 2018.

National Park Service. (2018). National Register of Historic Places. Website: <https://www.nps.gov/maps/full.html?mapId=7ad17cc9-b808-4ff8-a2f9-a99909164466>. Accessed September 2018.

Sauer, S. (2015). Caltrans' Division of Mass Transportation. Level of Service and Caltrans. Website: <https://pdfs.semanticscholar.org/presentation/2eee/4d9e08ad85519cebea225f6d9ade1cef6410.pdf>. Accessed June 2018.

Tulare County. (2010). Background Report Tulare County General Plan. Website: <http://generalplan.co.tulare.ca.us/documents/GeneralPlan2010/BackgroundReport.pdf>. Accessed September 2018.

Tulare County General Plan 2030 Update. Website: <http://generalplan.co.tulare.ca.us/> Accessed April, 2019.

Tulare County. Draft Ivanhoe Community Plan 2019 Update.

Tulare County. (2018). ArcGIS 10.5.1. Accessed September 2018.

Tulare County Administrative Office. (2018). Local Agency Management Program for Onsite Wastewater Treatment Systems. Tulare County, California. January 2018. Website: [https://www.waterboards.ca.gov/centralvalley/board\\_decisions/tentative\\_orders/1804/07\\_tulareco\\_lamp/3\\_tulareco\\_lamp.pdf](https://www.waterboards.ca.gov/centralvalley/board_decisions/tentative_orders/1804/07_tulareco_lamp/3_tulareco_lamp.pdf). Accessed September 2018.

Tulare County Association of Governments (TCAG). (2014). Regional Transportation Plan & Sustainable Communities Strategy. For Tulare County – 18th Edition. Adopted June 30, 2014. Website: <http://www.tularecog.org/wp-content/uploads/2015/06/Final-2014-Regional-Transportation-Plan-Sustainable-Communities-Strategy-FULL-DOCUMENT.pdf>. Accessed October 2018.

Tulare County Resource Management Agency (RMA). (2014). Tulare County Housing Element Action Program 9 Existing Infrastructure April 2014. Website accessed September 2018:  
<http://tularecounty.ca.gov/rma/assets/File/Tulare%20County%20Action%20Program%209%20Existing%20Infrastructure%20041014.pdf>.

U.S. Army Corps of Engineers. (2013). Dam Safety Action Classification (DSAC) Ratings. Website:  
[https://www.spl.usace.army.mil/Portals/17/docs/DamSafety/damsafety\\_actionsclassification.pdf](https://www.spl.usace.army.mil/Portals/17/docs/DamSafety/damsafety_actionsclassification.pdf). Accessed October 2018.

U.S. Army Corps of Engineers. (2018). Dam Safety Program. Website:  
<http://www.spk.usace.army.mil/Missions/Civil-Works/Dam-Safety-Program/>. Accessed October 2018.

U.S. Army Corps of Engineers. (2018). Success Dam Safety Modification Study. Website:  
<http://www.spk.usace.army.mil/Missions/Civil-Works/Success-Dam/>. Accessed October 2018.

U.S. Department of Agriculture. (2018). Natural Resources Conservation Service. Areas of Interest. Website:  
<https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>. Accessed September 2018.

U.S. Environmental Protection Agency. (2018). Superfund. Website: <https://www.epa.gov/superfund/search-superfund-sites-where-you-live>. Accessed September 2018.

U.S. Geological Survey. (2018). Do All Faults Cause Earthquakes? Website:  
[https://geomaps.wr.usgs.gov/sfgeo/quaternary/stories/all\\_faults.html](https://geomaps.wr.usgs.gov/sfgeo/quaternary/stories/all_faults.html). Accessed September 2018.

U.S. Geological Survey. (2018). What is Quaternary? Website:  
[https://geomaps.wr.usgs.gov/sfgeo/quaternary/stories/what\\_is.html](https://geomaps.wr.usgs.gov/sfgeo/quaternary/stories/what_is.html). Accessed September 2018.

U.S. Government Publishing Office. (2017). 40 CFR Appendix I To Part 204 - Appendix I To Part 204. Website:  
<https://www.gpo.gov/fdsys/search/pagedetails.action?collectionCode=CFR&browsePath=Title+40%2FChapter%2FSubchapter+G%2FPart+204%2FAppendix+I+to+Part+204&granuleId=CFR-1996-title40-vol6-part204-appI&packageId=CFR-1996-title40-vol6&collapse=true&fromBrowse=true>. Accessed September 2018.

VRPA Technologies, Inc. “*Ivanhoe Community Plan Update Traffic Impact Study*” May 2019. Page E-1. Prepared by VRPA Technologies, Inc. and included in Attachment “E” of this IS/MND.

# Attachment “A”

---

## Air Quality Technical Memorandum



# RESOURCE MANAGEMENT AGENCY

5961 SOUTH MOONEY BLVD

VISALIA, CA 93277

PHONE (559) 624-7000

FAX (559) 730-2653

Aaron R. Bock

Reed Schenke

Sherman Dix

Economic Development and Planning

Public Works

Fiscal Services

---

## TECHNICAL MEMORANDUM AIR QUALITY ASSESSMENT

**DATE:** May 15, 2019

**TO:** Hector Guerra, Chief Environmental Planner

**FROM:** Jessica Willis, Planner IV

**SUBJECT:** Air Quality Assessment for the Ivanhoe Community Plan Update (GPA 17-006, PZC 18-008, PZC 18-006, PZC 18-007)

---

### PURPOSE AND NEED FOR ASSESSMENT

This document is intended to assist Tulare County Resource Management Agency (RMA) staff in the preparation of the Air Quality component of the Mitigated Negative Declaration (MND) being prepared for the Ivanhoe Community Plan Update (Project). The assessment is intended to provide sufficient detail regarding potential impacts of Project implementation and to identify mitigation measures, if necessary, to reduce potentially significant impacts.

The air quality assessment provided in this document was prepared to evaluate whether the air pollutant emissions generated from implementation of the Project (i.e., future development projects) would cause significant impacts to air quality and health risks to nearby receptors. The air quality assessment was conducted within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000, et seq.). The assessment is intended to provide the County of Tulare (County) with sufficient detail regarding potential impacts of Project implementation and to identify mitigation measures, if necessary, to reduce potentially significant impacts.

The estimated emissions are compared to federal and state ambient air quality standards (AAQS) and the thresholds of significance established by the San Joaquin Valley Unified Air Pollution Control District (Air District). The methodology for the air quality assessment follows the Air District recommendations for quantification of emissions and evaluation of potential impacts as provided in their guidance document *Guidance for Assessing and Mitigating Air Quality Impacts* (GAMAQI), adopted March 19, 2015.<sup>1</sup>

---

<sup>1</sup> Air District. *Guidance for Assessing and Mitigating Air Quality Impacts*. March 19, 2015. [http://www.valleyair.org/transportation/GAMAQI\\_3-19-15.pdf](http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf). Accessed May 15, 2019.

## **PROJECT DESCRIPTION**

Ivanhoe is currently designated an Unincorporated Community in the 2030 Tulare County General Plan. The objective of the Ivanhoe Community Plan Update is to develop an updated plan, which can accurately reflect the needs and priorities of the unincorporated community of Ivanhoe. The Land Use and Circulation portions of this Plan provide the mechanism to minimize or avoid the potential adverse impacts of urban growth. The development of an orderly, harmonious land use pattern and appropriate implementation measures are designed to reduce potential conflict between neighboring uses across Tulare County's 2030 planning horizon, consistent with the Tulare County 2030 General Plan Update. The Plan is needed to increase the availability of infrastructure funding, such as drinking water system improvements (wells, water distribution piping, storage tanks, etc.), wastewater system (such as piping, lift stations, etc.), and public work/safety improvements (such as curbs, gutters, sidewalks, etc.), and to stimulate economic development within the community.

Tulare County is proposing new land use and zoning designations within an expanded UDB. The proposed Community Plan Update, if adopted, will update these designations to be consistent with the General Plan, and will bring existing non-compliant properties into conformity with the Tulare County Zoning Ordinance. The Community Plan Update also includes the Complete Streets and Road Maintenance programs and the community's anticipated growth through year 2030 based on the existing land uses, census population data, and the projected 1.3% annual growth rate in unincorporated areas of Tulare County. Other than the Complete Streets and Road Maintenance Programs, there are no specific development projects (such as residential, commercial, or industrial uses) proposed as part of this project. As an unknown number of proposals may occur within the lifetime of the Community Plan Update, the Community Plan is intended to direct the density, intensity, and types of growth needed to meet the needs of the community. Future developments within the Project planning area will be required to undergo additional CEQA evaluation on a project-by-project basis at such time development is proposed to determine potential environmental impacts.

### **Complete Streets and Road Maintenance.**

The Ivanhoe Complete Streets and Road Maintenance Programs are included in the Circulation Element of the proposed Community Plan Update. The Complete Streets Program has thoroughly analyzed the alternative forms of transportation, including transit, bicycle ways, and pedestrian circulation. Improvements proposed in the Complete Streets Program include, but are not limited to, installation of streetlights, bus shelters, street signage and striping, curbs, gutters, sidewalks, drainage system, and utilities. Road maintenance activities vary by road segment dependent upon the condition of the road and may include chip seal, overlay resurfacing, and asphalt reconstructions.

### **Growth Projections.**

There are no specific development projects proposed with the Ivanhoe Community Plan Update; however, the Plan does include updates to land use designations that could increase the buildout potential of the planning area. Population and residential growth through planning horizon year 2030 was estimated by applying a 1.3% annual growth rate, consistent with the Tulare County 2030 General Plan, to the 2017 baseline population and housing data, as provided in the United

States Census Bureau 2017 American Community Survey (ACS).<sup>2</sup> Non-residential growth was estimated through planning horizon year 2030 for a worst-case emissions scenario by applying a 1.3% annual growth rate to the existing uses based on existing zoning and assuming all parcels have been improved with structures at a floor to area ratio of 0.20. Using these assumptions for baseline conditions provides a conservative (larger) overall growth estimate. **Table 1** summarizes the projected growth of the community through horizon Year 2030.

| <b>Table 1. Projected Growth through Year 2030</b> |                          |                |  |       |                         |       |
|--|--------------------------|----------------|--|-------|-------------------------|-------|
|  | Residential <sup>1</sup> |                | Commercial / Retail / Other <sup>2</sup> |       | Industrial <sup>2</sup> |       |
| Year   | Population               | Dwelling Units | Square Feet                              | Acres | Square Feet             | Acres |
| 2017   | 3,804                    | 1,161          | 586,318                                  | 67.30 | 337,154                 | 38.70 |
| 2030   | 4,499                    | 1,373          | 693,515                                  | 79.60 | 398,797                 | 45.78 |
| Overall Growth                                     | 695                      | 212            | 107,197                                  | 12.30 | 61,642                  | 7.08  |

<sup>1</sup> Projections based on 2017 American Community Survey data applying an annual growth rate of 1.3%.  
<sup>2</sup> Projections based on existing land uses assuming developments/improvements with a Floor to Area Ratio of 0.2 and annual growth rate of 1.3%.

## SIGNIFICANCE THRESHOLDS

CEQA Guidelines define a significant effect on the environment as a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project.<sup>3</sup> To determine if a project would have a significant impact on air quality and climate change, the type, level, and impact of criteria pollutant and GHG emissions generated by the project must be evaluated. Appendix G of the CEQA Guidelines provides the criteria (as Checklist Items) for evaluating potential impacts on the environment. The CEQA criteria and the Air District’s significance thresholds and guidance for evaluation are provided below.

### Air Quality Plans

The Air District has established thresholds of significance for criteria pollutant emissions. These thresholds are based on District New Source Review (NSR) offset requirements for stationary sources. “Stationary sources in the District are subject to some of the toughest regulatory requirements in the nation. Emission reductions achieved through implementation of District offset requirements are a major component of the District’s air quality plans. Thus, projects with emissions below the thresholds of significance for criteria pollutants would be determined to “Not conflict or obstruct implementation of the District’s air quality plan”.<sup>4</sup>

The Air District has three sets of significance thresholds based on the source of the emissions. According to the GAMAQI, “The District identifies thresholds that separate a project’s short-term emissions from its long-term emissions. The short-term emissions are mainly related to the construction phase of a project and are recognized to be short in duration. The long-term

<sup>2</sup> United States Census Bureau. American FactFinder. 2017 American Community Survey. 2013-2017 American Community Survey 5-Year Estimates. Demographic and Housing Estimates (DP05) and Selected Housing Characteristics (DP04). [https://factfinder.census.gov/faces/nav/jsf/pages/community\\_facts.xhtml](https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml). May 15, 2019.

<sup>3</sup> CEQA §§ 15002(g), 15382

<sup>4</sup> Air District, GAMAQI, Section 7.12, Page 65.

emissions are mainly related to the activities that will occur indefinitely as a result of project operations.”<sup>5</sup>

Long-term (operational) emissions are further separated into permitted and non-permitted equipment and activities. Stationary (permitted) sources that comply or will comply with Air District rules and regulations are generally not considered to have a significant air quality impact. Specifically, the GAMAQI states, “District Regulation II ensures that stationary source emissions will be reduced or mitigated to below the District’s significance thresholds... District implementation of New Source Review (NSR) ensures that there is no net increase in emissions above specified thresholds from New and Modified Stationary Sources for all nonattainment pollutants and their precursors. Furthermore, in general, permitted sources emitting more than the NSR Offset Thresholds for any criteria pollutant must offset all emission increases in excess of the thresholds....”<sup>6</sup>

The Air District’s significance thresholds are provided in **Table 2**.

| <b>Table 2. Air District Criteria Pollutant Significance Thresholds</b> |                                   |   |  |
|---|-----------------------------------|---|--|
| <b>Pollutant/<br/>Precursor</b>   | <b>Construction<br/>Emissions</b> | <b>Operational Emissions</b>                  |  |
|   |                                   | <b>Permitted Equipment<br/>and Activities</b> | <b>Non- Permitted Equipment<br/>and Activities</b> |
|   | <b>Emissions (tpy)</b>            | <b>Emissions (tpy)</b>                        | <b>Emissions (tpy)</b>                             |
| <b>CO</b>   | 100                               | 100   | 100  |
| <b>NOx</b>  | 10                                | 10  | 10   |
| <b>ROG</b>  | 10                                | 10  | 10   |
| <b>SOx</b>  | 27                                | 27  | 27   |
| <b>PM<sub>10</sub></b>  | 15                                | 15  | 15   |
| <b>PM<sub>2.5</sub></b>   | 15                                | 15  | 15   |

Source: Air District, GAMAQI, Table 2, page 80; and <http://www.valleyair.org/transportation/0714-GAMAQI-Criteria-Pollutant-Thresholds-of-Significance.pdf>, accessed May 30, 2018.

### **Air Quality Violations**

“Determination of whether project emissions would violate any ambient air quality standard is largely a function of air quality dispersion modeling. If project emissions would not exceed State and Federal ambient air quality standards at the project’s property boundaries, the project would be considered to not violate any air quality standard or contribute substantially to an existing or projected air quality violation. The need to perform an air quality dispersion modeling analysis for any project (urban development, commercial, or industrial projects) is determined on a case-by-case basis depending on the level of emissions associated with the proposed project. If such modeling is found necessary, the project consultant should check with the District to determine the appropriate model and input data to use in the analysis. Specific information for assessing significance, including screening tools and modeling guidance is available on-line at the District’s website [www.valleyair.org](http://www.valleyair.org).”<sup>7</sup>

<sup>5</sup> Air District, GAMAQI, Section 8.1, Page 75  
<sup>6</sup> Air District, GAMAQI, Section 8.2.1, Page 76  
<sup>7</sup> Air District, GAMAQI, Section 7.13, Page 65

“The thresholds of significance for Ambient Air Quality are based on the California Ambient Air Quality Standard (CAAQS) and National Ambient Air Quality Standard (NAAQS). A project would be considered to have a significant impact if its emissions are predicted to cause or contribute to a violation of an ambient air quality standard by exceeding any of the following:

1. Any of the CAAQS, or
2. Any of the NAAQS, and if available, the associated Significant Impact Level (SIL).”<sup>8</sup>

**Table 3** provides the California and National Ambient Air Quality Standards.

| <b>Table 3. Ambient Air Quality Standards</b>          |                        |                                       |  |                                      |
|--|------------------------|---------------------------------------|--|--------------------------------------|
| <b>Pollutant</b>                                       | <b>Averaging Time</b>  | <b>California Standards</b>           | <b>National Standards</b>                    |                                      |
|  |                        | <b>Concentration</b>                  | <b>Primary</b>                               | <b>Secondary</b>                     |
| <b>Ozone (O<sub>3</sub>)</b>                           | 1 Hour                 | 0.09 ppm<br>(180 µg/m <sup>3</sup> )  | ---  | Same as Primary                      |
|  | 8 Hour                 | 0.070 ppm<br>(137 µg/m <sup>3</sup> ) | 0.070 ppm*<br>(137 µg/m <sup>3</sup> )       |                                      |
| <b>Respirable Particulate Matter (PM<sub>10</sub>)</b> | 24 Hour                | 50 µg/m <sup>3</sup>                  | 150 µg/m <sup>3</sup>                        | Same as Primary                      |
|  | Annual Arithmetic Mean | 20 µg/m <sup>3</sup>                  | ---  |                                      |
| <b>Fine Particulate Matter (PM<sub>2.5</sub>)</b>      | 24 Hour                | ---                                   | 35 µg/m <sup>3</sup>                         | Same as Primary                      |
|  | Annual Arithmetic Mean | 12 µg/m <sup>3</sup>                  | 12.0 µg/m <sup>3</sup>                       | 15.0 µg/m <sup>3</sup>               |
| <b>Carbon Monoxide (CO)</b>                            | 1 Hour                 | 20 ppm<br>(23 mg/m <sup>3</sup> )     | 35 ppm<br>(40 mg/m <sup>3</sup> )            | ---                                  |
|  | 8 Hour                 | 9.0 ppm<br>(10 mg/m <sup>3</sup> )    | 9 ppm<br>(10 mg/m <sup>3</sup> )             | ---                                  |
|  | 8 Hour (Lake Tahoe)    | 6 ppm (7 mg/m <sup>3</sup> )          | ---  | ---                                  |
| <b>Nitrogen Dioxide (NO<sub>2</sub>)</b>               | 1 Hour                 | 0.18 ppm<br>(339 µg/m <sup>3</sup> )  | 100 ppb<br>(188 µg/m <sup>3</sup> )          | Same as Primary                      |
|  | Annual Arithmetic Mean | 0.030 ppm<br>(57 µg/m <sup>3</sup> )  | 0.053 ppm<br>(100 µg/m <sup>3</sup> )        |                                      |
| <b>Sulfur Dioxide (SO<sub>2</sub>)</b>                 | 1 Hour                 | 0.25 ppm<br>(655 µg/m <sup>3</sup> )  | 75 ppb<br>(196 µg/m <sup>3</sup> )           | ---                                  |
|  | 3 Hour                 | ---                                   | ---  | 0.5 ppm<br>(1300 µg/m <sup>3</sup> ) |
|  | 24 Hour                | 0.04 ppm<br>(105 µg/m <sup>3</sup> )  | 0.14 ppm<br>(for certain areas)              | ---                                  |
|  | Annual Arithmetic Mean | ---                                   | 0.030 ppm<br>(for certain areas)             | ---                                  |
| <b>Lead</b>  | 30 Day Average         | 1.5 µg/m <sup>3</sup>                 | ---  | ---                                  |
|  | Calendar Quarter       | ---                                   | 1.5 µg/m <sup>3</sup><br>(for certain areas) | Same as Primary                      |

<sup>8</sup> Air District, GAMAQI, Section 8.4, Page 90

| <b>Table 3. Ambient Air Quality Standards</b>  |                       |   |                              |                        |
|--|-----------------------|---|------------------------------|------------------------|
| <b>Pollutant</b>   | <b>Averaging Time</b> | <b>California Standards</b>                           | <b>National Standards</b>    |                        |
|  |                       | <b>Concentration</b>                                  | <b>Primary</b>               | <b>Secondary</b>       |
|  |                       | Rolling 3-Month Average                               | ---                          | 0.15 µg/m <sup>3</sup> |
| <b>Visibility Reducing Particles</b>   | 8 Hour                | Extinction of 0.23/km; visibility of 10 miles or more | <b>No National Standards</b> |                        |
| <b>Sulfates</b>  | 24 Hour               | 25 µg/m <sup>3</sup>                                  |                              |                        |
| <b>Hydrogen Sulfide</b>  | 1 Hour                | 0.03 ppm (42 µg/m <sup>3</sup> )                      |                              |                        |
| <b>Vinyl Chloride</b>  | 24 Hour               | 0.01 ppm (26 µg/m <sup>3</sup> )                      |                              |                        |
| <p>* The standard at the time of the GAMAQI was 0.075 ppm; the standard presented here was finalized on October 26, 2015.<br/>                     Abbreviations: ppm = parts per million; mg/m<sup>3</sup> = milligram per cubic meter; µg/m<sup>3</sup> = micrograms per cubic meter.<br/>                     Sources: Air District, GAMAQI, <a href="#">Table 3, page 91</a>; ARB, <a href="http://www.arb.ca.gov/research/aaqs/aaqs2.pdf">http://www.arb.ca.gov/research/aaqs/aaqs2.pdf</a>, accessed May 30, 2018.</p> |                       |   |                              |                        |

“The District ISR rule exempts small development projects (see Table 4 [of the GAMAQI]) from project-specific mitigation requirements. The District performed extensive analysis to identify small projects for which additional mitigation is not feasible. For instance, the exemptions include small residential housing developments of less than 50 units and commercial developments of less than 2,000 square feet. All projects on the exemption list emit less than 2 tons per year of either PM10 or NOx, which is substantially lower than the District’s 10-ton per year significance thresholds. Furthermore, as the tailpipe emissions from motor vehicles continue to decline, these projects will emit even less today than was estimated in 2005 when this rule was adopted. In addition, two tons per year is expected to result in daily emissions of less than the 100 lb/day screening level for either NOx or PM10 that the District has concluded that projects under the ISR exemption thresholds will have a less than significant impact on air quality. Consequently, projects below ISR applicability thresholds are not expected to exceed the thresholds of significance for criteria pollutants emissions (see Section 8.3 [of the GAMAQI]). In addition, projects below the ISR applicability thresholds are not expected to violate any air quality standards or contribute substantially to an existing or projected air quality violation and will not exceed the thresholds of significance for ambient air quality. In this case, the District concludes no emission calculation is needed and no ambient air quality analysis is required.”<sup>9</sup>

**Table 4** provides the Air District’s ambient air quality analysis (AAQA) screening levels for development projects. For projects that exceed the screening thresholds identified in Table 4, the Air District provides further guidance on how to evaluate the 100 pound per day screening level in their guidance document *Ambient Air Quality Analysis Project Daily Emissions Assessment*.<sup>10</sup>

<sup>9</sup> Air District, GAMAQI, Section 8.4.4, Page 95

<sup>10</sup> Air District, <http://www.valleyair.org/transportation/CEQA%20Rules/Ambient-Air-Quality-Analysis-Project-Daily-Emissions-Assessment.pdf>, accessed May 30, 2018.

| <b>Table 4: AAQA Screening Levels For Development Project</b> |   |
|---|---|
| <b>Development Project Type</b>                               | <b>Space / Size</b>   |
| Residential   | 50 dwelling units   |
| Commercial  | 2,000 square feet   |
| Light Industrial  | 25,000 square feet  |
| Heavy Industrial  | 100,000 square feet   |
| Medical Office  | 20,000 square feet  |
| General Office  | 39,000 square feet  |
| Educational   | 9,000 square feet   |
| Governmental  | 10,000 square feet  |
| Recreational  | 20,000 square feet  |
| Transportation / Transit                                      | Construction exhaust emissions equal or exceeding 2.0 tons NOx or 2.0 tons PM <sub>10</sub> |
| Source: Air District, GAMAQI, Table 4, page 96                |   |

### **Cumulative Increase in Emissions**

“By its very nature, air pollution is largely a cumulative impact. The nonattainment status of regional pollutants is a result of past and present development. Future attainment of State and Federal ambient air quality standards is a function of successful implementation of the District’s attainment plans. Consequently, the District’s application of thresholds of significance for criteria pollutants is relevant to the determination of whether a project’s individual emissions would have a cumulatively significant impact on air quality. A Lead Agency may determine that a project’s incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan or mitigation program, including, but not limited to an air quality attainment or maintenance plan that provides specific requirements that will avoid or substantially lessen the cumulative problem within the geographic area in which the project is located [CCR §15064(h)(3)]. Thus, if project specific emissions exceed the thresholds of significance for criteria pollutants the project would be expected to result in a cumulatively considerable net increase of any criteria pollutant for which the District is in non-attainment under applicable Federal or State ambient air quality standards. This does not imply that if the project is below all such significance thresholds, it cannot be cumulatively significant.”<sup>11</sup>

**Table 5** provides the San Joaquin Valley Air Basin attainment status for federal and state ambient air quality standards.

<sup>11</sup> Air District, GAMAQI, Section 7.14, Pages 65-66

| <b>Table 5. San Joaquin Valley Attainment Status</b>  |                               |                         |
|---|-------------------------------|-------------------------|
| <b>Pollutant</b>  | <b>Designation</b>            |                         |
|   | <b>Federal Standards</b>      | <b>State Standards</b>  |
| Ozone—1-hour  | No Federal Standard           | Nonattainment/Severe    |
| Ozone—8-hour  | Nonattainment/Extreme         | Nonattainment           |
| PM <sub>10</sub>  | Attainment                    | Nonattainment           |
| PM <sub>2.5</sub>   | Nonattainment                 | Nonattainment           |
| Carbon monoxide   | Attainment/Unclassified       | Attainment/Unclassified |
| Nitrogen dioxide  | Attainment/Unclassified       | Attainment              |
| Sulfur dioxide  | Attainment/Unclassified       | Attainment              |
| Lead (Particulate)  | No Designation/Classification | Attainment              |
| Hydrogen sulfide  | No Federal Standard           | Unclassified            |
| Sulfates  | No Federal Standard           | Attainment              |
| Visibility-reducing particles   | No Federal Standard           | Unclassified            |
| Vinyl chloride  | No Federal Standard           | Attainment              |
| Source: Air District, <a href="http://www.valleyair.org/aqinfo/attainment.htm">http://www.valleyair.org/aqinfo/attainment.htm</a> , accessed May 30, 2018 |                               |                         |

## **Exposure Risks**

The location of a project is a major factor in determining whether the project will result in localized air quality impacts. The potential for adverse air quality impacts increases as the distance between the source of emissions and receptors decreases. From a health risk perspective, there are two (2) categories of projects that have the potential to cause long-term health risks impacts:

- Type A Projects: Land use projects that will place new toxic sources in the vicinity of existing receptors. This category includes sources of toxic emissions such as gasoline dispensing facilities, asphalt batch plants, warehouse distribution centers, freeways and high traffic roads, and other stationary sources that emit toxic substances.
- Type B Projects: Land use projects that will place new receptors in the vicinity of existing toxic sources. This category includes residential, commercial, and institutional developments proposed in the vicinity of existing sources such as stationary sources, freeways and high traffic roads, rail yards, and warehouse distribution centers.<sup>12</sup>

“Various tools already exist to perform a screening analysis from stationary sources impacting receptors (Type A projects) as developed for the AB2588 Hot Spots and air district permitting programs. Screening tools may include prioritization charts, AERSCREEN and various spreadsheets. For projects being impacted by existing sources (Type B projects), one screening tool is contained in the ARB Handbook: *Air Quality and Land Use Handbook: A Community Health Perspective*. The document includes a table entitled “*Recommendations on Siting New Sensitive Land Uses Such As Residences, Schools, Daycare Centers, Playgrounds, or Medical Facilities*” with recommended buffer distances associated with various types of common sources. If a proposed project is located within an established buffer distance to any of the listed

<sup>12</sup> Air District, GAMAQI, Section 6.5, Page 44

sources, a health risk screening and/or assessment should be performed to assess risk to potential sensitive receptors. These guidelines are intended only for projects that are impacted by a single source. Another useful tool is the CAPCOA Guidance Document: *Health Risk Assessments for Proposed Land Use Projects*. CAPCOA prepared the guidance to assist Lead Agencies in complying with CEQA requirements. The guidance document describes when and how a health risk assessment should be prepared and what to do with the results.”<sup>13</sup>

**Table 6** presents the Air District’s and ARB’s siting recommendations for projects proposing sensitive land uses.

| <b>Table 6: ARB Recommendations on Siting New Sensitive Land Uses</b>   |  |
|---|--|
| <b>Source Category</b>  | <b>Advisory Recommendations</b>  |
| Freeways and High-Traffic Roads   | Avoid siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day.   |
| Distribution Centers  | Avoid siting new sensitive land uses within 1,000 feet of a distribution center (that accommodates more than 100 trucks per day, more than 40 trucks with operating transport refrigeration units (TRUs) per day, or where TRU unit operations exceed 300 hours per week).<br><br>Take into account the configuration of existing distribution centers and avoid locating residences and other new sensitive land uses near entry and exit points. |
| Rail Yards  | Avoid siting new sensitive land uses within 1,000 feet of a major service and maintenance rail yard. Within one mile of a rail yard, consider possible siting limitations and mitigation approaches.   |
| Ports   | Avoid siting of new sensitive land uses immediately downwind of ports in the most heavily impacted zones. Consult local air districts or the ARB on the status of pending analyses of health risks.  |
| Refineries  | Avoid siting new sensitive land uses immediately downwind of petroleum refineries. Consult with local air districts and other local agencies to determine an appropriate separation.   |
| Chrome Platers  | Avoid siting new sensitive land uses within 1,000 feet of a chrome plater.   |
| Dry Cleaners Using Perchloroethylene  | Avoid siting new sensitive land uses within 300 feet of any dry cleaning operation. For operations with two or more machines, provide 500 feet. For operations with 3 or more machines, consult with the local air district.<br><br>Do not site new sensitive land uses in the same building with perchloroethylene dry cleaning operations.   |
| Gasoline Dispensing Facilities  | Avoid siting new sensitive land uses within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater). A 50 foot separation is recommended for typical gas dispensing facilities.   |
| Sources:<br>Air Resources Board, <i>Air Quality and Land Use Handbook: A Community Health Perspective</i> , Table 1-1, <a href="https://www.arb.ca.gov/ch/handbook.pdf">https://www.arb.ca.gov/ch/handbook.pdf</a> , accessed May 30, 2018.<br>California Air Pollution Control Officers Association, <i>Health Risk Assessments for Proposes Land Use Projects</i> , Table 2, <a href="http://www.valleyair.org/transportation/CAPCOA_HRA_LU_Guidelines_8-6-09.pdf">http://www.valleyair.org/transportation/CAPCOA_HRA_LU_Guidelines_8-6-09.pdf</a> , accessed May 30, 2018. |  |

<sup>13</sup> Air District, GAMAQI, Section 6.5, Page 45

“Determination of whether project emissions would expose sensitive receptors to substantial pollutant concentrations is a function of assessing potential health risks. Sensitive receptors are facilities that house or attract children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants. Hospitals, schools, convalescent facilities, and residential areas are examples of sensitive receptors. When evaluating whether a development proposal has the potential to result in localized impacts, Lead Agency staff need to consider the nature of the air pollutant emissions, the proximity between the emitting facility and sensitive receptors, the direction of prevailing winds, and local topography. Lead Agencies are encouraged to use the screening tools for Toxic Air Contaminant presented in section 6.5 (Potential Land Use Conflicts and Exposure of Sensitive Receptors [pages 44 – 45 of the GAMAQI]) to identify potential conflicts between land use and sensitive receptors and include the result of their analysis in the referral document.”<sup>14</sup>

### **Nuisance Odors**

“Due to the subjective nature of odor impacts, the number of variables that can influence the potential for an odor impact, and the variety of odor sources, there are no quantitative or formulaic methodologies to determine the presence of a significant odor impact. Rather, the District recommends that odor analyses strive to fully disclose all pertinent information. The intensity of an odor source’s operations and its proximity to sensitive receptors influences the potential significance of odor emissions. The District has identified some common types of facilities that have been known to produce odors in the San Joaquin Valley. These are presented in Chapter 8 [of the GAMAQI] along with a reasonable distance from the source within which, the degree of odors could possibly be significant.”<sup>15</sup>

Two situations create a potential for odor impact. The first occurs when a new odor source is located near an existing receptor. The second occurs when a new receptor locates near an existing source of odor. “An analysis of potential odor impacts should be conducted for the following two situations:

1. Generators – projects that would potentially generate odorous emissions proposed to locate near existing sensitive receptors or other land uses where people may congregate, and
2. Receivers – residential or other sensitive receptor projects or other projects built for the intent of attracting people locating near existing odor sources.”<sup>16</sup>

“The intensity of an odor source’s operations and its proximity to sensitive receptors influences the potential significance of odor emissions. The District has identified some common types of facilities that have been known to produce odors in the San Joaquin Valley Air Basin. These are presented in Table 6 (Screening Levels For Potential Odor Sources) [of the GAMAQI] along with a reasonable distance from the source within which, the degree of odors could possibly be significant. Table 6 (Screening Levels for Potential Odor Sources) [of the GAMAQI], can be used as a screening tool to qualitatively assess a project’s potential to adversely affect area receptors. This list of facilities is not all-inclusive. The Lead Agency should evaluate facilities not included in the table or projects separated by greater distances if warranted by local

---

<sup>14</sup> Air District, GAMAQI, Section 7.15, Page 66

<sup>15</sup> Air District, GAMAQI, Section 7.16, Pages 66-67

<sup>16</sup> Air District, GAMAQI, Section 8.6, Page 102

conditions or special circumstances. If the proposed project would result in sensitive receptors being located closer than the screening level distances, a more detailed analysis should be provided.”<sup>17</sup>

**Table 7** presents the Air District’s screening levels for potential nuisance odor sources.

| <b>Table 7. Air District Screening Levels for Potential Odor Sources</b>  |                 |
|---|-----------------|
| <b>Odor Generator / Type of Facility</b>  | <b>Distance</b> |
| Wastewater Treatment Facilities   | 2 miles         |
| Sanitary Landfill   | 1 mile          |
| Transfer Station  | 1 mile          |
| Composting Facility   | 1 mile          |
| Petroleum Refinery  | 2 miles         |
| Asphalt Batch Plant   | 1 mile          |
| Chemical Manufacturing  | 1 mile          |
| Fiberglass Manufacturing  | 1 mile          |
| Painting/Coating Operations (e.g., auto body shop)  | 1 mile          |
| Food Processing Facility  | 1 mile          |
| Feed Lot/Dairy  | 1 mile          |
| Rendering Plant   | 1 mile          |
| Sources: Air District, GAMAQI, Table 6, page 103; and <a href="http://www.valleyair.org/transportation/GAMAQI-2015/GAMAQI-Criteria-Pollutant-Thresholds-of-Odors.pdf">http://www.valleyair.org/transportation/GAMAQI-2015/GAMAQI-Criteria-Pollutant-Thresholds-of-Odors.pdf</a> . |                 |

## IMPACT EVALUATION

### AIR QUALITY IMPACTS

**a) Would the project conflict with or obstruct implementation of the applicable air quality plan?**

Project Impact Analysis:                    *Less Than Significant Impact*

The Air District has determined that projects with emissions below the thresholds of significance for criteria pollutants would “Not conflict or obstruct implementation of the District’s air quality plan.”<sup>18</sup> There are no specific development projects (such as residential, commercial, or industrial uses) associated with the Community Plan Update. However, the Plan does include updates to land use designations that could increase the buildout potential of the planning area. As such, projected growth estimates for population, housing, and non-residential land uses are based on the 1.3% annual growth rate projected for the County in the Tulare County 2030 General Plan. To assess a worst-case growth scenario, the 1.3% growth rate was applied to the existing 2017 base year population and housing data (as provided in the United States Census

---

<sup>17</sup> Air District, GAMAQI, Section 8.6, Pages 102-103

<sup>18</sup> Air District, GAMAQI, Section 7.12, Page 65.

Bureau 2017 American Community Survey) and the existing non-residential zoning within the community (assuming that all properties have been improved with structures at a floor-to-area ratio of 0.2) to determine the amount of development that could occur by 2030. The projected growth is presented in **Table 1**.

The future buildout of the Project would result in short-term, temporary, and intermittent construction-related and long-term operations-related criteria air pollutant emissions. It is not necessary to calculate air quality emissions as, by analogy, the emission from this Project compared to similar projects within Tulare County would not exceed Air District thresholds of significance. The unincorporated communities of Pixley, Earlimart, and Poplar/Cotton Center have growth projections similar to that of Ivanhoe.<sup>19</sup> As such, the emissions analyses for these three communities serve as the basis for this qualitative analysis.

**Table 8** provides a comparison of the Pixley, Earlimart and Poplar/Cotton Center Community Plan growth projections and the criteria pollutant emissions associated with the projected growth.

| <b>Table 8. Comparison of Growth Projections<br/>Pixley, Earlimart, Poplar/Cotton Center, and Ivanhoe</b> |         |         |            |                      |
|---|---------|---------|------------|----------------------|
|   | Ivanhoe | Pixley  | Earlimart* | Poplar/Cotton Center |
| <b>Growth Projections</b>   |         |         |            |                      |
| Population  | 695     | 740     | 1,947      | 596                  |
| Residential<br>(dwelling units)   | 212     | 259     | 461        | 161                  |
| Commercial/Retail/Other<br>(square feet)  | 107,197 | 82,440  | 155,880    | 99,912               |
| Industrial<br>(square feet)   | 61,642  | 129,160 | 53,472     | 63,356               |
| Total Non-Residential<br>(square feet)  | 168,839 | 211,600 | 212,324    | 163,268              |
| <b>Average Annual Construction</b>  |         |         |            |                      |
| ROG   |         | 0.60    | 1.64       | 0.68                 |
| NOx   |         | 1.91    | 7.20       | 2.43                 |
| CO  |         | 1.58    | 5.29       | 2.33                 |
| SOx   |         | 0.002   | 0.01       | 0.006                |
| PM10  |         | 0.22    | 0.69       | 0.44                 |
| PM2.5   |         | 0.15    | 0.46       | 0.18                 |
| <b>Annual Operations at 2030 Buildout</b>   |         |         |            |                      |
| ROG   |         | 6.15    | 7.63       | 1.20                 |
| NOx   |         | 5.53    | 14.34      | 6.90                 |
| CO  |         | 28.34   | 32.72      | 7.08                 |
| SOx   |         | 0.07    | 0.09       | 0.02                 |
| PM10  |         | 5.05    | 7.08       | 1.06                 |
| PM2.5   |         | 1.45    | 2.40       | 0.30                 |

<sup>19</sup> Pixley Community Plan 2015 Update Environmental Impact Report. <https://tularecounty.ca.gov/rma/index.cfm/planning-building/community-plans/updated-community-plans/pixley-community-plan-2015-update/>.  
Earlimart Community Plan 2017 Update Environmental Impact Report. <https://tularecounty.ca.gov/rma/index.cfm/planning-building/community-plans/updated-community-plans/earlimart-community-plan-update/>.  
Poplar-Cotton Center Community Plan 2018 Update Mitigated Negative Declaration. <https://tularecounty.ca.gov/rma/index.cfm/planning-building/community-plans/draft-community-plans/poplar-cotton-center-community-plan-update/>.

\* Earlimart emissions include project specific information for a proposed high school (50,500 sf), as well as for projected annual growth at 1.3%, and represents the maximum annual average operational emissions.

Source: Air Quality analyses of the Pixley Community Plan 2015 Update EIR, Earlimart Community Plan 2017 Update EIR, and Poplar/Cotton Center Community Plan 2018 Update MND.

As presented in **Table 8**, criteria pollutant emissions for all three communities are below the Air District’s thresholds of significance, with the exception for NOx emissions in Earlimart. Although total non-residential development in Earlimart is similar to that in Pixley, Earlimart has higher commercial/retail/other growth and lower industrial growth than Pixley, while the residential and housing growth in Earlimart is higher than that of Pixley. The Earlimart emissions also included project-specific analysis for the proposed high school, as well as the emissions resulting from the 1.3% annual growth.

**Table 9** identifies the Project size as a percentage of the growth projections for the Pixley, Earlimart and Poplar/Cotton Center communities.

| <b>Table 9. Project Size in Comparison to Similar Projects<br/>(as a percentage of previous analysis)</b> |          |             |                        |
|---|----------|-------------|------------------------|
|   | % Pixley | % Earlimart | % Poplar/Cotton Center |
| Population  | 94       | 36          | 117                    |
| Residential   | 82       | 46          | 132                    |
| Total Non-Residential   | 80       | 81          | 103                    |
| Commercial/Retail/Other   | 130      | 69          | 107                    |
| Industrial  | 48       | 115         | 97                     |

As demonstrated in the table, Project-related residential land use is approximately 82% the size of Pixley, 46% the size of Earlimart, and 132% the size of Poplar/Cotton Center, while Project-related non-residential land use is approximately 80% the size of Pixley, 81% the size of Earlimart, and 103% the size of Poplar/Cotton Center. As such, Project residential (population and housing) growth is similar to Pixley while non-residential (commercial/retail/other and industrial) growth is similar to Poplar/Cotton Center. Therefore, the information provided for Earlimart is informational only and provided as a reference to how project size and land uses affects the emissions analysis.

As previously noted, there are no specific development projects associated with the Community Plan Update that would result in emissions exceeding Air District thresholds. Because future development is unknown and dependent upon the timing that actual developments are proposed and their project-specific details, there is potential for annual emissions to exceed the emissions thresholds presented in **Table 8**. However, as the Project is similar in size to the projected growth in Pixley and Poplar/Cotton Center, and emissions from the buildout of these two communities are below the Air District’s significance thresholds, it is reasonable to conclude that Project-related emissions would also fall below the significance thresholds. Furthermore, future developments will be subject to additional CEQA review and project-specific emissions will be evaluated at the time of submittal. The County will consult with the Air District on a project-by-project basis as new developments are proposed to evaluate project-specific impacts based on project-specific details and to determine whether a localized pollutant analysis (such as an

Ambient Air Quality Analysis or Health Risk Assessment) would be required. Future developments will comply with all applicable Air District rules and regulations including, but not limited to, Regulation VIII (Fugitive PM10 Prohibition, Rule 2201 (New and Modified Stationary Source Review, and Rule 9510 (Indirect Source Review). Furthermore, as indicated in the Earlimart Community Plan EIR, the Air District has used an average annual growth rate for Tulare County ranging from 1.44% to 1.94%.<sup>20</sup> The 1.3% annual growth rate applied in the Ivanhoe Community Plan Update is lower than the growth rates applied in the applicable Air Quality Plans (AQPs). As such, Project-related emissions would be included in the AQPs emissions inventories. Therefore, the Project would not conflict with or obstruct implementation of the applicable Air Quality Plans. The Project will have a *Less Than Significant Project-specific Impact* related to this Checklist Item.

Cumulative Impact Analysis:      *Less Than Significant Impact*

The geographic area of this cumulative analysis is the San Joaquin Air Basin. The emissions analysis demonstrates the Project will not exceed the Air District's thresholds of significance. As such, the Project will not conflict with or obstruct implementation of the applicable air quality plans. Furthermore, the County will consult with the Air District on a project-by-project basis, and future developments will be required to implement all applicable General Plan policies and to comply with all applicable Air District rules and regulations. Therefore, the Project will result in a *Less Than Significant Cumulative Impact* related to this Checklist Item.

Mitigation Measures:                      *None Required*

Conclusion:                                      *Less Than Significant Impact*

As previously noted, the Project will not exceed the Air District's thresholds of significance and therefore, will not conflict with or obstruct implementation of the applicable air quality plans. Therefore, *Less Than Significant Project-specific and Cumulative Impacts* related to this Checklist Item will occur.

**b) Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard?**

Project Impact Analysis:                      *Less Than Significant Impact*

The Project would be considered to have a significant cumulative impact on air quality if project-specific impacts are determined to be significant. As previously noted, the emissions analysis confirms that Project-specific emissions are below the Air District's thresholds of significance at a project-specific level, and that the Project will not cause or contribute to an existing air quality violation. Furthermore, the County will consult with the Air District on a project-by-project basis to ensure that future developments are implemented consistent with Air District rules and regulations, including but not limited to, Regulation VIII (Fugitive PM10 Prohibition), Rule 2201 (New and Modified Stationary Source Review, and Rule 9510 (Indirect Source Review). The Project will be required to implement all applicable General Plan policies and to comply

---

<sup>20</sup> Earlimart Community Plan 2017 Update Environmental Impact Report, Page 3.3-31

with all applicable Air District rules and regulations. Therefore, because the Project would have ***Less Than Significant Project-specific Impacts***, the Project will have a ***Less Than Significant Cumulative Impact*** on air quality.

Cumulative Impact Analysis:      ***Less Than Significant Impact***

The Project would be considered to have a significant cumulative impact on air quality if project-specific impacts are determined to be significant. Because project-specific impacts are less than significant, the Project will have a ***Less Than Significant Cumulative Impact*** on air quality.

Mitigation Measures:                      ***None Required***

Conclusion:                                      ***Less Than Significant Impact***

As previously noted, Project-related criteria pollutant emissions fall below the Air District's significance thresholds and the Project will be required to implement all applicable General Plan policies and to comply with all applicable Air District rules and regulations. Therefore, the Project will have a ***Less Than Significant Cumulative Impact*** related to this Checklist Item.

**c) Would the project expose sensitive receptors to substantial pollutant concentrations?**

Project Impact Analysis:                      ***Less Than Significant Impact***

Sensitive receptors are those individuals who are sensitive to air pollution and include children, the elderly, and persons with pre-existing respiratory or cardiovascular illness. The Air District considers a sensitive receptor to be a location that houses or attracts children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants. Examples of sensitive receptors include schools, parks and playgrounds, daycare centers, nursing homes, hospitals, and residential dwelling units.<sup>21</sup>

**Construction-Related Emissions**

***Construction Equipment TACs/HAPs:*** Particulate emissions from diesel powered construction equipment are considered a TAC by the California Air Resources Board. There are no specific development projects (such as residential, commercial, or industrial uses) associated with the Community Plan Update. However, future development projects have the potential to temporarily expose receptors to increased pollutant emission concentrations from diesel powered construction equipment during the short-term construction phase. However, construction emissions are temporary and would cease upon completion of construction activities. The short-term nature of construction-related emissions would not expose nearby receptors to substantial TAC concentrations. ***Less Than Significant Project-specific Impacts*** related to this Checklist Item will occur.

***Dust-borne TACs/HAPs:*** There are no specific development projects (such as residential, commercial, or industrial uses) associated with the Community Plan Update. However, future development projects have the potential to temporarily expose nearby receptors to fugitive

---

<sup>21</sup> Air District, *Guidance for Assessing and Mitigating Air Quality Impacts*, page 10

particulate (dust) emissions during the short-term construction phase or from landscaping activities once the development project is operational. As of May 15, 2019, there were no listings within the Project planning area in the California Department of Toxic Substances Control (DTSC) Hazardous Waste and Substances Site List.<sup>22</sup> A query performed on the DTSC *Envirostor* indicated that there are no superfund, state response, voluntary cleanup, school cleanup or corrective actions within four (4) miles of the Project planning area.<sup>23</sup> A query of the State Water Resources Control Board (WRCB) *GeoTracker* Site and Facilities mapping programs revealed three (3) permitted underground storage tank (UST) sites within the Project planning area; however, none of these sites are designated for cleanup.<sup>24</sup> A query performed on the U.S. Environmental Protection Agency (EPA) *Superfund Enterprise Management System* (SEMS) website found that there are no listed polluted sites within the Project planning area.<sup>25</sup> Therefore, fugitive dust emissions resulting from earthmoving activities during construction or landscaping activities during operations, would not expose future residents or nearby receptors to substantial pollutant concentrations. ***Less Than Significant Project-specific Impacts*** related to this Checklist Item will occur.

There are no specific development projects (such as residential, commercial, or industrial uses) associated with the Community Plan Update. However, future development projects have the potential to temporarily expose nearby residences to other airborne hazards from generation of fugitive dust emissions during construction-related earthmoving activities. Although not specifically required by CEQA, the following discussions related to valley fever and asbestos are included to satisfy requirements for full disclosure of potential Project-related impacts and are for information purposes only.

***Valley Fever:*** Valley fever, or coccidioidomycosis, is an infection caused by inhalation of the spores of the fungus, *Coccidioides immitis* (*C. immitis*). According to the Centers for Disease Control (CDC), the San Joaquin Valley is considered an endemic area for valley fever.<sup>26</sup> “People can get Valley fever by breathing in the microscopic fungal spores from the air, although most people who breathe in the spores don’t get sick. Usually, people who get sick with Valley fever will get better on their own within weeks to months, but some people will need antifungal medication.”<sup>27</sup> Construction-related activities generate fugitive dust that could potentially contain *C. immitis* spores. The Project will be required to implement General Plan Policy AQ-4.2 (Dust Suppression Measures), which was specifically designed to address impacts from the generation of dust emitted into the air. The Project will be required to comply with Air District Regulation VIII (Fugitive PM10 Prohibitions) requirements, including submittal of construction notification and/or dust control plan(s), which minimize the generation of fugitive dust during construction-related activities. Therefore, implementation of General Plan policies and compliance with Air District rules and regulations would reduce the chance of exposure to valley fever during

---

<sup>22</sup> DTSC. Hazardous Waste and Substance Site List.

[https://www.envirostor.dtsc.ca.gov/public/search.asp?page=8&cmd=search&business\\_name=&main\\_street\\_name=&city=&zip=&county=&status=ACT%2CBKLG%2CCOM&branch=&site\\_type=CSITES%2COPEN%2CFUDS%2CCLOSE&npl=&funding=&reporttitle=HAZARDOUS+WASTE+AND+SUBSTANCES+SITE+LIST&reporttype=CORTESE&federal\\_superfund=&state\\_response=&voluntary\\_cleanup=&school\\_cleanup=&operating=&post\\_closure=&non\\_operating=&corrective\\_action=&tiered\\_permit=&evaluation=&spec\\_prog=&national\\_priority\\_list=&senate=&congress=&assembly=&critical\\_pol=&business\\_type=&case\\_type=&searchtype=&hwmp\\_site\\_type=&cleanup\\_type=&ocierp=&hwmp=False&permitted=&pc\\_permitted=&inspections=&complaints=&censustract=&cesdecile=&school\\_district=&orderby=county](https://www.envirostor.dtsc.ca.gov/public/search.asp?page=8&cmd=search&business_name=&main_street_name=&city=&zip=&county=&status=ACT%2CBKLG%2CCOM&branch=&site_type=CSITES%2COPEN%2CFUDS%2CCLOSE&npl=&funding=&reporttitle=HAZARDOUS+WASTE+AND+SUBSTANCES+SITE+LIST&reporttype=CORTESE&federal_superfund=&state_response=&voluntary_cleanup=&school_cleanup=&operating=&post_closure=&non_operating=&corrective_action=&tiered_permit=&evaluation=&spec_prog=&national_priority_list=&senate=&congress=&assembly=&critical_pol=&business_type=&case_type=&searchtype=&hwmp_site_type=&cleanup_type=&ocierp=&hwmp=False&permitted=&pc_permitted=&inspections=&complaints=&censustract=&cesdecile=&school_district=&orderby=county). Accessed May 15, 2019.

<sup>23</sup> DTSC. Envirostor. Sites and Facilities mapping website. <https://www.envirostor.dtsc.ca.gov/public/map/>. Accessed May 15, 2019.

<sup>24</sup> WRCB, GeoTracker, Sites and Facilities mapping website. <https://geotracker.waterboards.ca.gov/>. Accessed May 15, 2019.

<sup>25</sup> EPA, SEMS Search, <https://www.epa.gov/enviro/sems-search>, accessed May 15, 2018.

<sup>26</sup> CDC, <https://www.cdc.gov/features/valleyfever/index.html>, accessed July 25, 2018.

<sup>27</sup> CDC, <https://www.cdc.gov/fungal/diseases/coccidioidomycosis/index.html>, accessed July 25, 2018.

construction-related activities. ***Less Than Significant Project-specific Impacts*** related to this Checklist Item will occur.

***Naturally Occurring Asbestos:*** In areas containing naturally occurring asbestos, earthmoving construction-related activities, such as grading and trenching, could expose receptors to windblown asbestos. According to a United States Geological Soil Survey map of areas where naturally occurring asbestos in California are likely to occur, the Project is not located in an area known to contain naturally occurring asbestos.<sup>28</sup> The Project planning area and the immediate vicinity has been previously disturbed by agricultural operations and by residential development. Future development projects will be required to implement General Plan Policy AQ-4.2 (Dust Suppression Measures) to comply with Air District Regulation VIII (Fugitive PM10 Prohibitions) requirements, thereby reducing the chance of exposure to valley fever during construction-related activities. Therefore, ***Less Than Significant Project-specific Impacts*** related to this Checklist Item will occur.

### **Operations-Related Emissions**

***Operations from Future Development:*** There are no specific development projects (such as residential, commercial, or industrial uses) associated with the Community Plan Update that would be a source of TAC or HAP emissions. However, construction- and operation-related activities associated with future development projects may require the transport and use of hazardous materials. Consumer products and gasoline are regulated by the State and use of these products would not pose a significant risk to residents or nearby receptors. Medium- and Heavy-duty diesel trucks would be a source of diesel particulate matter, which is considered to be a TAC. The County will work with the Air District on a project-by-project basis to determine whether health risk assessments would be required for projects generating diesel truck trips travelling through the Project planning area, and for other equipment that may require Air District permits. Furthermore, future applicants will be required to comply with all local, state, and federal policies related to emission of TACs/HAPs in the event such pollutants require control efforts to minimize their impacts. Tulare County Environmental Health Division will require a Hazardous Waste Business Plan if materials exceed 55 gallons (liquids), 500 pounds (solids), or 200 cubic feet (compressed gas) handled or stored on site.<sup>29</sup> As such, the Project will not expose sensitive receptors to substantial pollutant concentrations. ***Less Than Significant Project-specific Impacts*** related to this Checklist Item will occur.

***Existing Sources:*** There are no specific development projects (such as residential, commercial, or industrial uses) associated with the Community Plan Update that would be a source of TAC or HAP emissions, and the location of future development projects in close proximity to sensitive receptors cannot be determined until future projects are identified. To ensure that development within the Project planning area does not expose sensitive receptors to significant impacts from TAC emissions, the County will review individual projects on a project-by-project basis to determine if ARB's Air Quality Land Use Handbook screening criteria presented in **Table 6** are exceeded. Projects that exceed the screening criteria will be subject to analysis using screening

---

<sup>28</sup> USGS, *Reported Historic Asbestos Mines, Historic Asbestos Prospects, and Other Natural Occurrences of Asbestos in California*, <http://pubs.usgs.gov/of/2011/1188/>, accessed July 25, 2018.

<sup>29</sup> Tulare County Health and Human Services Agency, Environmental Health Division. Hazardous Material Business Plan. <https://tularecountyeh.org/eh/index.cfm/our-services/hazardous-materials-cupa/hazardous-materials-business-plan-hmbp/> and <https://tularecountyeh.org/eh/index.cfm/guidance-library/hazmat-cupa/hazardous-materials-business-plan-hmbp/business-plan-faqs/>. Accessed August 17, 2018.

models or may require dispersion modeling and a health risk assessment. Tulare County will also consult with the Air District during the CEQA process for guidance on the appropriate screening tools and modeling protocols for future development projects within the Plan Update area. Therefore, existing sources of TAC/HAP emissions would not expose receptors to substantial pollutant concentrations. ***Less Than Significant Project-specific Impacts*** related to this Checklist Item will occur.

***Existing Agricultural Operations:*** The Project planning area is located in a rural area with urban built up land as well as active agricultural operations. Agricultural operations typically include the use of chemicals on crops for activities such as pest control, damage control, weed abatement, etc. However, these chemicals are regulated by the State and would not pose a significant risk to the existing and future residents within the Project planning area. Furthermore, the Tulare County General Plan includes Policy AG-1.14 Right-to-Farm Noticing which requires new property owners to acknowledge and accept the inconveniences associated with normal farming activities. Future development projects adjacent to agricultural lands will be required to sign a “Right to Farm” notice. ***Less Than Significant Project-specific Impacts*** related to this Checklist Item will occur.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is the San Joaquin Valley Air Basin. The Tulare County General Plan includes policies, which were specifically designed to engage responsible agencies in the CEQA process, to reduce air pollutant emissions through project design, require compliance with emission-reducing regulations, and to address potential impacts from siting incompatible uses in close proximity to each other. Applicable General Plan policies will be implemented for the Project. The County will consult with the Air District on a project-by-project basis as new developments are proposed to evaluate project-specific impacts based on project-specific details and to determine whether a health risk assessment would be needed. Compliance with applicable Air District rules and regulations would further reduce potential impacts from exposure to TAC and HAP emissions, as well as valley fever and asbestos. As such, the development of the proposed Project would not expose the public to substantial pollutant concentrations. Therefore, a ***Less Than Significant Cumulative Impact*** related to this Checklist Item will occur.

Mitigation Measures: ***None Required***

Conclusion: ***Less Than Significant Impact***

There are no specific development projects (such as residential, commercial, or industrial uses) associated with the Community Plan Update. As such, the Project is not a source of, nor are there any known existing sources of, HAPs or TACs within the Project vicinity. Therefore, the proposed Project would not expose the public to substantial pollutant concentrations. ***Less Than Significant Project-specific and Cumulative Impacts*** related to this Checklist Item will occur.

**d) Would the project result in other emissions (such as those leading to odors adversely affecting a substantial number of people?)**

Project Impact Analysis: ***Less Than Significant Impact***

Two situations create a potential for odor impact. The first occurs when a new odor source is located near an existing sensitive receptor. The second occurs when a new sensitive receptor locates near an existing source of odor. There are no specific development projects (such as residential, commercial, or industrial uses) associated with the Community Plan Update that would be a source of nuisance odors. However, as the Community Plan is built out, dependent upon the location and nature of operations, potential exists for odor impacts to occur resulting from existing and/or new agricultural, commercial, and industrial land uses.

Potential odor sources associated with construction-related activities could originate from diesel exhaust from construction equipment and fumes from architectural coating and paving operations. However, construction-related odors, if perceptible, would dissipate as they mix with the surrounding air and would be of very limited duration. As such, objectionable odors during construction would not affect a substantial number of people.

As presented in **Table 7**, the Air District has determined the common land use types that are known to produce odors in the San Joaquin Valley Air Basin. As previously noted, there are no specific development projects associated with the Community Plan Update. However, the existing wastewater treatment facility located southwest of the community and agricultural uses in the vicinity of the community could be a source of nuisance odors. All projects, with the exception of agricultural operations, are subject to Air District Rule 4102 (Nuisance). Therefore, odors from agriculture-related operations would not be subject to complaint reporting. There is potential for these agricultural operations to generate objectionable odors; however, these odors would be temporary or seasonal. Furthermore, the Tulare County General Plan includes Policy AG-1.14 Right-to-Farm Noticing which requires new property owners to acknowledge and accept the inconveniences associated with normal farming activities. If future developments are proposed adjacent to active agricultural uses, future residents will be required to sign a “Right to Farm” notice. To ensure potential nuisance odor impacts are addressed, if proposed developments were to result in sensitive receptors being located closer than the recommended distances to any odor generator identified in **Table 7**, a more detailed analysis, is recommended. The detailed analysis would involve contacting the Air District’s Compliance Division for information regarding odor complaints Implementation of the applicable General Plan policies and compliance with applicable Air District rules and regulations specifically designed to address air quality and odor impacts, would reduce potential odor impacts. Therefore, the Project would not create or expose existing residents to objectionable odors. ***Less Than Significant Project-specific Impacts*** related to this Checklist Item will occur.

Cumulative Impact Analysis:      ***Less Than Significant Impact***

The geographic area of this cumulative analysis is the San Joaquin Valley Air Basin. As there are no development projects proposed with the Project, the Project does not include any new sources of odors. Future developments will be subject to Air District Rule 4102 (Nuisance) and General Plan Policy AG-1.14 Right-to-Farm Noticing will be implemented. As such, the Project will not expose a substantial number of people to objectionable odors. Therefore, ***Less Than Significant Cumulate Impacts*** related to this Checklist Item will occur.

Mitigation Measures:                      ***None Required***

Conclusion: *Less Than Significant Impact*

The Project is not a source of nuisance odors, nor are there existing sources of permanent odors in the Project vicinity that would affect future residents. As such, the Project will not expose a substantial number of people to objectionable odors. Therefore, *Less Than Significant Project-specific and Cumulative Impacts* related to this Checklist Item will occur.

# Attachment “B”

---

## Biological Resources Technical Memorandum

| <b>SUMMARY OF MITIGATION MEASURES BIO-1 THROUGH BIO-20</b>  |                               |   |
|---|-------------------------------|---|
| <b>MITIGATION</b>   | <b>TYPE OF MITIGATION</b>     | <b>SUMMARIZED DESCRIPTION</b>   |
| <b>Measures for Special Status Plant Species</b>  |                               |   |
| BIO-1   | Pre-construction Survey       | Qualified biologist/botanist conducts pre-construction surveys for special status plant species   |
| <b>Measures for Special Status Animal Species</b>   |                               |   |
| BIO-2   | Pre-construction Survey       | Qualified biologist conducts pre-construction surveys for special status animal species.  |
| <b>Measures for Special Status Plant and Animal Species Identified in Pre-construction Surveys.</b> |                               |   |
| BIO-3   | Employee Education Program    | Qualified biologist conducts tailgate meeting to train construction staff on special status species that occur/may occur on the project site.   |
| <b>Measures for Nesting Raptors and Migratory Birds</b>   |                               |   |
| BIO-4   | Avoidance                     | Where possible, Project will be constructed outside the nesting season (between September 1st and January 31st).  |
| BIO-5   | Pre-construction Survey       | If Project activities occur during the nesting season (February 1-August 31), a qualified biologist will conduct preconstruction surveys per the <i>Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley (2000)</i> .  |
| BIO-6   | Pre-construction Survey       | A qualified biologist will conduct pre-construction surveys per the <i>Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley (2000)</i> .   |
| BIO-7   | Buffers                       | Upon active nest discovery, the biologist determines appropriate construction setback distances and a behavioral baseline using applicable CDFW guidelines and/or the biology of the affected species.  |
| <b>Measures for San Joaquin Kit Fox</b>   |                               |   |
| BIO-8   | Pre-construction Survey       | Qualified biologist will conduct pre-construction surveys in accordance with USFWS <i>Standard Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance (2011)</i> .  |
| BIO-9   | Avoidance                     | If active or potential den is detected in or adjacent to work area during pre-construction survey, the den shall not be disturbed or destroyed. Compliance with USFWS <i>Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance (2011)</i> required. USFW and CDFW will be immediately contacted to determine best course of action   |
| BIO-10  | Minimization                  | Construction activities shall be carried out in a manner that minimizes disturbance to kit foxes.   |
| BIO-11  | Mortality Reporting           | USFWS and CDFW will be contacted immediately by phone and notified in writing within three working days in case of the accidental death or injury of a SJ kit fox during construction-related activities.   |
| <b>Measures for American Badger</b>   |                               |   |
| BIO-12  | Pre-Construction Survey       | A pre-construction survey for American badgers will be conducted by a qualified biologist within 30 days of the onset of Project-related activities involving ground disturbance or heavy equipment use.  |
| BIO-13  | Avoidance                     | Should an active natal den be identified during the pre-construction survey, a qualified biologist shall supervise the establishment of a disturbance-free buffer around the den. Such disturbance-free area shall be maintained until the cubs have dispersed or the den has been abandoned. If it is not a natal den, the badger will be left to leave of its own accord or be passively relocated with methods developed by a qualified biologist. |
| <b>Measures for Roosting Bats</b>   |                               |   |
| BIO-14  | Temporal Avoidance            | To avoid potential impacts to maternity bat roosts, removal of buildings and trees should occur outside of the period between April 1 and September 30.   |
| BIO-15  | Pre-construction Surveys      | If removal of buildings or trees is to occur between April 1 and September 30 (general maternity bat roost season), then within 30 days prior to these activities, a qualified biologist will survey affected buildings and trees for the presence of bats. The biologist will utilize bat detection techniques to determine presence of bats.  |
| BIO-16  | Minimization                  | If a non-breeding bat colony is detected during preconstruction surveys, a biologist shall supervise removal of bats and/or installation of bat exclusion devices to ensure no harm or take of bats occur.  |
| BIO-17  | Avoidance of Maternity Roosts | If a maternity colony is detected during preconstruction surveys, a qualified biologist will supervise establishment of a disturbance-free buffer around the  |

| <b>SUMMARY OF MITIGATION MEASURES BIO-1 THROUGH BIO-20</b> |                                     |   |
|--|-------------------------------------|---|
| <b>MITIGATION</b>  | <b>TYPE OF MITIGATION</b>           | <b>SUMMARIZED DESCRIPTION</b>   |
|  |                                     | colony and remain in place until a qualified biologist deems that the nursery is no longer active.  |
| <b>Measures for Burrowing Owl</b>                          |                                     |   |
| BIO-18   | Pre-Construction Survey             | A qualified biologist shall conduct a pre-construction survey for burrowing owls as outlined in <i>Burrowing Owl Survey Protocol and Mitigation Guidelines (CBOC 1997)</i> , within 30 days of the onset of Project-related activities involving ground disturbance or heavy equipment use. The survey area will include all suitable habitat on and within 500 feet of Project impact areas, where accessible.   |
| BIO-19   | Buffers                             | If active nest burrows are located within or near Project impact areas during breeding season, a 250-foot construction setback will be established around active owl nests, or alternate avoidance measures will be implemented in consultation with CDFW. The buffer areas will be enclosed with temporary fencing to prevent intrusion during duration of the breeding season. After breeding season, passive relocation of remaining owls may be allowed as described in BIO-20. |
| BIO-20   | Passive Relocation of Resident Owls | During the non-breeding season, resident owls occupying burrows in Project impact areas may be passively relocated to alternative habitat in accordance with a relocation plan prepared by a qualified biologist.   |



# RESOURCE MANAGEMENT AGENCY

5961 SOUTH MOONEY BLVD  
VISALIA, CA 93277  
PHONE (559) 624-7000  
FAX (559) 730-2653

Aaron R. Bock      Economic Development and Planning  
Reed Schenke      Public Works  
Sherman Dix      Fiscal Services

## INTRAOFFICE MEMORANDUM

---

DATE:            May 13, 2019

TO:              Hector Guerra, Chief Environmental Planner

FROM:          Jessica Willis, Planner IV

SUBJECT:      Biological Species Evaluation for the Ivanhoe Community Plan 2019 Update

---

### **PROJECT DESCRIPTION**

Ivanhoe is currently designated an Unincorporated Community in the 2030 Tulare County General Plan (2012). The objective of the Ivanhoe Community Plan Update is to develop an updated plan, which can accurately reflect the needs and priorities of the unincorporated community of Ivanhoe. The Land Use and Circulation portions of this Plan provide the mechanism to minimize or avoid the potential adverse impacts of urban growth. The development of an orderly, harmonious land use pattern and appropriate implementation measures are designed to reduce potential conflict between neighboring uses across Tulare County's 2030 planning horizon, consistent with the Tulare County 2030 General Plan Update. The Plan is needed to increase the availability of infrastructure funding, such as drinking water system improvements (wells, water distribution piping, storage tanks, etc.), wastewater system (such as piping, lift stations, etc.), and public work/safety improvements (such as curbs, gutters, sidewalks, etc.), and to stimulate economic development within the community.

### **PROJECT LOCATION**

Ivanhoe is a census-designated place located in the northwest portion of Tulare County. The Project site is located approximately ten (10) miles northeast of the City of Visalia. The community is generally bound by Avenue 336 on the north, Road 164 on the east, Avenue 320 on the south, and Road 152 on the west, and encompasses approximately two (2) square miles of land. State Route 216 traverses the southeastern portion of the community and provides access to State Route 198 in Visalia. State Route 99 is located approximately thirteen (13) miles west of Ivanhoe. (See Figure 1)

United States Geological Survey 7.5-minute Quadrangles: Ivanhoe & Exeter

Surrounding Quadrangles: Ivanhoe, Exeter, Stokes Mountain, Auckland, Woodlake, Rocky Hill, Visalia, Monson, Orange Cove South.

Public Land Survey System: Sections 1 & 12, Township 18 South, Range 25 East, Mount Diablo Base and Meridian

Latitude/Longitude:            36° 26' 16" N / 119° 23' 9" W

## **BIOLOGICAL SPECIES EVALUATION**

The most recent California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CNDDDB), RareFind 5 and Biogeographic Information and Observation System (BIOS) mapping applications were accessed on May 13, 2019.<sup>1</sup>

### **9-Quad CNDDDB Results**

Based on the information in the CNDDDB and BIOS, there are forty two (42) special status species (state or federally listed as threatened, endangered, proposed endangered, proposed threatened, candidate threatened, candidate endangered, rare; or ranked by the California Native Plant Society) and five (5) natural plant communities of special concern within the 9-quadrangle project area (Ivanhoe, Exeter, Stokes Mountain, Auckland, Woodlake, Rocky Hill, Visalia, Monson, and Orange Cove South quadrangles) (see Figures 3, 5 and 7).

### **Project Quad Results**

Based on the information in the CNDDDB and BIOS, there are twenty (20) special status species and three (3) natural plant communities of special concern within the Project area quadrangles (Ivanhoe and Exeter) (see Figures 3, 4 and 6). These species include: five (5) state or federally listed threatened or endangered animal species; two (2) state or federally listed threatened or endangered plant species; five (5) animal species of state concern; and seven (7) plant species of state concern.

### **Project Area Results**

No special status plant or animal species have been recorded within the Project site (i.e., the Woodville Urban Development Boundary, or UDB) (see Figure 3). However, there is a possibility that migratory birds and raptors may be present within the Project site, or that currently undeveloped areas within the UDB could provide habitat or foraging areas for special status species such as bats, kit fox, and badgers. Therefore, future development projects within the UDB subject to subsequent CEQA analysis may be required to implement mitigation measure(s) to reduce potential impacts on special status species to less than significant.

### **Measures for Special Status Plant Species**

BIO-1: (*Pre-construction Survey*) A qualified biologist/botanist shall conduct pre-construction surveys for special status plant species in accordance with the California Department of Fish and Wildlife (CDFW) *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (2009). This protocol includes identification of reference populations to facilitate the likelihood of field investigation occurring during the appropriate floristic period. Surveys should be timed to coincide with flowering periods for

---

<sup>1</sup> CDFW. <https://www.wildlife.ca.gov/Data/CNDDDB/Maps-and-Data#43018407-rarefind-5>

species that could occur (March-May). In the absence of protocol-level surveys being performed, additional surveys may be necessary.

- If special status plant species are not identified during pre-construction surveys, no further action is required.
- If special status plant species are detected during pre-construction surveys, the biologist/botanist will supervise establishment of a minimum 50-foot no disturbance buffer from the outer edge of the plant population. If buffers cannot be maintained, the Sacramento Field Office of the USFWS and the Fresno Field Office of CDFW shall be contacted immediately to identify the appropriate minimization actions to be taken as appropriate for the species identified and to determine permitting needs.

### **Measures for Special Status Animal Species**

BIO-2: (*Pre-construction Survey*) A qualified biologist will conduct pre-construction surveys during the appropriate periods for special status animal species in accordance with CDFW guidance and recommendations. In the absence of protocol-level surveys being performed, additional surveys may be necessary. If special status animal species are not identified during pre-construction surveys, no further action is required. If special status animal species are detected during pre-construction surveys, the Sacramento Field Office of the USFWS and the Fresno Field Office of CDFW shall be contacted immediately to identify the appropriate avoidance and minimization actions to be taken as applicable for the species identified and to determine permitting needs.

### **Measures for Special Status Plant and Animal Species Identified in Pre-construction Surveys**

BIO-3: (*Employee Education Program*) Prior to the start of construction, the applicant shall retain a qualified biologist/botanist to conduct a tailgate meeting to train all construction staff that will be involved with the project on the special status species that occur, or may occur, on the project site. This training will include a description of the species and its habitat needs; a report of the occurrence of the species in the project area; an explanation of the status of the species and its protection under the Endangered Species Act; and a list of the measures being taken to reduce impacts to the species during project construction and implementation.

### **Measures for Nesting Raptors and Migratory Birds**

BIO-4: (*Avoidance*) In order to avoid impacts to nesting raptors and migratory birds, individual Projects within the Project will be constructed, where possible, outside the nesting season (between September 1st and January 31st).

BIO-5: (*Pre-construction Survey*) If Project activities must occur during the nesting season (February 1-August 31), the proponent is responsible for ensuring that implementation does not violate the Migratory Bird Treaty Act or relevant Fish and Game Code. A qualified biologist shall conduct preconstruction surveys for active raptor and migratory bird nests within 10 days of the onset of these activities. The survey will include the proposed work area(s) and surrounding lands within 500 feet for all nesting raptors and migratory birds; with the exception of Swainson’s hawk. The Swainson’s hawk survey will utilize the Swainson’s Hawk Technical Advisory Committee *Recommended Timing and Methodology for Swainson’s Hawk Nesting Surveys in California’s Central Valley* (2000) methodology which will extend to ½-mile outside of work area boundaries. If no nesting pairs are found within the survey area, no further mitigation is required.

BIO-6: (*Pre-construction Survey*) A qualified biologist will conduct pre-construction surveys in accordance with the Swainson’s Hawk Technical Advisory Committee *Recommended Timing and Methodology for Swainson’s Hawk Nesting Surveys in California’s Central Valley* (2000) which employs the following:

| Survey Period | Survey Dates       | Survey Time                       | Number of Surveys Needed              |
|---------------|--------------------|-----------------------------------|---------------------------------------|
| I             | January – March 20 | All day                           | 1                                     |
| II            | March 20 – April 5 | Sunrise – 1000;<br>1600 to Sunset | 3                                     |
| III           | April 5 – April 20 | Sunrise – 1200;<br>1630 – Sunset  | 3                                     |
| IV            | April 21 – June 10 | Monitoring sites only             | Initiating surveys is not recommended |
| V             | June 10 – July 30  | Sunrise – 1200;<br>1600 – Sunset  | 3                                     |

If project activities must occur during the nesting season (February 1-August 31), the project proponent and/or their contractor is responsible for ensuring that implementation does not violate the Migratory Bird Treaty Act or relevant Fish and Game Code, and a qualified biologist will conduct pre-onstruction surveys for active raptor and migratory bird nests within 10 days of the onset of these activities. The survey will include the proposed work area(s) and surrounding lands within 500 feet for all nesting raptors and migratory birds save Swainson’s hawk; the Swainson’s hawk survey will extend to ½ mile outside of work area boundaries. If no nesting pairs are found within the survey area, no further mitigation is required.

BIO-7: (*Buffers*) Should any active nests be discovered near proposed work areas, a qualified biologist will determine appropriate construction setback distances and a behavioral baseline of all identified nests based on applicable CDFW guidelines and/or the biology of the affected species. Within these buffers, the biologist will continue monitoring to detect behavioral changes. If adverse behavioral changes

occur, the activity causing the changes will cease and CDFW will be consulted to determine if avoidance and minimization measures need to be modified to adequately protect the impacted birds. Construction-free buffers will be identified on the ground with flagging, fencing, or by other easily visible means, and will be maintained until the biologist has determined that the young have fledged (i.e., when a bird's feathers and wing muscles are sufficiently developed for flight). Unless a variance is approved by CDFW, the buffer shall not be less than 250 feet around active nests of non-listed bird species and not less than 500 feet around active nests of non-listed raptor species until the birds have fledged. Unless a variance is approved by CDFW, a ½ mile distance shall be used for SWHA until the birds have fledged.

### **Measures for San Joaquin Kit Fox**

- BIO-8: (*Pre-construction Survey*) Pre-construction surveys shall be conducted no less than 14 days, and no more than 30 days, prior to the beginning of ground disturbance, construction activities, and/or any project activity likely to impact the San Joaquin kit fox. These surveys will be conducted in accordance with the USFWS *Standard Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance* (2011). The primary objective is to identify kit fox habitat features (e.g. potential dens and refugia) on the project site and evaluate their use by kit fox through the use of remote monitoring techniques such as motion-triggered cameras and tracking medium. If potential dens are not identified, no further action is required.
- BIO-9: (*Avoidance*) Should an active or potential kit fox den be detected within or immediately adjacent to the area of work during pre-construction surveys, the den shall not be disturbed or destroyed. In accordance with the USFWS, *Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance* (2011), a minimum 50-foot no-disturbance buffer area shall be established around potential and man-made (atypical) dens and a minimum 100-foot no-disturbance buffer area shall be established around known den sites. The Sacramento Field Office of the USFWS and Fresno Field Office of the CDFW shall be contacted immediately by phone and in writing to determine the best course of action and, if required, to initiate the take authorization/permit process.
- BIO-10: (*Minimization*) Construction activities shall be carried out in a manner that minimizes disturbance to kit fox. Minimization measures include, but are not limited to: restriction of project-related vehicle traffic to established roads, construction areas, and other designated areas; inspection and covering of structures (e.g., pipes), as well as installation of escape structures, to prevent the inadvertent entrapment of kit fox; restriction of rodenticide and herbicide use; and proper disposal of food items and trash.

BIO-11: (*Mortality Reporting*) The Sacramento Field Office of the USFWS and the Fresno Field Office of CDFW will be contacted immediately by phone and notified in writing within three working days in case of the accidental death or injury of a San Joaquin kit fox during project-related activities. Notification must include the date, time, location of the incident or of the finding of a dead or injured animal, and any other pertinent information.

### **Measures for American Badger**

BIO-12: (*Pre-construction Surveys*) A pre-construction survey for American badgers will be conducted by a qualified biologist within 30 days of the onset of Project-related activities involving ground disturbance or heavy equipment use.

BIO-13: (*Avoidance*) Should an active natal den be identified during the pre-construction survey, a qualified biologist shall supervise the establishment of a disturbance-free buffer around the den and maintained until a qualified biologist has determined that the cubs have dispersed or the den has been abandoned. If it is not a natal den, and the badger does not leave of its own accord, then the badger can be passively relocated with methods developed by a qualified biologist.

### **Measures for Roosting Bats**

BIO-14: (*Temporal Avoidance*) To avoid potential impacts to maternity bat roosts, removal of buildings and trees should occur outside of the period between April 1 and September 30, the time frame within which colony-nesting bats generally assemble, give birth, nurse their young, and ultimately disperse.

BIO-15: (*Pre-construction Surveys*) If removal of buildings or trees is to occur between April 1 and September 30 (general maternity bat roost season), then within 30 days prior to these activities, a qualified biologist will survey affected buildings and trees for the presence of bats. The biologist will look for individuals, guano, and staining, and will listen for bat vocalizations. If necessary, the biologist will wait for nighttime emergence of bats from roost sites. If no bats are observed to be roosting or breeding, then no further action would be required, and construction will be allowed to proceed.

BIO-16: (*Minimization*) If a non-breeding bat colony is detected during pre-construction surveys, the individuals will be humanely evicted via partial dismantlement of trees prior to full removal and/or installation of exclusion devices on buildings prior to demolition under the direction of a qualified biologist to ensure that no harm or “take” of any bats occurs as a result of construction activities.

BIO-17: (*Avoidance of Maternity Roosts*) If a maternity colony is detected during preconstruction surveys, a disturbance-free buffer will be established around the colony and remain in place until a qualified biologist deems that the nursery is no

longer active. The disturbance-free buffer will range from 50 to 100 feet as determined by the biologist.

### Measures for Burrowing Owl

BIO-18: (*Pre-construction Survey*) A pre-construction survey for burrowing owls will be conducted by a qualified biologist using the California Burrowing Owl Consortium’s *Burrowing Owl Survey Protocol and Mitigation Guidelines* (CBOC 1997), within 30 days of the onset of Project-related activities involving ground disturbance or heavy equipment use. The survey area will include all suitable habitat on and within 500 feet of Project impact areas, where accessible.

BIO-19 (*Buffers*) If pre-construction surveys and subsequent Project activities are undertaken during the breeding season (February 1-August 31) and active nest burrows are located within or near Project impact areas, a 250-foot construction setback will be established around active owl nests, or alternate avoidance measures will be implemented in consultation with CDFW in accordance with CBOC 1997 to employ the following:

| Location      | Time of Year    | Level of Disturbance |        |       |
|---------------|-----------------|----------------------|--------|-------|
|               |                 | Low                  | Medium | High  |
| Nesting Sites | Apr 1 – Aug 15  | 200 m                | 500 m  | 500 m |
| Nesting Sites | Aug 16 – Oct 15 | 200 m                | 200 m  | 500 m |
| Nesting Sites | Oct 16 – Mar 31 | 50 m                 | 100 m  | 500 m |

The buffer areas will be enclosed with temporary fencing to prevent construction equipment and workers from entering the setback area. Buffers will remain in place for the duration of the breeding season, unless otherwise arranged with CDFW. After the breeding season (i.e. once all young have left the nest), passive relocation of any remaining owls may take place as described below.

BIO-20 (*Passive Relocation of Resident Owls*) During the non-breeding season (September 1-January 31), resident owls occupying burrows in Project impact areas may be passively relocated to alternative habitat in accordance with a relocation plan prepared by a qualified biologist. Passive relocation may include one or more of the following elements: 1) establishing a minimum 50 foot buffer around all active burrowing owl burrows, 2) removing all suitable burrows outside the 50 foot buffer and up to 160 feet outside of the impact areas as necessary, 3) installing one-way doors on all potential owl burrows within the 50 foot buffer, 4) leaving one-way doors in place for 48 hours to ensure owls have vacated the burrows, and 5) removing the doors and excavating the remaining burrows within the 50 foot buffer. Burrow exclusion is to be conducted by a qualified biologist and during non-breeding season after the burrow is confirmed empty through surveillance. Surveillance for exclusion through project site activities are to be conducted consistent with any relocation plans.

## **WATERS OF THE STATE AND U.S.**

Based on the information in the BIOS map, Wutchumna Ditch is located approximately 0.5-1.5 miles east, Matthews Ditch is located approximately 0.5-1.5 miles west, and the Saint John's River is located approximately 1.25 miles south of the Project site. However, based on the BIOS map, streams and lakes of the State are absent from the site itself (see Figure 8).

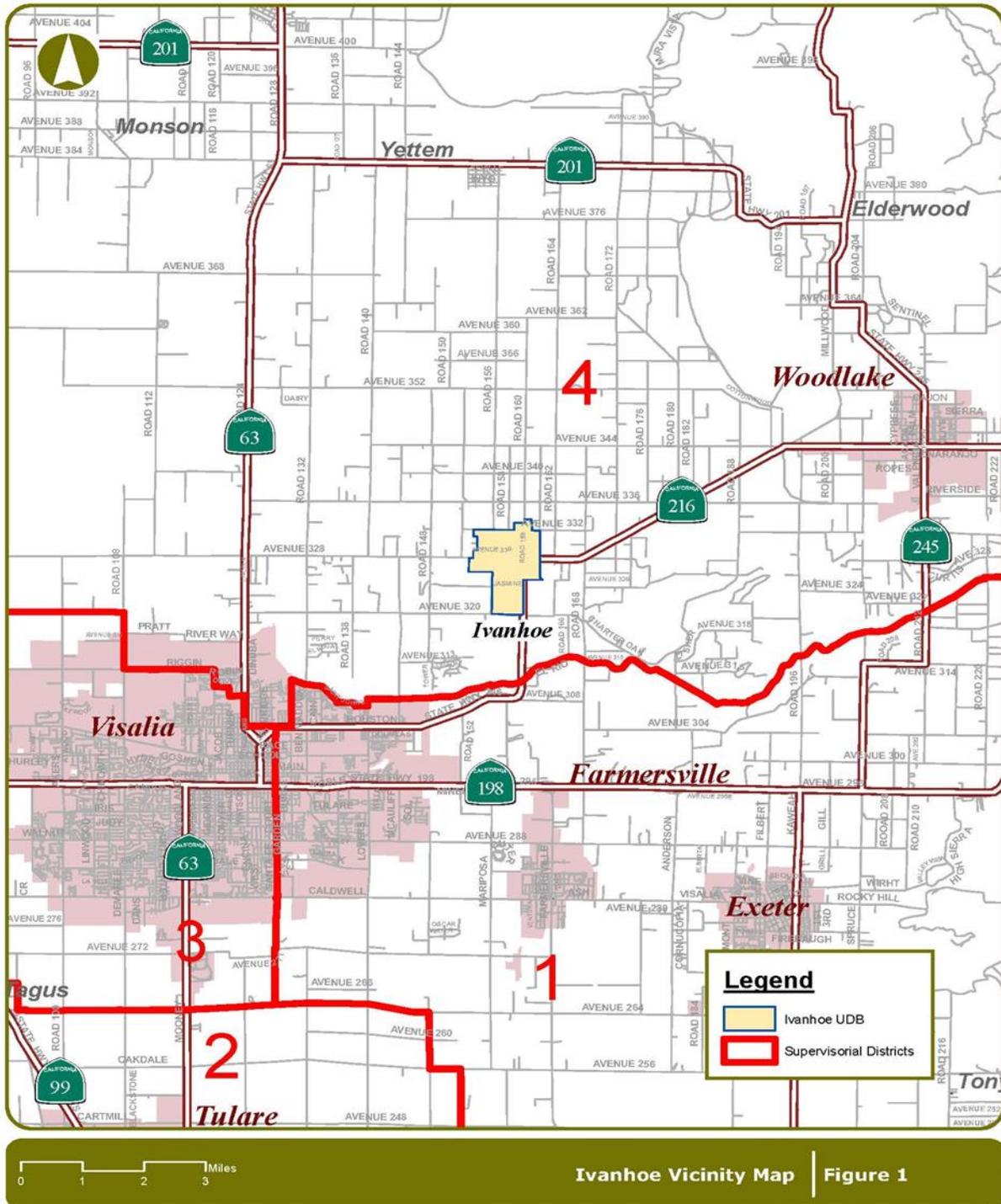
The most recent United States Geological Survey (USGS) National Water Information System (NWIS) and United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapping applications were accessed on May 13, 2019.<sup>2, 3</sup> Based on the information provided in the NWIS, the nearest body of water, owned by Ivanhoe Irrigation District, lies approximately 1.5 miles northeast of the Project site (see Figure 9). Based on the information provided in the NWI, there are freshwater ponds located within the Project site; these ponds are used for existing agricultural uses and the community's wastewater system (see Figure 10). Best management practices, including compliance with all applicable Regional Water Quality Control Board requirements, which includes a storm water pollution prevention plan (SWPPP), will be required during construction activities. A grading and drainage plan will be submitted and approved by the Tulare County RMA Engineering Branch. As such, the Project will not result in significant impact to any riparian habitats or other protected wetlands. Therefore, mitigation measures that would reduce impacts have not been proposed, nor would any measures be warranted.

---

<sup>2</sup> USGS. <https://maps.waterdata.usgs.gov/mapper/index.html>

<sup>3</sup> USFWS. <https://www.fws.gov/wetlands/data/mapper.HTML>

Figure 1. Project Vicinity



**Figure 2. Proposed Urban Development Boundary**

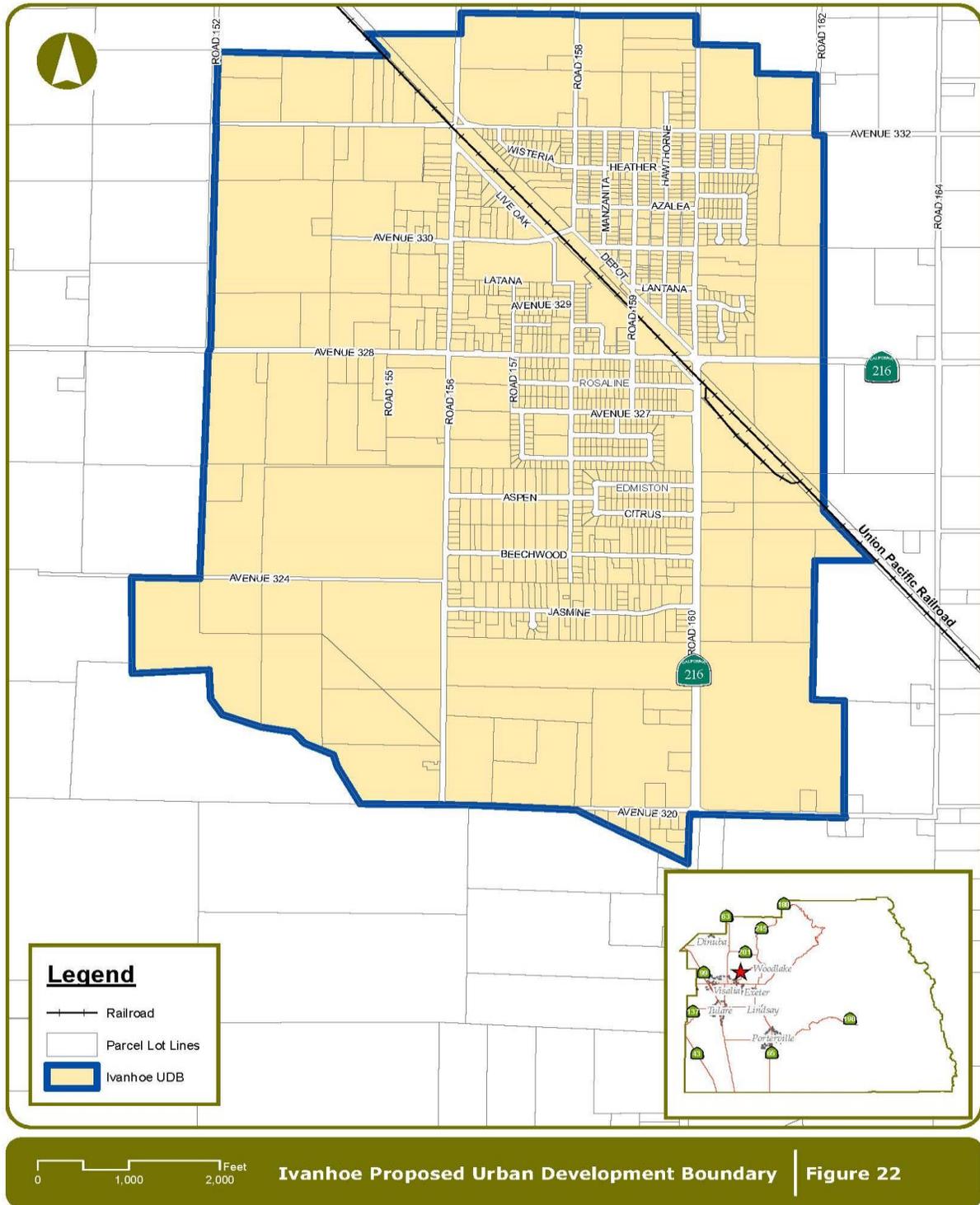




Figure 4. CNDDDB Species List (Project Quad)



**Selected Elements by Scientific Name**  
 California Department of Fish and Wildlife  
 California Natural Diversity Database



---

**Query Criteria:** Quad IS (Ivanhoe (3611942) OR Exeter (3611932)) AND Taxonomic Group IS (Dune OR Scrub OR Herbaceous OR Marsh OR Riparian OR Woodland OR Forest OR Alpine OR Inland Waters OR Marine OR Estuarine OR Riverine OR Palustrine OR Fish OR Amphibians OR Reptiles OR Birds OR Mammals OR Mollusks OR Arachnids OR Crustaceans OR Insects OR Ferns OR Gymnosperms OR Monocots OR Dicotyledons OR Lichens OR Bryophytes OR Fungi)

| Species   | Element Code | Federal Status | State Status | Global Rank | State Rank | Rare Plant Rank/CDFW SSC or FP |
|---|--------------|----------------|--------------|-------------|------------|--------------------------------|
| <i>Ambystoma californiense</i><br>California tiger salamander                             | AAAAA01180   | Threatened     | Threatened   | G2G3        | S2S3       | WL                             |
| <i>Anniella pulchra</i><br>northern California legless lizard                             | ARACC01020   | None           | None         | G3          | S3         | SSC                            |
| <i>Antrozous pallidus</i><br>pallid bat   | AMACC10010   | None           | None         | G5          | S3         | SSC                            |
| <i>Athene cunicularia</i><br>burrowing owl  | ABNSB10010   | None           | None         | G4          | S3         | SSC                            |
| <i>Atriplex cordulata</i> var. <i>erecticaulis</i><br>Earlilmart orache                   | PDCHE042V0   | None           | None         | G3T1        | S1         | 1B.2                           |
| <i>Atriplex minuscula</i><br>lesser saltscale   | PDCHE042M0   | None           | None         | G2          | S2         | 1B.1                           |
| <i>Atriplex persistens</i><br>vernal pool smallscale                                      | PDCHE042P0   | None           | None         | G2          | S2         | 1B.2                           |
| <i>Branchinecta lynchi</i><br>vernal pool fairy shrimp                                    | ICBRA03030   | Threatened     | None         | G3          | S3         |                                |
| <i>Delphinium recurvatum</i><br>recurved larkspur   | PDRAN0B1J0   | None           | None         | G2?         | S2?        | 1B.2                           |
| <i>Desmocerus californicus dimorphus</i><br>valley elderberry longhorn beetle             | IICOL48011   | Threatened     | None         | G3T2        | S2         |                                |
| <i>Eryngium spinosepalum</i><br>spiny-sepaled button-celery                               | PDAP10Z0Y0   | None           | None         | G2          | S2         | 1B.2                           |
| <i>Euphorbia hooveri</i><br>Hoover's spurge   | PDEUP0D150   | Threatened     | None         | G1          | S1         | 1B.2                           |
| <i>Great Valley Valley Oak Riparian Forest</i><br>Great Valley Valley Oak Riparian Forest | CTT61430CA   | None           | None         | G1          | S1.1       |                                |
| <i>Helianthus winteri</i><br>Winter's sunflower   | PDAST4N260   | None           | None         | G2?         | S2?        | 1B.2                           |
| <i>Lepidurus packardii</i><br>vernal pool tadpole shrimp                                  | ICBRA10010   | Endangered     | None         | G4          | S3S4       |                                |
| <i>Northern Hardpan Vernal Pool</i><br>Northern Hardpan Vernal Pool                       | CTT44110CA   | None           | None         | G3          | S3.1       |                                |

---

Government Version -- Dated May, 3 2019 -- Biogeographic Data Branch  
Report Printed on Monday, May 13, 2019

Page 1 of 2  
Information Expires 11/3/2019



**Selected Elements by Scientific Name**  
 California Department of Fish and Wildlife  
 California Natural Diversity Database



| Species   | Element Code | Federal Status | State Status | Global Rank | State Rank | Rare Plant Rank/CDFW SSC or FP |
|---|--------------|----------------|--------------|-------------|------------|--------------------------------|
| <i>Orcuttia inaequalis</i><br>San Joaquin Valley Orcutt grass | PMPOA4G060   | Threatened     | Endangered   | G1          | S1         | 1B.1                           |
| <i>Sagittaria sanfordii</i><br>Sanford's arrowhead            | PMALI040Q0   | None           | None         | G3          | S3         | 1B.2                           |
| <i>Spea hammondi</i><br>western spadefoot                     | AAABF02020   | None           | None         | G3          | S3         | SSC                            |
| <i>Talanites moodyae</i><br>Moody's gnaphosid spider          | ILARA98020   | None           | None         | G1G2        | S1S2       |                                |
| <i>Taxidea taxus</i><br>American badger                       | AMAJF04010   | None           | None         | G5          | S3         | SSC                            |
| <i>Valley Sacaton Grassland</i><br>Valley Sacaton Grassland   | CTT42120CA   | None           | None         | G1          | S1.1       |                                |
| <i>Vulpes macrotis mutica</i><br>San Joaquin kit fox          | AMAJA03041   | Endangered     | Threatened   | G4T2        | S2         |                                |
| Record Count: 23  |              |                |              |             |            |                                |

Figure 5. CNDDDB Species List (9-Quad)



**Selected Elements by Scientific Name**  
 California Department of Fish and Wildlife  
 California Natural Diversity Database



---

**Query Criteria:** Quad<span style="color:Red"> IS </span></span>(Ivanhoe (3611942)<span style="color:Red"></span> OR </span>Exeter (3611932)<span style="color:Red"></span>  
 style="color:Red"> OR </span>Stokes Mtn. (3611952)<span style="color:Red"></span> OR </span>Auckland (3611951)<span style="color:Red"></span>  
 OR </span>Woodlake (3611941)<span style="color:Red"></span> OR </span>Rocky Hill (3611931)<span style="color:Red"></span> OR </span>Visalia  
 (3611933)<span style="color:Red"></span> OR </span>Monson (3611943)<span style="color:Red"></span> OR </span>Orange Cove South (3611953)<br />
 /><span style="color:Red"> AND </span></span>Taxonomic Group<span style="color:Red"></span> IS </span>(Dune<span style="color:Red"></span> OR  
 </span>Scrub<span style="color:Red"></span> OR </span>Herbaceous<span style="color:Red"></span> OR </span>Marsh<span style="color:Red"></span> OR </span>Forest<span style="color:Red"></span> OR  
 </span>Riparian<span style="color:Red"></span> OR </span>Woodland<span style="color:Red"></span> OR </span>Alpine<span style="color:Red"></span> OR </span>Inland Waters<span style="color:Red"></span> OR  
 </span>Marine<span style="color:Red"></span> OR </span>Estuarine<span style="color:Red"></span> OR </span>Riverine<span style="color:Red"></span> OR </span>Palustrine<span style="color:Red"></span>  
 OR </span>Fish<span style="color:Red"></span> OR </span>Amphibians<span style="color:Red"></span> OR </span>Reptiles<span style="color:Red"></span> OR </span>Birds<span style="color:Red"></span>  
 OR </span>Mammals<span style="color:Red"></span> OR </span>Mollusks<span style="color:Red"></span> OR </span>Arachnids<span style="color:Red"></span> OR </span>Crustaceans<span style="color:Red"></span>  
 OR </span>Insects<span style="color:Red"></span> OR </span>Ferns<span style="color:Red"></span> OR </span>Gymnosperms<span style="color:Red"></span> OR  
 </span>Monocots<span style="color:Red"></span> OR </span>Dicots<span style="color:Red"></span> OR </span>Lichens<span style="color:Red"></span> OR </span>Bryophytes<span style="color:Red"></span>  
 OR </span>Fungi)

| Species  | Element Code | Federal Status | State Status | Global Rank | State Rank | Rare Plant Rank/CDFW SSC or FP |
|--|--------------|----------------|--------------|-------------|------------|--------------------------------|
| <i>Agelaius tricolor</i><br>tricolored blackbird                       | ABPBXB0020   | None           | Threatened   | G2G3        | S1S2       | SSC                            |
| <i>Ambystoma californiense</i><br>California tiger salamander          | AAAAA01180   | Threatened     | Threatened   | G2G3        | S2S3       | WL                             |
| <i>Anniella pulchra</i><br>northern California legless lizard          | ARACC01020   | None           | None         | G3          | S3         | SSC                            |
| <i>Antrozous pallidus</i><br>pallid bat                                | AMACC10010   | None           | None         | G5          | S3         | SSC                            |
| <i>Ardea herodias</i><br>great blue heron                              | ABNGA04010   | None           | None         | G5          | S4         |                                |
| <i>Athene cucularia</i><br>burrowing owl                               | ABNSB10010   | None           | None         | G4          | S3         | SSC                            |
| <i>Atriplex cordulata</i> var. <i>erecticaulis</i><br>Earlimart orache | PDCHE042V0   | None           | None         | G3T1        | S1         | 1B.2                           |
| <i>Atriplex depressa</i><br>brittlescale                               | PDCHE042L0   | None           | None         | G2          | S2         | 1B.2                           |
| <i>Atriplex minuscula</i><br>lesser saltscale                          | PDCHE042M0   | None           | None         | G2          | S2         | 1B.1                           |
| <i>Atriplex persistens</i><br>vernal pool smallscale                   | PDCHE042P0   | None           | None         | G2          | S2         | 1B.2                           |
| <i>Bombus crotchii</i><br>Crotch bumble bee                            | IIHYM24480   | None           | None         | G3G4        | S1S2       |                                |
| <i>Bombus morrisoni</i><br>Morrison bumble bee                         | IIHYM24480   | None           | None         | G4G5        | S1S2       |                                |
| <i>Branchinecta lynchi</i><br>vernal pool fairy shrimp                 | ICBRA03030   | Threatened     | None         | G3          | S3         |                                |
| <i>Brodiaea insignis</i><br>Kaweah brodiaea                            | PMLIL0C060   | None           | Endangered   | G1          | S1         | 1B.2                           |
| <i>Chrysis tularensis</i><br>Tulare cuckoo wasp                        | IIHYM72010   | None           | None         | G1G2        | S1S2       |                                |

---

Government Version -- Dated May, 3 2019 -- Biogeographic Data Branch  
Report Printed on Monday, May 13, 2019

Page 1 of 3  
Information Expires 11/3/2019



**Selected Elements by Scientific Name**  
 California Department of Fish and Wildlife  
 California Natural Diversity Database



| Species   | Element Code | Federal Status | State Status | Global Rank | State Rank | Rare Plant Rank/CDFW SSC or FP |
|---|--------------|----------------|--------------|-------------|------------|--------------------------------|
| <i>Coccyzus americanus occidentalis</i><br>western yellow-billed cuckoo                   | ABNRB02022   | Threatened     | Endangered   | G5T2T3      | S1         |                                |
| <i>Delphinium recurvatum</i><br>recurved larkspur   | PDRAN0B1J0   | None           | None         | G2?         | S2?        | 1B.2                           |
| <i>Desmocerus californicus dimorphus</i><br>valley elderberry longhorn beetle             | IICOL48011   | Threatened     | None         | G3T2        | S2         |                                |
| <i>Diplacus pictus</i><br>calico monkeyflower   | PDSCR1B240   | None           | None         | G2          | S2         | 1B.2                           |
| <i>Empidonax traillii</i><br>willow flycatcher  | ABPAE33040   | None           | Endangered   | G5          | S1S2       |                                |
| <i>Emys marmorata</i><br>western pond turtle  | ARAAD02030   | None           | None         | G3G4        | S3         | SSC                            |
| <i>Eryngium spinosepalum</i><br>spiny-sepaled button-celery                               | PDAP10Z0Y0   | None           | None         | G2          | S2         | 1B.2                           |
| <i>Eumops perotis californicus</i><br>western mastiff bat                                 | AMACD02011   | None           | None         | G5T4        | S3S4       | SSC                            |
| <i>Euphorbia hooveri</i><br>Hoover's spurge   | PDEUP0D150   | Threatened     | None         | G1          | S1         | 1B.2                           |
| <i>Fritillaria striata</i><br>striped adobe-lily  | PMLIL0V0K0   | None           | Threatened   | G1          | S1         | 1B.1                           |
| <b>Great Valley Valley Oak Riparian Forest</b><br>Great Valley Valley Oak Riparian Forest | CTT61430CA   | None           | None         | G1          | S1.1       |                                |
| <i>Helianthus winteri</i><br>Winter's sunflower   | PDAST4N260   | None           | None         | G2?         | S2?        | 1B.2                           |
| <i>Imperata brevifolia</i><br>California satintail  | PMPOA3D020   | None           | None         | G4          | S3         | 2B.1                           |
| <i>Lasiurus cinereus</i><br>hoary bat   | AMACC05030   | None           | None         | G5          | S4         |                                |
| <i>Lepidurus packardii</i><br>vernal pool tadpole shrimp                                  | ICBRA10010   | Endangered     | None         | G4          | S3S4       |                                |
| <i>Lithobates pipiens</i><br>northern leopard frog  | AAABH01170   | None           | None         | G5          | S2         | SSC                            |
| <i>Lytta hoppingi</i><br>Hopping's blister beetle   | IICOL4C010   | None           | None         | G1G2        | S1S2       |                                |
| <i>Lytta molesta</i><br>molestan blister beetle   | IICOL4C030   | None           | None         | G2          | S2         |                                |
| <b>Northern Claypan Vernal Pool</b><br>Northern Claypan Vernal Pool                       | CTT44120CA   | None           | None         | G1          | S1.1       |                                |
| <b>Northern Hardpan Vernal Pool</b><br>Northern Hardpan Vernal Pool                       | CTT44110CA   | None           | None         | G3          | S3.1       |                                |
| <i>Orcuttia inaequalis</i><br>San Joaquin Valley Orcutt grass                             | PMPOA4G060   | Threatened     | Endangered   | G1          | S1         | 1B.1                           |



**Selected Elements by Scientific Name**  
 California Department of Fish and Wildlife  
 California Natural Diversity Database



| Species   | Element Code | Federal Status | State Status         | Global Rank | State Rank | Rare Plant Rank/CDFW SSC or FP |
|---|--------------|----------------|----------------------|-------------|------------|--------------------------------|
| <i>Pseudobahia peirsonii</i><br>San Joaquin adobe sunburst      | PDAST7P030   | Threatened     | Endangered           | G1          | S1         | 1B.1                           |
| <i>Puccinellia simplex</i><br>California alkali grass           | PMPOA53110   | None           | None                 | G3          | S2         | 1B.2                           |
| <i>Rana boylei</i><br>foothill yellow-legged frog               | AAABH01050   | None           | Candidate Threatened | G3          | S3         | SSC                            |
| <i>Sagittaria sanfordii</i><br>Sanford's arrowhead              | PMALI040Q0   | None           | None                 | G3          | S3         | 1B.2                           |
| <i>Spea hammondii</i><br>western spadefoot                      | AAABF02020   | None           | None                 | G3          | S3         | SSC                            |
| <i>Sycamore Alluvial Woodland</i><br>Sycamore Alluvial Woodland | CTT62100CA   | None           | None                 | G1          | S1.1       |                                |
| <i>Talanites moodyae</i><br>Moody's gnaphosid spider            | ILARA98020   | None           | None                 | G1G2        | S1S2       |                                |
| <i>Taxidea taxus</i><br>American badger                         | AMAJF04010   | None           | None                 | G5          | S3         | SSC                            |
| <i>Tuctoria greenei</i><br>Greene's tuctoria                    | PMPOA6N010   | Endangered     | Rare                 | G1          | S1         | 1B.1                           |
| <i>Valley Sacaton Grassland</i><br>Valley Sacaton Grassland     | CTT42120CA   | None           | None                 | G1          | S1.1       |                                |
| <i>Vulpes macrotis mutica</i><br>San Joaquin kit fox            | AMAJA03041   | Endangered     | Threatened           | G4T2        | S2         |                                |

Record Count: 47

**Figure 6. CNDDDB Summary Table (Project Quads)**



**Summary Table Report**  
 California Department of Fish and Wildlife  
 California Natural Diversity Database



---

**Query Criteria:** Quad IS (Ivanhoe (3611942) OR Exeter (3611932)) AND Taxonomic Group IS (Dune OR Scrub OR Herbaceous OR Marsh OR Riparian OR Woodland OR Forest OR Alpine OR Inland Waters OR Marine OR Estuarine OR Riverine OR Palustrine OR Fish OR Amphibians OR Reptiles OR Birds OR Mammals OR Mollusks OR Arachnids OR Crustaceans OR Insects OR Ferns OR Gymnosperms OR Monocots OR Dicots OR Lichens OR Bryophytes OR Fungi)

| Name (Scientific/Common)  | CNDDDB Ranks | Listing Status (Fed/State) | Other Lists   | Elev. Range (ft.) | Total EO's  | Element Occ. Ranks |   |   |   |   | Population Status |                  | Presence        |        |               |         |
|---|--------------|----------------------------|---|-------------------|-------------|--------------------|---|---|---|---|-------------------|------------------|-----------------|--------|---------------|---------|
|   |              |                            |   |                   |             | A                  | B | C | D | X | U                 | Historic > 20 yr | Recent <= 20 yr | Extant | Poss. Extirp. | Extirp. |
| <i>Ambystoma californiense</i><br>California tiger salamander         | G2G3         | Threatened                 | CDFW_WL-Watch List<br>IUCN_VU-Vulnerable  | 345               | 1196<br>S:2 | 0                  | 1 | 1 | 0 | 0 | 0                 | 1                | 1               | 2      | 0             | 0       |
|   | S2S3         | Threatened                 |   | 347               |             | 0                  | 0 | 0 | 0 | 0 | 0                 | 0                | 0               | 0      | 0             | 0       |
| <i>Anniella pulchra</i><br>northern California legless lizard         | G3           | None                       | CDFW_SSC-Species of Special Concern<br>USFS_S-Sensitive   | 377               | 375<br>S:1  | 1                  | 0 | 0 | 0 | 0 | 0                 | 0                | 1               | 1      | 0             | 0       |
|   | S3           | None                       |   | 377               |             | 0                  | 0 | 0 | 0 | 0 | 0                 | 0                | 0               | 0      | 0             | 0       |
| <i>Antrozous pallidus</i><br>pallid bat                               | G5           | None                       | BLM_S-Sensitive<br>CDFW_SSC-Species of Special Concern<br>IUCN_LC-Least Concern<br>USFS_S-Sensitive<br>WBWG_H-High Priority | 368               | 419<br>S:1  | 1                  | 0 | 0 | 0 | 0 | 0                 | 0                | 1               | 1      | 0             | 0       |
|   | S3           | None                       |   | 368               |             | 0                  | 0 | 0 | 0 | 0 | 0                 | 0                | 0               | 0      | 0             | 0       |
| <i>Athene cunicularia</i><br>burrowing owl                            | G4           | None                       | BLM_S-Sensitive<br>CDFW_SSC-Species of Special Concern<br>IUCN_LC-Least Concern<br>USFWS_BCC-Birds of Conservation Concern  | 343               | 1984<br>S:1 | 1                  | 0 | 0 | 0 | 0 | 0                 | 0                | 1               | 1      | 0             | 0       |
|   | S3           | None                       |   | 343               |             | 0                  | 0 | 0 | 0 | 0 | 0                 | 0                | 0               | 0      | 0             | 0       |
| <i>Atriplex cordulata</i> var. <i>erecticaulis</i><br>Earlmarc orache | G3T1         | None                       | Rare Plant Rank - 1B.2<br>BLM_S-Sensitive   | 335               | 21<br>S:1   | 1                  | 0 | 0 | 0 | 0 | 0                 | 0                | 1               | 1      | 0             | 0       |
|   | S1           | None                       |   | 335               |             | 0                  | 0 | 0 | 0 | 0 | 0                 | 0                | 0               | 0      | 0             | 0       |
| <i>Atriplex minuscula</i><br>lesser saltscale                         | G2           | None                       | Rare Plant Rank - 1B.1  | 335               | 52<br>S:1   | 0                  | 1 | 0 | 0 | 0 | 0                 | 0                | 1               | 1      | 0             | 0       |
|   | S2           | None                       |   | 335               |             | 0                  | 0 | 0 | 0 | 0 | 0                 | 0                | 0               | 0      | 0             | 0       |
| <i>Atriplex persistens</i><br>vernal pool smallscale                  | G2           | None                       | Rare Plant Rank - 1B.2  | 345               | 41<br>S:2   | 2                  | 0 | 0 | 0 | 0 | 0                 | 0                | 2               | 2      | 0             | 0       |
|   | S2           | None                       |   | 345               |             | 0                  | 0 | 0 | 0 | 0 | 0                 | 0                | 0               | 0      | 0             | 0       |
| <i>Branchinecta lynchi</i><br>vernal pool fairy shrimp                | G3           | Threatened                 | IUCN_VU-Vulnerable  | 335               | 767<br>S:4  | 1                  | 1 | 0 | 0 | 0 | 2                 | 0                | 4               | 4      | 0             | 0       |
|   | S3           | None                       |   | 500               |             | 0                  | 0 | 0 | 0 | 0 | 0                 | 0                | 0               | 0      | 0             | 0       |

Government Version -- Dated May, 3 2019 -- Biogeographic Data Branch  
Report Printed on Monday, May 13, 2019

Page 1 of 3  
Information Expires 11/3/2019



**Summary Table Report**  
**California Department of Fish and Wildlife**  
**California Natural Diversity Database**



| Name (Scientific/Common)  | CNDDB Ranks  | Listing Status (Fed/State) | Other Lists   | Elev. Range (ft.) | Total EO's  | Element Occ. Ranks |    |   |   |   |   | Population Status |                 | Presence |               |        |   |
|---|--------------|----------------------------|---|-------------------|-------------|--------------------|----|---|---|---|---|-------------------|-----------------|----------|---------------|--------|---|
|   |              |                            |   |                   |             | A                  | B  | C | D | X | U | Historic > 20 yr  | Recent <= 20 yr | Extant   | Poss. Extrap. | Extrp. |   |
| <i>Delphinium recurvatum</i><br>recurved larkspur   | G2?<br>S2?   | None<br>None               | Rare Plant Rank - 1B.2<br>BLM_S-Sensitive   | 340<br>340        | 100<br>S:2  | 0                  | 0  | 0 | 0 | 0 | 0 | 2                 | 0               | 2        | 2             | 0      | 0 |
| <i>Desmocerus californicus dimorphus</i><br>valley elderberry longhorn beetle             | G3T2<br>S2   | Threatened<br>None         |   | 405<br>405        | 271<br>S:1  | 0                  | 0  | 1 | 0 | 0 | 0 | 1                 | 0               | 1        | 0             | 0      |   |
| <i>Eryngium spinosepalum</i><br>spiny-sepaled button-celery                               | G2<br>S2     | None<br>None               | Rare Plant Rank - 1B.2  | 335<br>510        | 108<br>S:5  | 1                  | 2  | 0 | 0 | 1 | 1 | 3                 | 2               | 4        | 1             | 0      |   |
| <i>Euphorbia hooveri</i><br>Hoover's spurge   | G1<br>S1     | Threatened<br>None         | Rare Plant Rank - 1B.2  | 335<br>345        | 29<br>S:2   | 0                  | 0  | 2 | 0 | 0 | 0 | 0                 | 2               | 2        | 0             | 0      |   |
| <i>Great Valley Valley Oak Riparian Forest</i><br>Great Valley Valley Oak Riparian Forest | G1<br>S1.1   | None<br>None               |   | 320<br>320        | 33<br>S:1   | 0                  | 1  | 0 | 0 | 0 | 0 | 1                 | 0               | 1        | 0             | 0      |   |
| <i>Helianthus winteri</i><br>Winter's sunflower   | G2?<br>S2?   | None<br>None               | Rare Plant Rank - 1B.2  | 460<br>950        | 55<br>S:7   | 0                  | 3  | 4 | 0 | 0 | 0 | 0                 | 7               | 7        | 0             | 0      |   |
| <i>Lepidurus packardii</i><br>vernal pool tadpole shrimp                                  | G4<br>S3S4   | Endangered<br>None         | IUCN_EN-Endangered  | 340<br>345        | 324<br>S:2  | 0                  | 1  | 0 | 0 | 0 | 1 | 1                 | 1               | 2        | 0             | 0      |   |
| <i>Northern Hardpan Vernal Pool</i><br>Northern Hardpan Vernal Pool                       | G3<br>S3.1   | None<br>None               |   | 345<br>345        | 126<br>S:1  | 0                  | 0  | 0 | 0 | 0 | 1 | 1                 | 0               | 1        | 0             | 0      |   |
| <i>Orcuttia inaequalis</i><br>San Joaquin Valley Orcutt grass                             | G1<br>S1     | Threatened<br>Endangered   | Rare Plant Rank - 1B.1  | 515<br>515        | 47<br>S:1   | 0                  | 0  | 0 | 0 | 1 | 0 | 1                 | 0               | 0        | 0             | 1      |   |
| <i>Sagittaria sanfordii</i><br>Sanford's arrowhead  | G3<br>S3     | None<br>None               | Rare Plant Rank - 1B.2<br>BLM_S-Sensitive   | 400<br>400        | 126<br>S:1  | 0                  | 0  | 1 | 0 | 0 | 0 | 0                 | 1               | 1        | 0             | 0      |   |
| <i>Spea hammondii</i><br>western spadefoot  | G3<br>S3     | None<br>None               | BLM_S-Sensitive<br>CDFW_SSC-Species of Special Concern<br>IUCN_NT-Near Threatened | 0<br>585          | 907<br>S:12 | 0                  | 11 | 1 | 0 | 0 | 0 | 1                 | 11              | 12       | 0             | 0      |   |
| <i>Talanites moodyae</i><br>Moody's gnaphosid spider                                      | G1G2<br>S1S2 | None<br>None               |   | 400<br>700        | 6<br>S:3    | 0                  | 0  | 0 | 0 | 0 | 3 | 3                 | 0               | 3        | 0             | 0      |   |
| <i>Taxidea taxus</i><br>American badger   | G5<br>S3     | None<br>None               | CDFW_SSC-Species of Special Concern<br>IUCN_LC-Least Concern                      | 370<br>370        | 589<br>S:1  | 0                  | 0  | 1 | 0 | 0 | 0 | 1                 | 0               | 1        | 0             | 0      |   |
| <i>Valley Sacaton Grassland</i><br>Valley Sacaton Grassland                               | G1<br>S1.1   | None<br>None               |   | 370<br>370        | 9<br>S:1    | 0                  | 0  | 0 | 0 | 0 | 1 | 1                 | 0               | 1        | 0             | 0      |   |



**Summary Table Report**  
 California Department of Fish and Wildlife  
 California Natural Diversity Database



| Name (Scientific/Common)                             | CNDDB Ranks | Listing Status (Fed/State) | Other Lists | Elev. Range (ft.) | Total EO's  | Element Occ. Ranks |   |   |   |   | Population Status |                  | Presence        |        |               |         |
|--|-------------|----------------------------|-------------|-------------------|-------------|--------------------|---|---|---|---|-------------------|------------------|-----------------|--------|---------------|---------|
|  |             |                            |             |                   |             | A                  | B | C | D | X | U                 | Historic > 20 yr | Recent <= 20 yr | Extant | Poss. Extirp. | Extirp. |
| <i>Vulpes macrotis mutica</i><br>San Joaquin kit fox | G4T2<br>S2  | Endangered<br>Threatened   |             | 345<br>720        | 1017<br>S:6 | 0                  | 0 | 0 | 0 | 0 | 6                 | 6                | 0               | 6      | 0             | 0       |

## Figure 7. CNDDDB Summary Table (9-Quad)

| Name (Scientific/Common)                                      | CNDDDB Ranks | Listing Status (Fed/State) | Other Lists   | Elev. Range (ft.) | Total EO's  | Element Occ. Ranks |   |   |   |   | Population Status |                  | Presence        |        |               |         |
|---|--------------|----------------------------|---|-------------------|-------------|--------------------|---|---|---|---|-------------------|------------------|-----------------|--------|---------------|---------|
|   |              |                            |   |                   |             | A                  | B | C | D | X | U                 | Historic > 20 yr | Recent <= 20 yr | Extant | Poss. Extirp. | Extirp. |
| <i>Agelaius tricolor</i><br>tricolored blackbird              | G2G3<br>S1S2 | None<br>Threatened         | BLM_S-Sensitive<br>CDFW_SSC-Species of Special Concern<br>IUCN_EN-Endangered<br>NABCI_RWL-Red Watch List<br>USFWS_BCC-Birds of Conservation Concern | 505<br>540        | 952<br>S:2  | 0                  | 0 | 0 | 0 | 0 | 2                 | 0                | 2               | 2      | 0             | 0       |
| <i>Ambystoma californiense</i><br>California tiger salamander | G2G3<br>S2S3 | Threatened<br>Threatened   | CDFW_WL-Watch List<br>IUCN_VU-Vulnerable  | 314<br>440        | 1196<br>S:8 | 1                  | 2 | 1 | 0 | 1 | 3                 | 4                | 4               | 7      | 1             | 0       |
| <i>Anniella pulchra</i><br>northern California legless lizard | G3<br>S3     | None<br>None               | CDFW_SSC-Species of Special Concern<br>USFS_S-Sensitive   | 325<br>377        | 375<br>S:2  | 1                  | 0 | 0 | 0 | 0 | 1                 | 1                | 1               | 2      | 0             | 0       |
| <i>Antrozous pallidus</i><br>pallid bat                       | G5<br>S3     | None<br>None               | BLM_S-Sensitive<br>CDFW_SSC-Species of Special Concern<br>IUCN_LC-Least Concern<br>USFS_S-Sensitive<br>WBWG_H-High Priority                         | 368<br>368        | 419<br>S:1  | 1                  | 0 | 0 | 0 | 0 | 0                 | 0                | 1               | 1      | 0             | 0       |
| <i>Ardea herodias</i><br>great blue heron                     | G5<br>S4     | None<br>None               | CDF_S-Sensitive<br>IUCN_LC-Least Concern  | 500<br>500        | 155<br>S:1  | 0                  | 0 | 0 | 0 | 0 | 1                 | 1                | 0               | 1      | 0             | 0       |
| <i>Athene cucularia</i><br>burrowing owl                      | G4<br>S3     | None<br>None               | BLM_S-Sensitive<br>CDFW_SSC-Species of Special Concern<br>IUCN_LC-Least Concern<br>USFWS_BCC-Birds of Conservation Concern                          | 300<br>475        | 1984<br>S:7 | 5                  | 2 | 0 | 0 | 0 | 0                 | 1                | 6               | 7      | 0             | 0       |



**Summary Table Report**  
**California Department of Fish and Wildlife**  
**California Natural Diversity Database**



| Name (Scientific/Common)  | CNDDB Ranks  | Listing Status (Fed/State) | Other Lists  | Elev. Range (ft.) | Total EO's  | Element Occ. Ranks |   |   |   |   |    | Population Status |                 | Presence |               |         |
|---|--------------|----------------------------|--|-------------------|-------------|--------------------|---|---|---|---|----|-------------------|-----------------|----------|---------------|---------|
|   |              |                            |  |                   |             | A                  | B | C | D | X | U  | Historic > 20 yr  | Recent <= 20 yr | Extant   | Poss. Extrap. | Extrap. |
| <i>Atriplex cordulata</i> var. <i>erecticaulis</i><br>Earlmarc orache         | G3T1<br>S1   | None<br>None               | Rare Plant Rank - 1B.2<br>BLM_S-Sensitive  | 335<br>335        | 21<br>S:1   | 1                  | 0 | 0 | 0 | 0 | 0  | 0                 | 1               | 1        | 0             | 0       |
| <i>Atriplex depressa</i><br>brittlescale                                      | G2<br>S2     | None<br>None               | Rare Plant Rank - 1B.2   |                   | 60<br>S:2   | 0                  | 0 | 0 | 0 | 0 | 2  | 2                 | 0               | 2        | 0             | 0       |
| <i>Atriplex minuscula</i><br>lesser saltscale                                 | G2<br>S2     | None<br>None               | Rare Plant Rank - 1B.1   | 335<br>335        | 52<br>S:1   | 0                  | 1 | 0 | 0 | 0 | 0  | 0                 | 1               | 1        | 0             | 0       |
| <i>Atriplex persistens</i><br>vernal pool smallscale                          | G2<br>S2     | None<br>None               | Rare Plant Rank - 1B.2   | 345<br>355        | 41<br>S:2   | 2                  | 0 | 0 | 0 | 0 | 0  | 0                 | 2               | 2        | 0             | 0       |
| <i>Bombus crotchii</i><br>Crotch bumble bee                                   | G3G4<br>S1S2 | None<br>None               |  | 350<br>600        | 234<br>S:4  | 0                  | 0 | 0 | 0 | 0 | 4  | 4                 | 0               | 4        | 0             | 0       |
| <i>Bombus morrisoni</i><br>Morrison bumble bee                                | G4G5<br>S1S2 | None<br>None               | IUCN_VU-Vulnerable   | 350<br>350        | 85<br>S:1   | 0                  | 0 | 0 | 0 | 0 | 1  | 1                 | 0               | 1        | 0             | 0       |
| <i>Branchinecta lynchi</i><br>vernal pool fairy shrimp                        | G3<br>S3     | Threatened<br>None         | IUCN_VU-Vulnerable   | 305<br>650        | 767<br>S:24 | 3                  | 3 | 1 | 0 | 0 | 17 | 8                 | 16              | 24       | 0             | 0       |
| <i>Brodiaea insignis</i><br>Kaweah brodiaea                                   | G1<br>S1     | None<br>Endangered         | Rare Plant Rank - 1B.2<br>BLM_S-Sensitive<br>USFS_S-Sensitive  | 560<br>560        | 27<br>S:1   | 1                  | 0 | 0 | 0 | 0 | 0  | 1                 | 0               | 1        | 0             | 0       |
| <i>Chrysis tularensis</i><br>Tulare cuckoo wasp                               | G1G2<br>S1S2 | None<br>None               |  | 450<br>450        | 5<br>S:1    | 0                  | 0 | 0 | 0 | 0 | 1  | 1                 | 0               | 1        | 0             | 0       |
| <i>Coccyzus americanus occidentalis</i><br>western yellow-billed cuckoo       | G5T2T3<br>S1 | Threatened<br>Endangered   | BLM_S-Sensitive<br>NABCI_RWL-Red<br>Watch List<br>USFS_S-Sensitive<br>USFWS_BCC-Birds of<br>Conservation Concern | 330<br>330        | 156<br>S:1  | 0                  | 0 | 0 | 0 | 1 | 0  | 1                 | 0               | 0        | 0             | 1       |
| <i>Delphinium recurvatum</i><br>recurved larkspur                             | G2?<br>S2?   | None<br>None               | Rare Plant Rank - 1B.2<br>BLM_S-Sensitive  | 320<br>440        | 100<br>S:4  | 0                  | 0 | 0 | 0 | 1 | 3  | 2                 | 2               | 3        | 0             | 1       |
| <i>Desmocerus californicus dimorphus</i><br>valley elderberry longhorn beetle | G3T2<br>S2   | Threatened<br>None         |  | 405<br>405        | 271<br>S:1  | 0                  | 0 | 1 | 0 | 0 | 0  | 1                 | 0               | 1        | 0             | 0       |
| <i>Diplacus pictus</i><br>calico monkeyflower                                 | G2<br>S2     | None<br>None               | Rare Plant Rank - 1B.2<br>BLM_S-Sensitive<br>SB_RSABG-Rancho<br>Santa Ana Botanic<br>Garden                      | 600<br>600        | 73<br>S:1   | 0                  | 0 | 0 | 0 | 0 | 1  | 1                 | 0               | 1        | 0             | 0       |



**Summary Table Report**  
**California Department of Fish and Wildlife**  
**California Natural Diversity Database**



| Name (Scientific/Common)  | CNDDB Ranks  | Listing Status (Fed/State) | Other Lists   | Elev. Range (ft.) | Total EO's  | Element Occ. Ranks |    |   |   |   |   | Population Status |                 | Presence |               |        |   |
|---|--------------|----------------------------|---|-------------------|-------------|--------------------|----|---|---|---|---|-------------------|-----------------|----------|---------------|--------|---|
|   |              |                            |   |                   |             | A                  | B  | C | D | X | U | Historic > 20 yr  | Recent <= 20 yr | Extant   | Poss. Extrap. | Extrp. |   |
| <i>Empidonax traillii</i><br>willow flycatcher  | G5<br>S1S2   | None<br>Endangered         | IUCN_LC-Least Concern<br>USFS_S-Sensitive<br>USFWS_BCC-Birds of Conservation Concern  | 570<br>570        | 90<br>S:1   | 0                  | 0  | 0 | 0 | 0 | 0 | 1                 | 1               | 0        | 1             | 0      | 0 |
| <i>Emys marmorata</i><br>western pond turtle  | G3G4<br>S3   | None<br>None               | BLM_S-Sensitive<br>CDFW_SSC-Species of Special Concern<br>IUCN_VU-Vulnerable<br>USFS_S-Sensitive  | 325<br>325        | 1367<br>S:1 | 0                  | 0  | 0 | 0 | 0 | 0 | 1                 | 1               | 0        | 1             | 0      | 0 |
| <i>Eryngium spinosepalum</i><br>spiny-sepaled button-celery                               | G2<br>S2     | None<br>None               | Rare Plant Rank - 1B.2  | 320<br>800        | 108<br>S:17 | 4                  | 8  | 1 | 0 | 0 | 1 | 3                 | 9               | 8        | 16            | 1      | 0 |
| <i>Eumops perotis californicus</i><br>western mastiff bat                                 | G5T4<br>S3S4 | None<br>None               | BLM_S-Sensitive<br>CDFW_SSC-Species of Special Concern<br>WBWG_H-High Priority  | 300<br>720        | 296<br>S:4  | 0                  | 1  | 0 | 0 | 0 | 3 | 3                 | 3               | 1        | 4             | 0      | 0 |
| <i>Euphorbia hooveri</i><br>Hoover's spurge   | G1<br>S1     | Threatened<br>None         | Rare Plant Rank - 1B.2  | 315<br>345        | 29<br>S:5   | 0                  | 1  | 3 | 0 | 1 | 0 | 0                 | 1               | 4        | 4             | 0      | 1 |
| <i>Fritillaria striata</i><br>striped adobe-lily  | G1<br>S1     | None<br>Threatened         | Rare Plant Rank - 1B.1<br>BLM_S-Sensitive<br>SB_RSABG-Rancho Santa Ana Botanic Garden<br>SB_USDA-US Dept of Agriculture<br>USFS_S-Sensitive |                   | 23<br>S:1   | 0                  | 0  | 0 | 0 | 1 | 0 | 0                 | 1               | 0        | 0             | 0      | 1 |
| <i>Great Valley Valley Oak Riparian Forest</i><br>Great Valley Valley Oak Riparian Forest | G1<br>S1.1   | None<br>None               |   | 320<br>320        | 33<br>S:1   | 0                  | 1  | 0 | 0 | 0 | 0 | 0                 | 1               | 0        | 1             | 0      | 0 |
| <i>Helianthus winteri</i><br>Winter's sunflower   | G2?<br>S2?   | None<br>None               | Rare Plant Rank - 1B.2  | 460<br>2,500      | 55<br>S:32  | 6                  | 20 | 4 | 1 | 0 | 1 | 0                 | 32              | 32       | 0             | 0      | 0 |
| <i>Imperata brevifolia</i><br>California satintail  | G4<br>S3     | None<br>None               | Rare Plant Rank - 2B.1<br>SB_SBBG-Santa Barbara Botanic Garden<br>USFS_S-Sensitive  | 300<br>300        | 32<br>S:1   | 0                  | 0  | 0 | 0 | 0 | 1 | 1                 | 0               | 0        | 1             | 0      | 0 |
| <i>Lasiurus cinereus</i><br>hoary bat   | G5<br>S4     | None<br>None               | IUCN_LC-Least Concern<br>WBWG_M-Medium Priority   |                   | 238<br>S:1  | 0                  | 0  | 0 | 0 | 0 | 1 | 1                 | 0               | 0        | 1             | 0      | 0 |



**Summary Table Report**  
 California Department of Fish and Wildlife  
 California Natural Diversity Database



| Name (Scientific/Common)  | CNDDB Ranks  | Listing Status (Fed/State)   | Other Lists   | Elev. Range (ft.) | Total EO's  | Element Occ. Ranks |    |   |   |   |   | Population Status |                 | Presence |               |         |
|---|--------------|------------------------------|---|-------------------|-------------|--------------------|----|---|---|---|---|-------------------|-----------------|----------|---------------|---------|
|   |              |                              |   |                   |             | A                  | B  | C | D | X | U | Historic > 20 yr  | Recent <= 20 yr | Extant   | Poss. Extirp. | Extirp. |
| <i>Lepidurus packardii</i><br>vernal pool tadpole shrimp            | G4<br>S3S4   | Endangered<br>None           | IUCN_EN-Endangered  | 330<br>420        | 324<br>S:4  | 1                  | 1  | 1 | 0 | 0 | 1 | 1                 | 3               | 4        | 0             | 0       |
| <i>Lithobates pipiens</i><br>northern leopard frog                  | G5<br>S2     | None<br>None                 | CDFW_SSC-Species of Special Concern<br>IUCN_LC-Least Concern  | 330<br>345        | 22<br>S:3   | 0                  | 0  | 0 | 0 | 0 | 3 | 3                 | 0               | 3        | 0             | 0       |
| <i>Lytta hoppingi</i><br>Hopping's blister beetle                   | G1G2<br>S1S2 | None<br>None                 |   | 325<br>325        | 5<br>S:1    | 0                  | 0  | 0 | 0 | 0 | 1 | 1                 | 0               | 1        | 0             | 0       |
| <i>Lytta molesta</i><br>molestan blister beetle                     | G2<br>S2     | None<br>None                 |   | 425<br>425        | 17<br>S:1   | 0                  | 0  | 0 | 0 | 0 | 1 | 1                 | 0               | 1        | 0             | 0       |
| <i>Northern Claypan Vernal Pool</i><br>Northern Claypan Vernal Pool | G1<br>S1,1   | None<br>None                 |   | 435<br>475        | 21<br>S:2   | 0                  | 0  | 0 | 0 | 0 | 2 | 2                 | 0               | 2        | 0             | 0       |
| <i>Northern Hardpan Vernal Pool</i><br>Northern Hardpan Vernal Pool | G3<br>S3,1   | None<br>None                 |   | 315<br>345        | 126<br>S:3  | 0                  | 0  | 0 | 0 | 0 | 3 | 3                 | 0               | 3        | 0             | 0       |
| <i>Orcuttia inaequalis</i><br>San Joaquin Valley Orcutt grass       | G1<br>S1     | Threatened<br>Endangered     | Rare Plant Rank - 1B.1  | 315<br>515        | 47<br>S:2   | 0                  | 0  | 1 | 0 | 1 | 0 | 1                 | 1               | 1        | 0             | 1       |
| <i>Pseudobahia peirsonii</i><br>San Joaquin adobe sunburst          | G1<br>S1     | Threatened<br>Endangered     | Rare Plant Rank - 1B.1<br>SB_RSABG-Rancho Santa Ana Botanic Garden                                    | 485<br>1,420      | 51<br>S:4   | 0                  | 0  | 0 | 1 | 0 | 3 | 4                 | 0               | 4        | 0             | 0       |
| <i>Puccinellia simplex</i><br>California alkali grass               | G3<br>S2     | None<br>None                 | Rare Plant Rank - 1B.2  | 320<br>320        | 71<br>S:1   | 0                  | 0  | 0 | 0 | 0 | 1 | 1                 | 0               | 1        | 0             | 0       |
| <i>Rana boylei</i><br>foothill yellow-legged frog                   | G3<br>S3     | None<br>Candidate Threatened | BLM_S-Sensitive<br>CDFW_SSC-Species of Special Concern<br>IUCN_NT-Near Threatened<br>USFS_S-Sensitive | 520<br>2,211      | 2379<br>S:5 | 0                  | 0  | 0 | 0 | 5 | 0 | 5                 | 0               | 0        | 0             | 5       |
| <i>Sagittaria sanfordii</i><br>Sanford's arrowhead                  | G3<br>S3     | None<br>None                 | Rare Plant Rank - 1B.2<br>BLM_S-Sensitive   | 330<br>400        | 126<br>S:8  | 1                  | 0  | 4 | 1 | 0 | 2 | 0                 | 8               | 8        | 0             | 0       |
| <i>Spea hammondi</i><br>western spadefoot                           | G3<br>S3     | None<br>None                 | BLM_S-Sensitive<br>CDFW_SSC-Species of Special Concern<br>IUCN_NT-Near Threatened                     | 0<br>743          | 907<br>S:32 | 1                  | 28 | 1 | 0 | 0 | 2 | 2                 | 30              | 32       | 0             | 0       |

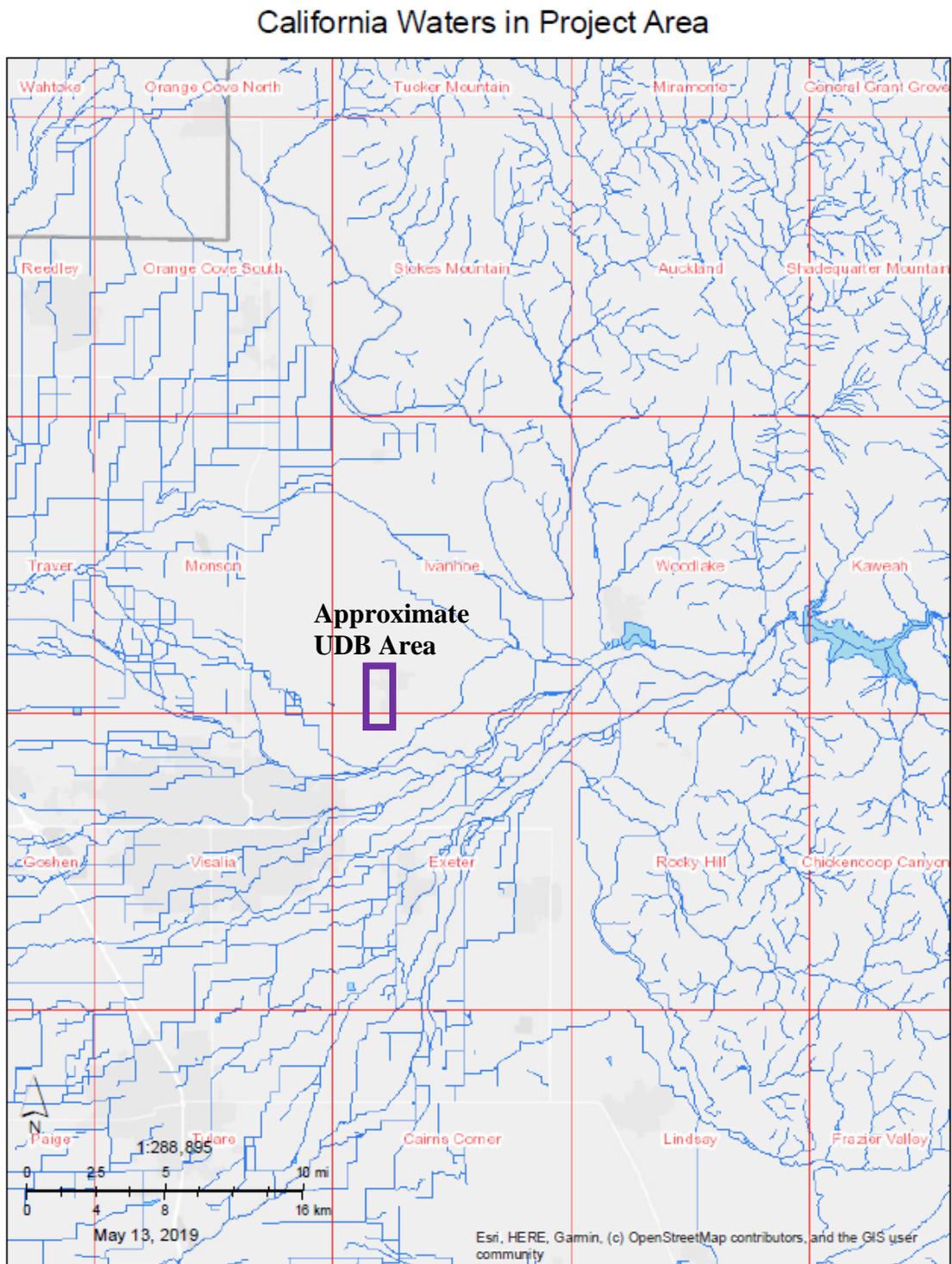


**Summary Table Report**  
 California Department of Fish and Wildlife  
 California Natural Diversity Database



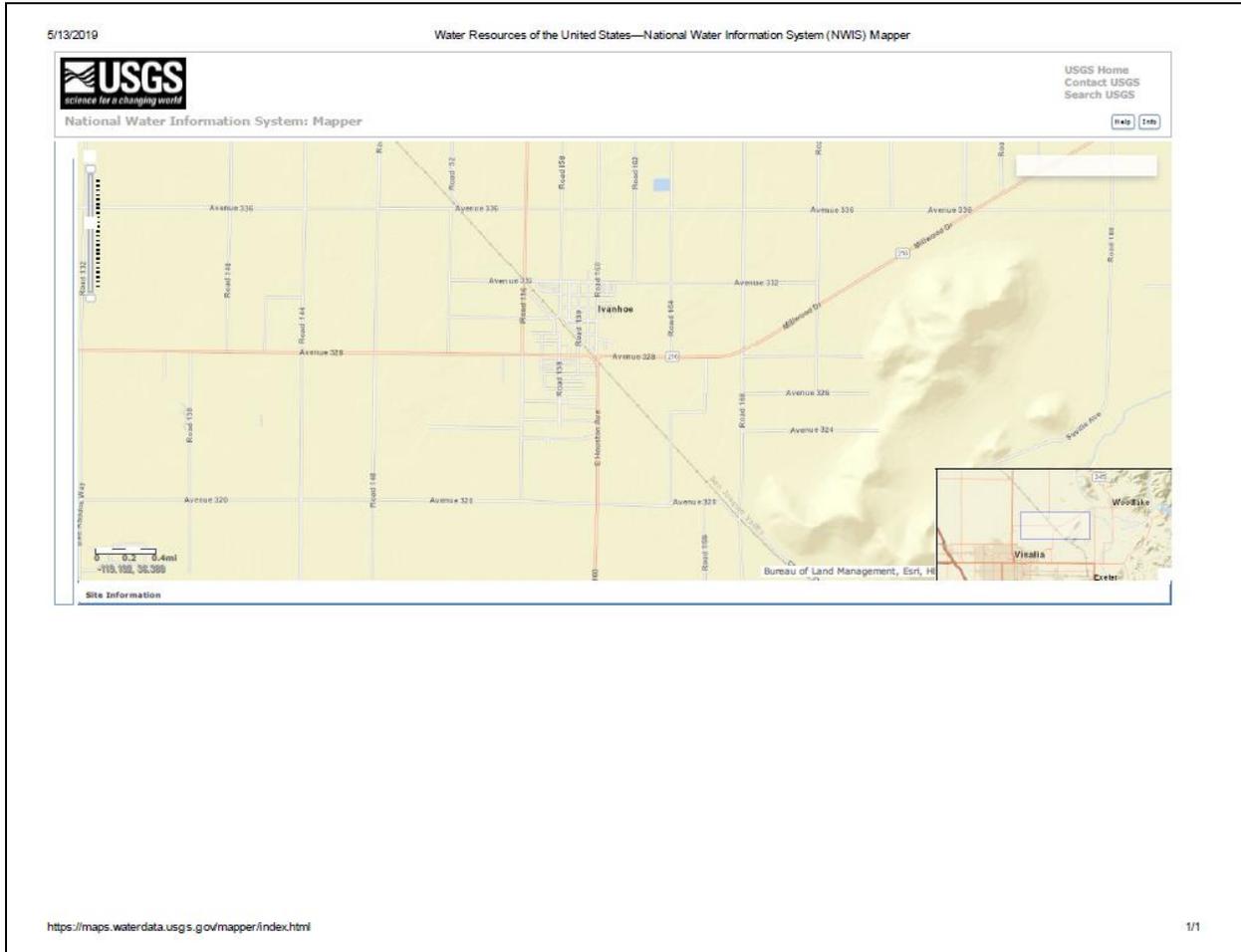
| Name (Scientific/Common)  | CNDDB Ranks  | Listing Status (Fed/State) | Other Lists  | Elev. Range (ft.) | Total EO's  | Element Occ. Ranks |   |   |   |   | Population Status |                  | Presence        |        |              |        |   |
|---|--------------|----------------------------|--|-------------------|-------------|--------------------|---|---|---|---|-------------------|------------------|-----------------|--------|--------------|--------|---|
|   |              |                            |  |                   |             | A                  | B | C | D | X | U                 | Historic > 20 yr | Recent <= 20 yr | Extant | Poss. Extrp. | Extrp. |   |
| <i>Sycamore Alluvial Woodland</i><br>Sycamore Alluvial Woodland | G1<br>S1.1   | None<br>None               |  | 580<br>580        | 17<br>S:1   | 0                  | 0 | 0 | 0 | 0 | 0                 | 1                | 1               | 0      | 1            | 0      | 0 |
| <i>Talanites moodyae</i><br>Moody's gnaphosid spider            | G1G2<br>S1S2 | None<br>None               |  | 400<br>1,200      | 6<br>S:5    | 0                  | 0 | 0 | 0 | 0 | 5                 | 5                | 0               | 5      | 0            | 0      | 0 |
| <i>Taxidea taxus</i><br>American badger                         | G5<br>S3     | None<br>None               | CDFW_SSC-Species of Special Concern<br>IUCN_LC-Least Concern | 370<br>370        | 589<br>S:1  | 0                  | 0 | 1 | 0 | 0 | 0                 | 1                | 0               | 1      | 0            | 0      | 0 |
| <i>Tuctoria greenei</i><br>Greene's tuctoria                    | G1<br>S1     | Endangered<br>Rare         | Rare Plant Rank - 1B.1                                       | 450<br>450        | 50<br>S:1   | 0                  | 0 | 0 | 0 | 1 | 0                 | 1                | 0               | 0      | 0            | 0      | 1 |
| <i>Valley Sacaton Grassland</i><br>Valley Sacaton Grassland     | G1<br>S1.1   | None<br>None               |  | 370<br>370        | 9<br>S:1    | 0                  | 0 | 0 | 0 | 0 | 1                 | 1                | 0               | 1      | 0            | 0      | 0 |
| <i>Vulpes macrotis mutica</i><br>San Joaquin kit fox            | G4T2<br>S2   | Endangered<br>Threatened   |  | 320<br>720        | 1017<br>S:9 | 0                  | 0 | 0 | 0 | 0 | 9                 | 9                | 0               | 9      | 0            | 0      | 0 |

**Figure 8. CNDDDB BIOS California Streams and Lakes Map**

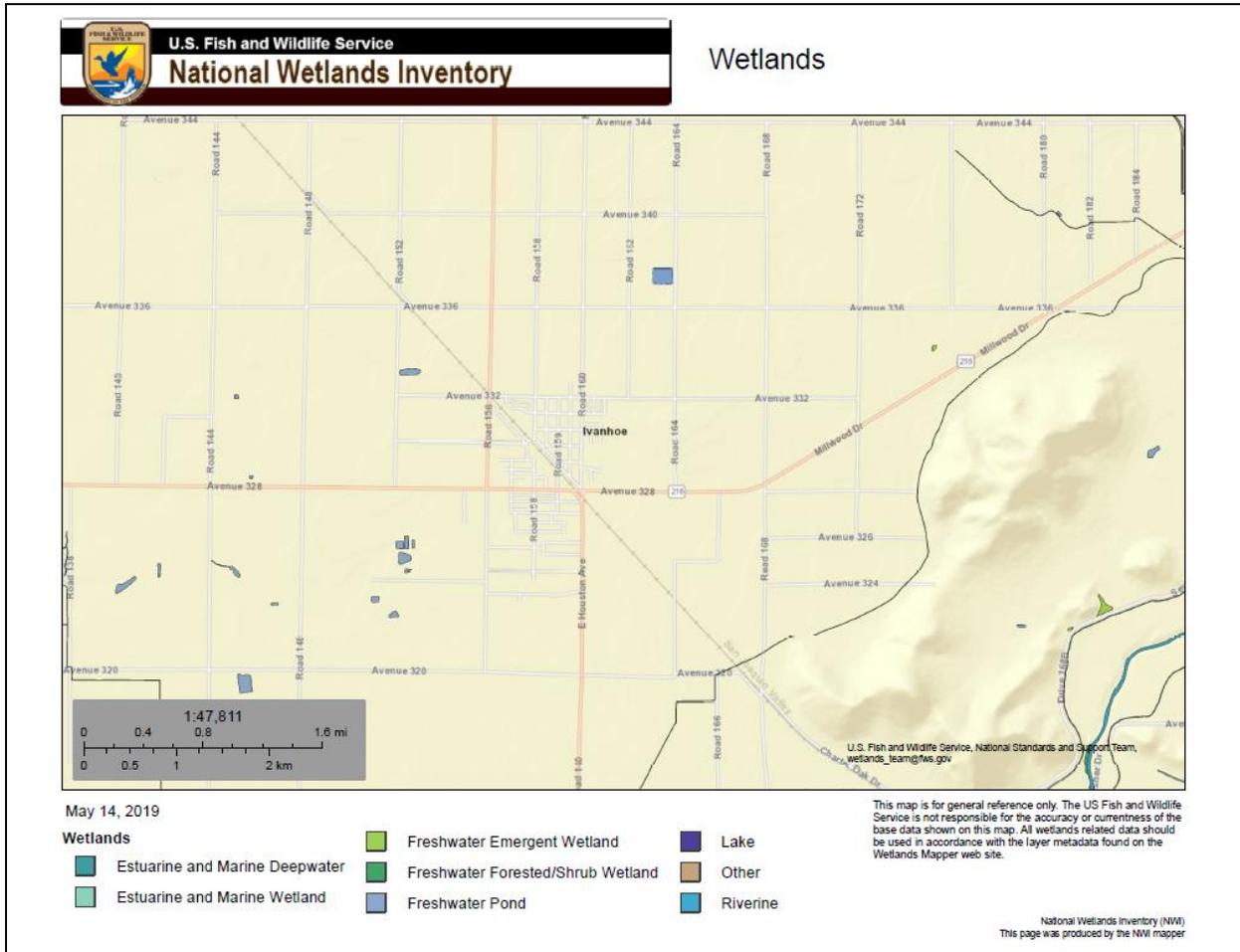


Author: cnddb\_gov@dfg.ca.gov  
Printed from <http://bios.dfg.ca.gov>

**Figure 9. USGS National Water Information System Map**



**Figure 10. USFWS National Wetlands Inventory Map**



# Attachment “C”

---

## Cultural & Tribal Cultural Resources



**To:** Hector Guerra  
Tulare County Resource Management Agency  
5961 South Mooney Blvd.  
Visalia, CA 93277

**Record Search 18-409**

**Tulare County  
Resource Management Agency**

**OCT 18 2018**

**Date:** October 15, 2018

**Re:** General Plan Initiation No. GPI 13-004 - Ivanhoe Community Plan

**County:** Tulare

**Map(s):** Exeter & Ivanhoe 7.5's

### **CULTURAL RESOURCES RECORDS SEARCH**

The California Office of Historic Preservation (OHP) contracts with the California Historical Resources Information System's (CHRIS) regional Information Centers (ICs) to maintain information in the CHRIS inventory and make it available to local, state, and federal agencies, cultural resource professionals, Native American tribes, researchers, and the public. Recommendations made by IC coordinators or their staff regarding the interpretation and application of this information are advisory only. Such recommendations do not necessarily represent the evaluation or opinion of the State Historic Preservation Officer in carrying out the OHP's regulatory authority under federal and state law.

The following are the results of a search of the cultural resource files at the Southern San Joaquin Valley Information Center. These files include known and recorded cultural resources sites, inventory and excavation reports filed with this office, and resources listed on the National Register of Historic Places, Historic Property Directory, California State Historical Landmarks, California Register of Historical Resources, California Inventory of Historic Resources, and California Points of Historical Interest. Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the Office of Historic Preservation are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area.

### **PRIOR CULTURAL RESOURCE STUDIES CONDUCTED WITHIN THE PROJECT AREA AND WITHIN THE ONE-HALF MILE RADIUS**

According to the information in our files, there have been six previous cultural resource studies conducted within the project area, TU-00515, 00582, 00610, 01014, 01242, and 01498. There have been six additional studies conducted within the one-half mile radius, TU-01395, 01499, 01512, 01514, 01611, and 01612.

**KNOWN/RECORDED CULTURAL RESOURCES WITHIN THE PROJECT AREA AND WITHIN THE ONE-HALF MILE RADIUS**

There is one recorded cultural resource within project area, P-54-004626, an historic era railroad. There is one recorded resource within the one-half mile radius, P-54-004845, a junction box.

There are no recorded cultural resources within the project area or radius that are listed in the National Register of Historic Places, the California Register of Historical Resources, the California Points of Historical Interest, California Inventory of Historic Resources, or the California State Historic Landmarks.

**COMMENTS AND RECOMMENDATIONS**

We understand this project consists of a General Plan Update for the Ivanhoe Community. Further, we understand no immediate ground disturbance will take place as a result of this update. Therefore, no further cultural resource investigation is recommended at this time. However, prior to any future ground disturbance project activities, we recommend a new record search be conducted so our office can then make project specific recommendations for further cultural resources study, if needed. A list of qualified consultants can be found at [www.chrisinfo.org](http://www.chrisinfo.org).

We also recommend that you contact the Native American Heritage Commission in Sacramento. They will provide you with a current list of Native American individuals/organizations that can assist you with information regarding cultural resources that may not be included in the CHRIS Inventory and that may be of concern to the Native groups in the area. The Commission can consult their "Sacred Lands Inventory" file in order to determine what sacred resources, if any, exist within this project area and the way in which these resources might be managed. Finally, please consult with the lead agency on this project to determine if any other cultural resource investigation is required. If you need any additional information or have any questions or concerns, please contact our office at (661) 654-2289.

By:



Celeste M. Thomson, Coordinator

**Date:** October 15, 2018

Please note that invoices for Information Center services will be sent under separate cover from the California State University, Bakersfield Accounting Office.

**Consultation Notice – Ivanhoe Community Plan Update Project**

| TRIBE CONTACTED   | REQUEST TYPE |       | DOCUMENTS SENT |                     |            |       |                     | MAILED   |        |       |                              | CONSULTATION PERIOD |             | CONSULTATION / ACTIONS |        |  |
|---|--------------|-------|----------------|---------------------|------------|-------|---------------------|----------|--------|-------|------------------------------|---------------------|-------------|------------------------|--------|--|
|   | AB 52        | SB 18 | Map            | Project Description | SLF Search | CHRIS | Other               | Date     | E-mail | FedEx | Certified US Mail            | Return Receipt      | Period Ends | Date                   | TYPE   | Summary  |
| <b>SACRED LAND FILE (SLF) REQUEST</b>   |              |       |                |                     |            |       |                     |          |        |       |                              |                     |             |                        |        |  |
| Native American Heritage Commission   | X            | x     | X              | X                   | X          | x     |                     |          | X      |       |                              | 10/11/18 (SLF)      | ---         |                        | Letter | Response to SLF Search request   |
| <b>CONSULTATION REQUEST LETTERS (CONCURRENT WITH NOP)</b>   |              |       |                |                     |            |       |                     |          |        |       |                              |                     |             |                        |        |  |
| Kern Valley Indian Council<br>Robert Robinson, Co-Chairperson<br>PO Box 1010<br>Lake Isabella, CA 93240                                       | X            | x     |                |                     |            |       | Notification Letter | 10/26/18 |        |       | 7013171<br>0000019<br>567426 | 10/29/18            |             |                        |        | Called and left a message on 3-5-19 at 13:24 for second consult RK   |
| Kern Valley Indian Council<br>Julie Turner, Secretary<br>P. Box 1010<br>Lake Isabella, CA 93240   | X            | x     |                |                     |            |       | Notification Letter | 10/26/18 |        |       | 7013171<br>0000019<br>567433 | 10/29/18            |             |                        |        |  |
| Santa Rosa Rancheria<br>Rueben Barrios Sr., Chairperson<br>P. O. Box 8<br>Lemoore, CA 93245   | X            | x     |                |                     |            |       | Notification Letter | 10/26/18 |        |       | 7013171<br>0000019<br>567440 | 10/29/18            |             |                        |        | Called and left a message on 3-5-19 at 13:53 for a second consult RK                                       |
| Santa Rosa Rancheria Tachi Yokut Tribe<br>Cultural Department<br>Greg Cuara, Cultural Specialist<br>P. O. Box 8<br>Lemoore, CA 93245          | X            | x     |                |                     |            |       | Notification Letter | 10/26/18 |        |       | 7013171<br>0000019<br>567464 | 10/29/18            |             |                        |        |  |
| Santa Rosa Rancheria<br>Shana Powers, Director<br>P. O. Box 8<br>Lemoore, CA 93245  | X            | x     |                |                     |            |       | Notification Letter | 10/26/18 |        |       | 7013171<br>0000019<br>567457 | 10/29/18            |             |                        |        |  |
| Torres Martinez Desert Cahuilla Indians<br>Michael Mirelez, Cultural Resource Coordinator<br>P. O. Box 1160<br>Thermal, CA 92274              | X            | x     |                |                     |            |       | Notification Letter | 10/26/18 | X      |       | 7013171<br>0000019<br>567471 | 10/29/18            |             |                        |        | Follow up E-mail sent to <a href="mailto:mmirelez@tmdci.org">mmirelez@tmdci.org</a> on 3-5-2019 RK         |
| Tubatulabals of Kern Valley<br>Robert L. Gomez, Jr., Chairperson<br>P. O. Box 226<br>Lake Isabella, CA 93240                                  | X            | x     |                |                     |            |       | Notification Letter | 10/26/18 |        |       | 7013171<br>0000019<br>567488 | 11/9/18             |             |                        |        | Follow up E-mail sent to <a href="mailto:rgomez@tubatulabal.org">rgomez@tubatulabal.org</a> on 3-5-2019 RK |
| Tule River Indian Tribe<br>Neil Peyron, Chairperson<br>P. O. Box 589<br>Porterville, CA 93258   | X            | x     |                |                     |            |       | Notification Letter | 10/26/18 |        |       | 7013171<br>0000019<br>567495 | 10/30/18            |             |                        |        | Called on 3-5-19 and got a busy signal. Will try again. RK   |
| Tule River Indian Tribe<br>Tribal Archaeological Department<br>Felix Chrisman, Tribal Archaeologist<br>P. O. Box 589<br>Porterville, CA 93258 | X            | x     |                |                     |            |       | Notification Letter | 10/26/18 |        |       | 7013171<br>0000019<br>567228 | 10/30/18            |             |                        |        |  |

**Consultation Notice – Ivanhoe Community Plan Update Project**

| TRIBE CONTACTED   | REQUEST TYPE |       | DOCUMENTS SENT |                     |            |       |                     | MAILED   |        |       |                              | CONSULTATION PERIOD |             | CONSULTATION / ACTIONS |      |  |
|---|--------------|-------|----------------|---------------------|------------|-------|---------------------|----------|--------|-------|------------------------------|---------------------|-------------|------------------------|------|--|
|   | AB 52        | SB 18 | Map            | Project Description | SLF Search | CHRIS | Other               | Date     | E-mail | FedEx | Certified US Mail            | Return Receipt      | Period Ends | Date                   | TYPE | Summary  |
| Tule River Indian Tribe<br>Environmental Department<br>Kerri Vera, Director<br>P. O. Box 589<br>Porterville, CA 93258 | X            | x     |                |                     |            |       | Notification Letter | 10/26/18 |        |       | 7013171<br>0000019<br>567211 | 10/30/18            |             |                        |      |  |
| Wuksache Indian Tribe/Eshom Valley Band<br>Kenneth Woodrow, Chairperson<br>1179 Rock Haven Ct.<br>Salinas, CA 93906   | X            | x     |                |                     |            |       | Notification Letter | 10/26/18 |        |       | 7013171<br>0000019<br>567235 | 10/29/18            |             |                        |      | Called and left a message on 3-5-19 at 14:33 for a second consult RK |

# AB 52 and SB 18 PROJECT NOTIFICATION AND TRIBAL CONSULTATION REQUEST

**Project Title:** Ivanhoe Community Plan Update.

**Project Location:** East of Road 152, South of Avenue 336.

USGS 7.5 Minute Quadrangle(s): Ivanhoe and Exeter.

PLSS: Sections 01, 02, 11, 12, Township 18 South, Range 25 East, MDB&M.

**Project Description:** On April 4, 2017, the Tulare County Board of Supervisors (BOS) by Resolution No. 2017-0222, approved the Planning Branch proposal to update the Ivanhoe Community Plan. The project EIR is based on a projected annual population growth rate of 1.3%. Additional growth beyond the 1.3% annual growth rate will require further growth analysis pursuant to CEQA. The Ivanhoe Community Plan Update components described later in this section will become consistent with the General Plan 2030 Update, and will include the following primary goals and objectives.

- 1) Land Use and Environmental Planning - Promote development within planning areas next to the Regional State Route 216 Corridor in order to implement the following General Plan goals:
  - a) Ensure that the text and mapping of the Community Plan Designations and Zoning Reclassifications address various development matters such as encouraging Agricultural Adaptive Reuse activities, recognizing Non-Conforming Use activities, and facilitating Ministerial Permit approvals;
  - b) Encourage infill development within Urban Development Boundaries, thereby discouraging leapfrog development within Tulare County;
  - c) Reduce development pressure on agriculturally-designated lands within the Valley Floor, thereby encouraging agricultural production to flourish;
  - d) Reduce vehicle miles travelled throughout the County, thereby positively affecting air quality and greenhouse gas reduction; and
  - e) Help to improve the circulation, transit and railroad transportation system within this community, including, but not limited to, laying the groundwork for the construction of key projects such as Safe Routes to Schools, Complete Streets, and Bike Lanes/Pedestrian Paths.
- 2) Improvements for a “disadvantaged community” - It is expected that the community planning areas will be improved for the following reasons:
  - a) With faster project processing resulting from an updated community plan, increased employment opportunities are more likely to be provided by the private sector as proposed project developments can be approved as expeditiously as possible;

- b) Increased housing grant awards are more likely to occur based on updated community plans that are consistent with the policies of the General Plan 2030 Update (August 2012) and the recently adopted Housing Element 2015 Update (November 2015); and
  - c) With updated community plans, enhanced infrastructure grant awards are more likely, thereby providing access to funding to install or upgrade road, water, wastewater, and storm water facilities.
- 3) Strengthening Relationship with TCAG - An important benefit of this expedited community plan process will be the opportunity for RMA to strengthen the County's relationship with the Tulare County Association of Governments (TCAG) in that this and other community plans will help to facilitate the funding and implementation of several key transportation programs such as Safe Routes to Schools, Complete Streets, and Bike/Pedestrian Projects.

By pursuing these transportation programs through a heightened collaborative process, the likelihood of getting actual projects in the ground will be realized faster than historically achieved. In doing so, these communities and others can become safer and healthier by providing a more efficient transportation network.

**Request for Consultation:** Pursuant to the provisions of AB 52 and SB 18, as the lead agency under the California Environmental Quality Act (CEQA), the County of Tulare hereby extends an invitation to consult on the California Environmental Quality Act (CEQA) review of the Ivanhoe Community Plan Update Project in order to assist with identifying and/or preserving and/or mitigating project impacts to Native American cultural places and tribal cultural resources.

If your Tribe desires to consult with the County on the review of this project, please respond in writing within thirty (30) days of receipt of this notification. Written correspondence can be mailed to the following addresses:

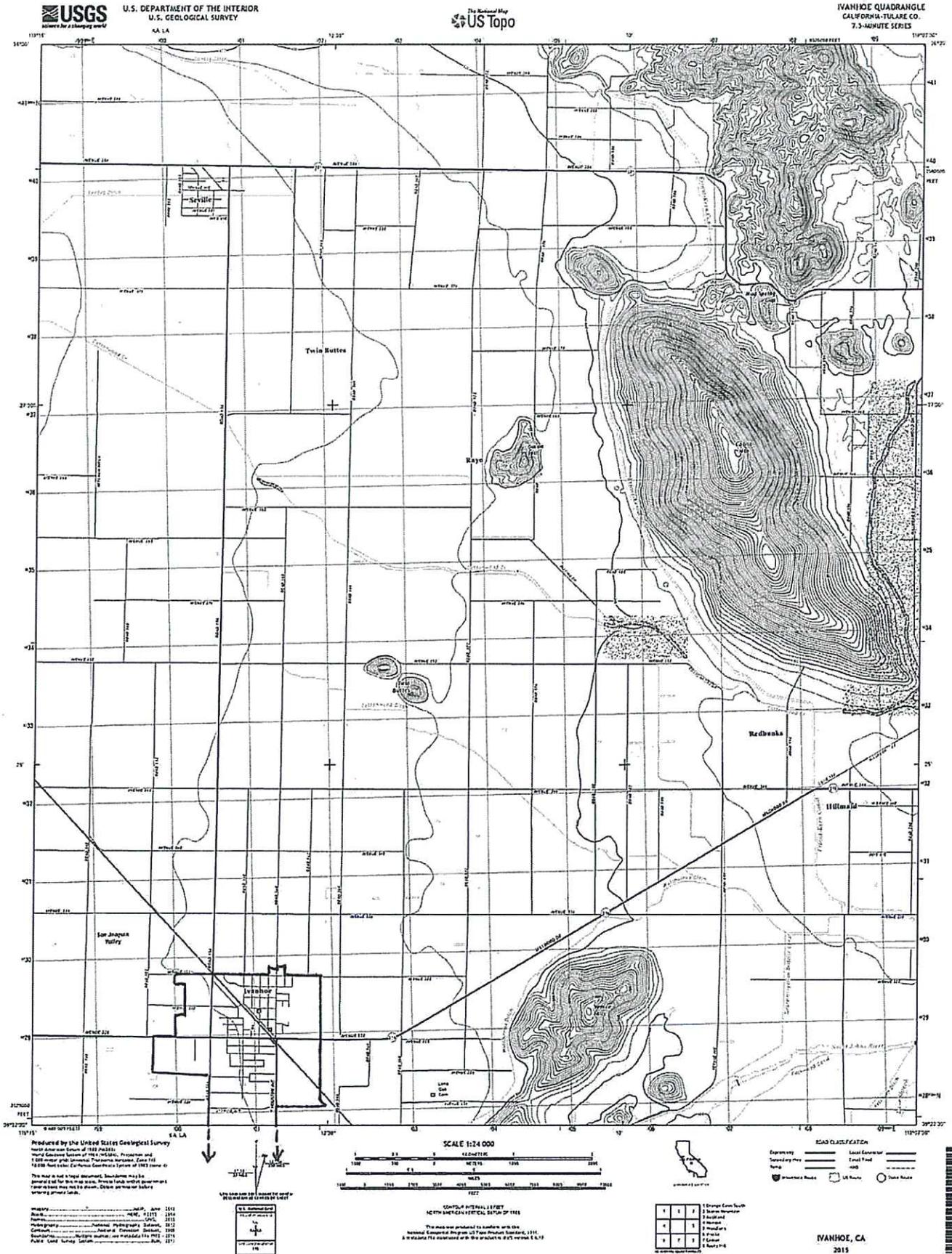
US Post: Tulare County Resource Management Agency  
Environmental Planning Division  
Attn: Jessica Willis / Hector Guerra  
5961 S. Mooney Blvd.  
Visalia, CA 93277-9394

E-mail: [JWillis@co.tulare.ca.us](mailto:JWillis@co.tulare.ca.us) and [HGuerra@co.tulare.ca.us](mailto:HGuerra@co.tulare.ca.us)

If you need further assistance or have any questions, please feel free to contact Jessica Willis by phone at (559) 624-7122, or Hector Guerra at (559) 624-7121.

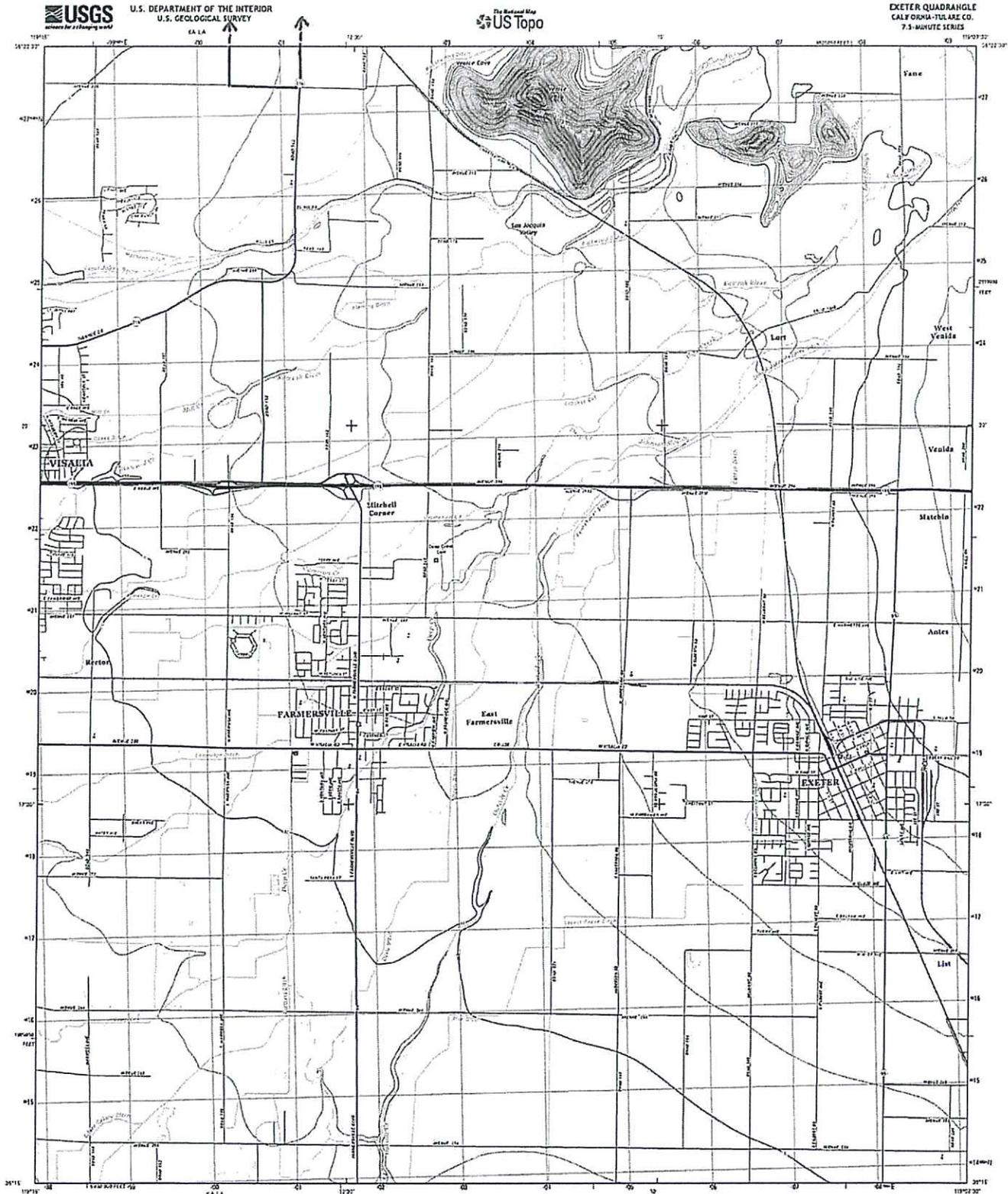
**If the County does not receive a response to this notification, it will be presumed that your Tribe has declined the opportunity to consult on this project pursuant to AB 52 and SB 18.**

# Ivanhoe Community Plan Update P1-2



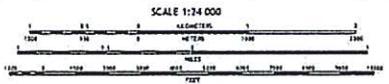
— Approximate Urban Development Boundary UDB

# Ivanhoe Community Plan Update P2-2



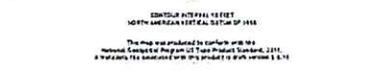
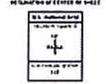
— Approximate Urban Development Boundary UDB

Produced by the United States Geological Survey  
 North American Datum of 1983 (NAD83)  
 North Geodetic Datum of 1983 (NAD83). Projection and  
 1:250,000 scale. California State Plane, Zone 10.  
 18250. North Zone, California State Plane of 1983 (Zone 10)  
 This map is not a legal document. Its use may be  
 restricted by local laws. Printed on demand by government  
 agencies. It is not to be used for any other purpose without  
 written permission from the publisher.



| ROAD CLASSIFICATION |                 |
|---------------------|-----------------|
| Expressway          | Local Connector |
| Secondary Hwy       | Local Road      |
| Artery              | Other           |
| Principal Road      | US Route        |
|                     | State Road      |

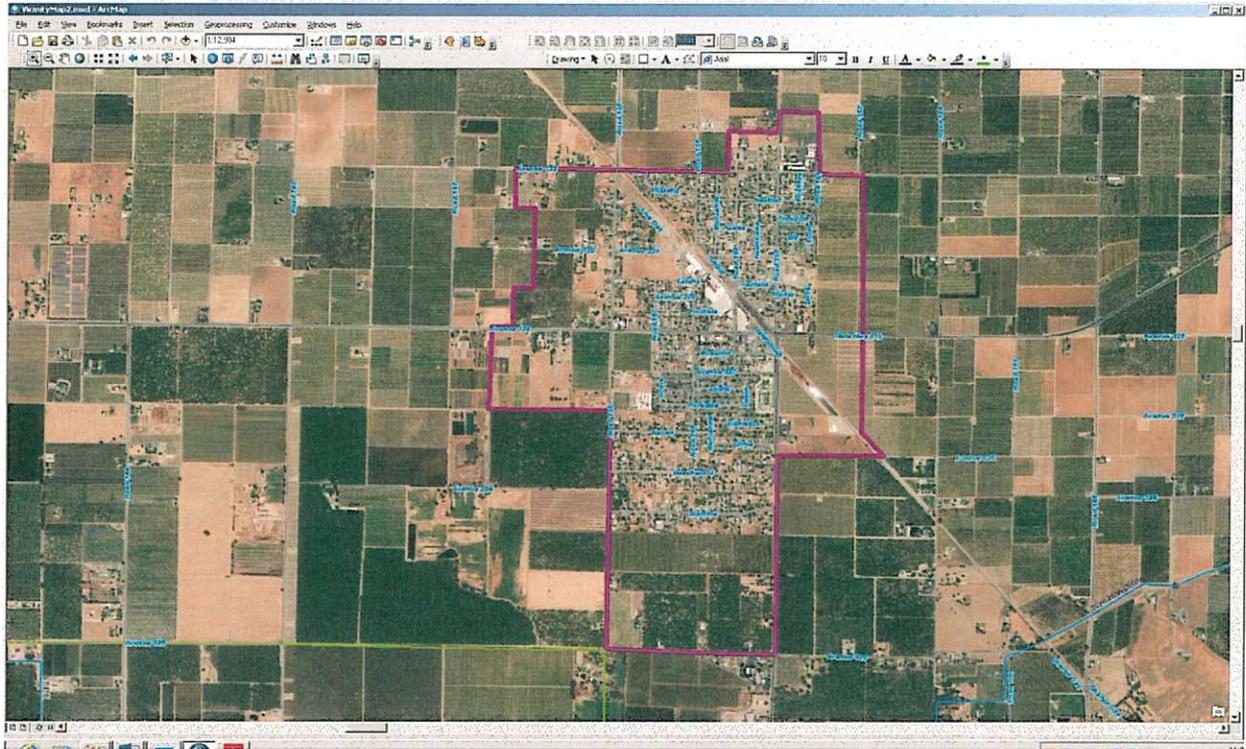
Map of the Ivanhoe area in Exeter, California, showing the approximate urban development boundary (UDB). The map includes a grid, scale bar, and various symbols for roads and landmarks.



| ROAD CLASSIFICATION |                 |
|---------------------|-----------------|
| Expressway          | Local Connector |
| Secondary Hwy       | Local Road      |
| Artery              | Other           |
| Principal Road      | US Route        |
|                     | State Road      |



EXETER, CA  
 2015





# RESOURCE MANAGEMENT AGENCY

5961 SOUTH MOONEY BLVD  
VISALIA, CA 93277  
PHONE (559) 624-7000  
FAX (559) 730-2653

Michael Washam      Economic Development and Planning  
Reed Schenke        Public Works  
Sherman Dix         Fiscal Services

REED SCHENKE, DIRECTOR

MICHAEL WASHAM, ASSOCIATE DIRECTOR

October 25, 2018

Kern Valley Indian Council  
Robert Robinson, Co-Chairperson  
PO Box 1010  
Lake Isabella, CA 93240

RE: Project Notification Pursuant to Assembly Bill (AB) 52 and Senate Bill (SB) 18 for the Ivanhoe Community Plan Update Project (GPA 17-006, PZC 18-008, PZC 18-006, PZC 18-007)

Dear Co-Chairperson Robinson,

Pursuant to the provisions of AB 52 and SB 18, as the lead agency under the California Environmental Quality Act (CEQA), the County of Tulare hereby extends an invitation to consult on the California Environmental Quality Act (CEQA) review of the Ivanhoe Community Plan Update Project in order to assist with identifying and/or preserving and/or mitigating project impacts to Native American cultural places including:

- Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine; and
- Native American historic, cultural, or sacred site that is listed or may be eligible for listing in the California Register of Historical Resources including historic or prehistoric ruins and any burial ground, archaeological, or historic site.

In accordance with the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.), the County of Tulare Resource Management Agency (RMA) will be preparing a Mitigated Negative Declaration (MND) to evaluate the environmental effects associated with the Project.

## **Sacred Lands File Search**

The County requested a Sacred Lands File (SLF) search through the Native American Heritage Commission (NAHC) on October 4, 2018, for the Cutler-Orosi Community Plan Update Project. The SLF search returned on October 11, 2018, with negative results; however, the NAHC recommended consultation with your Tribe. Results of the SLF search will be made available upon the release of the MND for public review. However, results may be made available to your Tribal Representatives if a written request for consultation is submitted to the County within thirty (30) days of receipt of this letter.

**California Historical Resources Information System**

A California Historical Resources Information System (CHRIS) search for the project area was requested through the Southern San Joaquin Valley Information Center (SSJVIC) on October 4, 2018. The CHRIS search dated October 15, 2018, indicated that there are two (2) recorded resources within the project area (site) or ½ mile radius. These resources consist of an historic era railroad and a junction box. The CHRIS search also indicated that there are no recorded cultural resources within the project area. The SSJVIC does not recommended any further cultural resource investigation at this time. As such, the County is requesting consultation with your Tribe to determine whether a Cultural Resources Study will be required. The results of the CHRIS search may be made available to your Tribal Representatives if a written request for consultation is received. Should the County not receive a response to this request within thirty (30) days of receipt of this letter, it will be presumed that there are no cultural resources of concern and a Cultural Resources Study will not be required.

If your Tribe desires to consult with the County on the review of this project, please respond in writing within thirty (30) days of receipt of this letter. Written correspondence can be mailed to the address provided above or e-mailed to the addresses provided below.

**If the County does not receive a response to this notification, it will be presumed that your Tribe has declined the opportunity to consult on this project pursuant to AB 52 and SB 18.**

Thank you for your consideration on this matter and please do not hesitate to contact me by phone or e-mail should you have any questions or need additional information. If you need immediate assistance and I am unavailable, please contact, Hector Guerra, Chief of Environmental Planning, by phone at (559) 624-7121, or by email at [hguerra@co.tulare.ca.us](mailto:hguerra@co.tulare.ca.us).

Sincerely,



Jessica Willis  
Planner IV  
(559) 624-7121  
[JWillis@co.tulare.ca.us](mailto:JWillis@co.tulare.ca.us)

Attachment: Tribal Consultation Notice



# RESOURCE MANAGEMENT AGENCY

5961 SOUTH MOONEY BLVD  
VISALIA, CA 93277  
PHONE (559) 624-7000  
FAX (559) 730-2653

Michael Washam      Economic Development and Planning  
Reed Schenke        Public Works  
Sherman Dix         Fiscal Services

REED SCHENKE, DIRECTOR

MICHAEL WASHAM, ASSOCIATE DIRECTOR

October 25, 2018

Kern Valley Indian Council  
Julie Turner, Secretary  
P.O. Box 1010  
Lake Isabella, CA 93240

RE: Project Notification Pursuant to Assembly Bill (AB) 52 and Senate Bill (SB) 18 for the Ivanhoe Community Plan Update Project (GPA 17-006, PZC 18-008, PZC 18-006, PZC 18-007)

Dear Ms Turner,

Pursuant to the provisions of AB 52 and SB 18, as the lead agency under the California Environmental Quality Act (CEQA), the County of Tulare hereby extends an invitation to consult on the California Environmental Quality Act (CEQA) review of the Ivanhoe Community Plan Update Project in order to assist with identifying and/or preserving and/or mitigating project impacts to Native American cultural places including:

- Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine; and
- Native American historic, cultural, or sacred site that is listed or may be eligible for listing in the California Register of Historical Resources including historic or prehistoric ruins and any burial ground, archaeological, or historic site.

In accordance with the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.), the County of Tulare Resource Management Agency (RMA) will be preparing a Mitigated Negative Declaration (MND) to evaluate the environmental effects associated with the Project.

## **Sacred Lands File Search**

The County requested a Sacred Lands File (SLF) search through the Native American Heritage Commission (NAHC) on October 4, 2018, for the Cutler-Orosi Community Plan Update Project. The SLF search returned on October 11, 2018, with negative results; however, the NAHC recommended consultation with your Tribe. Results of the SLF search will be made available upon the release of the MND for public review. However, results may be made available to your Tribal Representatives if a written request for consultation is submitted to the County within thirty (30) days of receipt of this letter.

## **California Historical Resources Information System**

A California Historical Resources Information System (CHRIS) search for the project area was requested through the Southern San Joaquin Valley Information Center (SSJVIC) on October 4, 2018. The CHRIS search dated October 15, 2018, indicated that there are two (2) recorded resources within the project area (site) or ½ mile radius. These resources consist of an historic era railroad and a junction box. The CHRIS search also indicated that there are no recorded cultural resources within the project area. The SSJVIC does not recommended any further cultural resource investigation at this time. As such, the County is requesting consultation with your Tribe to determine whether a Cultural Resources Study will be required. The results of the CHRIS search may be made available to your Tribal Representatives if a written request for consultation is received. Should the County not receive a response to this request within thirty (30) days of receipt of this letter, it will be presumed that there are no cultural resources of concern and a Cultural Resources Study will not be required.

If your Tribe desires to consult with the County on the review of this project, please respond in writing within thirty (30) days of receipt of this letter. Written correspondence can be mailed to the address provided above or e-mailed to the addresses provided below.

**If the County does not receive a response to this notification, it will be presumed that your Tribe has declined the opportunity to consult on this project pursuant to AB 52 and SB 18.**

Thank you for your consideration on this matter and please do not hesitate to contact me by phone or e-mail should you have any questions or need additional information. If you need immediate assistance and I am unavailable, please contact, Hector Guerra, Chief of Environmental Planning, by phone at (559) 624-7121, or by email at [hguerra@co.tulare.ca.us](mailto:hguerra@co.tulare.ca.us).

Sincerely,



Jessica Willis  
Planner IV  
(559) 624-7121  
[JWillis@co.tulare.ca.us](mailto:JWillis@co.tulare.ca.us)

Attachment: Tribal Consultation Notice



# RESOURCE MANAGEMENT AGENCY

5961 SOUTH MOONEY BLVD

VISALIA, CA 93277

PHONE (559) 624-7000

FAX (559) 730-2653

Michael Washam

Reed Schenke

Sherman Dix

Economic Development and Planning

Public Works

Fiscal Services

REED SCHENKE, DIRECTOR

MICHAEL WASHAM, ASSOCIATE DIRECTOR

October 25, 2018

Santa Rosa Rancheria  
Rueben Barrios Sr., Chairperson  
P. O. Box 8  
Lemoore, CA 93245

RE: Project Notification Pursuant to Assembly Bill (AB) 52 and Senate Bill (SB) 18 for the Ivanhoe Community Plan Update Project (GPA 17-006, PZC 18-008, PZC 18-006, PZC 18-007)

Dear Chairperson Barrios,

Pursuant to the provisions of AB 52 and SB 18, as the lead agency under the California Environmental Quality Act (CEQA), the County of Tulare hereby extends an invitation to consult on the California Environmental Quality Act (CEQA) review of the Ivanhoe Community Plan Update Project in order to assist with identifying and/or preserving and/or mitigating project impacts to Native American cultural places including:

- Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine; and
- Native American historic, cultural, or sacred site that is listed or may be eligible for listing in the California Register of Historical Resources including historic or prehistoric ruins and any burial ground, archaeological, or historic site.

In accordance with the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.), the County of Tulare Resource Management Agency (RMA) will be preparing a Mitigated Negative Declaration (MND) to evaluate the environmental effects associated with the Project.

## **Sacred Lands File Search**

The County requested a Sacred Lands File (SLF) search through the Native American Heritage Commission (NAHC) on October 4, 2018, for the Cutler-Orosi Community Plan Update Project. The SLF search returned on October 11, 2018, with negative results; however, the NAHC recommended consultation with your Tribe. Results of the SLF search will be made available upon the release of the MND for public review. However, results may be made available to your Tribal Representatives if a written request for consultation is submitted to the County within thirty (30) days of receipt of this letter.

## **California Historical Resources Information System**

A California Historical Resources Information System (CHRIS) search for the project area was requested through the Southern San Joaquin Valley Information Center (SSJVIC) on October 4, 2018. The CHRIS search dated October 15, 2018, indicated that there are two (2) recorded resources within the project area (site) or ½ mile radius. These resources consist of an historic era railroad and a junction box. The CHRIS search also indicated that there are no recorded cultural resources within the project area. The SSJVIC does not recommend any further cultural resource investigation at this time. As such, the County is requesting consultation with your Tribe to determine whether a Cultural Resources Study will be required. The results of the CHRIS search may be made available to your Tribal Representatives if a written request for consultation is received. Should the County not receive a response to this request within thirty (30) days of receipt of this letter, it will be presumed that there are no cultural resources of concern and a Cultural Resources Study will not be required.

If your Tribe desires to consult with the County on the review of this project, please respond in writing within thirty (30) days of receipt of this letter. Written correspondence can be mailed to the address provided above or e-mailed to the addresses provided below.

**If the County does not receive a response to this notification, it will be presumed that your Tribe has declined the opportunity to consult on this project pursuant to AB 52 and SB 18.**

Thank you for your consideration on this matter and please do not hesitate to contact me by phone or e-mail should you have any questions or need additional information. If you need immediate assistance and I am unavailable, please contact, Hector Guerra, Chief of Environmental Planning, by phone at (559) 624-7121, or by email at [hguerra@co.tulare.ca.us](mailto:hguerra@co.tulare.ca.us).

Sincerely,



Jessica Willis  
Planner IV  
(559) 624-7121  
[JWillis@co.tulare.ca.us](mailto:JWillis@co.tulare.ca.us)

Attachment: Tribal Consultation Notice



# RESOURCE MANAGEMENT AGENCY

5961 SOUTH MOONEY BLVD

VISALIA, CA 93277

PHONE (559) 624-7000

FAX (559) 730-2653

Michael Washam

Reed Schenke

Sherman Dix

Economic Development and Planning

Public Works

Fiscal Services

REED SCHENKE, DIRECTOR

MICHAEL WASHAM, ASSOCIATE DIRECTOR

October 25, 2018

Santa Rosa Rancheria Tachi Yokut Tribe  
Cultural Department  
Greg Cuara, Cultural Specialist  
P. O. Box 8  
Lemoore, CA 93245

RE: Project Notification Pursuant to Assembly Bill (AB) 52 and Senate Bill (SB) 18 for the Ivanhoe Community Plan Update Project (GPA 17-006, PZC 18-008, PZC 18-006, PZC 18-007)

Dear Mr. Cuara,

Pursuant to the provisions of AB 52 and SB 18, as the lead agency under the California Environmental Quality Act (CEQA), the County of Tulare hereby extends an invitation to consult on the California Environmental Quality Act (CEQA) review of the Ivanhoe Community Plan Update Project in order to assist with identifying and/or preserving and/or mitigating project impacts to Native American cultural places including:

- Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine; and
- Native American historic, cultural, or sacred site that is listed or may be eligible for listing in the California Register of Historical Resources including historic or prehistoric ruins and any burial ground, archaeological, or historic site.

In accordance with the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.), the County of Tulare Resource Management Agency (RMA) will be preparing a Mitigated Negative Declaration (MND) to evaluate the environmental effects associated with the Project.

## **Sacred Lands File Search**

The County requested a Sacred Lands File (SLF) search through the Native American Heritage Commission (NAHC) on October 4, 2018, for the Cutler-Orosi Community Plan Update Project. The SLF search returned on October 11, 2018, with negative results; however, the NAHC recommended consultation with your Tribe. Results of the SLF search will be made available upon the release of the MND for public review. However, results may be made available to your Tribal Representatives if a written request for consultation is submitted to the County within thirty (30) days of receipt of this letter.

## **California Historical Resources Information System**

A California Historical Resources Information System (CHRIS) search for the project area was requested through the Southern San Joaquin Valley Information Center (SSJVIC) on October 4, 2018. The CHRIS search dated October 15, 2018, indicated that there are two (2) recorded resources within the project area (site) or ½ mile radius. These resources consist of an historic era railroad and a junction box. The CHRIS search also indicated that there are no recorded cultural resources within the project area. The SSJVIC does not recommended any further cultural resource investigation at this time. As such, the County is requesting consultation with your Tribe to determine whether a Cultural Resources Study will be required. The results of the CHRIS search may be made available to your Tribal Representatives if a written request for consultation is received. Should the County not receive a response to this request within thirty (30) days of receipt of this letter, it will be presumed that there are no cultural resources of concern and a Cultural Resources Study will not be required.

If your Tribe desires to consult with the County on the review of this project, please respond in writing within thirty (30) days of receipt of this letter. Written correspondence can be mailed to the address provided above or e-mailed to the addresses provided below.

**If the County does not receive a response to this notification, it will be presumed that your Tribe has declined the opportunity to consult on this project pursuant to AB 52 and SB 18.**

Thank you for your consideration on this matter and please do not hesitate to contact me by phone or e-mail should you have any questions or need additional information. If you need immediate assistance and I am unavailable, please contact, Hector Guerra, Chief of Environmental Planning, by phone at (559) 624-7121, or by email at [hguerra@co.tulare.ca.us](mailto:hguerra@co.tulare.ca.us).

Sincerely,



Jessica Willis  
Planner IV  
(559) 624-7121  
[JWillis@co.tulare.ca.us](mailto:JWillis@co.tulare.ca.us)

Attachment: Tribal Consultation Notice



# RESOURCE MANAGEMENT AGENCY

5961 SOUTH MOONEY BLVD  
VISALIA, CA 93277  
PHONE (559) 624-7000  
FAX (559) 730-2653

Michael Washam      Economic Development and Planning  
Reed Schenke        Public Works  
Sherman Dix         Fiscal Services

REED SCHENKE, DIRECTOR

MICHAEL WASHAM, ASSOCIATE DIRECTOR

October 25, 2018

Santa Rosa Rancheria  
Shana Powers, Director  
P. O. Box 8  
Lemoore, CA 93245

RE: Project Notification Pursuant to Assembly Bill (AB) 52 and Senate Bill (SB) 18 for the Ivanhoe Community Plan Update Project (GPA 17-006, PZC 18-008, PZC 18-006, PZC 18-007)

Dear Ms. Powers,

Pursuant to the provisions of AB 52 and SB 18, as the lead agency under the California Environmental Quality Act (CEQA), the County of Tulare hereby extends an invitation to consult on the California Environmental Quality Act (CEQA) review of the Ivanhoe Community Plan Update Project in order to assist with identifying and/or preserving and/or mitigating project impacts to Native American cultural places including:

- Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine; and
- Native American historic, cultural, or sacred site that is listed or may be eligible for listing in the California Register of Historical Resources including historic or prehistoric ruins and any burial ground, archaeological, or historic site.

In accordance with the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.), the County of Tulare Resource Management Agency (RMA) will be preparing a Mitigated Negative Declaration (MND) to evaluate the environmental effects associated with the Project.

## **Sacred Lands File Search**

The County requested a Sacred Lands File (SLF) search through the Native American Heritage Commission (NAHC) on October 4, 2018, for the Cutler-Orosi Community Plan Update Project. The SLF search returned on October 11, 2018, with negative results; however, the NAHC recommended consultation with your Tribe. Results of the SLF search will be made available upon the release of the MND for public review. However, results may be made available to your Tribal Representatives if a written request for consultation is submitted to the County within thirty (30) days of receipt of this letter.

## **California Historical Resources Information System**

A California Historical Resources Information System (CHRIS) search for the project area was requested through the Southern San Joaquin Valley Information Center (SSJVIC) on October 4, 2018. The CHRIS search dated October 15, 2018, indicated that there are two (2) recorded resources within the project area (site) or ½ mile radius. These resources consist of an historic era railroad and a junction box. The CHRIS search also indicated that there are no recorded cultural resources within the project area. The SSJVIC does not recommend any further cultural resource investigation at this time. As such, the County is requesting consultation with your Tribe to determine whether a Cultural Resources Study will be required. The results of the CHRIS search may be made available to your Tribal Representatives if a written request for consultation is received. Should the County not receive a response to this request within thirty (30) days of receipt of this letter, it will be presumed that there are no cultural resources of concern and a Cultural Resources Study will not be required.

If your Tribe desires to consult with the County on the review of this project, please respond in writing within thirty (30) days of receipt of this letter. Written correspondence can be mailed to the address provided above or e-mailed to the addresses provided below.

**If the County does not receive a response to this notification, it will be presumed that your Tribe has declined the opportunity to consult on this project pursuant to AB 52 and SB 18.**

Thank you for your consideration on this matter and please do not hesitate to contact me by phone or e-mail should you have any questions or need additional information. If you need immediate assistance and I am unavailable, please contact, Hector Guerra, Chief of Environmental Planning, by phone at (559) 624-7121, or by email at [hguerra@co.tulare.ca.us](mailto:hguerra@co.tulare.ca.us).

Sincerely,



Jessica Willis  
Planner IV  
(559) 624-7121  
[JWillis@co.tulare.ca.us](mailto:JWillis@co.tulare.ca.us)

Attachment: Tribal Consultation Notice



# RESOURCE MANAGEMENT AGENCY

5961 SOUTH MOONEY BLVD

VISALIA, CA 93277

PHONE (559) 624-7000

FAX (559) 730-2653

Michael Washam

Reed Schenke

Sherman Dix

Economic Development and Planning

Public Works

Fiscal Services

REED SCHENKE, DIRECTOR

MICHAEL WASHAM, ASSOCIATE DIRECTOR

October 25, 2018

Torres Martinez Desert Cahuilla Indians  
Michael Mirelez, Cultural Resource Coordinator  
P. O. Box 1160  
Thermal, CA 92274

RE: Project Notification Pursuant to Assembly Bill (AB) 52 and Senate Bill (SB) 18 for the Ivanhoe Community Plan Update Project (GPA 17-006, PZC 18-008, PZC 18-006, PZC 18-007)

Dear Mr. Mirelez,

Pursuant to the provisions of AB 52 and SB 18, as the lead agency under the California Environmental Quality Act (CEQA), the County of Tulare hereby extends an invitation to consult on the California Environmental Quality Act (CEQA) review of the Ivanhoe Community Plan Update Project in order to assist with identifying and/or preserving and/or mitigating project impacts to Native American cultural places including:

- Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine; and
- Native American historic, cultural, or sacred site that is listed or may be eligible for listing in the California Register of Historical Resources including historic or prehistoric ruins and any burial ground, archaeological, or historic site.

In accordance with the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.), the County of Tulare Resource Management Agency (RMA) will be preparing a Mitigated Negative Declaration (MND) to evaluate the environmental effects associated with the Project.

## **Sacred Lands File Search**

The County requested a Sacred Lands File (SLF) search through the Native American Heritage Commission (NAHC) on October 4, 2018, for the Cutler-Orosi Community Plan Update Project. The SLF search returned on October 11, 2018, with negative results; however, the NAHC recommended consultation with your Tribe. Results of the SLF search will be made available upon the release of the MND for public review. However, results may be made available to your Tribal Representatives if a written request for consultation is submitted to the County within thirty (30) days of receipt of this letter.

## **California Historical Resources Information System**

A California Historical Resources Information System (CHRIS) search for the project area was requested through the Southern San Joaquin Valley Information Center (SSJVIC) on October 4, 2018. The CHRIS search dated October 15, 2018, indicated that there are two (2) recorded resources within the project area (site) or ½ mile radius. These resources consist of an historic era railroad and a junction box. The CHRIS search also indicated that there are no recorded cultural resources within the project area. The SSJVIC does not recommended any further cultural resource investigation at this time. As such, the County is requesting consultation with your Tribe to determine whether a Cultural Resources Study will be required. The results of the CHRIS search may be made available to your Tribal Representatives if a written request for consultation is received. Should the County not receive a response to this request within thirty (30) days of receipt of this letter, it will be presumed that there are no cultural resources of concern and a Cultural Resources Study will not be required.

If your Tribe desires to consult with the County on the review of this project, please respond in writing within thirty (30) days of receipt of this letter. Written correspondence can be mailed to the address provided above or e-mailed to the addresses provided below.

**If the County does not receive a response to this notification, it will be presumed that your Tribe has declined the opportunity to consult on this project pursuant to AB 52 and SB 18.**

Thank you for your consideration on this matter and please do not hesitate to contact me by phone or e-mail should you have any questions or need additional information. If you need immediate assistance and I am unavailable, please contact, Hector Guerra, Chief of Environmental Planning, by phone at (559) 624-7121, or by email at [hguerra@co.tulare.ca.us](mailto:hguerra@co.tulare.ca.us).

Sincerely,



Jessica Willis  
Planner IV  
(559) 624-7121  
[JWillis@co.tulare.ca.us](mailto:JWillis@co.tulare.ca.us)

Attachment: Tribal Consultation Notice



# RESOURCE MANAGEMENT AGENCY

5961 SOUTH MOONEY BLVD

VISALIA, CA 93277

PHONE (559) 624-7000

FAX (559) 730-2653

Michael Washam

Reed Schenke

Sherman Dix

Economic Development and Planning

Public Works

Fiscal Services

REED SCHENKE, DIRECTOR

MICHAEL WASHAM, ASSOCIATE DIRECTOR

October 25, 2018

Tubatulabals of Kern Valley  
Robert L. Gomez, Jr., Chairperson  
P. O. Box 226  
Lake Isabella, CA 93240

RE: Project Notification Pursuant to Assembly Bill (AB) 52 and Senate Bill (SB) 18 for the Ivanhoe Community Plan Update Project (GPA 17-006, PZC 18-008, PZC 18-006, PZC 18-007)

Dear Chairperson Gomez,

Pursuant to the provisions of AB 52 and SB 18, as the lead agency under the California Environmental Quality Act (CEQA), the County of Tulare hereby extends an invitation to consult on the California Environmental Quality Act (CEQA) review of the Ivanhoe Community Plan Update Project in order to assist with identifying and/or preserving and/or mitigating project impacts to Native American cultural places including:

- Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine; and
- Native American historic, cultural, or sacred site that is listed or may be eligible for listing in the California Register of Historical Resources including historic or prehistoric ruins and any burial ground, archaeological, or historic site.

In accordance with the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.), the County of Tulare Resource Management Agency (RMA) will be preparing a Mitigated Negative Declaration (MND) to evaluate the environmental effects associated with the Project.

## **Sacred Lands File Search**

The County requested a Sacred Lands File (SLF) search through the Native American Heritage Commission (NAHC) on October 4, 2018, for the Cutler-Orosi Community Plan Update Project. The SLF search returned on October 11, 2018, with negative results; however, the NAHC recommended consultation with your Tribe. Results of the SLF search will be made available upon the release of the MND for public review. However, results may be made available to your Tribal Representatives if a written request for consultation is submitted to the County within thirty (30) days of receipt of this letter.

## **California Historical Resources Information System**

A California Historical Resources Information System (CHRIS) search for the project area was requested through the Southern San Joaquin Valley Information Center (SSJVIC) on October 4, 2018. The CHRIS search dated October 15, 2018, indicated that there are two (2) recorded resources within the project area (site) or ½ mile radius. These resources consist of an historic era railroad and a junction box. The CHRIS search also indicated that there are no recorded cultural resources within the project area. The SSJVIC does not recommended any further cultural resource investigation at this time. As such, the County is requesting consultation with your Tribe to determine whether a Cultural Resources Study will be required. The results of the CHRIS search may be made available to your Tribal Representatives if a written request for consultation is received. Should the County not receive a response to this request within thirty (30) days of receipt of this letter, it will be presumed that there are no cultural resources of concern and a Cultural Resources Study will not be required.

If your Tribe desires to consult with the County on the review of this project, please respond in writing within thirty (30) days of receipt of this letter. Written correspondence can be mailed to the address provided above or e-mailed to the addresses provided below.

**If the County does not receive a response to this notification, it will be presumed that your Tribe has declined the opportunity to consult on this project pursuant to AB 52 and SB 18.**

Thank you for your consideration on this matter and please do not hesitate to contact me by phone or e-mail should you have any questions or need additional information. If you need immediate assistance and I am unavailable, please contact, Hector Guerra, Chief of Environmental Planning, by phone at (559) 624-7121, or by email at [hguerra@co.tulare.ca.us](mailto:hguerra@co.tulare.ca.us).

Sincerely,



Jessica Willis  
Planner IV  
(559) 624-7121  
[JWillis@co.tulare.ca.us](mailto:JWillis@co.tulare.ca.us)

Attachment: Tribal Consultation Notice



# RESOURCE MANAGEMENT AGENCY

5961 SOUTH MOONEY BLVD

VISALIA, CA 93277

PHONE (559) 624-7000

FAX (559) 730-2653

Michael Washam

Reed Schenke

Sherman Dix

Economic Development and Planning

Public Works

Fiscal Services

REED SCHENKE, DIRECTOR

MICHAEL WASHAM, ASSOCIATE DIRECTOR

October 25, 2018

Tule River Indian Tribe  
Neil Peyron, Chairperson  
P. O. Box 589  
Porterville, CA 93258

RE: Project Notification Pursuant to Assembly Bill (AB) 52 and Senate Bill (SB) 18 for the Ivanhoe Community Plan Update Project (GPA 17-006, PZC 18-008, PZC 18-006, PZC 18-007)

Dear Chairperson Peyron,

Pursuant to the provisions of AB 52 and SB 18, as the lead agency under the California Environmental Quality Act (CEQA), the County of Tulare hereby extends an invitation to consult on the California Environmental Quality Act (CEQA) review of the Ivanhoe Community Plan Update Project in order to assist with identifying and/or preserving and/or mitigating project impacts to Native American cultural places including:

- Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine; and
- Native American historic, cultural, or sacred site that is listed or may be eligible for listing in the California Register of Historical Resources including historic or prehistoric ruins and any burial ground, archaeological, or historic site.

In accordance with the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.), the County of Tulare Resource Management Agency (RMA) will be preparing a Mitigated Negative Declaration (MND) to evaluate the environmental effects associated with the Project.

## **Sacred Lands File Search**

The County requested a Sacred Lands File (SLF) search through the Native American Heritage Commission (NAHC) on October 4, 2018, for the Cutler-Orosi Community Plan Update Project. The SLF search returned on October 11, 2018, with negative results; however, the NAHC recommended consultation with your Tribe. Results of the SLF search will be made available upon the release of the MND for public review. However, results may be made available to your Tribal Representatives if a written request for consultation is submitted to the County within thirty (30) days of receipt of this letter.

## **California Historical Resources Information System**

A California Historical Resources Information System (CHRIS) search for the project area was requested through the Southern San Joaquin Valley Information Center (SSJVIC) on October 4, 2018. The CHRIS search dated October 15, 2018, indicated that there are two (2) recorded resources within the project area (site) or ½ mile radius. These resources consist of an historic era railroad and a junction box. The CHRIS search also indicated that there are no recorded cultural resources within the project area. The SSJVIC does not recommended any further cultural resource investigation at this time. As such, the County is requesting consultation with your Tribe to determine whether a Cultural Resources Study will be required. The results of the CHRIS search may be made available to your Tribal Representatives if a written request for consultation is received. Should the County not receive a response to this request within thirty (30) days of receipt of this letter, it will be presumed that there are no cultural resources of concern and a Cultural Resources Study will not be required.

If your Tribe desires to consult with the County on the review of this project, please respond in writing within thirty (30) days of receipt of this letter. Written correspondence can be mailed to the address provided above or e-mailed to the addresses provided below.

**If the County does not receive a response to this notification, it will be presumed that your Tribe has declined the opportunity to consult on this project pursuant to AB 52 and SB 18.**

Thank you for your consideration on this matter and please do not hesitate to contact me by phone or e-mail should you have any questions or need additional information. If you need immediate assistance and I am unavailable, please contact, Hector Guerra, Chief of Environmental Planning, by phone at (559) 624-7121, or by email at [hguerra@co.tulare.ca.us](mailto:hguerra@co.tulare.ca.us).

Sincerely,



Jessica Willis  
Planner IV  
(559) 624-7121  
[JWillis@co.tulare.ca.us](mailto:JWillis@co.tulare.ca.us)

Attachment: Tribal Consultation Notice



# RESOURCE MANAGEMENT AGENCY

5961 SOUTH MOONEY BLVD  
VISALIA, CA 93277  
PHONE (559) 624-7000  
FAX (559) 730-2653

Michael Washam      Economic Development and Planning  
Reed Schenke        Public Works  
Sherman Dix         Fiscal Services

REED SCHENKE, DIRECTOR

MICHAEL WASHAM, ASSOCIATE DIRECTOR

October 25, 2018

Tule River Indian Tribe  
Tribal Archaeological Department  
Felix Chrisman, Tribal Archaeologist  
P. O. Box 589  
Porterville, CA 93258

RE: Project Notification Pursuant to Assembly Bill (AB) 52 and Senate Bill (SB) 18 for the Ivanhoe Community Plan Update Project (GPA 17-006, PZC 18-008, PZC 18-006, PZC 18-007)

Dear Mr. Chrisman,

Pursuant to the provisions of AB 52 and SB 18, as the lead agency under the California Environmental Quality Act (CEQA), the County of Tulare hereby extends an invitation to consult on the California Environmental Quality Act (CEQA) review of the Ivanhoe Community Plan Update Project in order to assist with identifying and/or preserving and/or mitigating project impacts to Native American cultural places including:

- Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine; and
- Native American historic, cultural, or sacred site that is listed or may be eligible for listing in the California Register of Historical Resources including historic or prehistoric ruins and any burial ground, archaeological, or historic site.

In accordance with the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.), the County of Tulare Resource Management Agency (RMA) will be preparing a Mitigated Negative Declaration (MND) to evaluate the environmental effects associated with the Project.

## **Sacred Lands File Search**

The County requested a Sacred Lands File (SLF) search through the Native American Heritage Commission (NAHC) on October 4, 2018, for the Cutler-Orosi Community Plan Update Project. The SLF search returned on October 11, 2018, with negative results; however, the NAHC recommended consultation with your Tribe. Results of the SLF search will be made available upon the release of the MND for public review. However, results may be made available to your Tribal Representatives if a written request for consultation is submitted to the County within thirty (30) days of receipt of this letter.

## California Historical Resources Information System

A California Historical Resources Information System (CHRIS) search for the project area was requested through the Southern San Joaquin Valley Information Center (SSJVIC) on October 4, 2018. The CHRIS search dated October 15, 2018, indicated that there are two (2) recorded resources within the project area (site) or ½ mile radius. These resources consist of an historic era railroad and a junction box. The CHRIS search also indicated that there are no recorded cultural resources within the project area. The SSJVIC does not recommended any further cultural resource investigation at this time. As such, the County is requesting consultation with your Tribe to determine whether a Cultural Resources Study will be required. The results of the CHRIS search may be made available to your Tribal Representatives if a written request for consultation is received. Should the County not receive a response to this request within thirty (30) days of receipt of this letter, it will be presumed that there are no cultural resources of concern and a Cultural Resources Study will not be required.

If your Tribe desires to consult with the County on the review of this project, please respond in writing within thirty (30) days of receipt of this letter. Written correspondence can be mailed to the address provided above or e-mailed to the addresses provided below.

**If the County does not receive a response to this notification, it will be presumed that your Tribe has declined the opportunity to consult on this project pursuant to AB 52 and SB 18.**

Thank you for your consideration on this matter and please do not hesitate to contact me by phone or e-mail should you have any questions or need additional information. If you need immediate assistance and I am unavailable, please contact, Hector Guerra, Chief of Environmental Planning, by phone at (559) 624-7121, or by email at [hguerra@co.tulare.ca.us](mailto:hguerra@co.tulare.ca.us).

Sincerely,



Jessica Willis  
Planner IV  
(559) 624-7121  
[JWillis@co.tulare.ca.us](mailto:JWillis@co.tulare.ca.us)

Attachment: Tribal Consultation Notice



# RESOURCE MANAGEMENT AGENCY

5961 SOUTH MOONEY BLVD  
VISALIA, CA 93277  
PHONE (559) 624-7000  
FAX (559) 730-2653

Michael Washam      Economic Development and Planning  
Reed Schenke        Public Works  
Sherman Dix         Fiscal Services

REED SCHENKE, DIRECTOR

MICHAEL WASHAM, ASSOCIATE DIRECTOR

October 25, 2018

Tule River Indian Tribe  
Environmental Department  
Kerri Vera, Director  
P. O. Box 589  
Porterville, CA 93258

RE: Project Notification Pursuant to Assembly Bill (AB) 52 and Senate Bill (SB) 18 for the Ivanhoe Community Plan Update Project (GPA 17-006, PZC 18-008, PZC 18-006, PZC 18-007)

Dear Ms. Vera,

Pursuant to the provisions of AB 52 and SB 18, as the lead agency under the California Environmental Quality Act (CEQA), the County of Tulare hereby extends an invitation to consult on the California Environmental Quality Act (CEQA) review of the Ivanhoe Community Plan Update Project in order to assist with identifying and/or preserving and/or mitigating project impacts to Native American cultural places including:

- Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine; and
- Native American historic, cultural, or sacred site that is listed or may be eligible for listing in the California Register of Historical Resources including historic or prehistoric ruins and any burial ground, archaeological, or historic site.

In accordance with the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.), the County of Tulare Resource Management Agency (RMA) will be preparing a Mitigated Negative Declaration (MND) to evaluate the environmental effects associated with the Project.

## **Sacred Lands File Search**

The County requested a Sacred Lands File (SLF) search through the Native American Heritage Commission (NAHC) on October 4, 2018, for the Cutler-Orosi Community Plan Update Project. The SLF search returned on October 11, 2018, with negative results; however, the NAHC recommended consultation with your Tribe. Results of the SLF search will be made available upon the release of the MND for public review. However, results may be made available to your Tribal Representatives if a written request for consultation is submitted to the County within thirty (30) days of receipt of this letter.

## **California Historical Resources Information System**

A California Historical Resources Information System (CHRIS) search for the project area was requested through the Southern San Joaquin Valley Information Center (SSJVIC) on October 4, 2018. The CHRIS search dated October 15, 2018, indicated that there are two (2) recorded resources within the project area (site) or ½ mile radius. These resources consist of an historic era railroad and a junction box. The CHRIS search also indicated that there are no recorded cultural resources within the project area. The SSJVIC does not recommended any further cultural resource investigation at this time. As such, the County is requesting consultation with your Tribe to determine whether a Cultural Resources Study will be required. The results of the CHRIS search may be made available to your Tribal Representatives if a written request for consultation is received. Should the County not receive a response to this request within thirty (30) days of receipt of this letter, it will be presumed that there are no cultural resources of concern and a Cultural Resources Study will not be required.

If your Tribe desires to consult with the County on the review of this project, please respond in writing within thirty (30) days of receipt of this letter. Written correspondence can be mailed to the address provided above or e-mailed to the addresses provided below.

**If the County does not receive a response to this notification, it will be presumed that your Tribe has declined the opportunity to consult on this project pursuant to AB 52 and SB 18.**

Thank you for your consideration on this matter and please do not hesitate to contact me by phone or e-mail should you have any questions or need additional information. If you need immediate assistance and I am unavailable, please contact, Hector Guerra, Chief of Environmental Planning, by phone at (559) 624-7121, or by email at [hguerra@co.tulare.ca.us](mailto:hguerra@co.tulare.ca.us).

Sincerely,



Jessica Willis  
Planner IV  
(559) 624-7121  
[JWillis@co.tulare.ca.us](mailto:JWillis@co.tulare.ca.us)

Attachment: Tribal Consultation Notice



# RESOURCE MANAGEMENT AGENCY

5961 SOUTH MOONEY BLVD  
VISALIA, CA 93277  
PHONE (559) 624-7000  
FAX (559) 730-2653

Michael Washam      Economic Development and Planning  
Reed Schenke        Public Works  
Sherman Dix         Fiscal Services

REED SCHENKE, DIRECTOR

MICHAEL WASHAM, ASSOCIATE DIRECTOR

October 25, 2018

Wuksache Indian Tribe/Eshom Valley Band  
Kenneth Woodrow, Chairperson  
1179 Rock Haven Ct.  
Salinas, CA 93906

RE: Project Notification Pursuant to Assembly Bill (AB) 52 and Senate Bill (SB) 18 for the Ivanhoe Community Plan Update Project (GPA 17-006, PZC 18-008, PZC 18-006, PZC 18-007)

Dear Chairperson Woodrow,

Pursuant to the provisions of AB 52 and SB 18, as the lead agency under the California Environmental Quality Act (CEQA), the County of Tulare hereby extends an invitation to consult on the California Environmental Quality Act (CEQA) review of the Ivanhoe Community Plan Project in order to assist with identifying and/or preserving and/or mitigating project impacts to Native American cultural places including:

- Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine; and
- Native American historic, cultural, or sacred site that is listed or may be eligible for listing in the California Register of Historical Resources including historic or prehistoric ruins and any burial ground, archaeological, or historic site.

In accordance with the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.), the County of Tulare Resource Management Agency (RMA) will be preparing a Mitigated Negative Declaration (MND) to evaluate the environmental effects associated with the Project.

## **Sacred Lands File Search**

The County requested a Sacred Lands File (SLF) search through the Native American Heritage Commission (NAHC) on October 4, 2018, for the Cutler-Orosi Community Plan Update Project. The SLF search returned on October 11, 2018, with negative results; however, the NAHC recommended consultation with your Tribe. Results of the SLF search will be made available upon the release of the MND for public review. However, results may be made available to your Tribal Representatives if a written request for consultation is submitted to the County within thirty (30) days of receipt of this letter.

## California Historical Resources Information System

A California Historical Resources Information System (CHRIS) search for the project area was requested through the Southern San Joaquin Valley Information Center (SSJVIC) on October 4, 2018. The CHRIS search dated October 15, 2018, indicated that there are two (2) recorded resources within the project area (site) or ½ mile radius. These resources consist of an historic era railroad and a junction box. The CHRIS search also indicated that there are no recorded cultural resources within the project area. The SSJVIC does not recommended any further cultural resource investigation at this time. As such, the County is requesting consultation with your Tribe to determine whether a Cultural Resources Study will be required. The results of the CHRIS search may be made available to your Tribal Representatives if a written request for consultation is received. Should the County not receive a response to this request within thirty (30) days of receipt of this letter, it will be presumed that there are no cultural resources of concern and a Cultural Resources Study will not be required.

If your Tribe desires to consult with the County on the review of this project, please respond in writing within thirty (30) days of receipt of this letter. Written correspondence can be mailed to the address provided above or e-mailed to the addresses provided below.

**If the County does not receive a response to this notification, it will be presumed that your Tribe has declined the opportunity to consult on this project pursuant to AB 52 and SB 18.**

Thank you for your consideration on this matter and please do not hesitate to contact me by phone or e-mail should you have any questions or need additional information. If you need immediate assistance and I am unavailable, please contact, Hector Guerra, Chief of Environmental Planning, by phone at (559) 624-7121, or by email at [hguerra@co.tulare.ca.us](mailto:hguerra@co.tulare.ca.us).

Sincerely,



Jessica Willis  
Planner IV  
(559) 624-7121  
[JWillis@co.tulare.ca.us](mailto:JWillis@co.tulare.ca.us)

Attachment: Tribal Consultation Notice

**From:** Russell Kashiwa  
**To:** rgomez@tubatulabal.org  
**CC:** Guerra, Hector; Willis, Jessica  
**Date:** 3/5/2019 2:26 PM  
**Subject:** Re: Tribal Consultation Request for Cutler-Orosi and Ivanhoe Community Plan Updates  
**Attachments:** Ianhoe\_AB52\_SB18\_Consultation Notice.pdf; Cutler-Orosi\_AB52\_SB18\_Consultation Notice.pdf; Tubatulabals\_Gomez\_Tribal\_Consultation\_Letter\_Initial.docx; Tubatulabals\_Gomez\_Tribal\_Consultation Ivanhoe.docx

Chairman Gomez,

I have been requested to send you these consultation requests. This is the second request as the first was sent to PO Box 226 Lake Isabella, CA on October 26, 2018 as certified mail and both were signed and accepted on November 9th. Please respond within 30 days upon receiving this E-mail. If you have any questions please feel free to reach out to myself or Jessica Willis at: [Jwillis@co.tulare.ca.us](mailto:Jwillis@co.tulare.ca.us) or 559-624-7122.

Thank you,  
Russell Kashiwa  
Planning Technician II  
(559) 624-7110

**From:** Russell Kashiwa  
**To:** mmirelez@tmdci.org  
**CC:** Guerra, Hector; Willis, Jessica  
**Date:** 3/5/2019 2:14 PM  
**Subject:** Tribal Consultation Request for Cutler-Orosi and Ivanhoe Community Plan Updates  
**Attachments:** Torres Martinez\_Mirelez\_Tribal\_Consultation\_Letter\_Initial.docx; Ianhoe\_AB52\_SB18\_Consultation Notice.pdf; Torres Martinez\_Mirelez\_Tribal\_Consultation Cutler-Orosi.docx; Cutler-Orosi\_AB52\_SB18\_Consultation Notice.pdf

Mr. Mirelez,

I have been requested to send you these consultation requests. This is the second request as the first was sent to PO Box 1160 Thermal, CA on October 26, 2018 as certified mail and was signed and accepted on October 30th for the Cutler-Orosi request and October 29th for the Ivanhoe request. Please respond within 30 days upon receiving this E-mail. If you have any questions please feel free to reach out to myself or Jessica Willis at: [Jwillis@co.tulare.ca.us](mailto:Jwillis@co.tulare.ca.us) or 559-624-7122.

Thank you,  
Russell Kashiwa  
Planning Technician II  
(559) 624-7110

# Attachment “D”

---

## Greenhouse Gas Technical Memorandum



# RESOURCE MANAGEMENT AGENCY

5961 SOUTH MOONEY BLVD  
VISALIA, CA 93277  
PHONE (559) 624-7000  
FAX (559) 730-2653

Aaron R. Bock  
Reed Schenke  
Sherman Dix

Economic Development and Planning  
Public Works  
Fiscal Services

---

## TECHNICAL MEMORANDUM GREENHOUSE GAS ASSESSMENT

**DATE:** May 15, 2019

**TO:** Hector Guerra, Chief Environmental Planner

**FROM:** Jessica Willis, Planner IV

**SUBJECT:** Greenhouse Gas Assessment for the Ivanhoe Community Plan Update (GPA 17-006, PZC 18-008, PZC 18-006, PZC 18-007)

---

### PURPOSE AND NEED FOR ASSESSMENT

This document is intended to assist Tulare County Resource Management Agency (RMA) staff in the preparation of the Greenhouse Gas (GHG) component of the Mitigated Negative Declaration (MND) being prepared for the Ivanhoe Community Plan Update (Project). The assessment is intended to provide sufficient detail regarding potential impacts of Project implementation and to identify mitigation measures, if necessary, to reduce potentially significant impacts.

The GHG assessment was prepared to evaluate whether the estimated GHG emissions generated from the implementation of the Project (i.e., future development projects) would cause significant impacts on global climate change. The assessment was conducted within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000, et seq.). The methodology for the GHG assessment follows Air District recommendations for quantification of GHG emissions and evaluation of potential impacts on global climate change as provided in their guidance documents:

- *Guidance for Assessing and Mitigating Air Quality Impacts (GAMAQI)*, adopted March 19, 2015.<sup>1</sup>
- *Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Project under CEQA*, adopted December 17, 2009.<sup>2</sup>

---

<sup>1</sup> Air District. *Guidance for Assessing and Mitigating Air Quality Impacts*. March 19, 2015. [http://www.valleyair.org/transportation/GAMAQI\\_3-19-15.pdf](http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf). Accessed August 15, 2018.

<sup>2</sup> Air District. *Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Project under CEQA*. December 17, 2009. <https://www.valleyair.org/Programs/CCAP/12-17-09/3%20CCAP%20-%20FINAL%20LU%20Guidance%20-%20Dec%2017%202009.pdf>. Accessed August 15, 2018.

## **PROJECT DESCRIPTION**

Ivanhoe is currently designated an Unincorporated Community in the 2030 Tulare County General Plan. The objective of the Ivanhoe Community Plan Update is to develop an updated plan, which can accurately reflect the needs and priorities of the unincorporated community of Ivanhoe. The Land Use and Circulation portions of this Plan provide the mechanism to minimize or avoid the potential adverse impacts of urban growth. The development of an orderly, harmonious land use pattern and appropriate implementation measures are designed to reduce potential conflict between neighboring uses across Tulare County's 2030 planning horizon, consistent with the Tulare County 2030 General Plan Update. The Plan is needed to increase the availability of infrastructure funding, such as drinking water system improvements (wells, water distribution piping, storage tanks, etc.), wastewater system (such as piping, lift stations, etc.), and public work/safety improvements (such as curbs, gutters, sidewalks, etc.), and to stimulate economic development within the community.

Tulare County is proposing new land use and zoning designations within an expanded UDB. The proposed Community Plan Update, if adopted, will update these designations to be consistent with the General Plan, and will bring existing non-compliant properties into conformity with the Tulare County Zoning Ordinance. The Community Plan Update also includes the Complete Streets and Road Maintenance programs and the community's anticipated growth through year 2030 based on the existing land uses, census population data, and the projected 1.3% annual growth rate in unincorporated areas of Tulare County. Other than the Complete Streets and Road Maintenance Programs, there are no specific development projects (such as residential, commercial, or industrial uses) proposed as part of this project. As an unknown number of proposals may occur within the lifetime of the Community Plan Update, the Community Plan is intended to direct the density, intensity, and types of growth needed to meet the needs of the community. Future developments within the Project planning area will be required to undergo additional CEQA evaluation on a project-by-project basis at such time development is proposed to determine potential environmental impacts.

### **Complete Streets and Road Maintenance.**

The Ivanhoe Complete Streets and Road Maintenance Programs are included in the Circulation Element of the proposed Community Plan Update. The Complete Streets Program has thoroughly analyzed the alternative forms of transportation, including transit, bicycle ways, and pedestrian circulation. Improvements proposed in the Complete Streets Program include, but are not limited to, installation of streetlights, bus shelters, street signage and striping, curbs, gutters, sidewalks, drainage system, and utilities. Road maintenance activities vary by road segment dependent upon the condition of the road and may include chip seal, overlay resurfacing, and asphalt reconstructions.

### **Growth Projections.**

Population and residential unit growth through planning horizon year 2030 was estimated by applying a 1.3% annual growth rate (consistent with the Tulare County 2030 General Plan) to the 2017 baseline population as provided in the United States Census Bureau 2017 American

Community Survey (ACS) data.<sup>3</sup> **Table 1** summarizes the projected growth of the community through horizon Year 2030.

| <b>Table 1. Projected Growth through Year 2030</b> |                          |                |  |       |                         |       |
|--|--------------------------|----------------|--|-------|-------------------------|-------|
|  | Residential <sup>1</sup> |                | Commercial / Retail / Other <sup>2</sup> |       | Industrial <sup>2</sup> |       |
| Year   | Population               | Dwelling Units | Square Feet                              | Acres | Square Feet             | Acres |
| 2017   | 3,804                    | 1,161          | 586,318                                  | 67.30 | 337,154                 | 38.70 |
| 2030   | 4,499                    | 1,373          | 693,515                                  | 79.60 | 398,797                 | 45.78 |
| Overall Growth                                     | 695                      | 212            | 107,197                                  | 12.30 | 61,642                  | 7.08  |

<sup>1</sup> Projections based on 2017 American Community Survey data applying an annual growth rate of 1.3%.  
<sup>2</sup> Projections based on existing land uses assuming developments/improvements with a Floor to Area Ratio of 0.2 and annual growth rate of 1.3%.

## SIGNIFICANCE THRESHOLDS

CEQA Guidelines define a significant effect on the environment as a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project.<sup>4</sup> To determine if a project would have a significant impact on climate change, the type, level, and impact of GHG emissions generated by the Project must be evaluated. Appendix G of the CEQA Guidelines provides the criteria (as Checklist Items) for evaluating potential impacts on the environment. The CEQA criteria and the Air District’s significance thresholds and guidance for evaluation are provided below.

### 2008 Climate Change Scoping Plan

The California State Legislature adopted Assembly Bill 32 (AB 32) on September 27, 2006. AB 32 focuses on reducing GHG emissions to 1990 levels by the year 2020 and to 80% below 1990 levels by the year 2050. Pursuant to the requirements in AB 32, the ARB adopted the Climate Change Scoping Plan (2008 Scoping Plan), which outlines actions recommended to obtain that goal. The 2008 Scoping Plan calls for an “ambitious but achievable” reduction in California’s GHG emissions, cutting emissions approximately 29% from BAU emission levels projected for 2020, or about 10% from 2008 levels. On a per capita basis, that means reducing annual emissions of 14 tons of carbon dioxide for every man, woman, and child in California down to about 10 tons per person by 2020.<sup>5</sup>

### 2017 Climate Change Scoping Plan

The California State Legislature adopted Senate Bill 32 (SB 32) on September 8, 2016. SB 32 focuses on reducing GHG emissions to 40% below 1990 levels by the year 2030. Pursuant to the requirements in SB 32, the ARB adopted the Climate Change Scoping Plan Update (2017 Scoping Plan), which outlines actions recommended to obtain that goal. ARB recommends

<sup>3</sup> United States Census Bureau. American FactFinder. 2017 American Community Survey. 2013-2017 American Community Survey 5-Year Estimates. Demographic and Housing Estimates (DP05) and Selected Housing Characteristics (DP04). [https://factfinder.census.gov/faces/nav/jsf/pages/community\\_facts.xhtml](https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml). May 15, 2019.

<sup>4</sup> CEQA §§ 15002(g), 15382

<sup>5</sup> Climate Change Scoping Plan website: <http://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm>

statewide targets of no more than six (6) metric tons CO<sub>2</sub>e per capita by 2030 and no more than two (2) metric tons CO<sub>2</sub>e per capita by 2050.<sup>6</sup>

### **Air District Guidance**

On December 17, 2009, the District’s Governing Board adopted the District Policy: *Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency*. The District’s Governing Board also approved the guidance document: *Guidance for Valley Land-Use Agencies in Addressing GHG Emission Impacts for New Projects Under CEQA*. In support of the policy and guidance document, District staff prepared a staff report: *Addressing Greenhouse Gas Emissions Under the California Environmental Quality Act*. These documents adopted in December of 2009 continue to be the relevant policies to address GHG emissions under CEQA. As these documents may be modified under a separate process, the latest versions should be referenced to determine the District’s current guidance at the time of analyzing a particular project.”<sup>7</sup>

“It is widely recognized that no single project could generate enough GHG emissions to noticeably change the global climate temperature. However, the combination of GHG emissions from past, present and future projects could contribute substantially to global climate change. Thus, project specific GHG emissions should be evaluated in terms of whether or not they would result in a cumulatively significant impact on global climate change. GHG emissions, and their associated contribution to climate change, are inherently a cumulative impact issue. Therefore, project-level impacts of GHG emissions are treated as one-in-the-same as cumulative impacts.

In summary, the staff report evaluates different approaches for assessing significance of GHG emission impacts. As presented in the report, District staff reviewed the relevant scientific information and concluded that the existing science is inadequate to support quantification of the extent to which project specific GHG emissions would impact global climate features such as average air temperature, average rainfall, or average annual snow pack. In other words, the District was not able to determine a specific quantitative level of GHG emissions increase, above which a project would have a significant impact on the environment, and below which would have an insignificant impact. This is readily understood, when one considers that global climate change is the result of the sum total of GHG emissions, both manmade and natural that occurred in the past; that is occurring now; and will occur in the future.

In the absence of scientific evidence supporting establishment of a numerical threshold, the District policy applies performance based standards to assess project-specific GHG emission impacts on global climate change. The determination is founded on the principal that projects whose emissions have been reduced or mitigated consistent with the California Global Warming Solutions Act of 2006, commonly referred to as “AB 32”, should be considered to have a less than significant impact on global climate change. For a detailed discussion of the District’s establishment of thresholds of significance for GHG emissions, and the District’s application of said thresholds, the reader is referred to the above referenced staff report, District Policy, and District Guidance documents.”<sup>8</sup>

---

<sup>6</sup> ARB, California’s 2017 Climate Change Scoping Plan , Page 99, [https://www.arb.ca.gov/cc/scopingplan/scoping\\_plan\\_2017.pdf](https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf), accessed August 3, 20183

<sup>7</sup> Air District, GAMAQI, Section 8.9, Page 110

<sup>8</sup> Air District, GAMAQI, Section 8.9.1, Pages 111-112

“As presented in Figure 6 (Process of Determining Significance of Greenhouse Gas Emissions) [of the GAMAQI], the policy provides for a tiered approach in assessing significance of project specific GHG emission increases.

- Projects complying with an approved GHG emission reduction plan or GHG mitigation program which avoids or substantially reduces GHG emissions within the geographic area in which the project is located would be determined to have a less than significant individual and cumulative impact for GHG emissions. Such plans or programs must be specified in law or approved by the Lead Agency with jurisdiction over the affected resource and supported by a CEQA compliant environmental review document adopted by the Lead Agency. Projects complying with an approved GHG emission reduction plan or GHG mitigation program would not be required to implement Best Performance Standards (BPS).
- Projects implementing BPS would not require quantification of project specific GHG emissions. Consistent with CEQA Guideline, such projects would be determined to have a less than significant individual and cumulative impact for GHG emissions.
- Projects not implementing BPS would require quantification of project specific GHG emissions and demonstration that project specific GHG emissions would be reduced or mitigated by at least 29%, compared to Business as Usual (BAU), including GHG emission reductions achieved since the 2002-2004 baseline period, consistent with GHG emission reduction targets established in ARB’s AB 32 Scoping Plan. Projects achieving at least a 29% GHG emission reduction compared to BAU would be determined to have a less than significant individual and cumulative impact for GHG.

The District guidance for development projects also relies on the use of BPS. For development projects, BPS includes project design elements, land use decisions, and technologies that reduce GHG emissions. Projects implementing any combination of BPS, and/or demonstrating a total 29 percent reduction in GHG emissions from business-as-usual (BAU), would be determined to have a less than cumulatively significant impact on global climate change.”<sup>9</sup>

The Air District’s *Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Project under CEQA* states, “Projects implementing Best Performance Standards in accordance with this guidance would be determined to have a less than significant individual and cumulative impact on global climate change and would not require project specific quantification of GHG emissions. Projects exempt from the requirements of CEQA, and projects complying with an approved GHG emission reduction plan or mitigation program would also be determined to have a less than significant individual or cumulative impact. Such plans or programs must be specified in law or adopted by the public agency with jurisdiction over the affected resources and have a certified final CEQA document. Projects not implementing BPS would require quantification of project specific GHG emissions. To be determined to have a less than significant individual and cumulative impact on global climate changes, such projects must be determined to have reduced or mitigated GHG emissions by 29%, consistent with GHG emission reduction targets established in ARB’s AB 32 Scoping Plan. Furthermore, quantification of GHG emissions would be expected for all projects for which the lead agency has determined that an Environmental Impact Report is required, regardless of whether the project incorporates Best Performance Standards.”<sup>10</sup>

---

<sup>9</sup> Air District, GAMAQI, Section 8.9.1, Page 112

<sup>10</sup> Air District, Guidance for Valley Land-use Agencies, Page 4

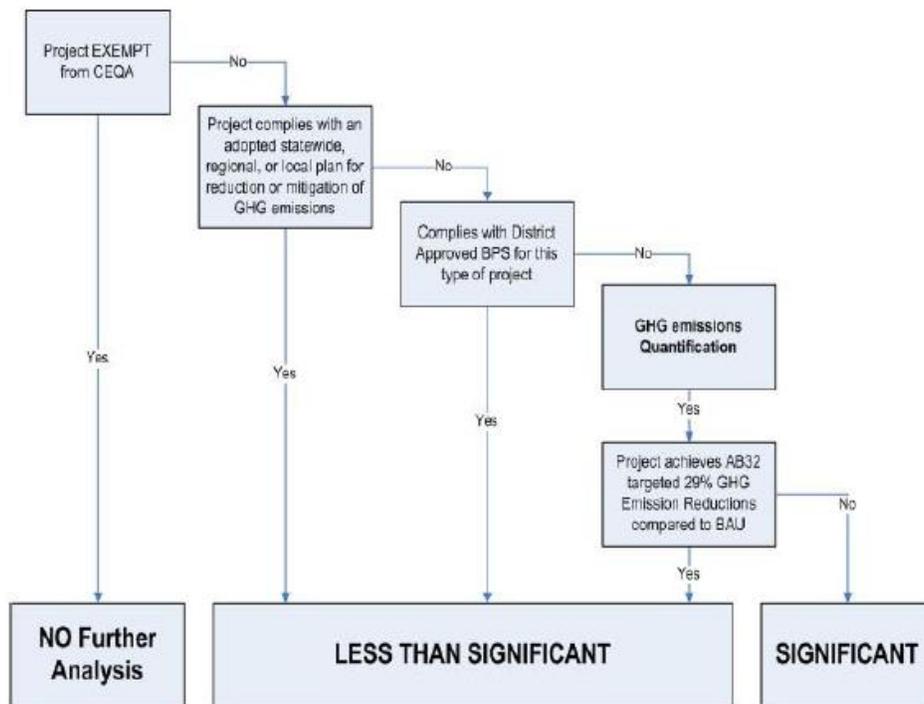
“If total GHG emissions reductions measures add up to 29% or more, are enforceable, and are required as a part of the development’s approval process, the project achieves the Best Performance Standard (BPS) for the respective type of development project. Thus, the GHG emissions from the development project would be determined to have a less than individually and cumulatively significant impact on global climate change for CEQA purposes.”<sup>11</sup>

“By definition, BPS for development projects is achieving a project-by-project 29% reduction in GHG emissions, compared to BAU. Thus, it is reasonable to conclude that Lead Agencies implementing the proposed *Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA* threshold will achieve an overall reduction in GHG emissions consistent with AB 32 emission reduction targets...”<sup>12</sup>

The Air District’s guidance document was adopted to provide a basis for lead agencies to establish significance thresholds consistent with ARB’s 2008 Scoping Plan. The Air District currently does not have a recommendation for establishing thresholds or assessing significance consistent with the reduction requirements established in ARB’s 2017 Scoping Plan Update, which requires a 33.2% reduction from BAU to achieve the 2030 target. The County is currently undergoing review of the Tulare County Climate Action Plan (CAP) and, if needed will adopt revisions to demonstrate consistency with the new reduction targets.

**Figure 1** provides a visual summary of the Air District’s process for determining significance of project-related GHG emissions.

**Figure 1. Process of Determining Significance of Greenhouse Gas Emissions**



Source: Air District, GAMAQI, Figure 6, Page 113

<sup>11</sup> Air District, Guidance for Valley Land-use Agencies, Pages 7-8

<sup>12</sup> Air District, Guidance for Valley Land-use Agencies, Page 8

## IMPACT EVALUATION

### a) **Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?**

Project Impact Analysis:                    *Less Than Significant Impact*

The Air District has determined that projects consistent with an adopted Climate Action Plan (CAP) would be considered to have a less than significant impact on the environment. The Tulare County Climate Action Plan was adopted in 2012 and updated in 2018. The Tulare County CAP serves as a guiding document for County actions to reduce GHG emissions and adapt to the potential effects of climate change. The CAP is an implementation measure of the Tulare County General Plan and builds on the General Plan's framework with more specific actions that will be applied to achieve emission reduction targets required by State of California legislation. The General Plan fulfills many sustainability and GHG reduction objectives at the program level. Projects implementing the General Plan will comply with these policies resulting in long-term benefits to GHG reductions that will help the County achieve the CAP reduction targets. The CAP identifies the policies from the various General Plan elements that promote more efficient development and reduce travel and energy consumption.

There are no specific development projects (such as residential, commercial, or industrial uses) associated with the Community Plan Update. As such, the proposed Project will not result in GHG emissions until specific development occurs. Future developments would be required to comply with the CAP. The CAP states, "The 2018 CAP Update includes an additional method of determining project consistency with the CAP and 2030 targets. Projects subject to CEQA review could use a checklist containing design features and measures that are needed to determine consistency. Large projects (500-unit subdivisions and 100,000 square feet of retail or equivalent intensity for other uses) and new specific plans should provide a greenhouse gas analysis report quantifying GHG emissions to demonstrate that the project emissions are at least 31 percent below 2015 levels by 2030 or 9 percent below BAU emissions in 2030. These are the amounts currently required from development related sources to demonstrate consistency with SB 32 2030 targets. Smaller projects may also prepare a GHG analysis report if the checklist is not appropriate for a particular project or is deemed necessary by the project proponent or County staff. The GHG analysis should incorporate as many measures as possible from the CalEEMod mitigation component as described in Table 15 and can take credit for 2017 Scoping Plan measures that have not been incorporated into CalEEMod but that will be adopted prior to 2030 such as 50 percent RPS."<sup>13</sup>

"The County has already approved a substantial number of lots for development. Development of some of these lots will be limited by various factors such as water supply, sewer/septic capability, road capacity, etc. that cannot be addressed during the planning horizon due to lack of resources. This means that the County expects that new development proposals will be received that are more likely to develop before existing lots are developed because the rural community, landowner, or developer has the resources to provide all improvements and services required for the site. As a rough estimate, this analysis assumes that 40 percent of the development will occur on existing lots and 60 percent will occur in new developments. Development occurring on

---

<sup>13</sup> Tulare County Climate Action Plan, December 2018 Update, page 73

existing lots will be subject to existing conditions of the approved subdivision and zoning standards. Development occurring in new subdivisions and projects [after 2012] would be subject to additional measures required to mitigate significant impacts. The County will encourage developers of existing lots [established prior to 2012] to implement measures that reduce greenhouse gas emissions, but it has no authority to require additional reductions beyond those required by State regulation, the building code, and local ordinance.”<sup>14</sup>

“Commercial and industrial development in Tulare County during the 2020 and 2030 planning timeframes will comply with increasingly stringent State energy efficiency regulations in most projects. For industrial projects where the SJVAPCD is a Responsible Agency, the project will be expected to implement Best Performance Standards included in the SJVAPCD Guidelines for Addressing Greenhouse Gas Emissions on the processes and stationary equipment that emit greenhouse gases to levels that meet or exceed State targets and may be subject to Cap-and-Trade Program requirements.”<sup>15</sup>

The Project demonstrates continued progress towards the County achieving the 2017 Scoping Plan. In addition, the State anticipates increases in the number of zero emission vehicles operated in the State under the Advanced Clean Car Program. Compliance with SB 375 reduction targets for light duty vehicles will provide continued reductions in emissions from that source through SB 375’s 2035 milestone year. Furthermore, the Project will provide a GHG emission reduction benefit as future buildout of the community will supply residents within the Ivanhoe UDB and immediate vicinity with greater shopping and employment opportunities, thereby reducing vehicle miles traveled from travelling to larger communities/cities for such opportunities. Since future development projects would undergo additional CEQA review, the Project will continue to comply with existing and future regulations, and the General Plan, Community Plan, and CAP will continue to be implemented through 2030, the growth projected for 2030 would not result in significant greenhouse gas impacts. Therefore, *Less Than Significant Project-specific Impacts* related to this Checklist Item will occur.

Cumulative Impact Analysis:      *Less Than Significant Impact*

The geographic area of this cumulative analysis is the San Joaquin Valley Air Basin. The Project-related emissions would be considered to have a significant cumulative impact if project-specific impacts are determined to be significant. As previously noted, there are no specific development projects (such as residential, commercial, or industrial uses) associated with the Community Plan Update. Future developments would be required to comply with the CAP to achieve reductions in GHG emissions beyond those reductions achieved through compliance with existing regulations. As such, the Project is consistent with the Tulare County CAP and therefore, AB 32 reduction targets for years 2020 and 2030. As the proposed Project would result in Less Than Significant Project-specific Impacts, *Less Than Significant Cumulative Impacts* would also occur.

Mitigation Measures:                      *None Required*

---

<sup>14</sup>Ibid. 76

<sup>15</sup>Op. Cit.

Conclusion: *Less Than Significant Impact*

As previously noted, the Project is consistent with the Tulare County CAP and the AB 32 scoping plan reduction targets established for 2020 and 2030. As such, the Project would not generate GHG emissions that would have a significant impact on the environment. *Less Than Significant Project-specific and Cumulative Impacts* related to this Checklist Item will occur.

**b) Would the project conflict with any applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?**

Impact Analysis: *Less Than Significant Impact*

To be considered a less than significant impact, the Project must demonstrate consistency with the Tulare County CAP, the Air District’s Climate Change Action Plan, and the ARB’s 2008 Scoping Plan and 2017 Scoping Plan Update.

**Tulare County CAP:** The CAP identifies General Plan policies in place to assist the County in reducing GHG emissions. **Table 2** identifies these policies by policy titles. For a discussion of the benefits of the policies, refer to the CAP.<sup>16</sup> The Project will implement the applicable General Plan policies.

| <b>Table 2. General Plan Policies Having Greenhouse Gas Emission Reductions</b> |   |          |   |
|---|---|----------|---|
| <b>Sustainability and Greenhouse Gas Emissions</b>                              |   |          |   |
| PF-1.1  | Maintain Urban Edges                                  | ERM-1.2  | Development in Environmentally Sensitive Areas                    |
| PF-1.2  | Location of Urban Development                         | ERM-1.3  | Encourage Cluster Development                                     |
| PF-1.3  | Land Uses in UDBs/HDBs                                | ERM-1.4  | Protect Riparian Management Plans and Mining Reclamation Plans    |
| PF-1.4  | Available Infrastructure                              | ERM-1.6  | Management of Wetlands  |
| AG-1.7  | Conservation Easements                                | ERM-1.7  | Planting of Native Vegetation                                     |
| AG-1.8  | Agriculture Within Urban Boundaries                   | ERM-1.8  | Open Space Buffers  |
| AG-1.11   | Agricultural Buffers                                  | ERM-1.14 | Mitigation and Conservation Banking Program                       |
| AG-1.14   | Right to Farm Noticing                                | ERM-4.1  | Energy Conservation and Efficiency Measures                       |
| AG-2.11   | Energy Production                                     | ERM-4.2  | Streetscape and Parking Area Improvements for Energy Conservation |
| AG-2.6  | Biotechnology and Biofuels                            | ERM-4.3  | Local and State Programs  |
| AQ-1.6  | Purchase of Low Emission/Alternative Fuel Vehicles    | ERM-4.4  | Promote Energy Conservation Awareness                             |
| AQ-1.7  | Support Statewide Global Warming Solutions            | ERM-4.6  | Renewable Energy  |
| AQ-1.8  | Greenhouse Gas Emissions Reduction Plan               | ERM-4.7  | Reduce Energy Use in County Facilities**                          |
| AQ-1.9  | Off-Site Measures to Reduce Greenhouse Gas Emissions* | ERM-4.8  | Energy Efficiency Standards**                                     |
| AQ-1.10   | Alternative Fuel Vehicle Infrastructure**             | ERM-5.1  | Parks as Community Focal Points                                   |
| AQ-2.1  | Transportation Demand Management Programs             | ERM-5.6  | Location and Size Criteria for Parks                              |
| AQ-2.3  | Transportation and Air Quality                        | ERM-5.15 | Open Space Preservation   |
| AQ-2.4  | Transportation Management Associations                | HS-1.4   | Building and Codes  |
| AQ-2.5  | Ridesharing   | TC-2.1   | Rail Service  |
| AQ-3.1  | Location of Support Services                          | TC-2.4   | High Speed Rail (HSR)   |
| AQ-3.2  | Infill Near Employment                                | TC-2.7   | Rail Facilities and Existing Development*                         |
| AQ-3.3  | Street Design   | TC-4.4   | Nodal Land Use Patterns that Support Public                       |
| AQ-3.5  | Alternative Energy Design                             |          |   |
| AQ-3.6  | Mixed Use Development                                 |          |   |

<sup>16</sup> The Tulare County CAP is available online at <http://generalplan.co.tulare.ca.us/documents/GP/001Adopted%20Tulare%20County%20General%20Plan%20Materials/220Climate%20Action%20Plan/CLIMATE%20ACTION%20PLAN%202018%20UPDATE.pdf>

| <b>Table 2. General Plan Policies Having Greenhouse Gas Emission Reductions</b>   |   |          |  |
|---|---|----------|--|
| <b>Sustainability and Greenhouse Gas Emissions</b>  |   |          |  |
| LU-1.1  | Smart Growth and Healthy Communities                |          | Transit  |
| LU-1.2  | Innovative Development                              | TC-5.1   | Bicycle/Pedestrian Trail System                          |
| LU-1.3  | Prevent Incompatible Uses                           | TC-5.2   | Consider Non-Motorized Modes in Planning and Development |
| LU-1.4  | Compact Development                                 |          |  |
| LU-1.8  | Encourage Infill Development                        | TC-5.3   | Provisions for Bicycle Use                               |
| LU-2.1  | Agricultural Lands                                  | TC-5.4   | Design Standards for Bicycle Routes                      |
| LU-3.2  | Cluster Development                                 | TC-5.5   | Facilities   |
| LU-3.3  | High-Density Residential Locations                  | TC-5.6   | Regional Bicycle Plan                                    |
| LU-4.1  | Neighborhood Commercial Uses                        | TC-5.7   | Designated Bike Paths                                    |
| LU-7.1  | Distinctive Neighborhoods                           | TC-5.8   | Multi-Use Trails   |
| LU-7.2  | Integrate Natural Features                          | PFS-1.3  | Impact Mitigation  |
| LU-7.3  | Friendly Streets                                    | PFS-1.15 | Efficient Expansion                                      |
| LU-7.15   | Energy Conservation                                 | PFS-2.1  | Water Supply   |
| ED-2.3  | New Industries                                      | PFS-2.2  | Adequate Systems   |
| ED-2.8  | Jobs/Housing Ratio                                  | PFS-3.3  | New Development Requirements                             |
| ED-5.9  | Bikeways  | PFS-5.3  | Solid Waste Reduction                                    |
| ED-6.1  | Revitalization of Community Centers                 | PFS-5.4  | County Usage of Recycled Materials and Products          |
| ED-6.2  | Comprehensive Redevelopment Plan                    | PFS-5.5  | Private Use of Recycled Products                         |
| ED-6.3  | Entertainment Venues                                | PFS-8.3  | Location of School Sites                                 |
| ED-6.4  | Culturally Diverse Business                         | PFS-8.5  | Government Facilities and Services                       |
| ED-6.5  | Intermodal Hubs for Community and Hamlet Core Areas | WR-1.5   | Expand Use of Reclaimed Wastewater                       |
| ED-6.7  | Existing Commercial Centers                         | WR-1.6   | Expand Use of Reclaimed Water                            |
| SL-3.1  | Community Centers and Neighborhoods                 | WR-3.5   | Use of Native and Drought Tolerant Landscaping           |
| ERM-1.1   | Protection of Rare and Endangered Species           |          |  |
| <p>Source: Tulare County Climate Action Plan, Table 20.</p> <p>* This GHG reduction policy is not included in the Tulare County CAP, but is included in the Tulare County General Plan 2030 Update.</p> <p>** This GHG reduction policy is not included in Table 20 of the CAP, but it is included in the detailed list of policies provided within pages 64-77 of the CAP.</p> |   |          |  |

There are no specific development projects (such as residential, commercial, or industrial uses) associated with the Community Plan Update. Future developments would be required to comply with the CAP to achieve reductions in GHG emissions beyond those reductions achieved through compliance with existing regulations. **Less Than Significant Project-specific Impacts** related to this Checklist Item will occur.

**Air District Climate Change Action Plan:** The Air District adopted the Climate Change Action Plan (CCAP) in 2008, which included a carbon-exchange bank for voluntary GHG reductions.<sup>17</sup> The Carbon Exchange Program is not applicable to this Project, and the Project would not require Voluntary Greenhouse Gas Mitigation Agreements. The Project would comply with all applicable GHG regulations contained in the CCAP. **Less Than Significant Project-specific Impacts** related to this Checklist Item will occur.

**AB 32 Scoping Plans:** There are no specific development projects (such as residential, commercial, or industrial uses) associated with the Community Plan Update. The 2018 CAP Update includes an additional method of determining project consistency with the CAP and 2030 targets. Future developments would be required to comply with the CAP to achieve reductions in GHG emissions beyond those reductions achieved through compliance with existing

<sup>17</sup> SJVAPCD Climate Change Action Plan website: [http://www.valleyair.org/Programs/CCAP/CCAP\\_menu.htm](http://www.valleyair.org/Programs/CCAP/CCAP_menu.htm).

regulations. Projects subject to CEQA review could use a checklist containing design features and measures that are needed to determine consistency with the CAP. Furthermore, the Project provides a GHG emission reduction benefit as the Project supplies residents with a local shopping and employment opportunities, thereby reducing vehicle miles traveled from travelling to larger communities/cities for similar opportunities.

Since the Project will provide local shopping and employment opportunities to the residents of Ivanhoe, and will continue to comply with existing and future regulations, and the General Plan and CAP will continue to be implemented through 2030, the Project would not result in significant greenhouse gas impacts. Therefore, *Less Than Significant Cumulative Impacts* related to this Checklist Item will occur.

Cumulative Impact Analysis:      *Less Than Significant Impact*

The geographic area of this cumulative analysis is the San Joaquin Valley Air Basin. As previously discussed, the Project is consistent with the applicable AB 32 Scoping Plan reductions measures and the Air District's CCAP. The Project will implement applicable Tulare County General Plan and Tulare County CAP policies. As such, the Project will not conflict with applicable state, regional, and local plans, policies or regulation adopted for the purpose of reducing the emissions of greenhouse gases. *Less Than Significant Cumulative Impacts* related to this Checklist Item will occur.

Mitigation Measures:                      *None Required*

Conclusion:                                      *Less Than Significant Impact*

As the proposed Project is consistent with aforementioned plans, policies, and regulations, *Less Than Significant Project-specific and Cumulative Impacts* related to this Checklist Item would occur.

# **Attachment “E”**

---

## **Traffic Impact Study**



## Ivanhoe Community Plan Update

### Traffic Impact Study Report May 2019

**Prepared for:**

Tulare County RMA  
5961 South Mooney Boulevard  
Visalia , California 93277

**Prepared by:**

VRPA Technologies, Inc.  
4630 W. Jennifer, Suite 105  
Fresno, CA 93722  
Project Manager: Jason Ellard



# Ivanhoe Community Plan Update Traffic Impact Study

## Study Team

- ✓ Georgiena Vivian, President, VRPA Technologies, Inc., [gvivian@vrpatechnologies.com](mailto:gvivian@vrpatechnologies.com), (559) 259-9257
  - ✓ Erik Ruehr, Dir. of Traffic Engineering, VRPA Technologies, Inc., [eruehr@vrpatechnologies.com](mailto:eruehr@vrpatechnologies.com), (858) 566-1766
  - ✓ Jason Ellard, Transportation Engineer, VRPA Technologies, Inc., [jellard@vrpatechnologies.com](mailto:jellard@vrpatechnologies.com), (559) 271-1200
-

# Table of Contents

| Section    | Description  | Page       |
|------------|--|------------|
|            | <b>Executive Summary</b>                             | <b>E-1</b> |
| <b>1.0</b> | <b>Introduction</b>                                  | <b>1</b>   |
| 1.1        | Description of the Region/Project                    | 1          |
| 1.1.1      | Study Area   | 1          |
| 1.1.2      | Study Scenarios                                      | 4          |
| 1.2        | Methodology  | 4          |
| 1.2.1      | Intersection Analysis                                | 4          |
| 1.2.2      | Roadway Segment Analysis                             | 7          |
| 1.3        | Policies to Maintain Level of Service                | 7          |
| <b>2.0</b> | <b>Existing Conditions</b>                           | <b>11</b>  |
| 2.1        | Existing Traffic Counts and Roadway Geometrics       | 11         |
| 2.2        | Existing Functional Roadway Classification System    | 11         |
| 2.3        | Affected Streets and Highways                        | 15         |
| 2.4        | Level of Service                                     | 16         |
| 2.4.1      | Intersection Capacity Analysis                       | 16         |
| 2.4.2      | Roadway Segment Capacity Analysis                    | 16         |
| 2.5        | Queuing Analysis                                     | 16         |
| 2.6        | Ivanhoe Community Collision Data                     | 19         |
| 2.7        | Public Transit and Active Transportation Systems     | 19         |
| 2.8        | AMTRAK   | 21         |
| 2.9        | High Speed Rail                                      | 21         |
| 2.10       | Aviation   | 22         |
| 2.11       | Bikeway and Pedestrian Facilities                    | 22         |
| <b>3.0</b> | <b>Traffic Impacts and Circulation Analysis</b>      | <b>23</b>  |
| 3.1        | Future Year Traffic Forecasts                        | 23         |
| 3.1.1      | Future Year 2040 No Build                            | 23         |
| 3.1.2      | Future Year 2040 Build                               | 23         |
| 3.2        | Impacts  | 29         |
| 3.2.1      | Intersection Capacity Analysis                       | 29         |
| 3.2.2      | Roadway Segment Capacity Analysis                    | 29         |
| 3.3        | Queuing Analysis                                     | 29         |
| 3.4        | Public Transit, Bikeways, and Pedestrian Circulation | 29         |
| 3.5        | Left-Turn Lane Assessment                            | 32         |

|       |  |    |
|-------|--|----|
| 4.0   | Standards of Significance  | 33 |
| 4.1   | Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?         | 33 |
| 4.1.1 | Intersections  | 34 |
| 4.2   | Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?   | 34 |
| 4.3   | Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (eg., farm equipment)? | 35 |
| 4.4   | Result in inadequate emergency access?   | 35 |

## Appendices

Appendix A – Modified HCM-Based Tables (Florida Tables)  
Appendix B – Traffic Counts  
Appendix C – SYNCHRO 10 (HCM 6<sup>th</sup> Edition) Worksheets  
Appendix D – Peak Hour Traffic Signal Warrant

## List of Tables

|     |  |    |
|-----|--|----|
| 1-1 | Signalized Intersections Level of Service Definitions                | 5  |
| 1-2 | Unsignalized Intersections Level of Service Definitions              | 6  |
| 1-3 | Roadway Segment Level of Service Definitions                         | 9  |
| 1-4 | Peak Hour Two-Way Volumes  | 10 |
| 2-1 | Existing Intersection Operations                                     | 17 |
| 2-2 | Existing Segment Operations  | 18 |
| 2-3 | Existing Queuing Operations  | 18 |
| 2-4 | Ivanhoe Community Collision Data (2013-2017)                         | 19 |
| 3-1 | Intersection Operations  | 30 |
| 3-2 | Segment Operations   | 31 |
| 3-3 | Queuing Operations   | 31 |
| 3-4 | Recommended Left-Turn Treatment Warrants for Rural Two-Lane Highways | 32 |
| 3-5 | Intersection Operations with Improvements                            | 35 |

## List of Figures

|     |                               |    |
|-----|-------------------------------|----|
| 1-1 | Regional Location             | 2  |
| 1-2 | Study Area                    | 3  |
| 2-1 | Existing Lane Geometry        | 12 |
| 2-2 | Existing AM Peak Hour Traffic | 13 |
| 2-3 | Existing PM Peak Hour Traffic | 14 |
| 2-4 | Collision Data (2013-2017)    | 20 |

|     |  |    |
|-----|--|----|
| 3-1 | Proposed Land Use                              | 24 |
| 3-2 | Future Year 2040 No Build AM Peak Hour Traffic | 25 |
| 3-3 | Future Year 2040 No Build PM Peak Hour Traffic | 26 |
| 3-4 | Future Year 2040 Build AM Peak Hour Traffic    | 27 |
| 3-5 | Future Year 2040 Build PM Peak Hour Traffic    | 28 |

## Executive Summary

This Traffic Impact Study (TIS) has been prepared for the purpose of analyzing traffic conditions related to the Ivanhoe Community Plan Update. The TIS will provide a policy framework to address potential traffic impacts encountered in the planning process. The TIS shall be used as a guide for establishing land use patterns that minimize traffic impacts on the community and shall include measures and solutions to address existing and foreseeable traffic conflicts.

The community of Ivanhoe lies within the central portion of the San Joaquin Valley. The community is located on the Valley floor at an elevation of approximately 364 feet above sea level with the surrounding area mostly flat. Figure 1-1 from Section 1.0 of the report shows Ivanhoe in the context of its region. The transportation system within the Ivanhoe planning area includes State Route (SR) 216 and several County routes and a grid of local streets as shown in Figure 1-2.

### IMPACTS

#### Intersections

Table E-1 shows the anticipated level of service conditions at study intersections for the Future Year 2040 scenarios. Results of the analysis show that two (2) of the study intersections will exceed level of service standards under the Future Year 2040 No Build and Future Year 2040 Build scenarios. The improvement projects listed in Section 4.0 will alleviate level of service deficiencies at study intersections for all Future Year 2040 scenarios. Results of the analysis show that all of the study intersections and roadway segments will meet Tulare County's LOS "D" criteria and Caltrans' LOS "C" criteria through the year 2040 with the development of specific roadway improvements.

#### Segments

Table E-2 shows the anticipated level of service conditions at study roadway segments for the Future Year 2040 scenarios. Results of the analysis show that all of the study roadway segments will meet the applicable level of service standards. As a result, no roadway segment improvements are warranted.

**Table E-1**  
**Intersection Operations**

| INTERSECTION                   | CONTROL            | TARGET LOS | PEAK HOUR | FUTURE YEAR 2040 NO BUILD |            | FUTURE YEAR 2040 BUILD |            |
|--------------------------------|--------------------|------------|-----------|---------------------------|------------|------------------------|------------|
|                                |                    |            |           | DELAY                     | LOS        | DELAY                  | LOS        |
| 1. Avenue 332 & Road 156       | Two-Way Stop Sign  | D          | AM        | 11.1                      | B          | 11.4                   | B          |
|                                |                    |            | PM        | 12.5                      | B          | 13.1                   | B          |
| 2. Avenue 332 & Road 160       | Four-Way Stop Sign | D          | AM        | 10.7                      | B          | 11.7                   | B          |
|                                |                    |            | PM        | 7.7                       | A          | 7.7                    | A          |
| 3. Avenue 328 & Road 156       | Two-Way Stop Sign  | D          | AM        | 23.6                      | C          | 29.5                   | D          |
|                                |                    |            | PM        | <b>49.9</b>               | <b>E +</b> | <b>106.9</b>           | <b>F +</b> |
| 4. Avenue 328 & Road 160       | Four-Way Stop Sign | C          | AM        | <b>28.2</b>               | <b>D +</b> | <b>48.3</b>            | <b>E +</b> |
|                                |                    |            | PM        | 23.5                      | C          | <b>37.0</b>            | <b>E +</b> |
| 4b. Depot Drive & Road 160     | One-Way Stop Sign  | C          | AM        | 11.1                      | B          | 11.5                   | B          |
|                                |                    |            | PM        | 10.5                      | B          | 10.8                   | B          |
| 5. Depot Drive & Road 159      | Two-Way Stop Sign  | D          | AM        | 10.0                      | B          | 10.2                   | B          |
|                                |                    |            | PM        | 10.8                      | B          | 11.1                   | B          |
| 5b. Lantana Ave & Road 159     | One-Way Stop Sign  | D          | AM        | 9.2                       | A          | 9.3                    | A          |
|                                |                    |            | PM        | 9.3                       | A          | 9.4                    | A          |
| 6. Edmiston Avenue & Road 160  | One-Way Stop Sign  | C          | AM        | 16.1                      | C          | 17.9                   | C          |
|                                |                    |            | PM        | 13.9                      | B          | 15.3                   | C          |
| 7. Citrus Avenue & Road 160    | One-Way Stop Sign  | C          | AM        | 14.9                      | B          | 16.5                   | C          |
|                                |                    |            | PM        | 14.4                      | B          | 15.8                   | C          |
| 8. Beechwood Avenue & Road 160 | One-Way Stop Sign  | C          | AM        | 17.3                      | C          | 19.8                   | C          |
|                                |                    |            | PM        | 14.7                      | B          | 16.4                   | C          |
| 9. Jasmine Avenue & Road 160   | One-Way Stop Sign  | C          | AM        | 17.0                      | C          | 19.2                   | C          |
|                                |                    |            | PM        | 16.1                      | C          | 18.2                   | C          |

DELAY is measured in seconds

LOS = Level of Service / **BOLD** denotes LOS standard has been exceeded

For all-way stop controlled intersections, delay results show the average for the entire intersection. For one-way and two-way stop controlled intersections, delay results show the delay for the worst movement.

+ Meets Peak Hour Signal warrants

**Table E-2**  
**Segment Operations**

| STREET SEGMENT                    | SEGMENT DESCRIPTION | TARGET LOS | PEAK HOUR | FUTURE YEAR 2040 NO BUILD |     | FUTURE YEAR 2040 BUILD |     |
|-----------------------------------|---------------------|------------|-----------|---------------------------|-----|------------------------|-----|
|                                   |                     |            |           | VOLUME                    | LOS | VOLUME                 | LOS |
| <b>1. Avenue 332</b>              |                     |            |           |                           |     |                        |     |
| Road 156 to Road 160              | 2 Lanes Undivided   | D          | AM        | 326                       | B   | 363                    | B   |
|                                   |                     |            | PM        | 159                       | B   | 177                    | B   |
| <b>2. Avenue 328</b>              |                     |            |           |                           |     |                        |     |
| Road 156 to Road 160              | 2 Lanes Undivided   | D          | AM        | 711                       | B   | 792                    | B   |
|                                   |                     |            | PM        | 833                       | B   | 928                    | B   |
| <b>3. Road 156</b>                |                     |            |           |                           |     |                        |     |
| Avenue 332 to Avenue 328          | 2 Lanes Undivided   | D          | AM        | 257                       | B   | 286                    | B   |
|                                   |                     |            | PM        | 342                       | B   | 380                    | B   |
| <b>4. Road 160</b>                |                     |            |           |                           |     |                        |     |
| Avenue 332 to Avenue 328          | 2 Lanes Undivided   | D          | AM        | 714                       | B   | 795                    | B   |
|                                   |                     |            | PM        | 614                       | B   | 683                    | B   |
| Avenue 328 to Edmiston Avenue     | 2 Lanes Undivided   | C          | AM        | 875                       | B   | 974                    | B   |
|                                   |                     |            | PM        | 880                       | B   | 980                    | B   |
| Edmiston Avenue to Jasmine Avenue | 2 Lanes Undivided   | C          | AM        | 869                       | B   | 968                    | B   |
|                                   |                     |            | PM        | 920                       | B   | 1,024                  | B   |

LOS = Level of Service / **BOLD** denotes LOS standard has been exceeded

### CEQA Environmental Checklist

The following thresholds of significance are based on Appendix G of the CEQA Guidelines. Implementation of the Ivanhoe Community Plan Update would result in a significant impact if it would:

- ✓ Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

**Less Than Significant Impact After Mitigation** - The proposed Ivanhoe Community Plan Update traffic analysis provides a policy framework to address potential traffic impacts encountered in the planning process. Results of the traffic analysis shows that the Ivanhoe Community Plan Update is in harmony with both the Tulare County General Plan and the TCAG Regional Transportation Plan. The General Plan currently calls for all intersections and roadway segments to be maintained at LOS "D" or better; this objective would be obtained given implementation of the Community Plan and the specific roadway improvements (mitigation measures) noted below. The Ivanhoe Community Plan also meets Caltrans' acceptable level of service criteria in the study area with the development of specific roadway improvements noted below. As a result, the Ivanhoe Community Plan Update will not conflict with a program, plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.

Described below are mitigation measures at study area intersections and segments for the Future Year 2040 scenarios that address future transportation and circulation issues in the Ivanhoe community. The improvements identified would result in acceptable levels of service as shown in Table E-3.

#### Intersections

- ✓ Future Year 2040 No Build Scenario

MM TR - 1. Avenue 328 / Road 156  
○ Install Four-Way Stop

MM TR - 2. Avenue 328 / Road 160  
○ Widen the southbound approach to 1 shared left-through lane and 1 right turn lane (adding 1 right turn lane)

- ✓ Future Year 2040 Build Scenario

MM TR - 3. Avenue 328 / Road 156

- See MM TR-1

**MM TR - 4.** Avenue 328 / Road 160

- Widen the southbound approach to 1 shared left-through lane and 1 right turn lane (adding 1 right turn lane)
- Widen the eastbound approach to 1 left turn lane and 1 through lane with a shared right (adding 1 left turn lane)

**Table E-3**  
**Intersection Operations with Improvements**

| INTERSECTION             | CONTROL            | TARGET LOS | PEAK HOUR | FUTURE YEAR 2040 NO BUILD |     | FUTURE YEAR 2040 BUILD |     |
|--------------------------|--------------------|------------|-----------|---------------------------|-----|------------------------|-----|
|                          |                    |            |           | DELAY                     | LOS | DELAY                  | LOS |
| 3. Avenue 328 & Road 156 | Four-Way Stop Sign | D          | AM        | 13.6                      | B   | 16.2                   | C   |
|                          |                    |            | PM        | 17.5                      | C + | 25.3                   | D + |
| 4. Avenue 328 & Road 160 | Four-Way Stop Sign | C          | AM        | 20.7                      | C + | 22.4                   | C + |
|                          |                    |            | PM        | 20.4                      | C   | 22.6                   | C + |

DELAY is measured in seconds

LOS = Level of Service / **BOLD** denotes LOS standard has been exceeded

For all-way stop controlled intersections, delay results show the average for the entire intersection.

+ Meets Peak Hour Signal warrants

- ✓ Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

**Less Than Significant Impact** - In the fall of 2013, Senate Bill 743 (SB 743) was passed by the legislature and signed into law by the governor. For some parts of California (and possibly the entire state), this legislation will eventually change the way that transportation studies are conducted for environmental documents. In the areas where SB 743 is implemented, delay-based metrics such as roadway capacity and level of service will no longer be the performance measures used for the determination of the transportation impacts of projects in studies conducted under CEQA. Instead, new performance measures such as vehicle miles travelled (VMT) or other similar measures will be used.

July 1, 2020 is the statewide implementation date and agencies may opt-in use of new metrics prior to that date. Therefore, the traffic analysis follows current practice regarding state and local guidance as of the date of preparation. The General Plan currently calls for all intersections and roadway segments to be maintained at LOS “D” or better; this objective would be obtained given implementation of the Community Plan and the specific roadway improvements (mitigation measures) noted in Section 4.1.1 above. As a result, the Project will not conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b). Therefore, no mitigation is

needed.

- ✓ Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (eg., farm equipment)?

**Less Than Significant Impact** - The Ivanhoe Community Plan Update would not result in hazards due to design features, since all proposed improvements would be built to County design standards. The proposed Community Plan land uses would not increase the use of farm equipment on streets and roads in the Ivanhoe Community. As a result, the Project will not substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment). Therefore, no mitigation is needed.

- ✓ Result in inadequate emergency access?

**Less Than Significant Impact** - The Ivanhoe Community Plan Update would not result in any degradation of emergency access within the community. Congestion at an intersection or along a roadway can adversely impact emergency access. Results of the traffic analysis shows that all of the study intersections and roadway segments will meet acceptable levels of service with the development of specific roadway improvements. As a result, the Project will not result in inadequate emergency access. Therefore, no mitigation is needed.

This Traffic Impact Study (TIS) has been prepared for the purpose of analyzing traffic conditions related to the Ivanhoe Community Plan Update. The TIS will provide a policy framework to address potential traffic impacts encountered in the planning process. The TIS shall be used as a guide for establishing land use patterns that minimize traffic impacts on the community and shall include measures and solutions to address existing and foreseeable traffic conflicts.

## 1.0 Introduction

### 1.1 Description of the Region/Project

The community of Ivanhoe lies within the central portion of the San Joaquin Valley. The community is located on the Valley floor at an elevation of approximately 364 feet above sea level with the surrounding area mostly flat. Figure 1-1 shows Ivanhoe in the context of its region. The transportation system within the Ivanhoe planning area includes State Route (SR) 216 and several County routes and a grid of local streets as shown in Figure 1-2. Ivanhoe is located approximately 5 miles northeast of the City of Visalia.

#### 1.1.1 Study Area

The following intersections and adjoining roadway segments included in this TIS were determined in consultation with Tulare County Resource Management Agency (RMA) and California Department of Transportation (Caltrans) staff and include:

#### Intersections

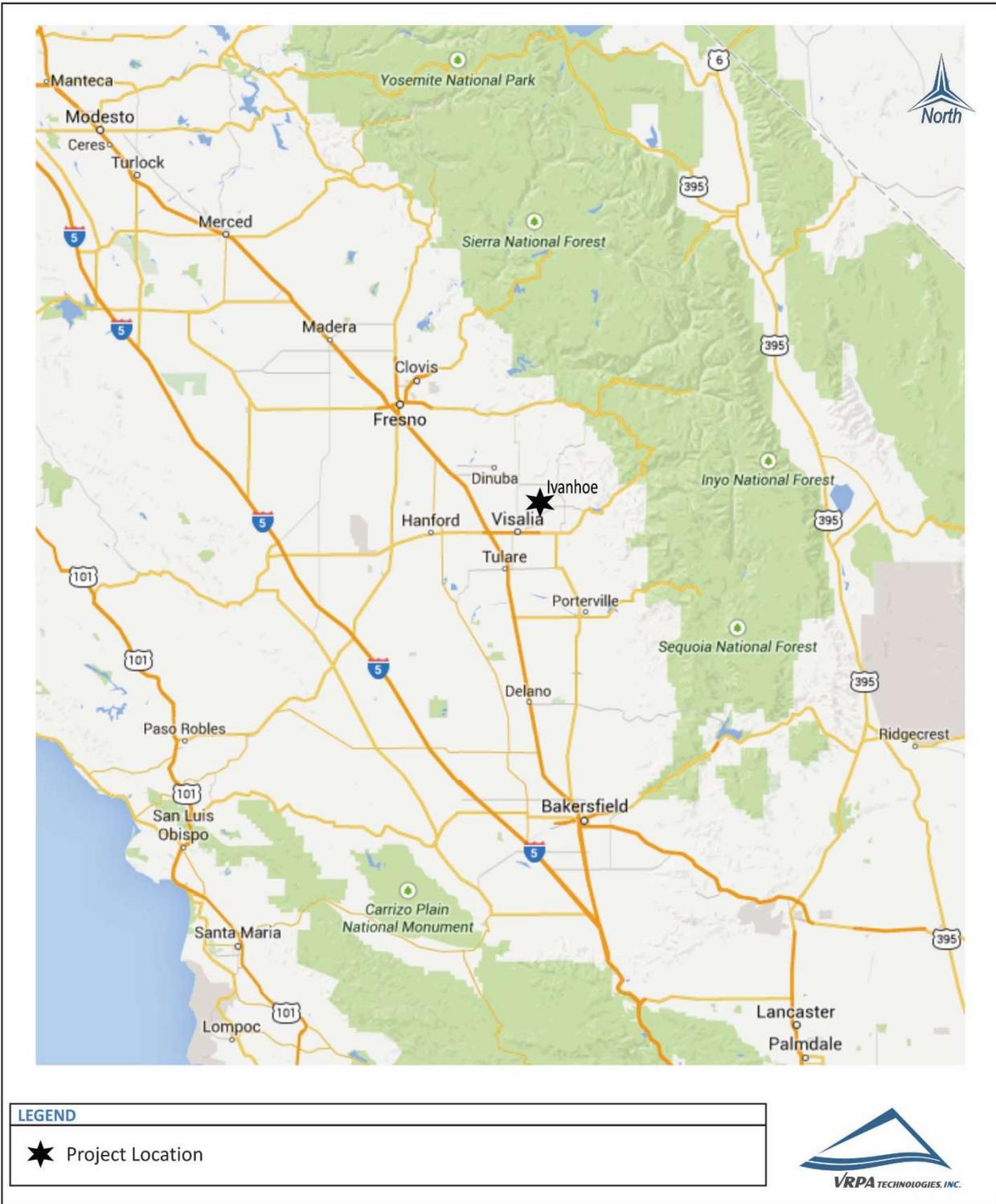
1. Avenue 332 at Road 156
2. Avenue 332 at Road 160
3. Avenue 328 at Road 156
4. Avenue 328 at Road 160 (SR 216)
5. Depot Drive/Lantana Avenue at Road 159
6. Edmiston Avenue at Road 160 (SR 216)
7. Citrus Avenue at Road 160 (SR 216)
8. Beechwood Avenue at Road 160 (SR 216)
9. Jasmine Avenue at Road 160 (SR 216)

#### Roadway Segments

1. Avenue 332:
  - Road 156 to Avenue 160
2. Avenue 328:
  - Road 156 to Avenue 160
3. Avenue 156:
  - Avenue 332 to Avenue 328
4. Avenue 160:
  - Avenue 332 to Avenue 328

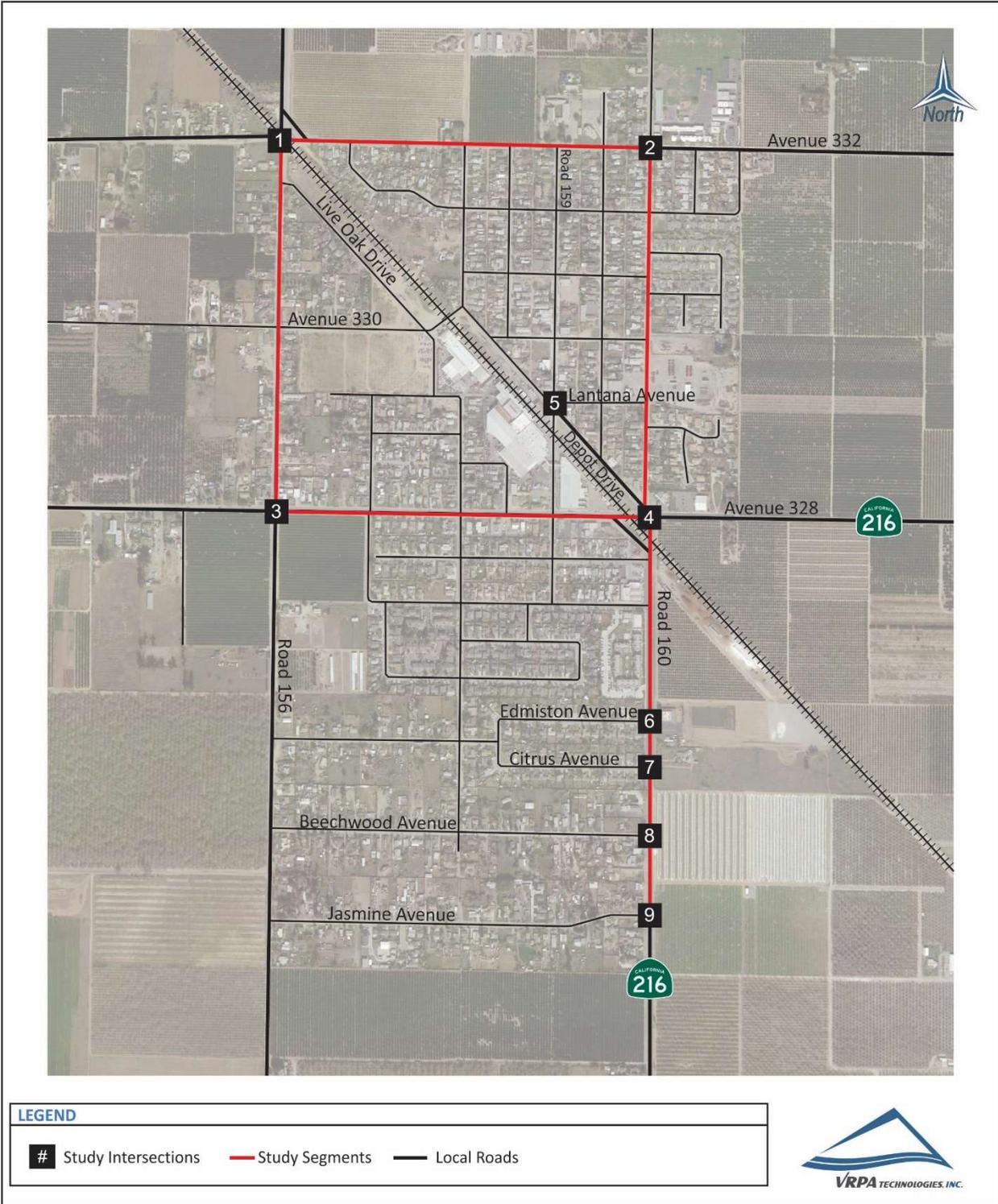
Ivanhoe Community Plan Update  
Regional Location

Figure  
1-1



Ivanhoe Community Plan Update  
Study Area

Figure  
1-2



- Avenue 328 to Edmiston Avenue
- Edmiston Avenue to Jasmine Avenue

### 1.1.2 Study Scenarios

The TIS completed for the proposed Project includes level of service (LOS) analysis for the following traffic scenarios:

- ✓ Existing Year 2018 Conditions
- ✓ Future Year 2040 No Build Conditions
- ✓ Future Year 2040 Build Conditions

## 1.2 Methodology

When preparing a TIS, guidelines set by affected agencies are followed. In analyzing street and intersection capacities the Level of Service (LOS) methodologies are applied. LOS standards are applied by transportation agencies to quantitatively assess a street and highway system's performance. In addition, safety concerns are analyzed to determine the need for appropriate mitigation resulting from increased traffic near sensitive uses and other evaluations such as the need for signalized intersections or other improvements.

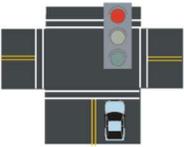
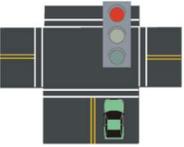
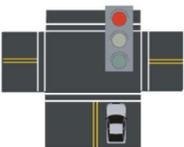
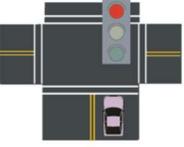
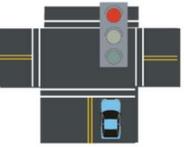
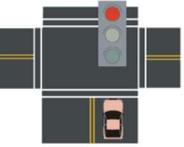
### 1.2.1 Intersection Analysis

Intersection LOS analysis was conducted using the Synchro 10 software program. Synchro 10 supports the Highway Capacity Manual (HCM) 6<sup>th</sup> Edition methodologies and is an accepted program by Tulare County staff for assessment of traffic impacts. Levels of Service can be determined for both signalized and unsignalized intersections.

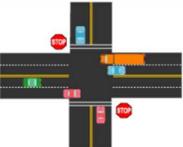
Tables 1-1 and 1-2 indicate the ranges in the amounts of average delay for a vehicle at signalized and unsignalized intersections for the various levels of service ranging from LOS "A" to "F". LOS "A" represents the best operating conditions and LOS "F" represents the worst operating conditions. For signalized intersections, LOS operations are based on an intersection's average control delay expressed in seconds per vehicle. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The LOS is directly related to the average control delay per vehicle and is correlated to a LOS designation as described in Table 1-1.

At two-way or one-way stop-controlled intersections, LOS is calculated for each controlled movement in addition to the overall LOS of the entire intersection. For approaches composed of a single lane, the delay is computed as the average of all movements in that lane. For all-way stop controlled intersections, LOS is computed for the intersection as a whole.

**Table 1-1**  
**Signalized Intersections**  
**Level of Service Definitions**  
**(Highway Capacity Manual)**

| LEVEL OF SERVICE | DEFINITION  |   | AVERAGE TOTAL DELAY (sec/veh) |
|------------------|---|---|-------------------------------|
| A                | Describes operations with very low delay. This level of service occurs when there is no conflicting traffic for a minor street.   |    | ≤ 10.0                        |
| B                | Describes operations with moderately low delay. This level generally occurs with a small amount of conflicting traffic causing higher levels of average delay.  |    | > 10.0 - 20.0                 |
| C                | Describes operations with average delays. These higher delays may result from a moderate amount of minor street traffic. Queues begin to get longer.  |    | > 20.0 - 35.0                 |
| D                | Describes a crowded operation, with below average delays. At level D, the influence of congestion becomes more noticeable. Longer delays may result from shorter gaps on the mainline and an increase of minor street traffic. The queues of vehicles are increasing.   |   | > 35.0 - 55.0                 |
| E                | Describes operations at or near capacity. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor gaps for the minor street to cross and large queues.   |  | > 55.0 - 80.0                 |
| F                | Describes operations that are at the failure point. This level, considered to be unacceptable to most drivers, often occurs with over-saturation, that is, when arrival flow rates exceed the capacity of the intersection. Insufficient gaps of suitable size exist to allow minor traffic to cross the intersection safely. |  | > 80.0                        |

**Table 1-2**  
**Unsignalized Intersections**  
**Level of Service Definitions**  
**(Highway Capacity Manual)**

| LEVEL OF SERVICE | DEFINITION  |   | AVERAGE TOTAL DELAY (sec/veh) |
|------------------|---|---|-------------------------------|
| A                | No delay for stop-controlled approaches.  |    | 0 - 10.0                      |
| B                | Describes operations with minor delay.  |    | > 10.0 - 15.0                 |
| C                | Describes operations with moderate delays.  |    | > 15.0 - 25.0                 |
| D                | Describes operations with some delays.  |   | > 25.0 - 35.0                 |
| E                | Describes operations with high delays and long queues.  |  | > 35.0 - 50.0                 |
| F                | Describes operations with extreme congestion, with very high delays and long queues unacceptable to most drivers. |  | > 50.0                        |

The signalized LOS standards applied to calculate intersection LOS are in accordance with the current edition of the HCM. Intersection turning movement counts and roadway geometrics used to develop LOS calculations were obtained from field review findings and count data provided from the traffic count sources identified in Section 2.1.

When an unsignalized intersection does not meet acceptable LOS standards, the investigation of the need for a traffic signal shall be evaluated. The latest edition of the California Manual on Uniform Traffic Control Devices (California MUTCD) introduces standards for determining the need for traffic signals. The California MUTCD indicates that the satisfaction of one or more traffic signal warrants does not in itself require the installation of a traffic signal. In addition to the warrant analysis, an engineering study of the current or expected traffic conditions should be conducted to determine whether the installation of a traffic signal is justified. The California MUTCD Peak Hour Warrant (Warrant 3) will be used, as necessary, to determine if a traffic signal is warranted at unsignalized intersections that fall below current LOS standards.

### 1.2.2 Roadway Segment Analysis

According to the HCM, LOS is categorized by two parameters of traffic: uninterrupted and interrupted flow. Uninterrupted flow facilities do not have fixed elements such as traffic signals that cause interruptions in traffic flow. Interrupted flow facilities do have fixed elements that cause an interruption in the flow of traffic, such as stop signs and signalized intersections along arterial roads. A roadway segment is defined as a stretch of roadway generally located between signalized or controlled intersections.

Segment LOS is important in order to understand whether the capacity of a roadway can accommodate future traffic volumes. Table 1-3 provides a definition of segment LOS. The performance criteria used for evaluating volumes and capacities on the road and highway system for this study were estimated using the Modified HCM-Based LOS Tables (Florida Tables). The tables consider the capacity of individual road and highway segments based on numerous roadway variables (design speed, passing opportunities, signalized intersections per mile, number of lanes, saturation flow, etc.). These variables were identified and applied to reflect segment LOS conditions. Street segment capacity was determined using information shown in Table 1-4, which comes from the Modified Arterial Level of Service Tables included in Appendix A.

## 1.3 Policies to Maintain Level of Service

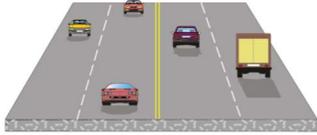
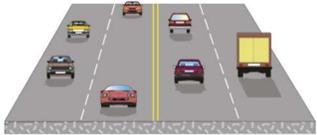
An important goal is to maintain acceptable levels of service along the highway, street, and road network. To accomplish this, Tulare County and Caltrans adopt minimum levels of service in an attempt to control congestion that may result as new development occurs.

Tulare County's 2030 General Plan, policy number TC-1.16, identifies a minimum LOS standard of "D" on the County roadway system (both segments and intersections).

Based on guidance from Caltrans, the LOS for operating State highway facilities is based on Measures of Effectiveness (MOE) identified in the Highway Capacity Manual (HCM). Caltrans endeavors to maintain a target LOS at the transition between LOS “C” and LOS “D” on State highway facilities; however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing State highway facility is operating at less than this target LOS, the existing MOE should be maintained. In general, the region-wide goal for an acceptable LOS on all freeways, roadways segments, and intersections is “D”. For undeveloped or not densely developed locations, the goal may be to achieve LOS “C”.

Given the LOS standards of the various agencies in the Project area, the goal of the Project is to provide LOS results that meet the minimum LOS “C” for Caltrans facilities and LOS “D” for County facilities for all intersections and segments.

**Table 1-3**  
**Roadway Segment**  
**Level of Service Definitions**  
**(Highway Capacity Manual)**

| LEVEL OF SERVICE | DEFINITION   |
|------------------|--|
| A                | <p>Represents free flow. Individual vehicles are virtually unaffected by the presence of others in the traffic stream.</p>    |
| B                | <p>Is in the range of stable flow, but the presence of other vehicles in the traffic stream begins to be noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver.</p>   |
| C                | <p>Is in the range of stable flow, but marks the beginning of the range of flow in which the operation of individual vehicles becomes significantly affected by interactions with other vehicles in the traffic stream.</p>    |
| D                | <p>Is a crowded segment of roadway with a large number of vehicles restricting mobility and a stable flow. Speed and freedom to maneuver are severely restricted, and the driver experiences a generally poor level of comfort and convenience.</p>   |
| E                | <p>Represents operating conditions at or near the level capacity. All speeds are reduced to a low, but relatively uniform value. Small increases in flow will cause breakdowns in traffic movement.</p>   |
| F                | <p>Is used to define forced or breakdown flow (stop-and-go gridlock). This condition exists when the amount of traffic approaches a point where the amount of traffic exceeds the amount that can travel to a destination. Operations within the queues are characterized by stop and go waves, and they are extremely unstable.</p>  |

**Table 1-4**  
**Peak Hour Two-Way Volumes**  
**Areas Transitioning into Urbanized Areas or**  
**Areas Over 5,000 Not in Urbanized Areas**

| Level of Service                     |           |       |       |        |        |
|--------------------------------------|-----------|-------|-------|--------|--------|
| Lanes                                | Divided   | B     | C     | D      | E      |
| <b>UNINTERRUPTED FLOW FACILITIES</b> |           |       |       |        |        |
| Freeways                             |           |       |       |        |        |
| 4                                    | Divided   | 3,820 | 5,160 | 6,000  | 6,360  |
| 6                                    | Divided   | 5,290 | 7,420 | 8,780  | 9,530  |
| 8                                    | Divided   | 6,780 | 9,690 | 11,490 | 12,710 |
| Highways                             |           |       |       |        |        |
| 2                                    | Undivided | 1,110 | 1,690 | 2,290  | 3,070  |
| 4                                    | Divided   | 3,220 | 4,650 | 5,600  | 6,000  |
| 6                                    | Divided   | 4,840 | 7,000 | 8,400  | 9,000  |
| <b>INTERRUPTED FLOW FACILITIES</b>   |           |       |       |        |        |
| State Signalized Arterials           |           |       |       |        |        |
| 2                                    | Undivided | 1,640 | 1,670 | **     | **     |
| 4                                    | Divided   | *     | 2,530 | 3,350  | **     |
| 6                                    | Divided   | *     | 4,150 | 5,070  | **     |
| Non-State Signalized Roadways        |           |       |       |        |        |
| 2                                    | Undivided | 1,476 | 1,503 | **     | **     |
| 2                                    | Divided   | 1,558 | 1,587 | **     | **     |
| 4                                    | Undivided | *     | 1,771 | 2,345  | **     |
| 4                                    | Divided   | *     | 2,277 | 3,015  | **     |
| 6                                    | Divided   | *     | 3,735 | 4,563  | **     |

\* Cannot be achieved using table input value defaults.

\*\* Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached.

## 2.0 Existing Conditions

### 2.1 Existing Traffic Counts and Roadway Geometrics

The first step toward assessing Project traffic impacts is to assess existing traffic conditions. Existing AM and PM peak hour turning movements were collected at each study intersection by National Data and Surveying Services. Intersection turning movement counts were conducted for the peak hour periods of 7:00-9:00 AM and 4:00-6:00 PM for all key intersections on Tuesday, November 27, 2018. Traffic count data worksheets are provided in Appendix B.

Existing lane geometry is shown in Figure 2-1. Existing (2018) AM and PM peak hour traffic volumes are shown in Figures 2-2 and 2-3.

### 2.2 Existing Functional Roadway Classification System

Functional classification is the process by which streets and highways are grouped into classes according to the type of service they provide. Streets and highways are classified according to their primary function and may be assigned into several basic classifications:

- ✓ **State Highways (which may be freeways, expressways or conventional highways)** – Connect regional destinations and generally pass through several jurisdictions. Traffic carrying capacity is maintained through access control at two-mile or more intervals, with shorter intervals between access points permitted in large urban areas.

State Route (SR) 216 is the principle state highway serving Ivanhoe. SR 216 is a regionally significant corridor between the City of Visalia and the smaller agriculture communities of Ivanhoe, Lemon Cove, and the City of Woodlake.

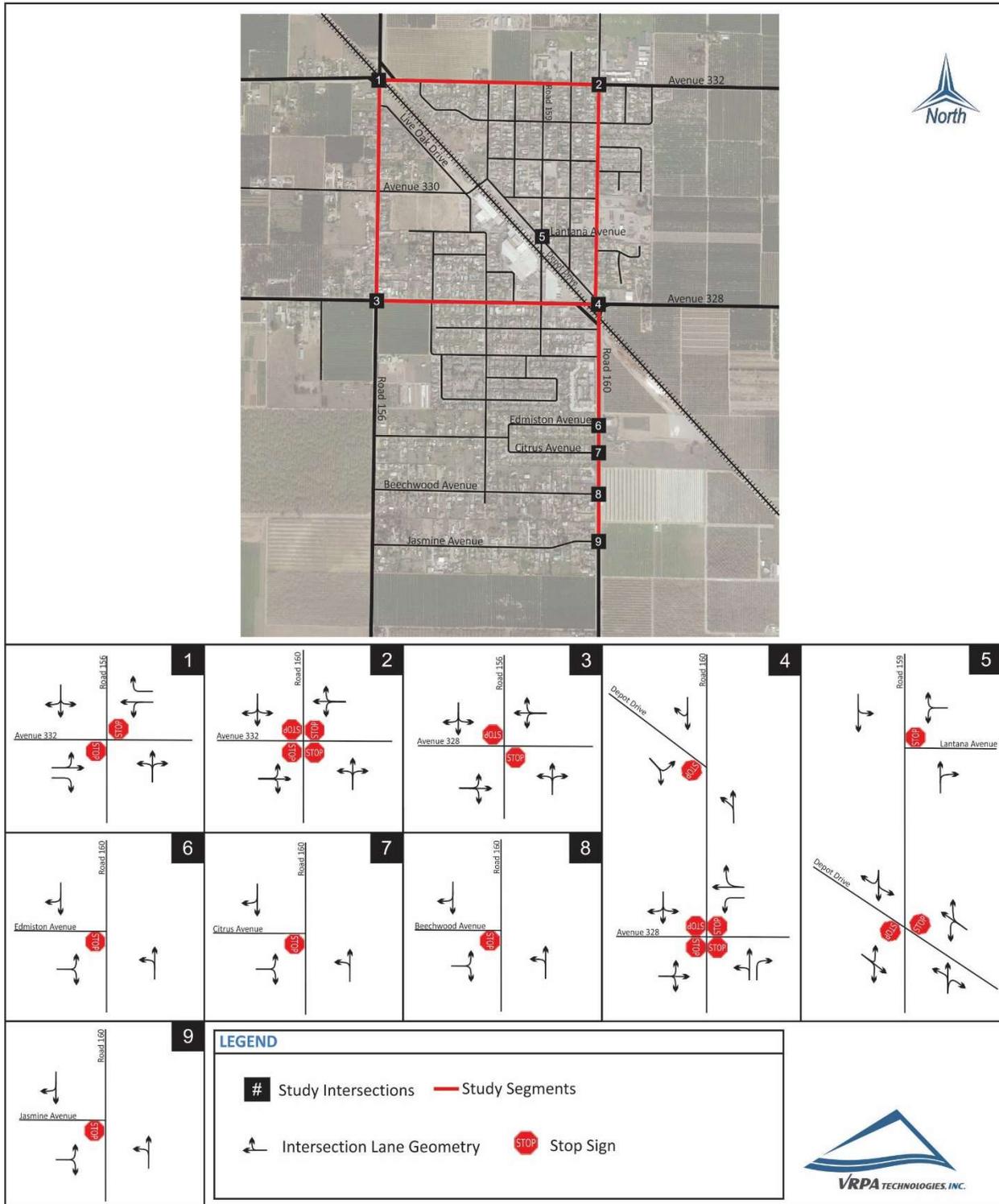
- ✓ **Arterials** – Serve as the principal network for cross-town traffic flow. They connect areas of major traffic generation within the community area and connect with important county roads and state highways. They also provide for the distribution and collection of through traffic to and from collector and local streets.

Road 160, south of Avenue 328, is classified as a minor arterial roadway with two travel lanes and a posted speed limit of 50 miles per hour. Road 160 (also designated as Ivanhoe Drive) runs south from the community of Ivanhoe towards the City of Visalia which is located southwest of Ivanhoe.

Avenue 328 (also designated as Millwood Drive), east of Road 160, is classified as a minor arterial roadway with two travel lanes in the study area. The roadway has a posted speed limit of 55 miles per hour.

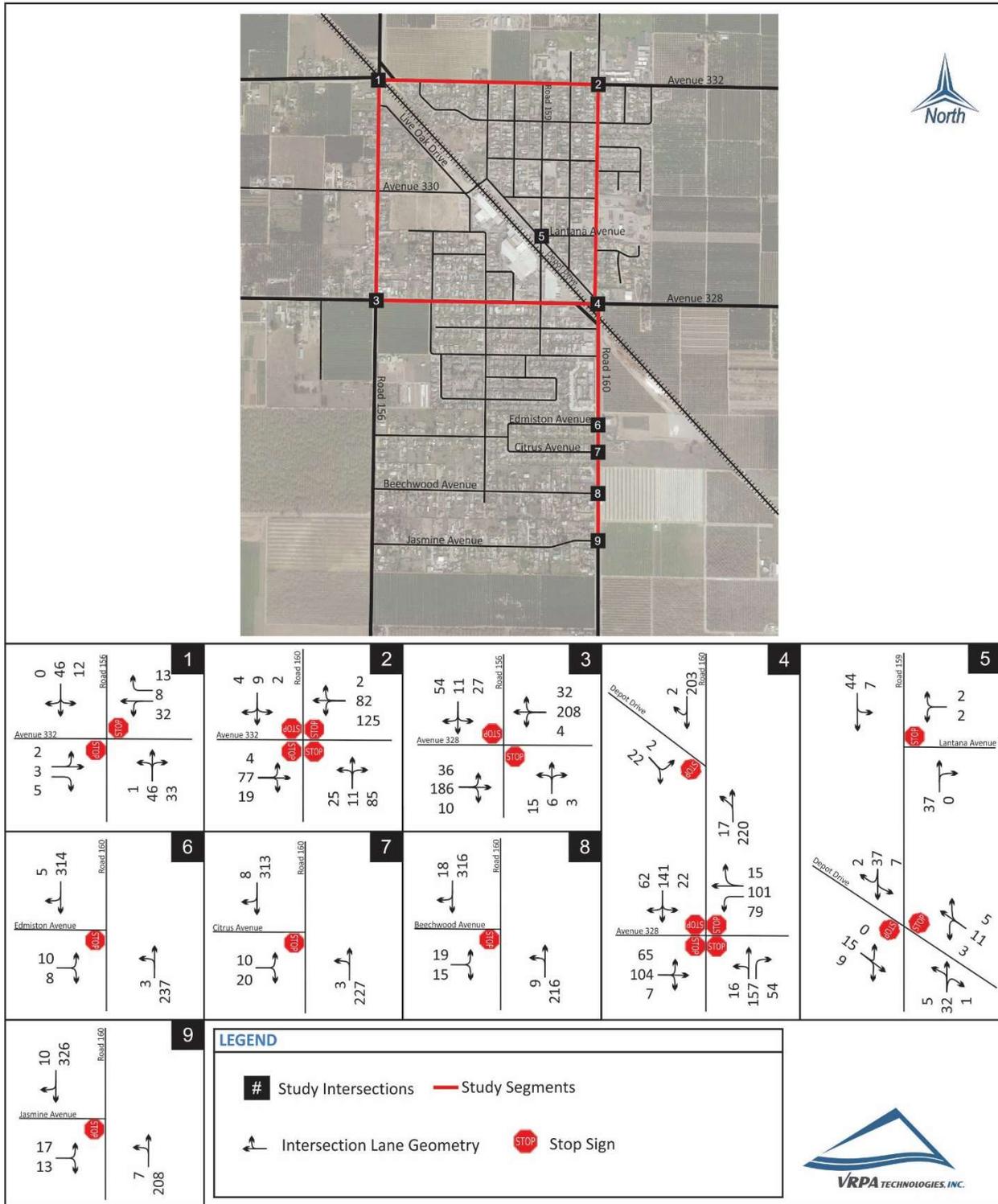
Ivanhoe Community Plan Update  
 Existing Lane Geometry

Figure  
 2-1



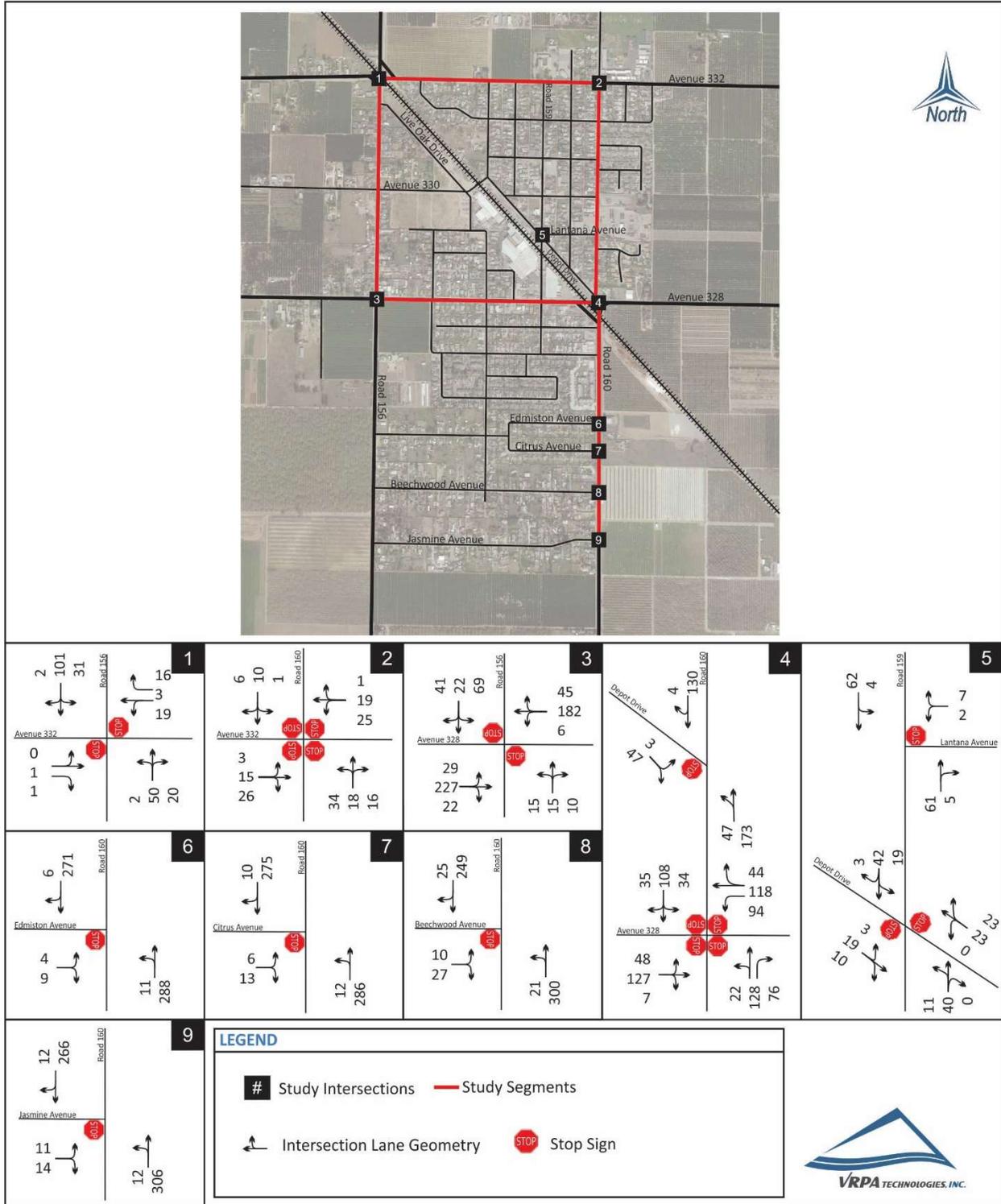
Ivanhoe Community Plan Update  
Existing AM Peak Hour Traffic

Figure  
2-2



Ivanhoe Community Plan Update  
Existing PM Peak Hour Traffic

Figure  
2-3



- ✓ **Collectors** – Provide for traffic movement between arterial and local streets, traffic movement within and between neighborhoods and major activity centers, and limited direct access to abutting properties.

Road 160, north of Avenue 328, is classified as a collector street. The roadway consists of two travel lanes with a posted speed limit of 35 miles per hour.

Avenue 328, west of Road 160, is classified as a collector street. The roadway consists of two travel lanes and allows for intermittent parallel parking.

- ✓ **Local Streets** – Provide for direct access to abutting properties and for very localized traffic movements within residential, commercial and industrial areas.

In recent years the concept of “Complete Streets” has evolved. Under this concept, while streets may still carry a primary functional classification, the design of streets aims to allow all modes and trip purposes to be safely accommodated to the extent feasible and as warranted by local needs and conditions.

### 2.3 Affected Streets and Highways

Major street and highway intersections and segments in the Ivanhoe Community were analyzed to determine levels of service utilizing HCM-based methodologies described previously. The study intersections and street and highway segments included in this TIS are listed below.

#### Intersections

1. Avenue 332 at Road 156
2. Avenue 332 at Road 160
3. Avenue 328 at Road 156
4. Avenue 328 at Road 160 (SR 216)
5. Depot Drive/Lantana Avenue at Road 159
6. Edmiston Avenue at Road 160 (SR 216)
7. Citrus Avenue at Road 160 (SR 216)
8. Beechwood Avenue at Road 160 (SR 216)
9. Jasmine Avenue at Road 160 (SR 216)

#### Roadway Segments

1. Avenue 332:
  - Road 156 to Avenue 160
2. Avenue 328:
  - Road 156 to Avenue 160
3. Avenue 156:
  - Avenue 332 to Avenue 328

4. Avenue 160:
  - Avenue 332 to Avenue 328
  - Avenue 328 to Edmiston Avenue
  - Edmiston Avenue to Jasmine Avenue

## 2.4 Level of Service

### 2.4.1 Intersection Capacity Analysis

All intersection LOS analyses were estimated using Synchro 10 Software. Various roadway geometrics, traffic volumes, and properties (peak hour factors, storage pocket length, etc.) were input into the Synchro 10 Software program in order to accurately determine the travel delay and LOS for each Study scenario. The intersection LOS and delays reported represent the 6<sup>th</sup> Edition HCM outputs.

Results of the analysis show that all of the study intersections are currently operating at acceptable levels of service. Table 2-1 shows the intersection LOS for the existing conditions. Synchro 10 (HCM 6<sup>th</sup> Edition) Worksheets are provided in Appendix C.

### 2.4.2 Roadway Segment Capacity Analysis

Results of the peak hour segment analysis along the existing street and highway system are reflected in Table 2-2. Roadway segment analysis was based on the Florida Department of Transportation, Generalized Peak Hour Two-Way Volumes for Florida's Areas Transitioning into Urbanized Areas or Areas Over 5,000 Not in Urbanized Areas, which are commonly utilized in the Central Valley. Results of the analysis show that all of the study roadway segments are currently operating at acceptable levels of service.

## 2.5 Queuing Analysis

Table 2-3 provides a queue length summary for the study intersections for the Existing scenario. Traffic queue lengths at an intersection or along a roadway segment assist in the determination of a roadway's overall performance. Excessive queuing at an intersection increases vehicle delay and reduces capacity. If a dedicated left turn lane doesn't provide adequate storage, vehicles will queue beyond the left turn storage pocket and into other travel lanes, thus increasing vehicle delay and reducing capacity. The queuing analysis is based upon methodology presented in Chapter 400 of Caltrans' Highway Design Manual (HDM). Appendix D includes Chapter 400 of Caltrans' HDM. The queue results shown in Table 2-3 represent the approximate queue lengths for the respective lane movements.

**Table 2-1**  
**Existing Intersection Operations**

| INTERSECTION                   | CONTROL            | TARGET LOS | PEAK HOUR | EXISTING |     |
|--------------------------------|--------------------|------------|-----------|----------|-----|
|                                |                    |            |           | DELAY    | LOS |
| 1. Avenue 332 & Road 156       | Two-Way Stop Sign  | D          | AM        | 10.5     | B   |
|                                |                    |            | PM        | 11.2     | B   |
| 2. Avenue 332 & Road 160       | Four-Way Stop Sign | D          | AM        | 10.0     | A   |
|                                |                    |            | PM        | 7.5      | A   |
| 3. Avenue 328 & Road 156       | Two-Way Stop Sign  | D          | AM        | 15.3     | C   |
|                                |                    |            | PM        | 17.5     | C   |
| 4. Avenue 328 & Road 160       | Four-Way Stop Sign | C          | AM        | 12.5     | B   |
|                                |                    |            | PM        | 12.1     | B   |
| 4b. Depot Drive & Road 160     | One-Way Stop Sign  | C          | AM        | 10.0     | B   |
|                                |                    |            | PM        | 9.6      | A   |
| 5. Depot Drive & Road 159      | Two-Way Stop Sign  | D          | AM        | 9.8      | A   |
|                                |                    |            | PM        | 10.2     | B   |
| 5b. Lantana Ave & Road 159     | One-Way Stop Sign  | D          | AM        | 9.1      | A   |
|                                |                    |            | PM        | 9.0      | A   |
| 6. Edmiston Avenue & Road 160  | One-Way Stop Sign  | C          | AM        | 12.9     | B   |
|                                |                    |            | PM        | 11.5     | B   |
| 7. Citrus Avenue & Road 160    | One-Way Stop Sign  | C          | AM        | 12.1     | B   |
|                                |                    |            | PM        | 11.8     | B   |
| 8. Beechwood Avenue & Road 160 | One-Way Stop Sign  | C          | AM        | 13.4     | B   |
|                                |                    |            | PM        | 11.7     | B   |
| 9. Jasmine Avenue & Road 160   | One-Way Stop Sign  | C          | AM        | 12.8     | B   |
|                                |                    |            | PM        | 12.4     | B   |

DELAY is measured in seconds

LOS = Level of Service / **BOLD** denotes LOS standard has been exceeded

For all-way stop controlled intersections, delay results show the average for the entire intersection.

For one-way and two-way stop controlled intersections, delay results show the delay for the worst movement.

**Table 2-2**  
**Existing Segment Operations**

| STREET SEGMENT                    | SEGMENT DESCRIPTION | TARGET LOS | PEAK HOUR | EXISTING |     |
|-----------------------------------|---------------------|------------|-----------|----------|-----|
|                                   |                     |            |           | VOLUME   | LOS |
| <b>1. Avenue 332</b>              |                     |            |           |          |     |
| Road 156 to Road 160              | 2 Lanes Undivided   | D          | AM        | 211      | B   |
|                                   |                     |            | PM        | 103      | B   |
| <b>2. Avenue 328</b>              |                     |            |           |          |     |
| Road 156 to Road 160              | 2 Lanes Undivided   | D          | AM        | 460      | B   |
|                                   |                     |            | PM        | 539      | B   |
| <b>3. Road 156</b>                |                     |            |           |          |     |
| Avenue 332 to Avenue 328          | 2 Lanes Undivided   | D          | AM        | 166      | B   |
|                                   |                     |            | PM        | 221      | B   |
| <b>4. Road 160</b>                |                     |            |           |          |     |
| Avenue 332 to Avenue 328          | 2 Lanes Undivided   | D          | AM        | 462      | B   |
|                                   |                     |            | PM        | 397      | B   |
| Avenue 328 to Edmiston Avenue     | 2 Lanes Undivided   | C          | AM        | 566      | B   |
|                                   |                     |            | PM        | 569      | B   |
| Edmiston Avenue to Jasmine Avenue | 2 Lanes Undivided   | C          | AM        | 562      | B   |
|                                   |                     |            | PM        | 595      | B   |

LOS = Level of Service / **BOLD** denotes LOS standard has been exceeded

**Table 2-3**  
**Existing Queuing Operations**

| INTERSECTION             | EXISTING QUEUE STORAGE LENGTH (ft) |     | EXISTING CONDITIONS |          |
|--------------------------|------------------------------------|-----|---------------------|----------|
|                          |                                    |     | AM Queue            | PM Queue |
| 1. Avenue 332 & Road 156 | EB Right                           | 75  | 4                   | 1        |
|                          | WB Right                           | 125 | 11                  | 13       |
| 4. Avenue 328 & Road 160 | NB Right                           | 75  | 45                  | 63       |
|                          | WB Left                            | 125 | 66                  | 78       |

Queue is measured in feet / **BOLD** denotes exceedance

## 2.6 Ivanhoe Community Collision Data

The Transportation Injury Mapping System (TIMS) provided by University of California, Berkeley was used to evaluate traffic collisions in the Ivanhoe Community along study segments. TIMS utilizes geocoded data provided by the Statewide Integrated Traffic Records System (SWITRS). SWITRS is a tool used by California Highway Patrol (CHP) and other Allied Agencies throughout California and includes various types of statistical reports and data. The database serves as a means to collect and process data gathered from a collision scene. Information from the TIMS database shows that approximately 19 injury or fatal accidents have occurred throughout the study area in the past 5 years. Table 2-4 provides a summary of the accidents reported in the Ivanhoe Community. Unsafe Speed was the primary collision factor which accounts for 21.1% of the accidents reported. A graphical representation of traffic collisions throughout the Ivanhoe Community for the past 5 years is provided in Figure 2-4.

**Table 2-4**  
**Ivanhoe Community Collision Data (2013-2017)**

| TOTAL ACCIDENTS | FATAL ACCIDENTS | INJURY ACCIDENTS | PEDESTRIAN / BICYCLE RELATED ACCIDENTS | PERSONS KILLED | PERSONS INJURED | PRIMARY COLLISION FACTOR (Top 3) |                  |                         | COLLISION TIME (Top 3) |                      |            |
|-----------------|-----------------|------------------|--|----------------|-----------------|----------------------------------|------------------|-------------------------|------------------------|----------------------|------------|
|                 |                 |                  |  |                |                 | UNSAFE SPEED                     | IMPROPER TURNING | ANTOMOBILE RIGHT OF WAY | REAR END               | VEHICLE / PEDESTRIAN | HIT OBJECT |
| 19              | 2               | 17               | 5                                      | 2              | 26              | 21.1%                            | 15.8%            | 15.8%                   | 31.6%                  | 21.1%                | 10.5%      |

## 2.7 Public Transit and Active Transport Systems

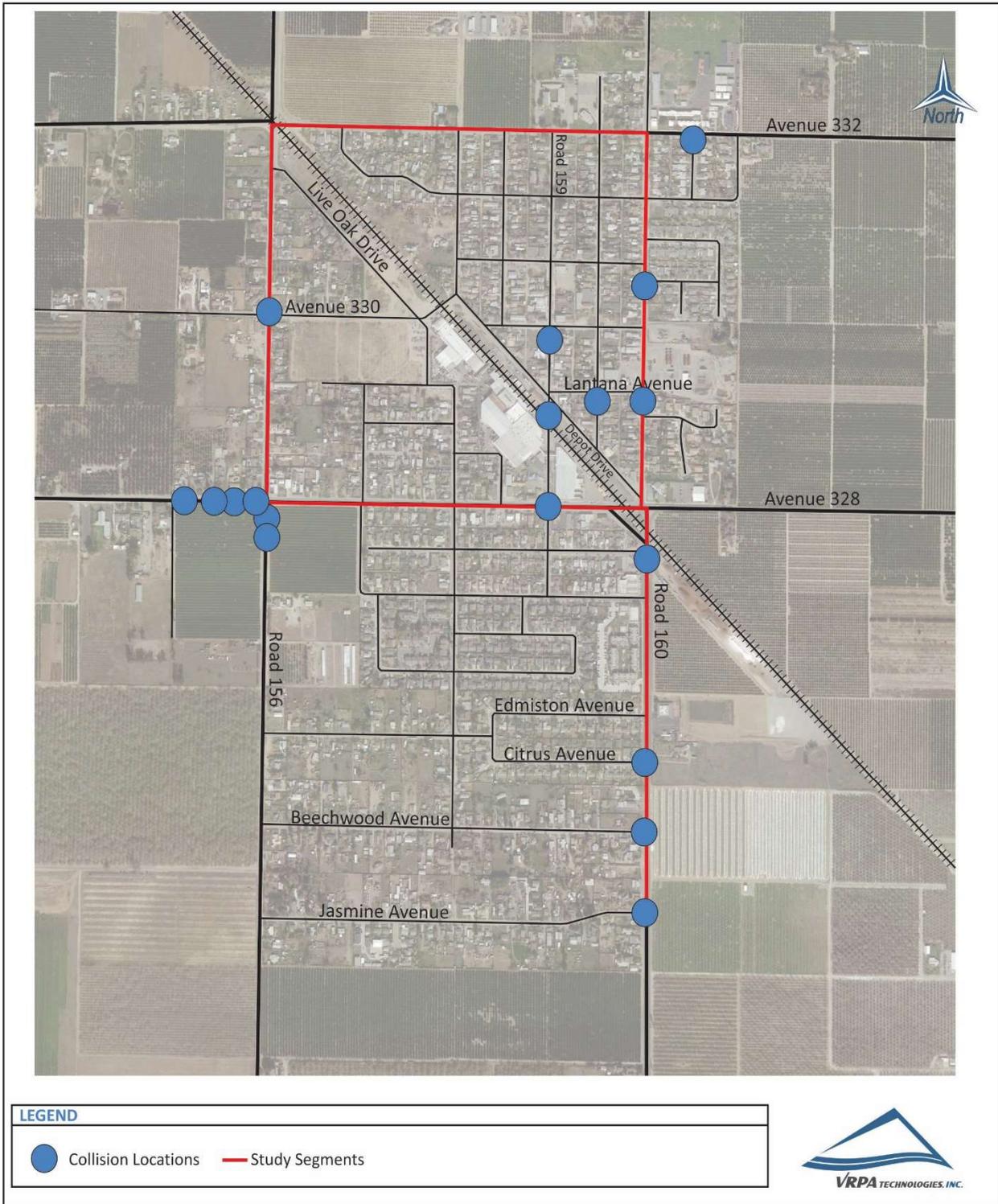
While the private automobile is the dominant mode of travel within Ivanhoe, as it is throughout Tulare County, other modes of transportation are important. The latest available Census survey data for Ivanhoe indicates that about 81 percent of commuters drive alone to work, while 19 percent use other means: 16 percent carpool or vanpool, 3 percent walked, 0 percent used public transportation and 0 percent worked at home.<sup>1</sup> The Census bureau does not collect data on non-work trips, which represent a greater share of travel than work trips but tend to be less concentrated in peak traffic periods. Off-peak trips also tend to have a greater proportion of shared ride and active (walk and bike) trips.

While congestion is not a major issue in Ivanhoe, overreliance on automobiles creates other costs for both society and households and means that many in the community who cannot drive (the young, the old, the disabled, the poor) must rely on those who can drive for their mobility. For this reason, it is important to encourage public transit systems and increased use of active modes of transportation, including bicycling and walking. The public transit system alternatives for Ivanhoe include fixed route public transit systems, common bus carriers, and other local agency transit and paratransit services.

<sup>1</sup> Source: US Census 2012 5-year American Community Survey, via the ProximityOne.com website: <http://proximityone.com/places12dp3.htm>

Ivanhoe Community Plan Update  
Collision Data (2013-2017)

Figure  
2-4



Tulare County Area Transit (TCaT) Route 30 operates in Ivanhoe along Road 160 south of Avenue 328 and along Avenue 328 east of Road 160. Route 30 provides 18 roundtrips to the Visalia Transit Center on weekdays and 6 roundtrips on Saturdays. Transfers can be made to connect to Visalia, Tulare, and the smaller cities and communities in the County served by TCaT and Visalia Transit fixed route transit systems. TCaT vehicles are wheelchair accessible and all full-size buses include bike racks.

Paratransit services are transportation services such as carpooling, vanpooling, taxi service, and dial-a-ride programs. The County supports reliable and efficient paratransit service by encouraging development of service systems that satisfy the transit needs of the elderly and physically handicapped.

Within Ivanhoe, TCaT provides a supplemental service to Fixed-Route service called Dial-A-Ride; a curb-to-curb para-transit service on a shared-ride / demand-response basis. TCaT's Dial-A-Ride service designed to provide paratransit service for Americans with Disabilities Act (ADA) certified individuals with disabilities that prevent them from riding the TCaT fixed-route buses. In addition, the Dial-A-Ride provides same day service to the general public (i.e., non-ADA-certified) passengers based on space availability. Services are operated on weekdays from 5:15 am – 8:15 pm and on weekends from 8:50 am - 6:00 pm.

The closest Greyhound intercity bus stop to Ivanhoe is located in Visalia, approximately 6 miles southwest of the community. This Greyhound station can be accessed by Ivanhoe residents by TCaT Route 30.

## 2.8 AMTRAK

The Hanford AMTRAK station, located 25 miles west in Kings County, is the closest station to Ivanhoe providing passenger rail service; the Fresno Amtrak station is 41 miles to the northwest. The San Joaquin Joint Powers Authority (SJJPA) is comprised of ten agencies including TCAG. They currently oversee the operation of six trains daily serving each of these stations. Service is provided to points north including San Francisco and Sacramento and to points south including Bakersfield and Los Angeles.

## 2.9 High Speed Rail

The California High-Speed Rail Authority (HSRA) has determined that high-speed rail is technically, environmentally and economically feasible once constructed, and would be operationally self-sufficient. The Authority's purpose is to fund and construct the high-speed rail system throughout California. The proposed service would serve new stations in Fresno and Kings Counties near Tulare.

## 2.10 Aviation

Fresno Yosemite International Airport (FAT), 39 miles northwest of Ivanhoe, is the principal passenger airfreight airport in the central San Joaquin Valley. Visalia Municipal Airport, 11 miles southwest, offers passenger service to Los Angeles.

## 2.11 Bikeway and Pedestrian Facilities

Investment in bikeways provides an inexpensive environment-friendly transportation opportunity. Bicycling is considered an effective alternative mode of transportation that can help to improve air quality and reduce the number of vehicles traveling along existing highways, especially within the cities and unincorporated communities. While the numbers of cyclists are small in comparison to the amount of auto traffic, the size of the community of Ivanhoe means that most trips within the community can be as fast by bicycle as by car.

Pedestrian facilities include sidewalks, walkways, crosswalks, signals, lighting, and benches, among other items. Where such facilities exist, people will be much more likely to make shorter trips by walking rather than by vehicle. Pedestrian facilities serving the school and recreational facilities enhance the safety of those who choose to walk to and from these destinations.

## 3.0 Traffic Impacts and Circulation Analysis

This chapter provides an assessment of the anticipated traffic as it relates to the Ivanhoe Community Land Use Plan (Figure 3-1) and the impact of that traffic on the surrounding street system.

### 3.1 Future Year Traffic Forecasts

To assess the impacts that the Ivanhoe Community Land Use Plan may have on the surrounding street and highway segments and intersections, the first step is to evaluate the variation in future year traffic model growth and the historic population growth within the community. The levels of traffic expected in the year 2040 relate to the cumulative effect of traffic increases resulting from the implementation of the General/Community Plans of local agencies. Traffic forecasts in the Ivanhoe Community area for Future Year 2040 were provided by Tulare County Association of Government (TCAG) staff. TCAG manages public transportation, biking, streets, highways, air quality, rail, Measure R, congestion, and infrastructure plans & funding in Tulare County.

#### 3.1.1 Future Year 2040 No Build

To project future traffic roadway conditions in the year 2040 considering the current Ivanhoe Community land use plan, a variety of sources were used. TCAG's Future Year 2040 model exhibited a growth rate of approximately 1.9% in the study area. Traffic projections in Caltrans' SR 216 Transportation Concept Report (TCR) displayed a growth rate of approximately 2.10% in the study area. Historical growth in the unincorporated portion of Tulare County is approximately 1.3% based on population trends as forecasted in the Tulare County General Plan 2030 Update. In addition, Ivanhoe census data shows that the population has increased by 0.67% per year since the year 2000. A growth rate of 2.0% is consistent with the overall growth in the study area and was used to evaluate Future Year 2040 No Build conditions.

The Future Year 2040 No Build traffic, resulting from the process described above, is shown in Figures 3-2 and 3-3.

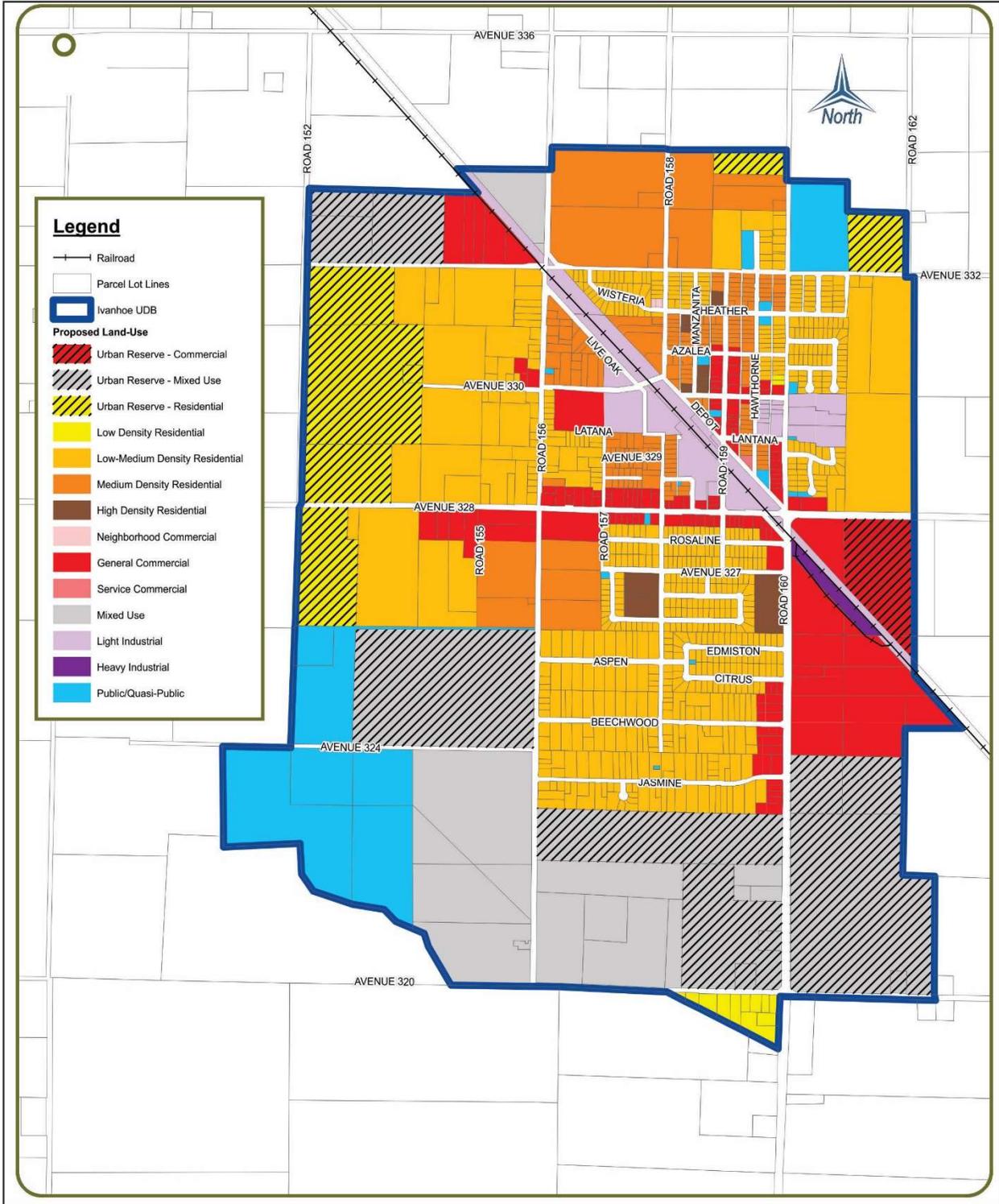
#### 3.1.2 Future Year 2040 Build

The net area increase in the urban development boundary is 582.2 acres when comparing the proposed Urban Development boundary and the Existing boundary. While this represents a 72% increase in Urban Development boundary, historical growth in and around the Ivanhoe Community will primarily remain constant. A growth rate of 2.5% was used to estimate the overall growth in the study area considering the proposed Land Use for the Ivanhoe Community given the increase in the Urban Development boundary.

The Future Year 2040 Build traffic, resulting from the process described above, is shown in Figures 3-4 and 3-5.

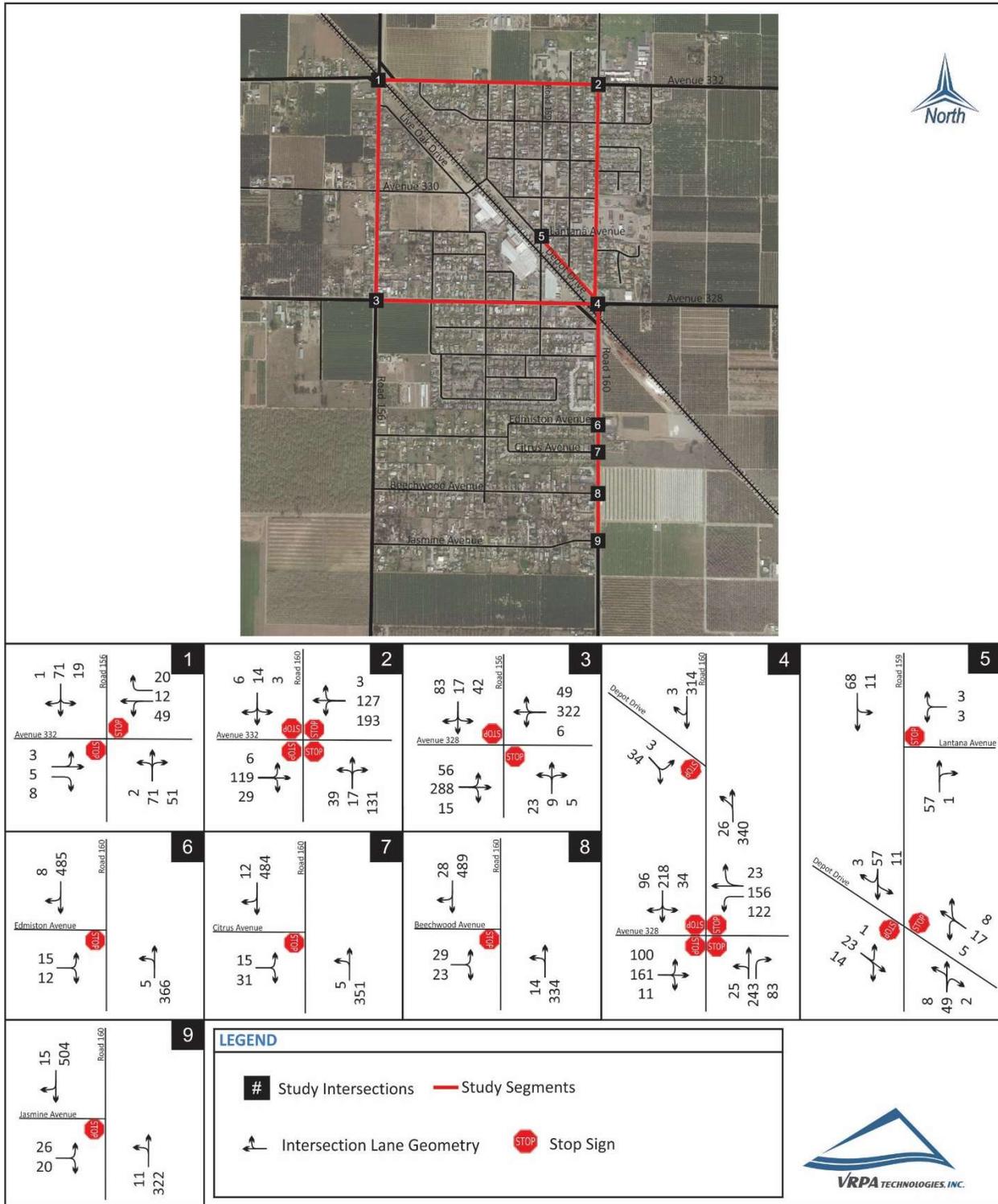
Ivanhoe Community Plan Update  
 Proposed Land Use

Figure  
 3-1



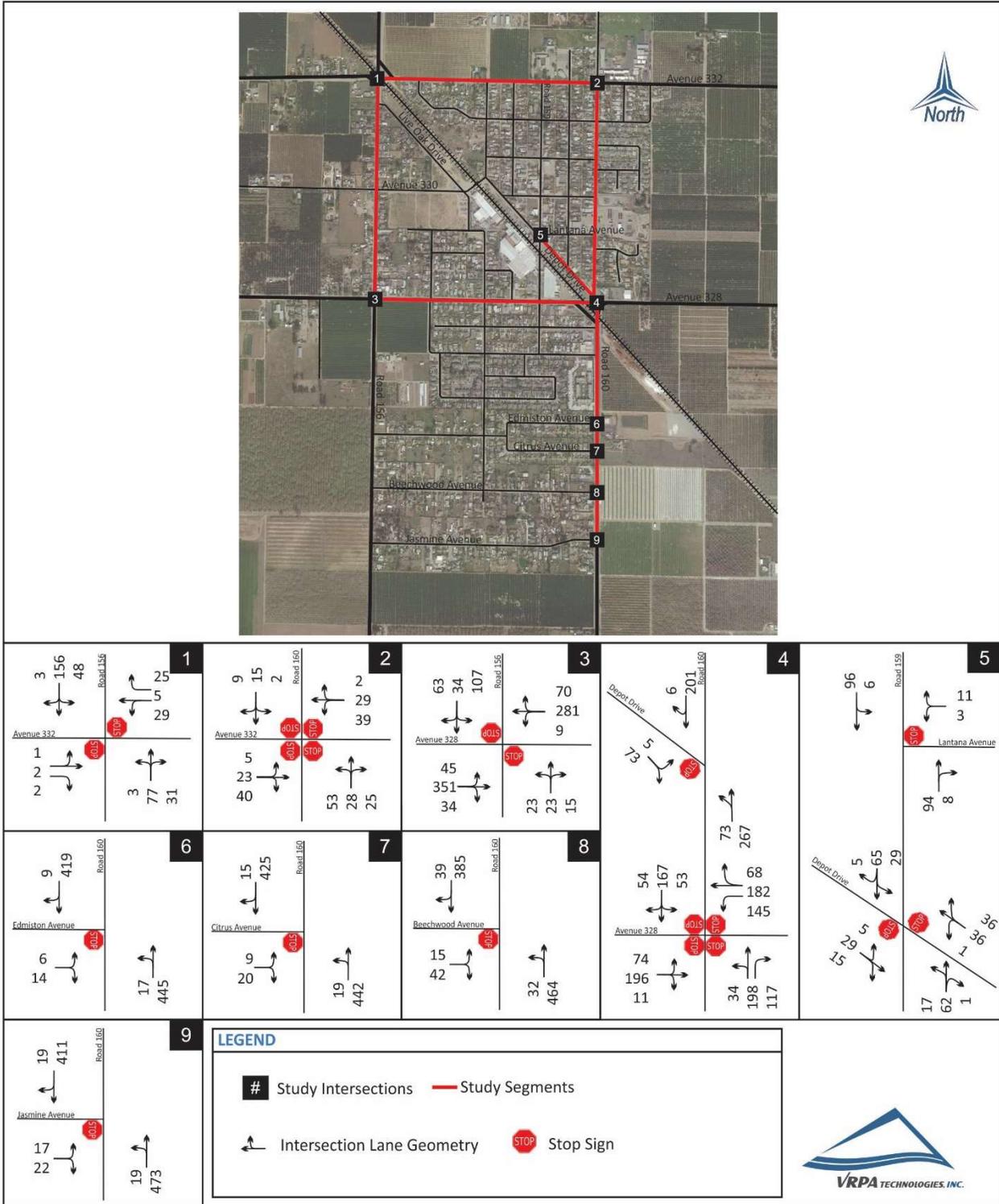
**Ivanhoe Community Plan Update**  
**Future Year 2040 No Build AM Peak Hour Traffic**

**Figure 3-2**



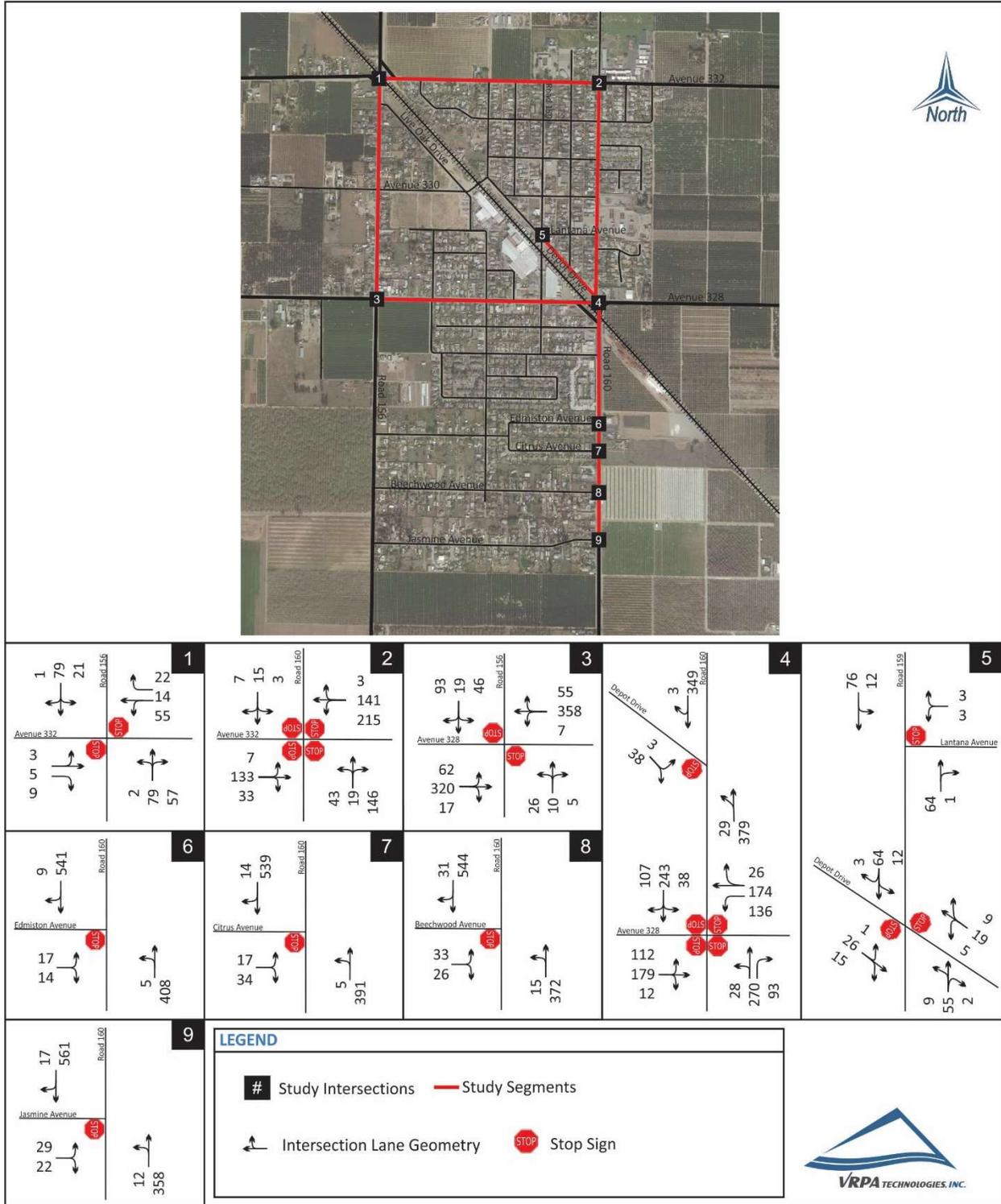
**Ivanhoe Community Plan Update Traffic Impact Study**  
**Future Year 2040 No Build PM Peak Hour Traffic**

**Figure**  
**3-3**



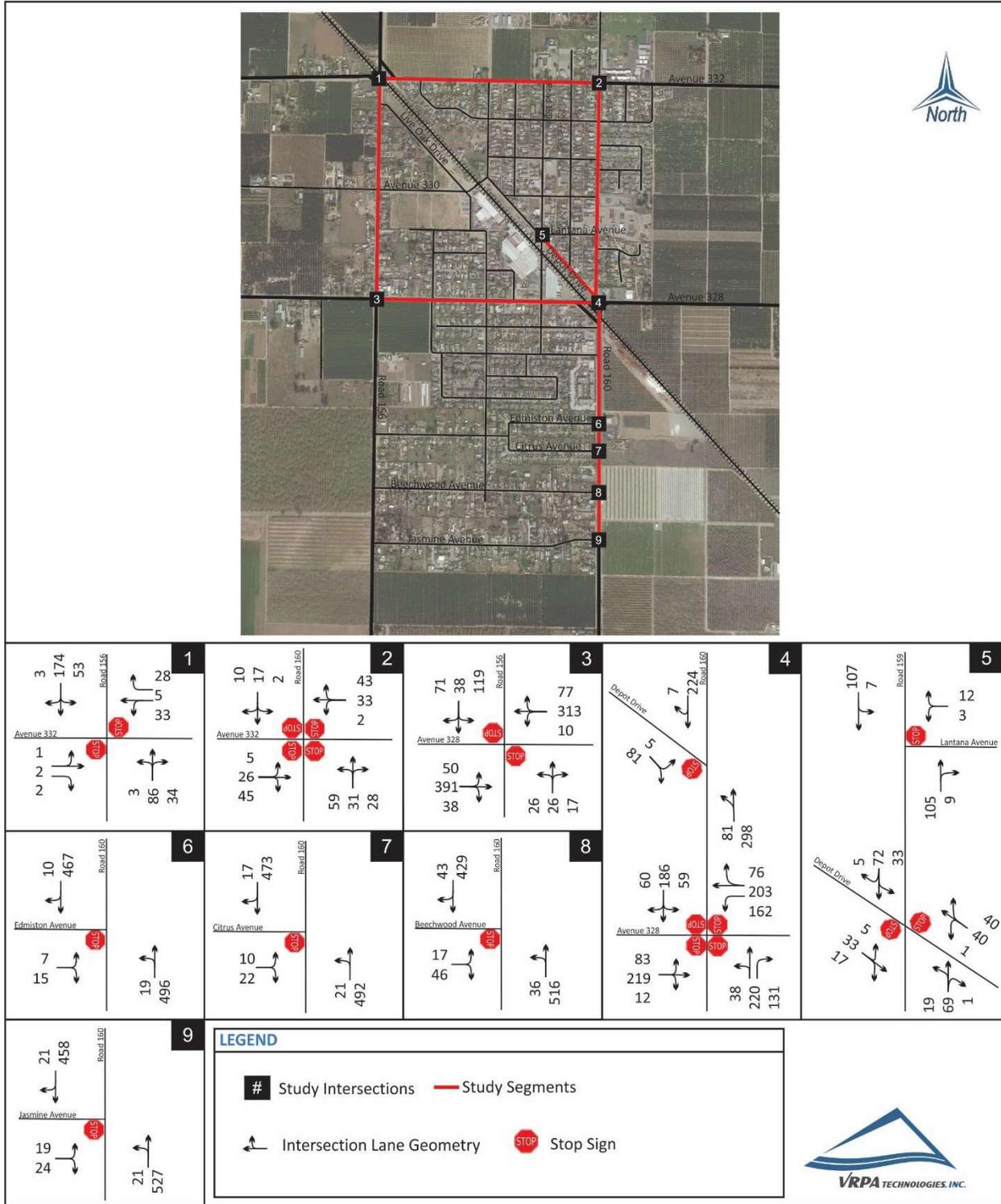
**Ivanhoe Community Plan Update Traffic Impact Study**  
**Future Year 2040 Build AM Peak Hour Traffic**

**Figure**  
**3-4**



Ivanhoe Community Plan Update Traffic Impact Study  
 Future Year 2040 Build PM Peak Hour Traffic

Figure 3-5



## 3.2 Impacts

### 3.2.1 Intersection Capacity Analysis

Table 3-1 shows the anticipated level of service conditions at study intersections for the Future Year 2040 scenarios. Results of the analysis show that two (2) of the study intersections will exceed level of service standards under the Future Year 2040 No Build and Future Year 2040 Build scenarios. The improvement projects listed in Section 4.0 will alleviate level of service deficiencies at study intersections for all Future Year 2040 scenarios.

### 3.2.2 Roadway Segment Capacity Analysis

Table 3-2 shows the anticipated level of service conditions at study roadway segments for the Future Year 2040 scenarios. Results of the analysis show that all of the study roadway segments will meet the applicable level of service standards. As a result, no roadway segment improvements are warranted.

## 3.3 Queuing Analysis

Table 3-3 provides a queue length summary for the study intersections for the Future Year 2040 scenarios. The queuing analyses is based upon methodology presented in Chapter 400 of Caltrans' Highway Design Manual (HDM). Appendix C includes Chapter 400 of Caltrans' HDM. The queue results shown in Table 3-3 represent the approximate queue lengths for the respective lane movements.

## 3.4 Public Transit, Bikeways, and Pedestrian Circulation

As noted previously, Ivanhoe has limited transit service and pedestrian and bicycle facilities. Public transit is likely to remain a limited option due to fiscal constraints and the high cost of providing services to a relatively low-density community. Furthermore, the low level of auto congestion in Ivanhoe, now and into the future suggests that driving will continue to be more convenient than public transit for those with access to a private car. For those without access to a car, the best approach for improving transit in Ivanhoe will be to enhance rider information systems that give potential transit patrons precise arrival and departure times for transit and paratransit vehicles. Such real time information systems, by reducing the uncertainty and time spent waiting, can both increase demand for public transit and paratransit and improve riders' overall experience.

With respect to pedestrian and bicycle modes, the current and projected low levels of vehicular traffic in Ivanhoe, together with short travel distances within the community, means that these modes can be very competitive for trips within Ivanhoe, even with minimal facilities. A reasonably flat, safe surface on the side of a low traffic road can often suffice for pedestrians and bicycles, especially if signs alert drivers to the presence of non-motorized traffic.

**Table 3-1**  
**Intersection Operations**

| INTERSECTION                   | CONTROL            | TARGET LOS | PEAK HOUR | FUTURE YEAR 2040 NO BUILD |            | FUTURE YEAR 2040 BUILD |            |
|--------------------------------|--------------------|------------|-----------|---------------------------|------------|------------------------|------------|
|                                |                    |            |           | DELAY                     | LOS        | DELAY                  | LOS        |
| 1. Avenue 332 & Road 156       | Two-Way Stop Sign  | D          | AM        | 11.1                      | B          | 11.4                   | B          |
|                                |                    |            | PM        | 12.5                      | B          | 13.1                   | B          |
| 2. Avenue 332 & Road 160       | Four-Way Stop Sign | D          | AM        | 10.7                      | B          | 11.7                   | B          |
|                                |                    |            | PM        | 7.7                       | A          | 7.7                    | A          |
| 3. Avenue 328 & Road 156       | Two-Way Stop Sign  | D          | AM        | 23.6                      | C          | 29.5                   | D          |
|                                |                    |            | PM        | <b>49.9</b>               | <b>E +</b> | <b>106.9</b>           | <b>F +</b> |
| 4. Avenue 328 & Road 160       | Four-Way Stop Sign | C          | AM        | <b>28.2</b>               | <b>D +</b> | <b>48.3</b>            | <b>E +</b> |
|                                |                    |            | PM        | 23.5                      | C          | <b>37.0</b>            | <b>E +</b> |
| 4b. Depot Drive & Road 160     | One-Way Stop Sign  | C          | AM        | 11.1                      | B          | 11.5                   | B          |
|                                |                    |            | PM        | 10.5                      | B          | 10.8                   | B          |
| 5. Depot Drive & Road 159      | Two-Way Stop Sign  | D          | AM        | 10.0                      | B          | 10.2                   | B          |
|                                |                    |            | PM        | 10.8                      | B          | 11.1                   | B          |
| 5b. Lantana Ave & Road 159     | One-Way Stop Sign  | D          | AM        | 9.2                       | A          | 9.3                    | A          |
|                                |                    |            | PM        | 9.3                       | A          | 9.4                    | A          |
| 6. Edmiston Avenue & Road 160  | One-Way Stop Sign  | C          | AM        | 16.1                      | C          | 17.9                   | C          |
|                                |                    |            | PM        | 13.9                      | B          | 15.3                   | C          |
| 7. Citrus Avenue & Road 160    | One-Way Stop Sign  | C          | AM        | 14.9                      | B          | 16.5                   | C          |
|                                |                    |            | PM        | 14.4                      | B          | 15.8                   | C          |
| 8. Beechwood Avenue & Road 160 | One-Way Stop Sign  | C          | AM        | 17.3                      | C          | 19.8                   | C          |
|                                |                    |            | PM        | 14.7                      | B          | 16.4                   | C          |
| 9. Jasmine Avenue & Road 160   | One-Way Stop Sign  | C          | AM        | 17.0                      | C          | 19.2                   | C          |
|                                |                    |            | PM        | 16.1                      | C          | 18.2                   | C          |

DELAY is measured in seconds

LOS = Level of Service / **BOLD** denotes LOS standard has been exceeded

For all-way stop controlled intersections, delay results show the average for the entire intersection. For one-way and two-way stop controlled intersections, delay results show the delay for the worst movement.

+ Meets Peak Hour Signal warrants

**Table 3-2**  
**Segment Operations**

| STREET SEGMENT                    | SEGMENT DESCRIPTION | TARGET LOS | PEAK HOUR | FUTURE YEAR 2040 NO BUILD |     | FUTURE YEAR 2040 BUILD |     |
|-----------------------------------|---------------------|------------|-----------|---------------------------|-----|------------------------|-----|
|                                   |                     |            |           | VOLUME                    | LOS | VOLUME                 | LOS |
| <b>1. Avenue 332</b>              |                     |            |           |                           |     |                        |     |
| Road 156 to Road 160              | 2 Lanes Undivided   | D          | AM        | 326                       | B   | 363                    | B   |
|                                   |                     |            | PM        | 159                       | B   | 177                    | B   |
| <b>2. Avenue 328</b>              |                     |            |           |                           |     |                        |     |
| Road 156 to Road 160              | 2 Lanes Undivided   | D          | AM        | 711                       | B   | 792                    | B   |
|                                   |                     |            | PM        | 833                       | B   | 928                    | B   |
| <b>3. Road 156</b>                |                     |            |           |                           |     |                        |     |
| Avenue 332 to Avenue 328          | 2 Lanes Undivided   | D          | AM        | 257                       | B   | 286                    | B   |
|                                   |                     |            | PM        | 342                       | B   | 380                    | B   |
| <b>4. Road 160</b>                |                     |            |           |                           |     |                        |     |
| Avenue 332 to Avenue 328          | 2 Lanes Undivided   | D          | AM        | 714                       | B   | 795                    | B   |
|                                   |                     |            | PM        | 614                       | B   | 683                    | B   |
| Avenue 328 to Edmiston Avenue     | 2 Lanes Undivided   | C          | AM        | 875                       | B   | 974                    | B   |
|                                   |                     |            | PM        | 880                       | B   | 980                    | B   |
| Edmiston Avenue to Jasmine Avenue | 2 Lanes Undivided   | C          | AM        | 869                       | B   | 968                    | B   |
|                                   |                     |            | PM        | 920                       | B   | 1,024                  | B   |

LOS = Level of Service / **BOLD** denotes LOS standard has been exceeded

**Table 3-3**  
**Queuing Operations**

| INTERSECTION             | EXISTING QUEUE STORAGE LENGTH (ft) |     | FUTURE YEAR 2040 NO BUILD |           | FUTURE YEAR 2040 BUILD |            |
|--------------------------|------------------------------------|-----|---------------------------|-----------|------------------------|------------|
|                          |                                    |     | AM Queue                  | PM Queue  | AM Queue               | PM Queue   |
| 1. Avenue 332 & Road 156 | EB Right                           | 75  | 7                         | 2         | 8                      | 2          |
|                          | WB Right                           | 125 | 17                        | 21        | 18                     | 23         |
| <hr/>                    |                                    |     |                           |           |                        |            |
| 4. Avenue 328 & Road 160 | NB Right                           | 75  | 69                        | <b>98</b> | <b>78</b>              | <b>109</b> |
|                          | WB Left                            | 125 | 102                       | 121       | 113                    | <b>135</b> |

Queue is measured in feet / **BOLD** denotes exceedance

### 3.5 Left-Turn Lane Assessment

As noted in Table 3-1, the intersections of Edmiston Avenue at Road 160, Citrus Avenue at Road 160, Beechwood Avenue at Road 160, and Jasmine Avenue at Road 160 currently meet Caltrans' acceptable level of service standard of 'C'. Figure 2-4 of Section 2.0 shows that over a five-year period, between 2013 to 2107, there were approximately six (6) accidents that occurred along Road 160 within the Ivanhoe Community. Improper turn was the primary collision factor for these accidents. The National Cooperative Highway Report Program (NCHRP) Report 745 includes left-turn lane warrant guidelines based on the peak hour volumes and the intersection configuration, as shown in Table 3-4. Left-turn lanes can reduce the potential for collisions and improve capacity by removing stopped vehicles from the main travel lane. Considering the peak hour traffic volumes for the Future Year 2040 No Build and Future Year 2040 Build scenarios, the left turn warrant criteria (Table 3-4) is satisfied for the northbound left volumes at the intersections of Edmiston Avenue at Road 160, Citrus Avenue at Road 160, Beechwood Avenue at Road 160, and Jasmine Avenue at Road 160.

**Table 3-4**  
**Recommended Left-Turn Treatment Warrants for**  
**Rural Two-Lane Highways**

| LEFT-TURN LANE<br>PEAK-HOUR<br>VOLUME (veh/hr) | THREE-LEG<br>INTERSECTION, MAJOR<br>TWO-LANE HIGHWAY<br>PEAK-HOUR VOLUME<br>(veh/hr/ln) THAT<br>WARRANTS A LEFT-<br>TURN LANE |
|--|---|
| 5  | 200   |
| 10   | 100   |
| 15   | 100   |
| 20   | 50  |
| 25   | 50  |
| 30   | 50  |
| 35   | 50  |
| 40   | 50  |
| 45   | 50  |
| 50 or more                                     | 50  |

Source: NCHRP Report 745

## 4.0 Standards of Significance

Results of the analysis show that all of the study intersections and roadway segments will meet Tulare County's LOS "D" criteria and Caltrans' LOS "C" criteria through the year 2040 with the development of specific roadway improvements.

### CEQA Environmental Checklist

The following thresholds of significance are based on Appendix G of the CEQA Guidelines. Implementation of the Ivanhoe Community Plan Update would result in a significant impact if it would:

- ✓ Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?
- ✓ Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?
- ✓ Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (eg., farm equipment)?
- ✓ Result in inadequate emergency access?

### 4.1 Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

**Less Than Significant Impact After Mitigation** - The proposed Ivanhoe Community Plan Update traffic analysis provides a policy framework to address potential traffic impacts encountered in the planning process. Results of the traffic analysis shows that the Ivanhoe Community Plan Update is in harmony with both the Tulare County General Plan and the TCAG Regional Transportation Plan. The General Plan currently calls for all intersections and roadway segments to be maintained at LOS "D" or better; this objective would be obtained given implementation of the Community Plan and the specific roadway improvements (mitigation measures) noted below. The Ivanhoe Community Plan also meets Caltrans' acceptable level of service criteria in the study area with the development of specific roadway improvements noted below. As a result, the Ivanhoe Community Plan Update will not conflict with a program, plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant

components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.

Described below are mitigation measures at study area intersections and segments for the Future Year 2040 scenarios that address future transportation and circulation issues in the Ivanhoe community. The improvements identified would result in acceptable levels of service as shown in Table 3-5.

#### 4.1.1 Intersections

##### ✓ Future Year 2040 No Build Scenario

- MM TR - 1. Avenue 328 / Road 156
- Install Four-Way Stop

- MM TR - 2. Avenue 328 / Road 160
- Widen the southbound approach to 1 shared left-through lane and 1 right turn lane (adding 1 right turn lane)

##### ✓ Future Year 2040 Build Scenario

- MM TR - 3. Avenue 328 / Road 156
- See MM TR-1

- MM TR - 4. Avenue 328 / Road 160
- Widen the southbound approach to 1 shared left-through lane and 1 right turn lane (adding 1 right turn lane)
  - Widen the eastbound approach to 1 left turn lane and 1 through lane with a shared right (adding 1 left turn lane)

#### 4.2 Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

**Less Than Significant Impact** – In the fall of 2013, Senate Bill 743 (SB 743) was passed by the legislature and signed into law by the governor. For some parts of California (and possibly the entire state), this legislation will eventually change the way that transportation studies are conducted for environmental documents. In the areas where SB 743 is implemented, delay-based metrics such as roadway capacity and level of service will no longer be the performance measures used for the determination of the transportation impacts of projects in studies conducted under CEQA. Instead, new performance measures such as vehicle miles travelled (VMT) or other similar measures will be used.

July 1, 2020 is the statewide implementation date and agencies may opt-in use of new metrics

prior to that date. Therefore, the traffic analysis follows current practice regarding state and local guidance as of the date of preparation. The General Plan currently calls for all intersections and roadway segments to be maintained at LOS “D” or better; this objective would be obtained given implementation of the Community Plan and the specific roadway improvements (mitigation measures) noted in Section 4.1.1 above. As a result, the Project will not conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b). Therefore, no mitigation is needed.

### 4.3 Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (eg., farm equipment)?

**Less Than Significant Impact** - The Ivanhoe Community Plan Update would not result in hazards due to design features, since all proposed improvements would be built to County design standards. The proposed Community Plan land uses would not increase the use of farm equipment on streets and roads in the Ivanhoe Community. As a result, the Project will not substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment). Therefore, no mitigation is needed.

### 4.4 Result in inadequate emergency access?

**Less Than Significant Impact** - The Ivanhoe Community Plan Update would not result in any degradation of emergency access within the community. Congestion at an intersection or along a roadway can adversely impact emergency access. Results of the traffic analysis shows that all of the study intersections and roadway segments will meet acceptable levels of service with the development of specific roadway improvements. As a result, the Project will not result in inadequate emergency access. Therefore, no mitigation is needed.

**Table 3-5**  
 Intersection Operations with Improvements

| INTERSECTION             | CONTROL            | TARGET LOS | PEAK HOUR | FUTURE YEAR 2040 NO BUILD |     | FUTURE YEAR 2040 BUILD |     |
|--------------------------|--------------------|------------|-----------|---------------------------|-----|------------------------|-----|
|                          |                    |            |           | DELAY                     | LOS | DELAY                  | LOS |
| 3. Avenue 328 & Road 156 | Four-Way Stop Sign | D          | AM        | 13.6                      | B   | 16.2                   | C   |
|                          |                    |            | PM        | 17.5                      | C + | 25.3                   | D + |
| 4. Avenue 328 & Road 160 | Four-Way Stop Sign | C          | AM        | 20.7                      | C + | 22.4                   | C + |
|                          |                    |            | PM        | 20.4                      | C   | 22.6                   | C + |

DELAY is measured in seconds

LOS = Level of Service / **BOLD** denotes LOS standard has been exceeded

For all-way stop controlled intersections, delay results show the average for the entire intersection.

+ Meets Peak Hour Signal warrants

# **APPENDIX A**

Modified HCM-Based Tables (Florida Tables)

Generalized **Peak Hour Two-Way** Volumes for Florida's  
**Areas Transitioning into Urbanized Areas OR**  
**Areas Over 5,000 Not In Urbanized Areas<sup>1</sup>**

**TABLE 5**

03/14/2018

| INTERRUPTED FLOW FACILITIES   |           |                         |                          |                       |        | UNINTERRUPTED FLOW FACILITIES   |           |                      |                  |                    |       |
|---|-----------|-------------------------|--------------------------|-----------------------|--------|---|-----------|----------------------|------------------|--------------------|-------|
| <b>STATE SIGNALIZED ARTERIALS</b>   |           |                         |                          |                       |        | <b>FREEWAYS</b>   |           |                      |                  |                    |       |
| <b>Principal</b> (1 signal per half mile)   |           |                         |                          |                       |        | Lanes   | B         | C                    | D                | E                  |       |
| Lanes   | Median    | B                       | C                        | D                     | E      | 4   | 4,580     | 5,950                | 7,040            | **                 |       |
| 2   | Undivided | *                       | 800                      | 1,650                 | 1,690  | 6   | 6,620     | 8,730                | 10,420           | 10,550             |       |
| 4   | Divided   | *                       | 2,490                    | 3,350                 | **     | 8   | 8,650     | 11,510               | 13,760           | 14,070             |       |
| 6   | Divided   | 840                     | 3,870                    | 5,090                 | **     | 10  | 11,200    | 14,950               | 17,580           | **                 |       |
| <b>Minor</b> (1 signal per quarter mile)  |           |                         |                          |                       |        | <b>Freeway Adjustments</b>  |           |                      |                  |                    |       |
| Lanes   | Median    | B                       | C                        | D                     | E      | Auxiliary Lanes<br>In Both Directions   |           |                      | Ramp<br>Metering |                    |       |
| 2   | Undivided | *                       | *                        | 270                   | 1,360  | + 1,800   |           |                      | + 5%             |                    |       |
| 4   | Divided   | *                       | 1,150                    | 2,490                 | 3,270  |   |           |                      |                  |                    |       |
| 6   | Divided   | *                       | 2,020                    | 3,840                 | 5,000  |   |           |                      |                  |                    |       |
| <b>Non-State Signalized Roadway Adjustments</b><br>(Alter corresponding state volumes<br>by the indicated percent.)   |           |                         |                          |                       |        |   |           |                      |                  |                    |       |
| Non-State Signalized Roadways - 10%   |           |                         |                          |                       |        |   |           |                      |                  |                    |       |
| <b>Median &amp; Turn Lane Adjustments</b>   |           |                         |                          |                       |        | <b>UNINTERRUPTED FLOW HIGHWAYS</b>  |           |                      |                  |                    |       |
| Lanes   | Median    | Exclusive<br>Left Lanes | Exclusive<br>Right Lanes | Adjustment<br>Factors |        | Lanes   | Median    | B                    | C                | D                  | E     |
| 2   | Divided   | Yes                     | No                       | +5%                   |        | 2   | Undivided | 1,110                | 1,690            | 2,290              | 3,070 |
| 2   | Undivided | No                      | No                       | -20%                  |        | 4   | Divided   | 3,160                | 4,560            | 5,710              | 6,290 |
| Multi   | Undivided | Yes                     | No                       | -5%                   |        | 6   | Divided   | 4,750                | 6,850            | 8,580              | 9,440 |
| Multi   | Undivided | No                      | No                       | -25%                  |        | <b>Uninterrupted Flow Highway Adjustments</b>   |           |                      |                  |                    |       |
| -   | -         | -                       | Yes                      | + 5%                  |        | Lanes   | Median    | Exclusive left lanes |                  | Adjustment factors |       |
| <b>One-Way Facility Adjustment</b><br>Multiply the corresponding two-directional<br>volumes in this table by 0.6  |           |                         |                          |                       |        | 2   | Divided   | Yes                  |                  | +5%                |       |
|   |           |                         |                          |                       |        | Multi   | Undivided | Yes                  |                  | -5%                |       |
|   |           |                         |                          |                       |        | Multi   | Undivided | No                   |                  | -25%               |       |
| <b>BICYCLE MODE<sup>2</sup></b><br>(Multiply motorized vehicle volumes shown below by number of<br>directional roadway lanes to determine two-way maximum service<br>volumes.)    |           |                         |                          |                       |        | <sup>1</sup> Values shown are presented as peak hour directional volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the Highway Capacity Manual and the Transit Capacity and Quality of Service Manual.<br><br><sup>2</sup> Level of service for the bicycle and pedestrian modes in this table is based on number of motorized vehicles, not number of bicyclists or pedestrians using the facility.<br><br><sup>3</sup> Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow.<br><br>* Cannot be achieved using table input value defaults.<br><br>** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.<br><br>Source:<br>Florida Department of Transportation<br>Systems Planning Office<br><a href="http://www.dot.state.fl.us/planning/systems/sm/los/default.shtm">www.dot.state.fl.us/planning/systems/sm/los/default.shtm</a> |           |                      |                  |                    |       |
| Paved   |           |                         |                          |                       |        |   |           |                      |                  |                    |       |
| Shoulder/Bicycle  |           |                         |                          |                       |        |   |           |                      |                  |                    |       |
| Lane Coverage   |           |                         |                          |                       |        |   |           |                      |                  |                    |       |
|   |           | B                       | C                        | D                     | E      |   |           |                      |                  |                    |       |
|   | 0-49%     | *                       | 140                      | 550                   | 1,760  |   |           |                      |                  |                    |       |
|   | 50-84%    | 170                     | 500                      | 1,650                 | >1,760 |   |           |                      |                  |                    |       |
|   | 85-100%   | 670                     | 1,760                    | >1,760                | **     |   |           |                      |                  |                    |       |
| <b>PEDESTRIAN MODE<sup>2</sup></b><br>(Multiply motorized vehicle volumes shown below by number of<br>directional roadway lanes to determine two-way maximum service<br>volumes.) |           |                         |                          |                       |        |   |           |                      |                  |                    |       |
| Sidewalk Coverage   |           |                         |                          |                       |        |   |           |                      |                  |                    |       |
|   |           | B                       | C                        | D                     | E      |   |           |                      |                  |                    |       |
|   | 0-49%     | *                       | *                        | 250                   | 850    |   |           |                      |                  |                    |       |
|   | 50-84%    | *                       | 150                      | 780                   | 1,410  |   |           |                      |                  |                    |       |
|   | 85-100%   | 340                     | 950                      | 1,540                 | >1,760 |   |           |                      |                  |                    |       |
| <b>BUS MODE (Scheduled Fixed Route)<sup>3</sup></b><br>(Buses in peak hour in peak direction)   |           |                         |                          |                       |        |   |           |                      |                  |                    |       |
| Sidewalk Coverage   |           |                         |                          |                       |        |   |           |                      |                  |                    |       |
|   |           | B                       | C                        | D                     | E      |   |           |                      |                  |                    |       |
|   | 0-84%     | > 5                     | ≥ 4                      | ≥ 3                   | ≥ 2    |   |           |                      |                  |                    |       |
|   | 85-100%   | > 4                     | ≥ 3                      | ≥ 2                   | ≥ 1    |   |           |                      |                  |                    |       |

TABLE 5  
(continued)

Generalized Peak Hour Two-Way Volumes for Florida's  
Areas Transitioning into Urbanized Areas OR  
Areas Over 5,000 Not In Urbanized Areas

03/14/2018

| INPUT VALUE ASSUMPTIONS                | Uninterrupted Flow Facilities |          |                  | Interrupted Flow Facilities |         |                 |           |            |           |
|--|-------------------------------|----------|------------------|-----------------------------|---------|-----------------|-----------|------------|-----------|
|  | Freeways                      | Highways |                  | Principal Arterials         |         | Minor Arterials | Bicycle   | Pedestrian |           |
| <b>ROADWAY CHARACTERISTICS</b>         |                               |          |                  |                             |         |                 |           |            |           |
| Area type (urban, rural)               | urban                         |          |                  |                             |         |                 |           |            |           |
| Number of through lanes (both dir.)    | 4-10                          | 2        | 4-6              | 2-4                         | 6       | 2               | 4-6       | 4          | 4         |
| Posted speed (mph)                     | 70                            | 50       | 50               | 50                          | 50      | 40              | 40        | 45         | 45        |
| Free flow speed (mph)                  | 75                            | 55       | 55               | 55                          | 55      | 45              | 45        | 50         | 50        |
| Auxiliary Lanes (n, y)                 | n                             |          |                  |                             |         |                 |           |            |           |
| Median (d, u, twlt)                    |                               |          | d                |                             |         |                 |           |            |           |
| Terrain (l,r)                          | l                             | l        | l                | l                           | l       | l               | l         | l          | l         |
| % no passing zone                      |                               | 60       |                  |                             |         |                 |           |            |           |
| Exclusive left turn lane impact (n, y) |                               | [n]      | y                | y                           | y       | y               | y         | y          | y         |
| Exclusive right turn lanes (n, y)      |                               |          |                  | n                           | y       | n               | y         |            |           |
| Facility length (mi)                   | 6                             | 5        | 5                | 2                           | 2       | 2               | 2         | 2          | 2         |
| Interchange Density (intch/mi)         | 0.5                           |          |                  |                             |         |                 |           |            |           |
| <b>TRAFFIC CHARACTERISTICS</b>         |                               |          |                  |                             |         |                 |           |            |           |
| Planning analysis hour factor (K)      | 0.090                         | 0.090    | 0.090            | 0.090                       | 0.090   | 0.090           | 0.090     | 0.090      | 0.090     |
| Directional distribution factor (D)    | 0.55                          | 0.55     | 0.55             | 0.55                        | 0.55    | 0.55            | 0.55      | 0.57       | 0.57      |
| Peak hour factor (PHF)                 | 1.00                          | 1.00     | 1.00             | 1.00                        | 1.00    | 1.00            | 1.00      | 1.00       | 1.00      |
| Base saturation flow rate (pcphpl)     | 2,400                         | 1,700    | 2,100            | 1,950                       | 1,950   | 1,950           | 1,950     | 1,950      | 1,950     |
| Heavy vehicle percent                  | 9.0                           | 4.0      | 4.0              | 3.0                         | 3.0     | 3.0             | 3.0       | 3.0        | 3.0       |
| Speed Adjustment Factor (SAF)          | 0.913                         |          | 0.913            |                             |         |                 |           |            |           |
| Capacity Adjustment Factor (CAF)       | 0.898                         |          | 0.898            |                             |         |                 |           |            |           |
| % left turns                           |                               |          |                  | 12                          | 12      | 12              | 12*       | 12         | 12        |
| % right turns                          |                               |          |                  | 12                          | 12      | 12              | 12        | 12         | 12        |
| <b>CONTROL CHARACTERISTICS</b>         |                               |          |                  |                             |         |                 |           |            |           |
| Number of signals                      |                               |          |                  | 5                           | 5       | 9               | 9         | 4          | 6         |
| Arrival type (1-6)                     |                               |          |                  | 3                           | 3       | 3               | 3         | 4          | 4         |
| Signal type (a, c, p)                  |                               |          |                  | c                           | c       | c               | c         | c          | c         |
| Cycle length (C)                       |                               |          |                  | 120                         | 120     | 110             | 110       | 120        | 120       |
| Effective green ratio (g/C)            |                               |          |                  | 0.44                        | 0.44    | 0.44            | 0.44      | 0.44       | 0.44      |
| <b>MULTIMODAL CHARACTERISTICS</b>      |                               |          |                  |                             |         |                 |           |            |           |
| Paved shoulder/bicycle lane (n, y)     |                               |          |                  |                             |         |                 |           | n, 50%, y  | n         |
| Outside lane width                     |                               |          |                  |                             |         |                 |           | t          | t         |
| Pavement condition                     |                               |          |                  |                             |         |                 |           | t          |           |
| On-street parking                      |                               |          |                  |                             |         |                 |           | n          | n         |
| Sidewalk (n, y)                        |                               |          |                  |                             |         |                 |           |            | n, 50%, y |
| Sidewalk/roadway separation (a, t, w)  |                               |          |                  |                             |         |                 |           |            | t         |
| Sidewalk protective barrier (n, y)     |                               |          |                  |                             |         |                 |           |            | n         |
| <b>LEVEL OF SERVICE THRESHOLDS</b>     |                               |          |                  |                             |         |                 |           |            |           |
| Level of Service                       | Freeways                      | Highways |                  | Arterials                   | Bicycle | Ped             | Bus       |            |           |
|  | Density pc/mi/ln              | Two-Lane | Multilane        | Principal & Minor           | Score   | Score           | Buses/hr. |            |           |
|  |                               | %ffs     | Density pc/mi/ln | %bffb                       |         |                 |           |            |           |
| B                                      | ≤ 18                          | > 83.3   | ≤ 18             | > 67                        | ≤ 2.75  | ≤ 2.75          | ≤ 6       |            |           |
| C                                      | ≤ 26                          | > 75.0   | ≤ 26             | > 50                        | ≤ 3.50  | ≤ 3.50          | ≤ 4       |            |           |
| D                                      | ≤ 35                          | > 66.7   | ≤ 35             | > 40                        | ≤ 4.25  | ≤ 4.25          | < 3       |            |           |
| E                                      | ≤ 45                          | ≤ 66.7   | ≤ 45             | > 30                        | ≤ 5.00  | ≤ 5.00          | < 2       |            |           |

\* 13% SB left turns for 6-lane minor arterials

pc/mi/ln = passenger cars per mile per lane %ffs = percent free flow speed %bffb = percent base free flow speed

# **APPENDIX B**

Traffic Count Worksheets

# National Data & Surveying Services

## Intersection Turning Movement Count

**Location:** Rd 156 & Ave 332  
**City:** Ivanhoe  
**Control:** Signalized

**Project ID:** 18-07426-010  
**Date:** 11/27/2018

**Total**

| NS/EW Streets:         | Rd 156                     |        |            |        |        | Ave 332    |       |           |        |        | Ave 332   |        |           |        |        | TOTAL     |       |    |    |  |              |
|------------------------|----------------------------|--------|------------|--------|--------|------------|-------|-----------|--------|--------|-----------|--------|-----------|--------|--------|-----------|-------|----|----|--|--------------|
|                        | NORTHBOUND                 |        | SOUTHBOUND |        | NU     | SOUTHBOUND |       | EASTBOUND |        | EU     | WESTBOUND |        | WESTBOUND |        | TOTAL  |           |       |    |    |  |              |
| AM                     | NL                         | NT     | NR         | NR     |        | SL         | ST    | SR        | SU     |        | EL        | ET     | ER        | EU     |        | WL        | WT    | WR | WU |  |              |
| 7:00 AM                | 0                          | 9      | 3          | 0      | 0      | 3          | 8     | 0         | 1      | 1      | 1         | 0      | 3         | 1      | 9      | 0         | 38    |    |    |  |              |
| 7:15 AM                | 0                          | 9      | 4          | 0      | 0      | 2          | 12    | 0         | 1      | 0      | 1         | 0      | 4         | 0      | 2      | 0         | 35    |    |    |  |              |
| 7:30 AM                | 1                          | 9      | 7          | 0      | 0      | 4          | 13    | 0         | 0      | 1      | 2         | 0      | 6         | 2      | 3      | 0         | 48    |    |    |  |              |
| 7:45 AM                | 0                          | 17     | 12         | 0      | 0      | 4          | 14    | 0         | 0      | 2      | 1         | 0      | 8         | 2      | 6      | 0         | 66    |    |    |  |              |
| 8:00 AM                | 0                          | 11     | 10         | 0      | 0      | 2          | 7     | 0         | 1      | 0      | 1         | 0      | 14        | 4      | 2      | 0         | 52    |    |    |  |              |
| 8:15 AM                | 1                          | 10     | 2          | 0      | 0      | 1          | 9     | 0         | 0      | 0      | 0         | 0      | 6         | 0      | 3      | 0         | 39    |    |    |  |              |
| 8:30 AM                | 1                          | 12     | 1          | 0      | 0      | 6          | 9     | 0         | 0      | 0      | 2         | 0      | 2         | 2      | 6      | 0         | 39    |    |    |  |              |
| 8:45 AM                | 0                          | 13     | 2          | 0      | 0      | 2          | 7     | 0         | 0      | 0      | 2         | 0      | 0         | 0      | 3      | 0         | 30    |    |    |  |              |
| <b>TOTAL VOLUMES:</b>  | NL                         | NT     | NR         | NR     | NU     | SL         | ST    | SR        | SU     | EL     | ET        | ER     | EU        | WL     | WT     | WR        | WU    |    |    |  |              |
| <b>APPROACH %'s:</b>   | 3                          | 90     | 41         | 30.60% | 0      | 24         | 79    | 1         | 0      | 3      | 4         | 7      | 0         | 43     | 11     | 34        | 0     |    |    |  |              |
|                        | 2.24%                      | 67.16% | 30.60%     | 0.00%  | 23.08% | 75.96%     | 0.96% | 0.00%     | 21.43% | 28.57% | 50.00%    | 0.00%  | 48.86%    | 12.50% | 38.64% | 0.00%     | 340   |    |    |  |              |
| <b>PEAK HR:</b>        | <b>07:15 AM - 08:15 AM</b> |        |            |        |        |            |       |           |        |        |           |        |           |        |        |           |       |    |    |  |              |
| <b>PEAK HR VOL:</b>    | 1                          | 46     | 33         | 0      | 0      | 12         | 46    | 0         | 0      | 2      | 3         | 5      | 0         | 32     | 8      | 13        | 0     |    |    |  |              |
| <b>PEAK HR FACTOR:</b> | 0.250                      | 0.676  | 0.688      | 0.000  | 0.000  | 0.750      | 0.821 | 0.000     | 0.000  | 0.500  | 0.375     | 0.625  | 0.000     | 0.571  | 0.500  | 0.542     | 0.000 |    |    |  |              |
|                        |                            | 0.690  |            |        |        |            | 0.806 |           |        |        | 0.833     |        |           |        | 0.663  |           | 0.761 |    |    |  |              |
| <b>TOTAL</b>           |                            |        |            |        |        |            |       |           |        |        |           |        |           |        |        |           |       |    |    |  |              |
| <b>PM</b>              | NORTHBOUND                 |        |            |        |        | SOUTHBOUND |       |           |        |        | EASTBOUND |        |           |        |        | WESTBOUND |       |    |    |  | <b>TOTAL</b> |
| 4:00 PM                | 0                          | 2      | 0          | 0      | 0      | 0          | 2     | 0         | 0      | 0      | 0.5       | 0.5    | 0         | 0      | 0.5    | 0.5       | 0     |    |    |  |              |
| 4:15 PM                | 1                          | 19     | 6          | 0      | 0      | 6          | 25    | 0         | 0      | 0      | 0         | 0      | 0         | 5      | 1      | 1         | 0     |    |    |  |              |
| 4:30 PM                | 0                          | 12     | 3          | 0      | 1      | 7          | 32    | 0         | 0      | 0      | 0         | 1      | 0         | 6      | 1      | 7         | 0     |    |    |  |              |
| 4:45 PM                | 0                          | 7      | 3          | 0      | 0      | 11         | 25    | 2         | 0      | 0      | 0         | 0      | 0         | 3      | 0      | 3         | 0     |    |    |  |              |
| 5:00 PM                | 0                          | 12     | 8          | 0      | 0      | 7          | 19    | 0         | 0      | 0      | 1         | 0      | 0         | 5      | 1      | 5         | 0     |    |    |  |              |
| 5:15 PM                | 0                          | 12     | 0          | 0      | 0      | 5          | 25    | 0         | 0      | 0      | 2         | 0      | 0         | 8      | 0      | 4         | 0     |    |    |  |              |
| 5:30 PM                | 1                          | 13     | 5          | 0      | 0      | 4          | 18    | 0         | 0      | 0      | 1         | 0      | 0         | 2      | 0      | 2         | 0     |    |    |  |              |
| 5:45 PM                | 0                          | 9      | 5          | 0      | 0      | 2          | 13    | 0         | 0      | 0      | 0         | 0      | 0         | 2      | 0      | 2         | 0     |    |    |  |              |
|                        | 0                          | 9      | 5          | 0      | 0      | 2          | 13    | 0         | 0      | 0      | 0         | 0      | 0         | 4      | 1      | 3         | 0     |    |    |  |              |
| <b>TOTAL VOLUMES:</b>  | NL                         | NT     | NR         | NR     | NU     | SL         | ST    | SR        | SU     | EL     | ET        | ER     | EU        | WL     | WT     | WR        | WU    |    |    |  |              |
| <b>APPROACH %'s:</b>   | 3                          | 90     | 38         | 1      | 0.76%  | 48         | 165   | 2         | 0      | 0      | 4         | 1      | 0         | 35     | 4      | 27        | 0     |    |    |  |              |
|                        | 2.27%                      | 68.18% | 28.79%     | 0.76%  | 22.33% | 76.74%     | 0.93% | 0.00%     | 0.00%  | 0.00%  | 80.00%    | 20.00% | 0.00%     | 53.03% | 6.06%  | 40.91%    | 0.00% |    |    |  |              |
| <b>PEAK HR:</b>        | <b>04:00 PM - 05:00 PM</b> |        |            |        |        |            |       |           |        |        |           |        |           |        |        |           |       |    |    |  |              |
| <b>PEAK HR VOL:</b>    | 1                          | 50     | 20         | 1      | 1      | 31         | 101   | 2         | 0      | 0      | 1         | 1      | 0         | 19     | 3      | 16        | 0     |    |    |  |              |
| <b>PEAK HR FACTOR:</b> | 0.250                      | 0.658  | 0.625      | 0.250  | 0.250  | 0.705      | 0.789 | 0.250     | 0.000  | 0.000  | 0.250     | 0.250  | 0.000     | 0.792  | 0.750  | 0.571     | 0.000 |    |    |  |              |
|                        |                            | 0.818  |            |        |        |            | 0.859 |           |        |        | 0.500     |        |           |        | 0.679  |           | 0.831 |    |    |  |              |
| <b>TOTAL</b>           |                            |        |            |        |        |            |       |           |        |        |           |        |           |        |        |           |       |    |    |  |              |



# National Data & Surveying Services

## Intersection Turning Movement Count

Location: Rd 156 & Ave 328  
 City: Ivanhoe  
 Control: 2-Way Stop(NB/SB)

Project ID: 18-07426-009  
 Date: 11/27/2018

**Total**

| NS/EW Streets:          | Rd 156              |        |            |       |       | Ave 328   |        |           |       |       | Ave 328   |        |           |       |       | TOTAL |        |        |       |       |
|-------------------------|---------------------|--------|------------|-------|-------|-----------|--------|-----------|-------|-------|-----------|--------|-----------|-------|-------|-------|--------|--------|-------|-------|
|                         | NORTHBOUND          |        | SOUTHBOUND |       | NU    | EASTBOUND |        | WESTBOUND |       | EU    | EASTBOUND |        | WESTBOUND |       | WU    |       |        |        |       |       |
| AM                      | 0                   | 1      | 0          | 0     |       | 0         | 0      | 1         | 0     |       | 0         | 0      | 0         | 1     |       | 0     | 0      | 0      |       |       |
| 7:00 AM                 | 4                   | 2      | 1          | 0     | 0     | 4         | 4      | 6         | 0     | 0     | 3         | 26     | 4         | 0     | 0     |       |        |        |       |       |
| 7:15 AM                 | 3                   | 4      | 3          | 0     | 0     | 11        | 1      | 6         | 0     | 0     | 5         | 33     | 1         | 0     | 0     |       |        |        |       |       |
| 7:30 AM                 | 1                   | 2      | 1          | 0     | 0     | 5         | 6      | 13        | 0     | 0     | 6         | 45     | 2         | 0     | 0     |       |        |        |       |       |
| 7:45 AM                 | 4                   | 4      | 1          | 0     | 0     | 7         | 3      | 19        | 0     | 0     | 14        | 51     | 1         | 0     | 0     |       |        |        |       |       |
| 8:00 AM                 | 8                   | 0      | 0          | 0     | 0     | 8         | 0      | 13        | 0     | 0     | 10        | 38     | 5         | 0     | 0     |       |        |        |       |       |
| 8:15 AM                 | 2                   | 0      | 1          | 0     | 0     | 6         | 2      | 9         | 1     | 0     | 6         | 52     | 2         | 0     | 0     |       |        |        |       |       |
| 8:30 AM                 | 3                   | 4      | 1          | 0     | 0     | 7         | 5      | 8         | 0     | 0     | 2         | 25     | 1         | 0     | 0     |       |        |        |       |       |
| 8:45 AM                 | 5                   | 3      | 1          | 0     | 0     | 4         | 5      | 2         | 0     | 0     | 4         | 24     | 5         | 0     | 0     |       |        |        |       |       |
| <b>TOTAL VOLUMES :</b>  | NL                  | NT     | NR         | NU    | 0.00% | SL        | ST     | SR        | SU    | 0.65% | EL        | ET     | ER        | EU    | 0.00% | WL    | WT     | WR     | WU    | 0.00% |
| <b>APPROACH %'s :</b>   | 30                  | 19     | 9          | 0     |       | 52        | 26     | 76        | 1     |       | 50        | 294    | 21        | 0     |       | 9     | 363    | 62     | 0     |       |
|                         | 51.72%              | 32.76% | 15.52%     | 0.00% |       | 33.55%    | 16.77% | 49.03%    | 0.65% |       | 13.70%    | 80.55% | 5.75%     | 0.00% |       | 2.07% | 83.64% | 14.29% | 0.00% |       |
| <b>PEAK HR :</b>        | 07:30 AM - 08:30 AM |        |            |       |       |           |        |           |       |       |           |        |           |       |       |       |        |        |       |       |
| <b>PEAK HR VOL :</b>    | 15                  | 6      | 3          | 0     | 0     | 26        | 11     | 54        | 1     | 0     | 36        | 186    | 10        | 0     | 0     | 4     | 208    | 32     | 0     | 0     |
| <b>PEAK HR FACTOR :</b> | 0.469               | 0.375  | 0.750      | 0.000 |       | 0.813     | 0.458  | 0.711     | 0.250 |       | 0.643     | 0.894  | 0.500     | 0.000 |       | 0.500 | 0.852  | 0.667  | 0.000 |       |
|                         |                     |        |            |       |       |           | 0.793  |           |       |       |           | 0.879  |           |       |       |       | 0.897  |        |       |       |
| <b>TOTAL</b>            | 592                 |        |            |       |       |           |        |           |       |       |           |        |           |       |       |       |        |        |       |       |
|                         | 0.860               |        |            |       |       |           |        |           |       |       |           |        |           |       |       |       |        |        |       |       |

| NS/EW Streets:          | Rd 156              |        |            |       |       | Ave 328   |        |           |       |       | Ave 328   |        |           |       |       | TOTAL |        |        |       |       |
|-------------------------|---------------------|--------|------------|-------|-------|-----------|--------|-----------|-------|-------|-----------|--------|-----------|-------|-------|-------|--------|--------|-------|-------|
|                         | NORTHBOUND          |        | SOUTHBOUND |       | NU    | EASTBOUND |        | WESTBOUND |       | EU    | EASTBOUND |        | WESTBOUND |       | WU    |       |        |        |       |       |
| PM                      | 0                   | 1      | 0          | 0     |       | 0         | 0      | 1         | 0     |       | 0         | 0      | 0         | 1     |       | 0     | 0      |        |       |       |
| 4:00 PM                 | 4                   | 6      | 1          | 0     | 0     | 18        | 10     | 12        | 0     | 0     | 13        | 56     | 6         | 0     | 0     |       |        |        |       |       |
| 4:15 PM                 | 5                   | 4      | 1          | 0     | 0     | 19        | 9      | 10        | 0     | 0     | 4         | 51     | 6         | 0     | 0     |       |        |        |       |       |
| 4:30 PM                 | 3                   | 3      | 6          | 0     | 0     | 17        | 3      | 10        | 0     | 0     | 4         | 53     | 4         | 0     | 0     |       |        |        |       |       |
| 4:45 PM                 | 3                   | 2      | 2          | 0     | 0     | 15        | 0      | 9         | 0     | 0     | 8         | 67     | 6         | 0     | 0     |       |        |        |       |       |
| 5:00 PM                 | 8                   | 2      | 2          | 0     | 0     | 12        | 6      | 9         | 0     | 0     | 4         | 54     | 8         | 0     | 0     |       |        |        |       |       |
| 5:15 PM                 | 0                   | 3      | 1          | 0     | 0     | 14        | 2      | 8         | 0     | 0     | 16        | 67     | 1         | 0     | 0     |       |        |        |       |       |
| 5:30 PM                 | 2                   | 2      | 1          | 0     | 0     | 8         | 1      | 8         | 0     | 0     | 9         | 54     | 8         | 0     | 0     |       |        |        |       |       |
| 5:45 PM                 | 3                   | 2      | 2          | 0     | 0     | 9         | 3      | 11        | 0     | 0     | 11        | 47     | 1         | 0     | 0     |       |        |        |       |       |
| <b>TOTAL VOLUMES :</b>  | NL                  | NT     | NR         | NU    | 0.00% | SL        | ST     | SR        | SU    | 0.00% | EL        | ET     | ER        | EU    | 0.00% | WL    | WT     | WR     | WU    | 0.00% |
| <b>APPROACH %'s :</b>   | 28                  | 24     | 16         | 0     |       | 112       | 34     | 77        | 0     |       | 69        | 449    | 40        | 0     |       | 13    | 328    | 84     | 0     |       |
|                         | 41.18%              | 35.29% | 23.53%     | 0.00% |       | 50.22%    | 15.25% | 34.53%    | 0.00% |       | 12.37%    | 80.47% | 7.17%     | 0.00% |       | 3.06% | 77.18% | 19.76% | 0.00% |       |
| <b>PEAK HR :</b>        | 04:00 PM - 05:00 PM |        |            |       |       |           |        |           |       |       |           |        |           |       |       |       |        |        |       |       |
| <b>PEAK HR VOL :</b>    | 15                  | 15     | 10         | 0     | 0     | 69        | 22     | 41        | 0     | 0     | 29        | 227    | 22        | 0     | 0     | 6     | 182    | 45     | 0     | 0     |
| <b>PEAK HR FACTOR :</b> | 0.750               | 0.625  | 0.417      | 0.000 |       | 0.908     | 0.550  | 0.854     | 0.000 |       | 0.558     | 0.847  | 0.917     | 0.000 |       | 0.500 | 0.929  | 0.804  | 0.000 |       |
|                         |                     |        |            |       |       |           | 0.825  |           |       |       |           | 0.858  |           |       |       |       | 0.910  |        |       |       |
| <b>TOTAL</b>            | 683                 |        |            |       |       |           |        |           |       |       |           |        |           |       |       |       |        |        |       |       |
|                         | 0.899               |        |            |       |       |           |        |           |       |       |           |        |           |       |       |       |        |        |       |       |

# National Data & Surveying Services Intersection Turning Movement Count

Location: Rd 160 & Ave 328/Depot Dr  
City: Leithroe  
Control: 4-Way Stop

Project ID: 18-07426-007  
Date: 11/27/2018

| NS/EW Streets:   | Total      |       |       |       |            |       |       |       |                  |       |       |       |                  |       |       |       |       |       |       |       |       |       |       |       |
|------------------|------------|-------|-------|-------|------------|-------|-------|-------|------------------|-------|-------|-------|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                  | Rd 160     |       |       |       | Rd 160     |       |       |       | Ave 328/Depot Dr |       |       |       | Ave 328/Depot Dr |       |       |       |       |       |       |       |       |       |       |       |
| AM               | NORTHBOUND |       |       |       | SOUTHBOUND |       |       |       | EASTBOUND        |       |       |       | WESTBOUND        |       |       |       |       |       |       |       |       |       |       |       |
|                  | NR         | NR    | NU    | NL2   | SL         | SR    | SU    | SR2   | EL               | ET    | ER    | EU    | EU2              | WL    | WT    | WR    | WU    | WT2   | WU2   | EL2   | ET2   | ER2   | EU2   |       |
| 7:00 AM          | 0          | 0.5   | 0     | 0     | 0          | 1     | 0     | 0     | 0                | 1     | 1     | 0     | 0                | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |
| 7:15 AM          | 3          | 11    | 10    | 3     | 5          | 14    | 0     | 0     | 1                | 15    | 3     | 0     | 0                | 8     | 26    | 2     | 0     | 0     | 0     | 0     | 1     | 1     | 1     | 2     |
| 7:30 AM          | 6          | 23    | 14    | 0     | 7          | 22    | 12    | 0     | 9                | 20    | 3     | 0     | 0                | 12    | 30    | 3     | 0     | 0     | 0     | 0     | 0     | 0     | 1     | 4     |
| 7:45 AM          | 3          | 33    | 13    | 0     | 2          | 13    | 5     | 0     | 15               | 28    | 3     | 0     | 0                | 26    | 33    | 1     | 0     | 0     | 0     | 0     | 1     | 2     | 4     | 0     |
| 8:00 AM          | 5          | 54    | 15    | 0     | 4          | 45    | 16    | 0     | 24               | 32    | 0     | 0     | 0                | 25    | 3     | 0     | 0     | 0     | 0     | 0     | 1     | 0     | 4     | 0     |
| 8:15 AM          | 2          | 34    | 12    | 0     | 5          | 45    | 27    | 0     | 17               | 24    | 1     | 0     | 0                | 22    | 23    | 4     | 0     | 0     | 0     | 0     | 1     | 1     | 4     | 2     |
| 8:30 AM          | 1          | 17    | 14    | 0     | 3          | 14    | 7     | 0     | 5                | 22    | 2     | 0     | 0                | 18    | 22    | 2     | 0     | 0     | 0     | 0     | 0     | 2     | 4     | 4     |
| 8:45 AM          | 2          | 15    | 9     | 0     | 2          | 15    | 5     | 0     | 5                | 24    | 1     | 0     | 0                | 13    | 19    | 3     | 0     | 0     | 0     | 0     | 0     | 1     | 4     | 0     |
|                  | 2          | 7     | 4     | 0     | 3          | 17    | 8     | 0     | 3                | 9     | 1     | 0     | 0                | 9     | 23    | 0     | 0     | 0     | 0     | 0     | 1     | 2     | 1     | 0     |
| TOTAL VOLUMES :  | NL         | NT    | NR    | NU    | SL         | ST    | SR    | SU    | EL               | ET    | ER    | EU    | EU2              | WL    | WT    | WR    | WU    | WT2   | WU2   | EL2   | ET2   | ER2   | EU2   | TOTAL |
| APPROACH % S :   | 24         | 194   | 91    | 0     | 31         | 185   | 80    | 0     | 79               | 174   | 12    | 0     | 0                | 127   | 191   | 19    | 0     | 11    | 0     | 5     | 11    | 30    | 5     | 1291  |
| PEAK HR VOL :    | 16         | 144   | 54    | 0     | 18         | 125   | 60    | 0     | 65               | 104   | 7     | 0     | 0                | 79    | 101   | 11    | 0     | 4     | 0     | 2     | 2     | 4     | 16    | 827   |
| PEAK HR FACTOR : | 0.687      | 0.687 | 0.500 | 0.000 | 0.643      | 0.694 | 0.566 | 0.000 | 0.677            | 0.813 | 0.583 | 0.000 | 0.000            | 0.760 | 0.842 | 0.688 | 0.000 | 0.500 | 0.500 | 0.300 | 0.300 | 0.500 | 1.000 | 0.820 |
|                  |            |       |       |       |            |       |       |       |                  |       |       |       |                  |       |       |       |       |       |       |       |       |       |       |       |
| PM               | NORTHBOUND |       |       |       | SOUTHBOUND |       |       |       | EASTBOUND        |       |       |       | WESTBOUND        |       |       |       |       |       |       |       |       |       |       |       |
|                  | NR         | NR    | NU    | NL2   | SL         | SR    | SU    | SR2   | EL               | ET    | ER    | EU    | EU2              | WL    | WT    | WR    | WU    | WT2   | WU2   | EL2   | ET2   | ER2   | EU2   |       |
| 4:00 PM          | 0          | 0.5   | 0     | 0     | 0          | 1     | 0     | 0     | 0                | 1     | 0     | 0     | 0                | 1     | 0.5   | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |
| 4:15 PM          | 1          | 17    | 12    | 0     | 2          | 19    | 8     | 0     | 1                | 37    | 1     | 0     | 0                | 21    | 25    | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 1     | 0     |
| 4:30 PM          | 4          | 31    | 15    | 0     | 7          | 19    | 8     | 0     | 10               | 37    | 1     | 0     | 0                | 21    | 25    | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 1     | 0     |
| 4:45 PM          | 7          | 22    | 24    | 0     | 6          | 25    | 6     | 0     | 18               | 26    | 3     | 0     | 0                | 27    | 26    | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 1     | 0     |
| 5:00 PM          | 4          | 18    | 14    | 0     | 2          | 24    | 12    | 0     | 7                | 40    | 1     | 0     | 0                | 19    | 36    | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 2     | 0     |
| 5:15 PM          | 7          | 25    | 21    | 0     | 7          | 11    | 7     | 0     | 10               | 30    | 1     | 0     | 0                | 28    | 30    | 7     | 0     | 0     | 0     | 0     | 2     | 2     | 4     | 15    |
| 5:30 PM          | 4          | 24    | 24    | 0     | 4          | 20    | 8     | 0     | 8                | 31    | 3     | 0     | 0                | 17    | 21    | 5     | 0     | 0     | 0     | 0     | 1     | 0     | 5     | 2     |
| 5:45 PM          | 2          | 23    | 22    | 0     | 6          | 12    | 5     | 0     | 11               | 35    | 4     | 0     | 0                | 11    | 29    | 4     | 0     | 0     | 0     | 0     | 0     | 0     | 1     | 0     |
| TOTAL VOLUMES :  | NL         | NT    | NR    | NU    | SL         | ST    | SR    | SU    | EL               | ET    | ER    | EU    | EU2              | WL    | WT    | WR    | WU    | WT2   | WU2   | EL2   | ET2   | ER2   | EU2   | TOTAL |
| APPROACH % S :   | 39         | 182   | 159   | 0     | 42         | 139   | 55    | 0     | 92               | 255   | 16    | 0     | 4                | 160   | 218   | 43    | 0     | 0     | 5     | 5     | 25    | 58    | 1579  |       |
| PEAK HR VOL :    | 22         | 96    | 76    | 0     | 22         | 76    | 32    | 0     | 45               | 127   | 7     | 0     | 3                | 94    | 118   | 29    | 0     | 0     | 15    | 0     | 3     | 12    | 848   |       |
| PEAK HR FACTOR : | 0.786      | 0.774 | 0.76  | 0.000 | 0.786      | 0.760 | 0.667 | 0.000 | 0.625            | 0.794 | 0.583 | 0.000 | 0.375            | 0.839 | 0.819 | 0.558 | 0.000 | 0.417 | 0.000 | 0.375 | 0.600 | 0.533 | 0.375 | 0.942 |

# National Data & Surveying Services Intersection Turning Movement Count

Location: Rd 159 & Depot Dr./Atlanta Ave  
 City: Rossmore  
 Control: 3-Way Stop(SB/EWB)

Project ID: 18-0726-011  
 Date: 11/27/2018

| NS/EW Streets:          | Rd 159     |        | Rd 159     |       | Depot Dr./Atlanta Ave |        | Depot Dr./Atlanta Ave |       | Depot Dr./Atlanta Ave |       | Depot Dr./Atlanta Ave |        | TOTAL |       |       |        |        |       |       |       |       |       |       |       |       |       |      |   |
|-------------------------|------------|--------|------------|-------|-----------------------|--------|-----------------------|-------|-----------------------|-------|-----------------------|--------|-------|-------|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|---|
|                         | NORTHBOUND |        | SOUTHBOUND |       | EASTBOUND             |        | WESTBOUND             |       | WESTBOUND2            |       | WESTBOUND2            |        |       |       |       |        |        |       |       |       |       |       |       |       |       |       |      |   |
| <b>AM</b>               | 0          | 1      | 0          | 0     | 0                     | 1      | 0                     | 0     | 0                     | 0     | 0                     | 0      | 21    |       |       |        |        |       |       |       |       |       |       |       |       |       |      |   |
| 7:00 AM                 | NL         | NT     | NR         | NU    | SL                    | ST     | SR                    | SU    | SL2                   | EL    | ET                    | ER     | EU    | ET2   | WL    | WT     | WR     | WU    | WU2   | WZL   | WZU   | WZL2  | WZU2  | WZL2  | WZU2  | WZL2  | WZU2 |   |
| 7:15 AM                 | 2          | 4      | 0          | 0     | 3                     | 3      | 1                     | 0     | 3                     | 0     | 4                     | 2      | 0     | 0     | 1     | 3      | 1      | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0 |
| 7:30 AM                 | 1          | 6      | 1          | 0     | 2                     | 3      | 1                     | 0     | 1                     | 0     | 4                     | 2      | 0     | 0     | 1     | 3      | 2      | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0 |
| 7:45 AM                 | 1          | 1      | 0          | 0     | 1                     | 1      | 0                     | 0     | 1                     | 0     | 1                     | 1      | 0     | 0     | 0     | 0      | 0      | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0 |
| 8:00 AM                 | 1          | 1      | 0          | 0     | 1                     | 1      | 0                     | 0     | 1                     | 0     | 1                     | 1      | 0     | 0     | 0     | 0      | 0      | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0 |
| 8:15 AM                 | 0          | 3      | 0          | 0     | 1                     | 3      | 0                     | 0     | 2                     | 0     | 4                     | 1      | 0     | 0     | 0     | 0      | 0      | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0 |
| 8:30 AM                 | 0          | 3      | 0          | 0     | 1                     | 3      | 0                     | 0     | 1                     | 0     | 4                     | 2      | 0     | 0     | 0     | 0      | 0      | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0 |
| 8:45 AM                 | 0          | 6      | 0          | 0     | 3                     | 6      | 0                     | 0     | 1                     | 0     | 2                     | 1      | 0     | 0     | 0     | 0      | 0      | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0 |
| <b>TOTAL VOLUMES:</b>   | NL         | NT     | NR         | NU    | SL                    | ST     | SR                    | SU    | SL2                   | EL    | ET                    | ER     | EU    | ET2   | WL    | WT     | WR     | WU    | WU2   | WZL   | WZU   | WZL2  | WZU2  | WZL2  | WZU2  | TOTAL |      |   |
| <b>APPROACH %'s:</b>    | 7          | 48     | 1          | 0     | 16                    | 52     | 4                     | 0     | 11                    | 1     | 29                    | 14     | 0     | 0     | 3     | 18     | 12     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 223   |      |   |
| <b>PEAK HR. VOL.:</b>   | 12.28%     | 84.21% | 1.75%      | 0.00% | 19.28%                | 62.65% | 4.82%                 | 0.00% | 13.25%                | 2.27% | 65.91%                | 31.82% | 0.00% | 0.00% | 9.09% | 54.55% | 36.36% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 156   |      |   |
| <b>PEAK HR. FACTOR:</b> | 0.625      | 0.615  | 1          | 0     | 0.583                 | 0.729  | 2                     | 0     | 0.583                 | 0     | 0.450                 | 0.450  | 0.000 | 0.000 | 0.750 | 0.917  | 0.417  | 0.000 | 0.000 | 0.000 | 0.000 | 0.500 | 0.500 | 0.500 | 0.500 | 0.810 |      |   |
|                         |            |        |            |       |                       |        |                       |       |                       |       |                       |        |       |       |       |        |        |       |       |       |       |       |       |       |       |       |      |   |
| <b>PM</b>               | 0          | 1      | 0          | 0     | 0                     | 1      | 0                     | 0     | 0                     | 0     | 1                     | 0      | 0     | 0     | 0     | 1      | 0      | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0    |   |
| 4:00 PM                 | NL         | NT     | NR         | NU    | SL                    | ST     | SR                    | SU    | SL2                   | EL    | ET                    | ER     | EU    | ET2   | WL    | WT     | WR     | WU    | WU2   | WZL   | WZU   | WZL2  | WZU2  | WZL2  | WZU2  | TOTAL |      |   |
| 4:15 PM                 | 2          | 7      | 0          | 0     | 11                    | 9      | 1                     | 0     | 3                     | 1     | 4                     | 2      | 0     | 0     | 0     | 6      | 2      | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 57    |      |   |
| 4:30 PM                 | 1          | 11     | 0          | 0     | 3                     | 11     | 0                     | 0     | 2                     | 0     | 5                     | 2      | 0     | 0     | 0     | 6      | 5      | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 51    |      |   |
| 4:45 PM                 | 3          | 11     | 0          | 0     | 2                     | 10     | 0                     | 0     | 2                     | 0     | 5                     | 2      | 0     | 0     | 0     | 6      | 5      | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 49    |      |   |
| 5:00 PM                 | 3          | 6      | 0          | 0     | 10                    | 9      | 1                     | 0     | 2                     | 1     | 7                     | 3      | 0     | 0     | 0     | 8      | 2      | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 45    |      |   |
| 5:15 PM                 | 3          | 12     | 0          | 0     | 2                     | 9      | 0                     | 0     | 1                     | 0     | 4                     | 2      | 0     | 0     | 0     | 6      | 2      | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 49    |      |   |
| 5:30 PM                 | 1          | 7      | 0          | 0     | 4                     | 7      | 0                     | 0     | 0                     | 0     | 4                     | 2      | 0     | 0     | 1     | 4      | 5      | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 42    |      |   |
| 5:45 PM                 | 1          | 7      | 0          | 0     | 4                     | 7      | 0                     | 0     | 0                     | 0     | 4                     | 2      | 0     | 0     | 1     | 4      | 5      | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 37    |      |   |
| <b>TOTAL VOLUMES:</b>   | NL         | NT     | NR         | NU    | SL                    | ST     | SR                    | SU    | SL2                   | EL    | ET                    | ER     | EU    | ET2   | WL    | WT     | WR     | WU    | WU2   | WZL   | WZU   | WZL2  | WZU2  | WZL2  | WZU2  | TOTAL |      |   |
| <b>APPROACH %'s:</b>    | 15.96%     | 74.47% | 0.00%      | 0.00% | 32.44%                | 57.14% | 2.38%                 | 1.59% | 6.35%                 | 6.90% | 60.34%                | 32.69% | 0.00% | 0.00% | 1.22% | 45.12% | 53.66% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 378   |      |   |
| <b>PEAK HR. VOL.:</b>   | 11         | 35     | 0          | 0     | 19                    | 41     | 2                     | 0     | 4                     | 3     | 19                    | 10     | 0     | 0     | 0     | 23     | 23     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 204   |      |   |
| <b>PEAK HR. FACTOR:</b> | 0.688      | 0.795  | 0.000      | 0.000 | 0.475                 | 0.932  | 0.500                 | 0.000 | 0.500                 | 0.375 | 0.679                 | 0.893  | 0.000 | 0.000 | 0.000 | 0.719  | 0.821  | 0.000 | 0.000 | 0.000 | 0.250 | 0.250 | 0.250 | 0.250 | 0.583 | 0.864 |      |   |
|                         |            |        |            |       |                       |        |                       |       |                       |       |                       |        |       |       |       |        |        |       |       |       |       |       |       |       |       |       |      |   |

**Total**

# National Data & Surveying Services

## Intersection Turning Movement Count

**Location:** Rd 160/SR 216 & Edmiston Av  
**City:** Ivanhoe  
**Control:** 1-Way Stop(EB)

**Project ID:** 18-07426-012  
**Date:** 11/27/2018

**Total**

| NS/EW Streets:          | Rd 160/SR 216 |        |            |       | Edmiston Ave |        |           |       | Edmiston Ave |       |           |       | TOTAL     |       |       |       |       |
|-------------------------|---------------|--------|------------|-------|--------------|--------|-----------|-------|--------------|-------|-----------|-------|-----------|-------|-------|-------|-------|
|                         | NORTHBOUND    |        | SOUTHBOUND |       | EASTBOUND    |        | WESTBOUND |       | EASTBOUND    |       | WESTBOUND |       |           |       |       |       |       |
| <b>AM</b>               | 0             | 1      | 0          | 0     | 0            | 1      | 0         | 0     | 0            | 1     | 0         | 0     | TOTAL     |       |       |       |       |
| 7:00 AM                 | NL            | NT     | NR         | NU    | SL           | ST     | SR        | SU    | EL           | ET    | ER        | EU    | WL        | WT    | WR    | WU    |       |
| 7:15 AM                 | 0             | 35     | 0          | 0     | 0            | 44     | 0         | 0     | 0            | 0     | 1         | 0     | 0         | 0     | 0     | 0     |       |
| 7:30 AM                 | 1             | 53     | 0          | 0     | 0            | 53     | 0         | 0     | 0            | 0     | 3         | 0     | 0         | 0     | 0     | 0     |       |
| 7:45 AM                 | 0             | 55     | 0          | 0     | 0            | 82     | 2         | 0     | 3            | 0     | 0         | 0     | 0         | 0     | 0     | 0     |       |
| 8:00 AM                 | 2             | 74     | 0          | 0     | 0            | 89     | 1         | 0     | 5            | 0     | 3         | 0     | 0         | 0     | 0     | 0     |       |
| 8:15 AM                 | 0             | 53     | 2          | 0     | 1            | 89     | 2         | 0     | 2            | 0     | 2         | 0     | 0         | 0     | 0     | 0     |       |
| 8:30 AM                 | 1             | 40     | 0          | 0     | 0            | 44     | 2         | 0     | 0            | 0     | 1         | 0     | 0         | 0     | 0     | 0     |       |
| 8:45 AM                 | 2             | 38     | 0          | 0     | 0            | 46     | 0         | 0     | 1            | 0     | 1         | 0     | 0         | 0     | 0     | 0     |       |
|                         | 0             | 29     | 0          | 0     | 0            | 47     | 3         | 0     | 1            | 0     | 0         | 0     | 0         | 0     | 0     | 0     |       |
| <b>TOTAL VOLUMES :</b>  | NL            | NT     | NR         | NU    | SL           | ST     | SR        | SU    | EL           | ET    | ER        | EU    | WL        | WT    | WR    | WU    |       |
| <b>APPROACH %'s :</b>   | 6             | 377    | 2          | 0     | 1            | 494    | 10        | 0     | 12           | 0     | 11        | 0     | 0         | 0     | 0     | 0     |       |
| <b>PEAK HR :</b>        | 1.56%         | 97.92% | 0.52%      | 0.00% | 0.20%        | 97.82% | 1.98%     | 0.00% | 52.17%       | 0.00% | 47.83%    | 0.00% | 0.00%     | 0.00% | 0.00% | 0.00% |       |
| <b>PEAK HR VOL :</b>    | 3             | 235    | 2          | 0     | 1            | 313    | 5         | 0     | 10           | 0     | 8         | 0     | 0         | 0     | 0     | 0     |       |
| <b>PEAK HR FACTOR :</b> | 0.375         | 0.794  | 0.250      | 0.000 | 0.250        | 0.879  | 0.625     | 0.000 | 0.500        | 0.000 | 0.667     | 0.000 | 0.000     | 0.000 | 0.000 | 0.000 |       |
|                         |               |        |            |       |              | 0.789  | 0.867     |       |              | 0.563 |           |       |           |       |       |       |       |
| <b>TOTAL</b>            |               |        |            |       |              |        |           |       |              |       |           |       | 913       |       |       |       |       |
| <b>TOTAL</b>            |               |        |            |       |              |        |           |       |              |       |           |       | 577       |       |       |       |       |
| <b>TOTAL</b>            |               |        |            |       |              |        |           |       |              |       |           |       | 0.829     |       |       |       |       |
| <b>PM</b>               | NORTHBOUND    |        |            |       | SOUTHBOUND   |        |           |       | EASTBOUND    |       |           |       | WESTBOUND |       |       |       | TOTAL |
| 4:00 PM                 | 0             | 1      | 0          | 0     | 0            | 1      | 0         | 0     | 0            | 1     | 0         | 0     | 0         | 1     | 0     | 0     |       |
| 4:15 PM                 | NL            | NT     | NR         | NU    | SL           | ST     | SR        | SU    | EL           | ET    | ER        | EU    | WL        | WT    | WR    | WU    |       |
| 4:30 PM                 | 2             | 60     | 0          | 0     | 0            | 69     | 3         | 0     | 2            | 0     | 2         | 0     | 0         | 0     | 0     | 0     |       |
| 4:45 PM                 | 0             | 65     | 0          | 0     | 0            | 58     | 2         | 0     | 2            | 0     | 3         | 0     | 1         | 0     | 0     | 0     |       |
| 5:00 PM                 | 2             | 79     | 0          | 0     | 0            | 78     | 3         | 0     | 3            | 0     | 2         | 0     | 0         | 0     | 0     | 0     |       |
| 5:15 PM                 | 2             | 65     | 0          | 0     | 0            | 58     | 1         | 0     | 0            | 0     | 2         | 0     | 0         | 0     | 0     | 0     |       |
| 5:30 PM                 | 3             | 72     | 0          | 0     | 0            | 76     | 1         | 0     | 1            | 0     | 3         | 0     | 0         | 0     | 0     | 0     |       |
| 5:45 PM                 | 4             | 72     | 0          | 0     | 0            | 59     | 1         | 0     | 0            | 0     | 1         | 0     | 0         | 0     | 0     | 0     |       |
|                         | 2             | 71     | 0          | 0     | 0            | 57     | 0         | 0     | 2            | 0     | 2         | 0     | 0         | 0     | 0     | 0     |       |
|                         | 4             | 53     | 0          | 0     | 0            | 43     | 1         | 0     | 0            | 0     | 1         | 0     | 0         | 0     | 0     | 0     |       |
| <b>TOTAL VOLUMES :</b>  | NL            | NT     | NR         | NU    | SL           | ST     | SR        | SU    | EL           | ET    | ER        | EU    | WL        | WT    | WR    | WU    |       |
| <b>APPROACH %'s :</b>   | 19            | 537    | 0          | 0     | 0            | 498    | 12        | 0     | 10           | 0     | 16        | 0     | 1         | 0     | 0     | 0     |       |
| <b>PEAK HR :</b>        | 3.42%         | 96.58% | 0.00%      | 0.00% | 0.00%        | 97.65% | 2.35%     | 0.00% | 38.46%       | 0.00% | 61.54%    | 0.00% | 100.00%   | 0.00% | 0.00% | 0.00% |       |
| <b>PEAK HR VOL :</b>    | 11            | 288    | 0          | 0     | 0            | 271    | 6         | 0     | 4            | 0     | 9         | 0     | 0         | 0     | 0     | 0     |       |
| <b>PEAK HR FACTOR :</b> | 0.688         | 0.911  | 0.000      | 0.000 | 0.000        | 0.869  | 0.500     | 0.000 | 0.333        | 0.000 | 0.750     | 0.000 | 0.000     | 0.000 | 0.000 | 0.000 |       |
|                         |               |        |            |       |              | 0.923  | 0.855     |       |              | 0.542 |           |       |           |       |       |       |       |
| <b>TOTAL</b>            |               |        |            |       |              |        |           |       |              |       |           |       | 1093      |       |       |       |       |
| <b>TOTAL</b>            |               |        |            |       |              |        |           |       |              |       |           |       | 589       |       |       |       |       |
| <b>TOTAL</b>            |               |        |            |       |              |        |           |       |              |       |           |       | 0.876     |       |       |       |       |

# National Data & Surveying Services

## Intersection Turning Movement Count

Location: Rd 160/SR 216 & Citrus Ave  
 City: Ivanhoe  
 Control: 1-Way Stop(EB)

Project ID: 18-07426-013  
 Date: 11/27/2018

**Total**

| NS/EW Streets:          | Rd 160/SR 216              |        |            |       | Rd 160/SR 216 |        |           |       | Citrus Ave |       |            |       | Citrus Ave |       |           |       | TOTAL |   |   |   |
|-------------------------|----------------------------|--------|------------|-------|---------------|--------|-----------|-------|------------|-------|------------|-------|------------|-------|-----------|-------|-------|---|---|---|
|                         | NORTHBOUND                 |        | SOUTHBOUND |       | EASTBOUND     |        | WESTBOUND |       | NORTHBOUND |       | SOUTHBOUND |       | EASTBOUND  |       | WESTBOUND |       |       |   |   |   |
| AM                      | 0                          | 1      | 0          | 0     | 0             | 1      | 0         | 0     | 0          | 1     | 0          | 0     | 0          | 0     | 0         | 0     | 0     | 0 | 0 | 0 |
| 7:00 AM                 | 0                          | 35     | 0          | 0     | 0             | 43     | 2         | 0     | 0          | 0     | 2          | 0     | 0          | 0     | 0         | 0     | 0     | 0 | 0 | 0 |
| 7:15 AM                 | 1                          | 52     | 0          | 0     | 0             | 56     | 0         | 0     | 1          | 0     | 5          | 0     | 1          | 0     | 0         | 0     | 0     | 0 | 0 | 0 |
| 7:30 AM                 | 0                          | 51     | 0          | 0     | 0             | 80     | 3         | 0     | 4          | 0     | 4          | 0     | 0          | 0     | 0         | 0     | 0     | 0 | 0 | 0 |
| 7:45 AM                 | 2                          | 74     | 0          | 0     | 0             | 87     | 1         | 0     | 3          | 0     | 6          | 0     | 0          | 0     | 0         | 0     | 0     | 0 | 0 | 0 |
| 8:00 AM                 | 0                          | 50     | 0          | 0     | 0             | 90     | 4         | 0     | 2          | 0     | 5          | 0     | 0          | 0     | 0         | 0     | 0     | 0 | 0 | 0 |
| 8:15 AM                 | 0                          | 44     | 0          | 0     | 0             | 44     | 0         | 0     | 0          | 0     | 0          | 0     | 0          | 0     | 0         | 0     | 0     | 0 | 0 | 0 |
| 8:30 AM                 | 2                          | 40     | 0          | 0     | 0             | 46     | 1         | 0     | 0          | 0     | 1          | 0     | 0          | 0     | 0         | 0     | 0     | 0 | 0 | 0 |
| 8:45 AM                 | 1                          | 29     | 0          | 0     | 0             | 49     | 0         | 0     | 0          | 0     | 5          | 1     | 0          | 0     | 0         | 0     | 0     | 0 | 0 | 0 |
| <b>TOTAL VOLUMES :</b>  | NL                         | NT     | NR         | NU    | SL            | ST     | SR        | SU    | EL         | ET    | ER         | EU    | WL         | WT    | WR        | WU    | TOTAL |   |   |   |
| <b>APPROACH %'s :</b>   | 6                          | 375    | 0          | 0     | 0             | 495    | 11        | 0     | 10         | 0     | 28         | 1     | 2          | 0     | 0         | 0     | TOTAL |   |   |   |
|                         | 1.57%                      | 98.43% | 0.00%      | 0.00% | 0.00%         | 97.83% | 2.11%     | 0.00% | 25.64%     | 0.00% | 71.79%     | 2.56% | 100.00%    | 0.00% | 0.00%     | 0.00% | 928   |   |   |   |
| <b>PEAK HR :</b>        | <b>07:15 AM - 08:15 AM</b> |        |            |       |               |        |           |       |            |       |            |       |            |       |           |       |       |   |   |   |
| <b>PEAK HR VOL :</b>    | 3                          | 227    | 0          | 0     | 0             | 313    | 8         | 0     | 10         | 0     | 20         | 0     | 1          | 0     | 0         | 0     | TOTAL |   |   |   |
| <b>PEAK HR FACTOR :</b> | 0.375                      | 0.767  | 0.000      | 0.000 | 0.000         | 0.869  | 0.500     | 0.000 | 0.625      | 0.000 | 0.833      | 0.000 | 0.250      | 0.000 | 0.000     | 0.000 | 582   |   |   |   |
|                         |                            |        |            |       |               | 0.854  |           |       |            | 0.833 |            |       |            | 0.250 |           |       | 0.841 |   |   |   |
| PM                      | NORTHBOUND                 |        |            |       | SOUTHBOUND    |        |           |       | EASTBOUND  |       |            |       | WESTBOUND  |       |           |       | TOTAL |   |   |   |
|                         | 0                          | 1      | 0          | 0     | 0             | 1      | 0         | 0     | 0          | 1     | 0          | 0     | 0          | 0     | 0         | 0     |       |   |   |   |
| 4:00 PM                 | 0                          | 56     | 0          | 0     | 0             | 64     | 2         | 0     | 4          | 0     | 4          | 0     | 0          | 0     | 0         | 0     | 132   |   |   |   |
| 4:15 PM                 | 3                          | 66     | 0          | 0     | 0             | 57     | 5         | 0     | 1          | 0     | 4          | 0     | 0          | 0     | 0         | 0     | 136   |   |   |   |
| 4:30 PM                 | 2                          | 80     | 0          | 0     | 0             | 83     | 2         | 0     | 0          | 0     | 2          | 0     | 0          | 0     | 0         | 0     | 169   |   |   |   |
| 4:45 PM                 | 3                          | 62     | 0          | 0     | 0             | 55     | 2         | 0     | 4          | 0     | 3          | 0     | 0          | 0     | 0         | 0     | 129   |   |   |   |
| 5:00 PM                 | 4                          | 78     | 0          | 0     | 0             | 80     | 1         | 0     | 1          | 0     | 4          | 0     | 0          | 0     | 0         | 0     | 168   |   |   |   |
| 5:15 PM                 | 3                          | 71     | 1          | 0     | 0             | 48     | 1         | 0     | 3          | 0     | 2          | 0     | 0          | 0     | 0         | 0     | 129   |   |   |   |
| 5:30 PM                 | 2                          | 72     | 0          | 0     | 0             | 69     | 2         | 0     | 1          | 0     | 4          | 0     | 0          | 0     | 0         | 0     | 150   |   |   |   |
| 5:45 PM                 | 3                          | 62     | 0          | 0     | 0             | 31     | 1         | 0     | 2          | 0     | 1          | 0     | 0          | 0     | 0         | 0     | 100   |   |   |   |
| <b>TOTAL VOLUMES :</b>  | NL                         | NT     | NR         | NU    | SL            | ST     | SR        | SU    | EL         | ET    | ER         | EU    | WL         | WT    | WR        | WU    | TOTAL |   |   |   |
| <b>APPROACH %'s :</b>   | 22                         | 547    | 1          | 0     | 0             | 487    | 16        | 0     | 16         | 0     | 24         | 0     | 0          | 0     | 0         | 0     | TOTAL |   |   |   |
|                         | 3.86%                      | 95.96% | 0.18%      | 0.00% | 0.00%         | 96.82% | 3.18%     | 0.00% | 40.00%     | 0.00% | 60.00%     | 0.00% |            |       |           |       | 1113  |   |   |   |
| <b>PEAK HR :</b>        | <b>04:15 PM - 05:15 PM</b> |        |            |       |               |        |           |       |            |       |            |       |            |       |           |       |       |   |   |   |
| <b>PEAK HR VOL :</b>    | 12                         | 286    | 0          | 0     | 0             | 275    | 10        | 0     | 6          | 0     | 13         | 0     | 0          | 0     | 0         | 0     | TOTAL |   |   |   |
| <b>PEAK HR FACTOR :</b> | 0.750                      | 0.894  | 0.000      | 0.000 | 0.000         | 0.828  | 0.500     | 0.000 | 0.375      | 0.000 | 0.813      | 0.000 | 0.000      | 0.000 | 0.000     | 0.000 | 0.891 |   |   |   |
|                         |                            |        |            |       |               | 0.838  |           |       |            | 0.679 |            |       |            |       |           |       |       |   |   |   |





# **APPENDIX C**

SYNCHRO 10 Worksheets

# EXISTING WORKSHEETS

| Intersection              |    |
|---------------------------|----|
| Intersection Delay, s/veh | 10 |
| Intersection LOS          | A  |

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h  | 4    | 77   | 19   | 125  | 82   | 2    | 25   | 11   | 85   | 2    | 9    | 4    |
| Future Vol, veh/h   | 4    | 77   | 19   | 125  | 82   | 2    | 25   | 11   | 85   | 2    | 9    | 4    |
| Peak Hour Factor    | 0.69 | 0.69 | 0.69 | 0.67 | 0.67 | 0.67 | 0.64 | 0.64 | 0.64 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles, %   | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow           | 6    | 112  | 28   | 187  | 122  | 3    | 39   | 17   | 133  | 2    | 10   | 4    |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB  | WB | NB  | SB  |
|----------------------------|-----|----|-----|-----|
| Opposing Approach          | WB  | EB | SB  | NB  |
| Opposing Lanes             | 1   | 1  | 1   | 1   |
| Conflicting Approach Left  | SB  | NB | EB  | WB  |
| Conflicting Lanes Left     | 1   | 1  | 1   | 1   |
| Conflicting Approach Right | NB  | SB | WB  | EB  |
| Conflicting Lanes Right    | 1   | 1  | 1   | 1   |
| HCM Control Delay          | 8.9 | 11 | 9.2 | 8.3 |
| HCM LOS                    | A   | B  | A   | A   |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 21%   | 4%    | 60%   | 13%   |
| Vol Thru, %            | 9%    | 77%   | 39%   | 60%   |
| Vol Right, %           | 70%   | 19%   | 1%    | 27%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 121   | 100   | 209   | 15    |
| LT Vol                 | 25    | 4     | 125   | 2     |
| Through Vol            | 11    | 77    | 82    | 9     |
| RT Vol                 | 85    | 19    | 2     | 4     |
| Lane Flow Rate         | 189   | 145   | 312   | 16    |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.245 | 0.189 | 0.409 | 0.023 |
| Departure Headway (Hd) | 4.664 | 4.703 | 4.722 | 5.152 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 768   | 759   | 761   | 690   |
| Service Time           | 2.713 | 2.756 | 2.768 | 3.221 |
| HCM Lane V/C Ratio     | 0.246 | 0.191 | 0.41  | 0.023 |
| HCM Control Delay      | 9.2   | 8.9   | 11    | 8.3   |
| HCM Lane LOS           | A     | A     | B     | A     |
| HCM 95th-tile Q        | 1     | 0.7   | 2     | 0.1   |

| Intersection              |      |
|---------------------------|------|
| Intersection Delay, s/veh | 12.5 |
| Intersection LOS          | B    |

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      | ↕    | ↕    |      |      | ↕    | ↕    |      | ↕    |      |
| Traffic Vol, veh/h  | 65   | 104  | 7    | 79   | 101  | 15   | 16   | 157  | 54   | 22   | 141  | 62   |
| Future Vol, veh/h   | 65   | 104  | 7    | 79   | 101  | 15   | 16   | 157  | 54   | 22   | 141  | 62   |
| Peak Hour Factor    | 0.95 | 0.95 | 0.95 | 0.87 | 0.87 | 0.87 | 0.94 | 0.94 | 0.94 | 0.84 | 0.84 | 0.84 |
| Heavy Vehicles, %   | 3    | 3    | 3    | 6    | 6    | 6    | 6    | 6    | 6    | 3    | 3    | 3    |
| Mvmt Flow           | 68   | 109  | 7    | 91   | 116  | 17   | 17   | 167  | 57   | 26   | 168  | 74   |
| Number of Lanes     | 0    | 1    | 0    | 1    | 1    | 0    | 0    | 1    | 1    | 0    | 1    | 0    |

| Approach                   | EB | WB   | NB   | SB   |
|----------------------------|----|------|------|------|
| Opposing Approach          | WB | EB   | SB   | NB   |
| Opposing Lanes             | 2  | 1    | 1    | 2    |
| Conflicting Approach Left  | SB | NB   | EB   | WB   |
| Conflicting Lanes Left     | 1  | 2    | 1    | 2    |
| Conflicting Approach Right | NB | SB   | WB   | EB   |
| Conflicting Lanes Right    | 2  | 1    | 2    | 1    |
| HCM Control Delay          | 13 | 11.2 | 11.5 | 14.3 |
| HCM LOS                    | B  | B    | B    | B    |

| Lane                   | NBLn1 | NBLn2 | EBLn1 | WBLn1 | WBLn2 | SBLn1 |
|------------------------|-------|-------|-------|-------|-------|-------|
| Vol Left, %            | 9%    | 0%    | 37%   | 100%  | 0%    | 10%   |
| Vol Thru, %            | 91%   | 0%    | 59%   | 0%    | 87%   | 63%   |
| Vol Right, %           | 0%    | 100%  | 4%    | 0%    | 13%   | 28%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 173   | 54    | 176   | 79    | 116   | 225   |
| LT Vol                 | 16    | 0     | 65    | 79    | 0     | 22    |
| Through Vol            | 157   | 0     | 104   | 0     | 101   | 141   |
| RT Vol                 | 0     | 54    | 7     | 0     | 15    | 62    |
| Lane Flow Rate         | 184   | 57    | 185   | 91    | 133   | 268   |
| Geometry Grp           | 7     | 7     | 6     | 7     | 7     | 6     |
| Degree of Util (X)     | 0.327 | 0.09  | 0.339 | 0.176 | 0.237 | 0.457 |
| Departure Headway (Hd) | 6.406 | 5.648 | 6.59  | 6.996 | 6.396 | 6.148 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 559   | 631   | 543   | 511   | 560   | 584   |
| Service Time           | 4.167 | 3.408 | 4.655 | 4.759 | 4.159 | 4.206 |
| HCM Lane V/C Ratio     | 0.329 | 0.09  | 0.341 | 0.178 | 0.237 | 0.459 |
| HCM Control Delay      | 12.3  | 9     | 13    | 11.3  | 11.2  | 14.3  |
| HCM Lane LOS           | B     | A     | B     | B     | B     | B     |
| HCM 95th-tile Q        | 1.4   | 0.3   | 1.5   | 0.6   | 0.9   | 2.4   |

HCM 6th TWSC  
1: Road 156 & Avenue 332

05/10/2019

| Intersection             |      |      |       |      |      |       |      |      |      |      |      |      |
|--------------------------|------|------|-------|------|------|-------|------|------|------|------|------|------|
| Int Delay, s/veh         | 3.8  |      |       |      |      |       |      |      |      |      |      |      |
| Movement                 | EBL  | EBT  | EBR   | WBL  | WBT  | WBR   | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations      |      | ↕    | ↗     |      | ↕    | ↗     |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h       | 2    | 3    | 5     | 32   | 8    | 13    | 1    | 46   | 33   | 12   | 46   | 0    |
| Future Vol, veh/h        | 2    | 3    | 5     | 32   | 8    | 13    | 1    | 46   | 33   | 12   | 46   | 0    |
| Conflicting Peds, #/hr   | 10   | 0    | 10    | 10   | 0    | 10    | 10   | 0    | 10   | 10   | 0    | 10   |
| Sign Control             | Stop | Stop | Stop  | Stop | Stop | Stop  | Free | Free | Free | Free | Free | Free |
| RT Channelized           | -    | -    | Yield | -    | -    | Yield | -    | -    | None | -    | -    | None |
| Storage Length           | -    | -    | 75    | -    | -    | 125   | -    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | -    | 0    | -     | -    | 0    | -     | -    | 0    | -    | -    | 0    | -    |
| Grade, %                 | -    | 0    | -     | -    | 0    | -     | -    | 0    | -    | -    | 0    | -    |
| Peak Hour Factor         | 83   | 83   | 83    | 66   | 66   | 66    | 69   | 69   | 69   | 81   | 81   | 81   |
| Heavy Vehicles, %        | 3    | 3    | 3     | 3    | 3    | 3     | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow                | 2    | 4    | 6     | 48   | 12   | 20    | 1    | 67   | 48   | 15   | 57   | 0    |

| Major/Minor          | Minor2 |       | Minor1 |       |       | Major1 |       | Major2 |   |       |   |   |
|----------------------|--------|-------|--------|-------|-------|--------|-------|--------|---|-------|---|---|
| Conflicting Flow All | 206    | 224   | 77     | 202   | 200   | 111    | 67    | 0      | 0 | 125   | 0 | 0 |
| Stage 1              | 97     | 97    | -      | 103   | 103   | -      | -     | -      | - | -     | - | - |
| Stage 2              | 109    | 127   | -      | 99    | 97    | -      | -     | -      | - | -     | - | - |
| Critical Hdwy        | 7.13   | 6.53  | 6.23   | 7.13  | 6.53  | 6.23   | 4.13  | -      | - | 4.13  | - | - |
| Critical Hdwy Stg 1  | 6.13   | 5.53  | -      | 6.13  | 5.53  | -      | -     | -      | - | -     | - | - |
| Critical Hdwy Stg 2  | 6.13   | 5.53  | -      | 6.13  | 5.53  | -      | -     | -      | - | -     | - | - |
| Follow-up Hdwy       | 3.527  | 4.027 | 3.327  | 3.527 | 4.027 | 3.327  | 2.227 | -      | - | 2.227 | - | - |
| Pot Cap-1 Maneuver   | 750    | 673   | 981    | 754   | 694   | 940    | 1528  | -      | - | 1455  | - | - |
| Stage 1              | 907    | 813   | -      | 900   | 808   | -      | -     | -      | - | -     | - | - |
| Stage 2              | 894    | 789   | -      | 905   | 813   | -      | -     | -      | - | -     | - | - |
| Platoon blocked, %   |        |       |        |       |       |        |       | -      | - | -     | - | - |
| Mov Cap-1 Maneuver   | 704    | 651   | 962    | 725   | 672   | 922    | 1513  | -      | - | 1441  | - | - |
| Mov Cap-2 Maneuver   | 704    | 651   | -      | 725   | 672   | -      | -     | -      | - | -     | - | - |
| Stage 1              | 897    | 796   | -      | 890   | 799   | -      | -     | -      | - | -     | - | - |
| Stage 2              | 853    | 780   | -      | 877   | 796   | -      | -     | -      | - | -     | - | - |

| Approach             | EB  |  | WB   |  | NB  |  | SB  |  |
|----------------------|-----|--|------|--|-----|--|-----|--|
| HCM Control Delay, s | 9.6 |  | 10.1 |  | 0.1 |  | 1.6 |  |
| HCM LOS              | A   |  | B    |  |     |  |     |  |

| Minor Lane/Major Mvmt | NBL   | NBT | NBR | EBLn1 | EBLn2 | WBLn1 | WBLn2 | SBL  | SBT | SBR |
|-----------------------|-------|-----|-----|-------|-------|-------|-------|------|-----|-----|
| Capacity (veh/h)      | 1513  | -   | -   | 671   | 962   | 714   | 922   | 1441 | -   | -   |
| HCM Lane V/C Ratio    | 0.001 | -   | -   | 0.009 | 0.006 | 0.085 | 0.021 | 0.01 | -   | -   |
| HCM Control Delay (s) | 7.4   | 0   | -   | 10.4  | 8.8   | 10.5  | 9     | 7.5  | 0   | -   |
| HCM Lane LOS          | A     | A   | -   | B     | A     | B     | A     | A    | A   | -   |
| HCM 95th %tile Q(veh) | 0     | -   | -   | 0     | 0     | 0.3   | 0.1   | 0    | -   | -   |

HCM 6th TWSC  
3: Road 156 & Avenue 328

05/10/2019

| Intersection             |      |      |      |      |      |      |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Int Delay, s/veh         | 3.5  |      |      |      |      |      |      |      |      |      |      |      |
| Movement                 | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations      |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h       | 36   | 186  | 10   | 4    | 208  | 32   | 15   | 6    | 3    | 27   | 11   | 54   |
| Future Vol, veh/h        | 36   | 186  | 10   | 4    | 208  | 32   | 15   | 6    | 3    | 27   | 11   | 54   |
| Conflicting Peds, #/hr   | 10   | 0    | 10   | 10   | 0    | 10   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized           | -    | -    | None |
| Storage Length           | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    |
| Grade, %                 | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    |
| Peak Hour Factor         | 88   | 88   | 88   | 90   | 90   | 90   | 67   | 67   | 67   | 79   | 79   | 79   |
| Heavy Vehicles, %        | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow                | 41   | 211  | 11   | 4    | 231  | 36   | 22   | 9    | 4    | 34   | 14   | 68   |

| Major/Minor          | Major1 |   |   | Major2 |   |   | Minor1 |       |       | Minor2 |       |       |
|----------------------|--------|---|---|--------|---|---|--------|-------|-------|--------|-------|-------|
| Conflicting Flow All | 277    | 0 | 0 | 232    | 0 | 0 | 607    | 594   | 227   | 572    | 581   | 259   |
| Stage 1              | -      | - | - | -      | - | - | 309    | 309   | -     | 267    | 267   | -     |
| Stage 2              | -      | - | - | -      | - | - | 298    | 285   | -     | 305    | 314   | -     |
| Critical Hdwy        | 4.13   | - | - | 4.13   | - | - | 7.13   | 6.53  | 6.23  | 7.13   | 6.53  | 6.23  |
| Critical Hdwy Stg 1  | -      | - | - | -      | - | - | 6.13   | 5.53  | -     | 6.13   | 5.53  | -     |
| Critical Hdwy Stg 2  | -      | - | - | -      | - | - | 6.13   | 5.53  | -     | 6.13   | 5.53  | -     |
| Follow-up Hdwy       | 2.227  | - | - | 2.227  | - | - | 3.527  | 4.027 | 3.327 | 3.527  | 4.027 | 3.327 |
| Pot Cap-1 Maneuver   | 1280   | - | - | 1330   | - | - | 407    | 417   | 810   | 429    | 424   | 777   |
| Stage 1              | -      | - | - | -      | - | - | 699    | 658   | -     | 736    | 686   | -     |
| Stage 2              | -      | - | - | -      | - | - | 709    | 674   | -     | 702    | 654   | -     |
| Platoon blocked, %   | -      | - | - | -      | - | - | -      | -     | -     | -      | -     | -     |
| Mov Cap-1 Maneuver   | 1268   | - | - | 1317   | - | - | 346    | 392   | 802   | 402    | 399   | 770   |
| Mov Cap-2 Maneuver   | -      | - | - | -      | - | - | 346    | 392   | -     | 402    | 399   | -     |
| Stage 1              | -      | - | - | -      | - | - | 667    | 627   | -     | 702    | 676   | -     |
| Stage 2              | -      | - | - | -      | - | - | 630    | 665   | -     | 663    | 623   | -     |

| Approach             | EB  |  |  | WB  |  |  | NB   |  |  | SB   |  |  |
|----------------------|-----|--|--|-----|--|--|------|--|--|------|--|--|
| HCM Control Delay, s | 1.2 |  |  | 0.1 |  |  | 15.3 |  |  | 13.1 |  |  |
| HCM LOS              |     |  |  |     |  |  | C    |  |  | B    |  |  |

| Minor Lane/Major Mvmt | NBLn1 | EBL   | EBT | EBR | WBL   | WBT | WBR | SBLn1 |
|-----------------------|-------|-------|-----|-----|-------|-----|-----|-------|
| Capacity (veh/h)      | 385   | 1268  | -   | -   | 1317  | -   | -   | 558   |
| HCM Lane V/C Ratio    | 0.093 | 0.032 | -   | -   | 0.003 | -   | -   | 0.209 |
| HCM Control Delay (s) | 15.3  | 7.9   | 0   | -   | 7.7   | 0   | -   | 13.1  |
| HCM Lane LOS          | C     | A     | A   | -   | A     | A   | -   | B     |
| HCM 95th %tile Q(veh) | 0.3   | 0.1   | -   | -   | 0     | -   | -   | 0.8   |

HCM 6th TWSC  
5: Road 159 & Depot Drive

05/10/2019

| Intersection             |      |      |      |      |      |      |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Int Delay, s/veh         | 3.9  |      |      |      |      |      |      |      |      |      |      |      |
| Movement                 | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  | SEL  | SET  | SER  | NWL  | NWT  | NWR  |
| Lane Configurations      |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h       | 5    | 32   | 1    | 7    | 37   | 2    | 0    | 15   | 9    | 3    | 11   | 5    |
| Future Vol, veh/h        | 5    | 32   | 1    | 7    | 37   | 2    | 0    | 15   | 9    | 3    | 11   | 5    |
| Conflicting Peds, #/hr   | 10   | 0    | 10   | 10   | 0    | 10   | 10   | 0    | 10   | 10   | 0    | 10   |
| Sign Control             | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized           | -    | -    | None |
| Storage Length           | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    |
| Grade, %                 | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    |
| Peak Hour Factor         | 68   | 68   | 68   | 80   | 80   | 80   | 75   | 75   | 75   | 79   | 79   | 79   |
| Heavy Vehicles, %        | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow                | 7    | 47   | 1    | 9    | 46   | 3    | 0    | 20   | 12   | 4    | 14   | 6    |

| Major/Minor          | Major1 |   | Major2 |       | Minor2 |   |       | Minor1 |       |       |       |       |
|----------------------|--------|---|--------|-------|--------|---|-------|--------|-------|-------|-------|-------|
| Conflicting Flow All | 59     | 0 | 0      | 58    | 0      | 0 | 158   | 148    | 68    | 164   | 149   | 68    |
| Stage 1              | -      | - | -      | -     | -      | - | 76    | 76     | -     | 72    | 72    | -     |
| Stage 2              | -      | - | -      | -     | -      | - | 82    | 72     | -     | 92    | 77    | -     |
| Critical Hdwy        | 4.13   | - | -      | 4.13  | -      | - | 7.13  | 6.53   | 6.23  | 7.13  | 6.53  | 6.23  |
| Critical Hdwy Stg 1  | -      | - | -      | -     | -      | - | 6.13  | 5.53   | -     | 6.13  | 5.53  | -     |
| Critical Hdwy Stg 2  | -      | - | -      | -     | -      | - | 6.13  | 5.53   | -     | 6.13  | 5.53  | -     |
| Follow-up Hdwy       | 2.227  | - | -      | 2.227 | -      | - | 3.527 | 4.027  | 3.327 | 3.527 | 4.027 | 3.327 |
| Pot Cap-1 Maneuver   | 1538   | - | -      | 1540  | -      | - | 806   | 742    | 992   | 798   | 741   | 992   |
| Stage 1              | -      | - | -      | -     | -      | - | 931   | 830    | -     | 935   | 833   | -     |
| Stage 2              | -      | - | -      | -     | -      | - | 924   | 833    | -     | 913   | 829   | -     |
| Platoon blocked, %   | -      | - | -      | -     | -      | - | -     | -      | -     | -     | -     | -     |
| Mov Cap-1 Maneuver   | 1523   | - | -      | 1525  | -      | - | 767   | 719    | 973   | 750   | 718   | 973   |
| Mov Cap-2 Maneuver   | -      | - | -      | -     | -      | - | 767   | 719    | -     | 750   | 718   | -     |
| Stage 1              | -      | - | -      | -     | -      | - | 918   | 817    | -     | 922   | 821   | -     |
| Stage 2              | -      | - | -      | -     | -      | - | 889   | 821    | -     | 866   | 816   | -     |

| Approach             | NB | SB  | SE  | NW  |
|----------------------|----|-----|-----|-----|
| HCM Control Delay, s | 1  | 1.1 | 9.7 | 9.8 |
| HCM LOS              |    |     | A   | A   |

| Minor Lane/Major Mvmt | NBL   | NBT | NBRNWLn1 | SELn1 | SBL  | SBT   | SBR |
|-----------------------|-------|-----|----------|-------|------|-------|-----|
| Capacity (veh/h)      | 1523  | -   | -        | 777   | 797  | 1525  | -   |
| HCM Lane V/C Ratio    | 0.005 | -   | -        | 0.031 | 0.04 | 0.006 | -   |
| HCM Control Delay (s) | 7.4   | 0   | -        | 9.8   | 9.7  | 7.4   | 0   |
| HCM Lane LOS          | A     | A   | -        | A     | A    | A     | -   |
| HCM 95th %tile Q(veh) | 0     | -   | -        | 0.1   | 0.1  | 0     | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 0.6  |      |      |      |      |      |
| Movement                 | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
| Lane Configurations      |      |      |      |      |      |      |
| Traffic Vol, veh/h       | 10   | 8    | 3    | 237  | 314  | 5    |
| Future Vol, veh/h        | 10   | 8    | 3    | 237  | 314  | 5    |
| Conflicting Peds, #/hr   | 0    | 0    | 10   | 0    | 0    | 10   |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 56   | 56   | 79   | 79   | 87   | 87   |
| Heavy Vehicles, %        | 3    | 3    | 6    | 6    | 6    | 6    |
| Mvmt Flow                | 18   | 14   | 4    | 300  | 361  | 6    |

| Major/Minor          | Minor2 | Major1 | Major2 |   |   |   |
|----------------------|--------|--------|--------|---|---|---|
| Conflicting Flow All | 682    | 374    | 377    | 0 | - | 0 |
| Stage 1              | 374    | -      | -      | - | - | - |
| Stage 2              | 308    | -      | -      | - | - | - |
| Critical Hdwy        | 6.43   | 6.23   | 4.16   | - | - | - |
| Critical Hdwy Stg 1  | 5.43   | -      | -      | - | - | - |
| Critical Hdwy Stg 2  | 5.43   | -      | -      | - | - | - |
| Follow-up Hdwy       | 3.527  | 3.327  | 2.254  | - | - | - |
| Pot Cap-1 Maneuver   | 414    | 670    | 1160   | - | - | - |
| Stage 1              | 693    | -      | -      | - | - | - |
| Stage 2              | 743    | -      | -      | - | - | - |
| Platoon blocked, %   |        |        |        | - | - | - |
| Mov Cap-1 Maneuver   | 404    | 664    | 1149   | - | - | - |
| Mov Cap-2 Maneuver   | 404    | -      | -      | - | - | - |
| Stage 1              | 683    | -      | -      | - | - | - |
| Stage 2              | 736    | -      | -      | - | - | - |

| Approach             | EB   | NB  | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 12.9 | 0.1 | 0  |
| HCM LOS              | B    |     |    |

| Minor Lane/Major Mvmt | NBL   | NBT | EBLn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h)      | 1149  | -   | 489   | -   | -   |
| HCM Lane V/C Ratio    | 0.003 | -   | 0.066 | -   | -   |
| HCM Control Delay (s) | 8.1   | 0   | 12.9  | -   | -   |
| HCM Lane LOS          | A     | A   | B     | -   | -   |
| HCM 95th %tile Q(veh) | 0     | -   | 0.2   | -   | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 0.7  |      |      |      |      |      |
| Movement                 | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
| Lane Configurations      |      |      |      |      |      |      |
| Traffic Vol, veh/h       | 10   | 20   | 3    | 227  | 313  | 8    |
| Future Vol, veh/h        | 10   | 20   | 3    | 227  | 313  | 8    |
| Conflicting Peds, #/hr   | 0    | 0    | 10   | 0    | 0    | 10   |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 83   | 83   | 76   | 76   | 85   | 85   |
| Heavy Vehicles, %        | 3    | 3    | 6    | 6    | 6    | 6    |
| Mvmt Flow                | 12   | 24   | 4    | 299  | 368  | 9    |

| Major/Minor          | Minor2 | Major1 | Major2 |   |   |   |
|----------------------|--------|--------|--------|---|---|---|
| Conflicting Flow All | 690    | 383    | 387    | 0 | - | 0 |
| Stage 1              | 383    | -      | -      | - | - | - |
| Stage 2              | 307    | -      | -      | - | - | - |
| Critical Hdwy        | 6.43   | 6.23   | 4.16   | - | - | - |
| Critical Hdwy Stg 1  | 5.43   | -      | -      | - | - | - |
| Critical Hdwy Stg 2  | 5.43   | -      | -      | - | - | - |
| Follow-up Hdwy       | 3.527  | 3.327  | 2.254  | - | - | - |
| Pot Cap-1 Maneuver   | 409    | 662    | 1150   | - | - | - |
| Stage 1              | 687    | -      | -      | - | - | - |
| Stage 2              | 744    | -      | -      | - | - | - |
| Platoon blocked, %   |        |        |        | - | - | - |
| Mov Cap-1 Maneuver   | 399    | 656    | 1139   | - | - | - |
| Mov Cap-2 Maneuver   | 399    | -      | -      | - | - | - |
| Stage 1              | 677    | -      | -      | - | - | - |
| Stage 2              | 737    | -      | -      | - | - | - |

| Approach             | EB   | NB  | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 12.1 | 0.1 | 0  |
| HCM LOS              | B    |     |    |

| Minor Lane/Major Mvmt | NBL   | NBT | EBLn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h)      | 1139  | -   | 540   | -   | -   |
| HCM Lane V/C Ratio    | 0.003 | -   | 0.067 | -   | -   |
| HCM Control Delay (s) | 8.2   | 0   | 12.1  | -   | -   |
| HCM Lane LOS          | A     | A   | B     | -   | -   |
| HCM 95th %tile Q(veh) | 0     | -   | 0.2   | -   | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 1.5  |      |      |      |      |      |
| Movement                 | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
| Lane Configurations      |      |      |      |      |      |      |
| Traffic Vol, veh/h       | 19   | 15   | 9    | 216  | 316  | 18   |
| Future Vol, veh/h        | 19   | 15   | 9    | 216  | 316  | 18   |
| Conflicting Peds, #/hr   | 0    | 0    | 10   | 0    | 0    | 10   |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 47   | 47   | 84   | 84   | 89   | 89   |
| Heavy Vehicles, %        | 3    | 3    | 6    | 6    | 6    | 6    |
| Mvmt Flow                | 40   | 32   | 11   | 257  | 355  | 20   |

| Major/Minor          | Minor2 | Major1 | Major2 |   |   |   |
|----------------------|--------|--------|--------|---|---|---|
| Conflicting Flow All | 654    | 375    | 385    | 0 | - | 0 |
| Stage 1              | 375    | -      | -      | - | - | - |
| Stage 2              | 279    | -      | -      | - | - | - |
| Critical Hdwy        | 6.43   | 6.23   | 4.16   | - | - | - |
| Critical Hdwy Stg 1  | 5.43   | -      | -      | - | - | - |
| Critical Hdwy Stg 2  | 5.43   | -      | -      | - | - | - |
| Follow-up Hdwy       | 3.527  | 3.327  | 2.254  | - | - | - |
| Pot Cap-1 Maneuver   | 430    | 669    | 1152   | - | - | - |
| Stage 1              | 693    | -      | -      | - | - | - |
| Stage 2              | 766    | -      | -      | - | - | - |
| Platoon blocked, %   |        |        |        | - | - | - |
| Mov Cap-1 Maneuver   | 417    | 663    | 1141   | - | - | - |
| Mov Cap-2 Maneuver   | 417    | -      | -      | - | - | - |
| Stage 1              | 678    | -      | -      | - | - | - |
| Stage 2              | 758    | -      | -      | - | - | - |

| Approach             | EB   | NB  | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 13.4 | 0.3 | 0  |
| HCM LOS              | B    |     |    |

| Minor Lane/Major Mvmt | NBL   | NBT | EBLn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h)      | 1141  | -   | 499   | -   | -   |
| HCM Lane V/C Ratio    | 0.009 | -   | 0.145 | -   | -   |
| HCM Control Delay (s) | 8.2   | 0   | 13.4  | -   | -   |
| HCM Lane LOS          | A     | A   | B     | -   | -   |
| HCM 95th %tile Q(veh) | 0     | -   | 0.5   | -   | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 0.8  |      |      |      |      |      |
| Movement                 | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
| Lane Configurations      | T    |      |      | T    |      |      |
| Traffic Vol, veh/h       | 17   | 13   | 7    | 208  | 326  | 10   |
| Future Vol, veh/h        | 17   | 13   | 7    | 208  | 326  | 10   |
| Conflicting Peds, #/hr   | 0    | 0    | 10   | 0    | 0    | 10   |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 83   | 83   | 80   | 80   | 91   | 91   |
| Heavy Vehicles, %        | 3    | 3    | 6    | 6    | 6    | 6    |
| Mvmt Flow                | 20   | 16   | 9    | 260  | 358  | 11   |

| Major/Minor          | Minor2 | Major1 | Major2 |   |   |   |
|----------------------|--------|--------|--------|---|---|---|
| Conflicting Flow All | 652    | 374    | 379    | 0 | - | 0 |
| Stage 1              | 374    | -      | -      | - | - | - |
| Stage 2              | 278    | -      | -      | - | - | - |
| Critical Hdwy        | 6.43   | 6.23   | 4.16   | - | - | - |
| Critical Hdwy Stg 1  | 5.43   | -      | -      | - | - | - |
| Critical Hdwy Stg 2  | 5.43   | -      | -      | - | - | - |
| Follow-up Hdwy       | 3.527  | 3.327  | 2.254  | - | - | - |
| Pot Cap-1 Maneuver   | 431    | 670    | 1158   | - | - | - |
| Stage 1              | 693    | -      | -      | - | - | - |
| Stage 2              | 767    | -      | -      | - | - | - |
| Platoon blocked, %   |        |        |        | - | - | - |
| Mov Cap-1 Maneuver   | 419    | 664    | 1147   | - | - | - |
| Mov Cap-2 Maneuver   | 419    | -      | -      | - | - | - |
| Stage 1              | 680    | -      | -      | - | - | - |
| Stage 2              | 759    | -      | -      | - | - | - |

| Approach             | EB   | NB  | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 12.8 | 0.3 | 0  |
| HCM LOS              | B    |     |    |

| Minor Lane/Major Mvmt | NBL   | NBT | EBLn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h)      | 1147  | -   | 499   | -   | -   |
| HCM Lane V/C Ratio    | 0.008 | -   | 0.072 | -   | -   |
| HCM Control Delay (s) | 8.2   | 0   | 12.8  | -   | -   |
| HCM Lane LOS          | A     | A   | B     | -   | -   |
| HCM 95th %tile Q(veh) | 0     | -   | 0.2   | -   | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 0.8  |      |      |      |      |      |
| Movement                 | NBL  | NBT  | SBT  | SBR  | SEL  | SER  |
| Lane Configurations      |      | ↶    | ↷    |      | ↶    | ↷    |
| Traffic Vol, veh/h       | 17   | 220  | 203  | 2    | 2    | 22   |
| Future Vol, veh/h        | 17   | 220  | 203  | 2    | 2    | 22   |
| Conflicting Peds, #/hr   | 10   | 0    | 0    | 10   | 0    | 0    |
| Sign Control             | Free | Free | Free | Free | Stop | Stop |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | -    | -    | -    | -    | 0    | -    |
| Veh in Median Storage, # | -    | 0    | 0    | -    | 0    | -    |
| Grade, %                 | -    | 0    | 0    | -    | 0    | -    |
| Peak Hour Factor         | 94   | 94   | 84   | 84   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow                | 18   | 234  | 242  | 2    | 2    | 24   |

| Major/Minor          | Major1 | Major2 | Minor2 |   |       |
|----------------------|--------|--------|--------|---|-------|
| Conflicting Flow All | 254    | 0      | -      | 0 | 523   |
| Stage 1              | -      | -      | -      | - | 253   |
| Stage 2              | -      | -      | -      | - | 270   |
| Critical Hdwy        | 4.13   | -      | -      | - | 6.43  |
| Critical Hdwy Stg 1  | -      | -      | -      | - | 5.43  |
| Critical Hdwy Stg 2  | -      | -      | -      | - | 5.43  |
| Follow-up Hdwy       | 2.227  | -      | -      | - | 3.527 |
| Pot Cap-1 Maneuver   | 1305   | -      | -      | - | 513   |
| Stage 1              | -      | -      | -      | - | 787   |
| Stage 2              | -      | -      | -      | - | 773   |
| Platoon blocked, %   |        | -      | -      | - |       |
| Mov Cap-1 Maneuver   | 1293   | -      | -      | - | 495   |
| Mov Cap-2 Maneuver   | -      | -      | -      | - | 495   |
| Stage 1              | -      | -      | -      | - | 767   |
| Stage 2              | -      | -      | -      | - | 765   |

| Approach             | NB  | SB | SE |
|----------------------|-----|----|----|
| HCM Control Delay, s | 0.6 | 0  | 10 |
| HCM LOS              |     |    | B  |

| Minor Lane/Major Mvmt | NBL   | NBT | SELn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h)      | 1293  | -   | 741   | -   | -   |
| HCM Lane V/C Ratio    | 0.014 | -   | 0.035 | -   | -   |
| HCM Control Delay (s) | 7.8   | 0   | 10    | -   | -   |
| HCM Lane LOS          | A     | A   | B     | -   | -   |
| HCM 95th %tile Q(veh) | 0     | -   | 0.1   | -   | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 0.8  |      |      |      |      |      |
| Movement                 | WBL  | WBR  | NBT  | NBR  | SBL  | SBT  |
| Lane Configurations      | W    |      | T    |      |      | T    |
| Traffic Vol, veh/h       | 2    | 2    | 37   | 0    | 7    | 44   |
| Future Vol, veh/h        | 2    | 2    | 37   | 0    | 7    | 44   |
| Conflicting Peds, #/hr   | 10   | 10   | 0    | 10   | 10   | 0    |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | 0    | -    | -    | 0    |
| Grade, %                 | 0    | -    | 0    | -    | -    | 0    |
| Peak Hour Factor         | 92   | 92   | 68   | 68   | 80   | 80   |
| Heavy Vehicles, %        | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow                | 2    | 2    | 54   | 0    | 9    | 55   |

| Major/Minor          | Minor1 | Major1 | Major2 |   |       |
|----------------------|--------|--------|--------|---|-------|
| Conflicting Flow All | 147    | 74     | 0      | 0 | 64    |
| Stage 1              | 64     | -      | -      | - | -     |
| Stage 2              | 83     | -      | -      | - | -     |
| Critical Hdwy        | 6.43   | 6.23   | -      | - | 4.13  |
| Critical Hdwy Stg 1  | 5.43   | -      | -      | - | -     |
| Critical Hdwy Stg 2  | 5.43   | -      | -      | - | -     |
| Follow-up Hdwy       | 3.527  | 3.327  | -      | - | 2.227 |
| Pot Cap-1 Maneuver   | 843    | 985    | -      | - | 1532  |
| Stage 1              | 956    | -      | -      | - | -     |
| Stage 2              | 938    | -      | -      | - | -     |
| Platoon blocked, %   |        |        | -      | - | -     |
| Mov Cap-1 Maneuver   | 821    | 966    | -      | - | 1517  |
| Mov Cap-2 Maneuver   | 821    | -      | -      | - | -     |
| Stage 1              | 941    | -      | -      | - | -     |
| Stage 2              | 929    | -      | -      | - | -     |

| Approach             | WB  | NB | SB |
|----------------------|-----|----|----|
| HCM Control Delay, s | 9.1 | 0  | 1  |
| HCM LOS              | A   |    |    |

| Minor Lane/Major Mvmt | NBT | NBRWBLn1 | SBL   | SBT   |
|-----------------------|-----|----------|-------|-------|
| Capacity (veh/h)      | -   | -        | 888   | 1517  |
| HCM Lane V/C Ratio    | -   | -        | 0.005 | 0.006 |
| HCM Control Delay (s) | -   | -        | 9.1   | 7.4   |
| HCM Lane LOS          | -   | -        | A     | A     |
| HCM 95th %tile Q(veh) | -   | -        | 0     | 0     |

| Intersection              |     |
|---------------------------|-----|
| Intersection Delay, s/veh | 7.5 |
| Intersection LOS          | A   |

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h  | 3    | 15   | 26   | 25   | 19   | 1    | 34   | 18   | 16   | 1    | 10   | 6    |
| Future Vol, veh/h   | 3    | 15   | 26   | 25   | 19   | 1    | 34   | 18   | 16   | 1    | 10   | 6    |
| Peak Hour Factor    | 0.61 | 0.61 | 0.61 | 0.75 | 0.75 | 0.75 | 0.85 | 0.85 | 0.85 | 0.53 | 0.53 | 0.53 |
| Heavy Vehicles, %   | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow           | 5    | 25   | 43   | 33   | 25   | 1    | 40   | 21   | 19   | 2    | 19   | 11   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB  | WB  | NB  | SB  |
|----------------------------|-----|-----|-----|-----|
| Opposing Approach          | WB  | EB  | SB  | NB  |
| Opposing Lanes             | 1   | 1   | 1   | 1   |
| Conflicting Approach Left  | SB  | NB  | EB  | WB  |
| Conflicting Lanes Left     | 1   | 1   | 1   | 1   |
| Conflicting Approach Right | NB  | SB  | WB  | EB  |
| Conflicting Lanes Right    | 1   | 1   | 1   | 1   |
| HCM Control Delay          | 7.3 | 7.7 | 7.7 | 7.3 |
| HCM LOS                    | A   | A   | A   | A   |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 50%   | 7%    | 56%   | 6%    |
| Vol Thru, %            | 26%   | 34%   | 42%   | 59%   |
| Vol Right, %           | 24%   | 59%   | 2%    | 35%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 68    | 44    | 45    | 17    |
| LT Vol                 | 34    | 3     | 25    | 1     |
| Through Vol            | 18    | 15    | 19    | 10    |
| RT Vol                 | 16    | 26    | 1     | 6     |
| Lane Flow Rate         | 80    | 72    | 60    | 32    |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.093 | 0.077 | 0.072 | 0.036 |
| Departure Headway (Hd) | 4.163 | 3.851 | 4.3   | 4.041 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 852   | 918   | 825   | 874   |
| Service Time           | 2.231 | 1.924 | 2.368 | 2.123 |
| HCM Lane V/C Ratio     | 0.094 | 0.078 | 0.073 | 0.037 |
| HCM Control Delay      | 7.7   | 7.3   | 7.7   | 7.3   |
| HCM Lane LOS           | A     | A     | A     | A     |
| HCM 95th-tile Q        | 0.3   | 0.2   | 0.2   | 0.1   |

| Intersection              |      |
|---------------------------|------|
| Intersection Delay, s/veh | 12.1 |
| Intersection LOS          | B    |

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      |      |      |      |      |      |      |      |      |      |      |      |
| Traffic Vol, veh/h  | 48   | 127  | 7    | 94   | 118  | 44   | 22   | 128  | 76   | 34   | 108  | 35   |
| Future Vol, veh/h   | 48   | 127  | 7    | 94   | 118  | 44   | 22   | 128  | 76   | 34   | 108  | 35   |
| Peak Hour Factor    | 0.95 | 0.95 | 0.95 | 0.87 | 0.87 | 0.87 | 0.94 | 0.94 | 0.94 | 0.84 | 0.84 | 0.84 |
| Heavy Vehicles, %   | 3    | 3    | 3    | 6    | 6    | 6    | 6    | 6    | 6    | 3    | 3    | 3    |
| Mvmt Flow           | 51   | 134  | 7    | 108  | 136  | 51   | 23   | 136  | 81   | 40   | 129  | 42   |
| Number of Lanes     | 0    | 1    | 0    | 1    | 1    | 0    | 0    | 1    | 1    | 0    | 1    | 0    |

| Approach                   | EB | WB   | NB   | SB   |
|----------------------------|----|------|------|------|
| Opposing Approach          | WB | EB   | SB   | NB   |
| Opposing Lanes             | 2  | 1    | 1    | 2    |
| Conflicting Approach Left  | SB | NB   | EB   | WB   |
| Conflicting Lanes Left     | 1  | 2    | 1    | 2    |
| Conflicting Approach Right | NB | SB   | WB   | EB   |
| Conflicting Lanes Right    | 2  | 1    | 2    | 1    |
| HCM Control Delay          | 13 | 11.6 | 11.1 | 13.3 |
| HCM LOS                    | B  | B    | B    | B    |

| Lane                   | NBLn1 | NBLn2 | EBLn1 | WBLn1 | WBLn2 | SBLn1 |
|------------------------|-------|-------|-------|-------|-------|-------|
| Vol Left, %            | 15%   | 0%    | 26%   | 100%  | 0%    | 19%   |
| Vol Thru, %            | 85%   | 0%    | 70%   | 0%    | 73%   | 61%   |
| Vol Right, %           | 0%    | 100%  | 4%    | 0%    | 27%   | 20%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 150   | 76    | 182   | 94    | 162   | 177   |
| LT Vol                 | 22    | 0     | 48    | 94    | 0     | 34    |
| Through Vol            | 128   | 0     | 127   | 0     | 118   | 108   |
| RT Vol                 | 0     | 76    | 7     | 0     | 44    | 35    |
| Lane Flow Rate         | 160   | 81    | 192   | 108   | 186   | 211   |
| Geometry Grp           | 7     | 7     | 6     | 7     | 7     | 6     |
| Degree of Util (X)     | 0.29  | 0.129 | 0.346 | 0.205 | 0.317 | 0.374 |
| Departure Headway (Hd) | 6.539 | 5.753 | 6.504 | 6.836 | 6.135 | 6.39  |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 547   | 620   | 552   | 524   | 585   | 560   |
| Service Time           | 4.302 | 3.515 | 4.567 | 4.595 | 3.894 | 4.453 |
| HCM Lane V/C Ratio     | 0.293 | 0.131 | 0.348 | 0.206 | 0.318 | 0.377 |
| HCM Control Delay      | 12    | 9.4   | 13    | 11.4  | 11.7  | 13.3  |
| HCM Lane LOS           | B     | A     | B     | B     | B     | B     |
| HCM 95th-tile Q        | 1.2   | 0.4   | 1.5   | 0.8   | 1.4   | 1.7   |

HCM 6th TWSC  
1: Road 156 & Avenue 332

05/10/2019

| Intersection             |      |      |       |      |      |       |      |      |      |      |      |      |
|--------------------------|------|------|-------|------|------|-------|------|------|------|------|------|------|
| Int Delay, s/veh         | 2.9  |      |       |      |      |       |      |      |      |      |      |      |
| Movement                 | EBL  | EBT  | EBR   | WBL  | WBT  | WBR   | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations      |      | ↖    | ↗     |      | ↖    | ↗     |      | ↔    |      |      | ↔    |      |
| Traffic Vol, veh/h       | 0    | 1    | 1     | 19   | 3    | 16    | 2    | 50   | 20   | 31   | 101  | 2    |
| Future Vol, veh/h        | 0    | 1    | 1     | 19   | 3    | 16    | 2    | 50   | 20   | 31   | 101  | 2    |
| Conflicting Peds, #/hr   | 10   | 0    | 10    | 10   | 0    | 10    | 10   | 0    | 10   | 10   | 0    | 10   |
| Sign Control             | Stop | Stop | Stop  | Stop | Stop | Stop  | Free | Free | Free | Free | Free | Free |
| RT Channelized           | -    | -    | Yield | -    | -    | Yield | -    | -    | None | -    | -    | None |
| Storage Length           | -    | -    | 75    | -    | -    | 125   | -    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | -    | 0    | -     | -    | 0    | -     | -    | 0    | -    | -    | 0    | -    |
| Grade, %                 | -    | 0    | -     | -    | 0    | -     | -    | 0    | -    | -    | 0    | -    |
| Peak Hour Factor         | 50   | 50   | 50    | 68   | 68   | 68    | 82   | 82   | 82   | 86   | 86   | 86   |
| Heavy Vehicles, %        | 3    | 3    | 3     | 3    | 3    | 3     | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow                | 0    | 2    | 2     | 28   | 4    | 24    | 2    | 61   | 24   | 36   | 117  | 2    |

| Major/Minor          | Minor2 |       | Minor1 |       | Major1 |       | Major2 |   |   |       |   |   |
|----------------------|--------|-------|--------|-------|--------|-------|--------|---|---|-------|---|---|
| Conflicting Flow All | 289    | 299   | 138    | 288   | 288    | 93    | 129    | 0 | 0 | 95    | 0 | 0 |
| Stage 1              | 200    | 200   | -      | 87    | 87     | -     | -      | - | - | -     | - | - |
| Stage 2              | 89     | 99    | -      | 201   | 201    | -     | -      | - | - | -     | - | - |
| Critical Hdwy        | 7.13   | 6.53  | 6.23   | 7.13  | 6.53   | 6.23  | 4.13   | - | - | 4.13  | - | - |
| Critical Hdwy Stg 1  | 6.13   | 5.53  | -      | 6.13  | 5.53   | -     | -      | - | - | -     | - | - |
| Critical Hdwy Stg 2  | 6.13   | 5.53  | -      | 6.13  | 5.53   | -     | -      | - | - | -     | - | - |
| Follow-up Hdwy       | 3.527  | 4.027 | 3.327  | 3.527 | 4.027  | 3.327 | 2.227  | - | - | 2.227 | - | - |
| Pot Cap-1 Maneuver   | 661    | 611   | 908    | 662   | 620    | 961   | 1451   | - | - | 1493  | - | - |
| Stage 1              | 800    | 734   | -      | 918   | 821    | -     | -      | - | - | -     | - | - |
| Stage 2              | 916    | 811   | -      | 799   | 733    | -     | -      | - | - | -     | - | - |
| Platoon blocked, %   |        |       |        |       |        |       |        | - | - | -     | - | - |
| Mov Cap-1 Maneuver   | 616    | 583   | 891    | 633   | 591    | 943   | 1437   | - | - | 1479  | - | - |
| Mov Cap-2 Maneuver   | 616    | 583   | -      | 633   | 591    | -     | -      | - | - | -     | - | - |
| Stage 1              | 791    | 708   | -      | 908   | 812    | -     | -      | - | - | -     | - | - |
| Stage 2              | 879    | 802   | -      | 767   | 707    | -     | -      | - | - | -     | - | - |

| Approach             | EB   |  | WB   |  | NB  |  | SB  |  |
|----------------------|------|--|------|--|-----|--|-----|--|
| HCM Control Delay, s | 10.1 |  | 10.2 |  | 0.2 |  | 1.7 |  |
| HCM LOS              | B    |  | B    |  |     |  |     |  |

| Minor Lane/Major Mvmt | NBL   | NBT | NBR | EBLn1 | EBLn2 | WBLn1 | WBLn2 | SBL   | SBT | SBR |
|-----------------------|-------|-----|-----|-------|-------|-------|-------|-------|-----|-----|
| Capacity (veh/h)      | 1437  | -   | -   | 583   | 891   | 627   | 943   | 1479  | -   | -   |
| HCM Lane V/C Ratio    | 0.002 | -   | -   | 0.003 | 0.002 | 0.052 | 0.025 | 0.024 | -   | -   |
| HCM Control Delay (s) | 7.5   | 0   | -   | 11.2  | 9     | 11.1  | 8.9   | 7.5   | 0   | -   |
| HCM Lane LOS          | A     | A   | -   | B     | A     | B     | A     | A     | A   | -   |
| HCM 95th %tile Q(veh) | 0     | -   | -   | 0     | 0     | 0.2   | 0.1   | 0.1   | -   | -   |

HCM 6th TWSC  
3: Road 156 & Avenue 328

05/10/2019

| Intersection             |      |      |      |      |      |      |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Int Delay, s/veh         | 4.9  |      |      |      |      |      |      |      |      |      |      |      |
| Movement                 | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations      |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h       | 29   | 227  | 22   | 6    | 182  | 45   | 15   | 15   | 10   | 69   | 22   | 41   |
| Future Vol, veh/h        | 29   | 227  | 22   | 6    | 182  | 45   | 15   | 15   | 10   | 69   | 22   | 41   |
| Conflicting Peds, #/hr   | 10   | 0    | 10   | 10   | 0    | 10   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized           | -    | -    | None |
| Storage Length           | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    |
| Grade, %                 | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    |
| Peak Hour Factor         | 86   | 86   | 86   | 91   | 91   | 91   | 83   | 83   | 83   | 83   | 83   | 83   |
| Heavy Vehicles, %        | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow                | 34   | 264  | 26   | 7    | 200  | 49   | 18   | 18   | 12   | 83   | 27   | 49   |

| Major/Minor          | Major1 |   |   | Major2 |   |   | Minor1 |       |       | Minor2 |       |       |
|----------------------|--------|---|---|--------|---|---|--------|-------|-------|--------|-------|-------|
| Conflicting Flow All | 259    | 0 | 0 | 300    | 0 | 0 | 632    | 628   | 287   | 609    | 617   | 235   |
| Stage 1              | -      | - | - | -      | - | - | 355    | 355   | -     | 249    | 249   | -     |
| Stage 2              | -      | - | - | -      | - | - | 277    | 273   | -     | 360    | 368   | -     |
| Critical Hdwy        | 4.13   | - | - | 4.13   | - | - | 7.13   | 6.53  | 6.23  | 7.13   | 6.53  | 6.23  |
| Critical Hdwy Stg 1  | -      | - | - | -      | - | - | 6.13   | 5.53  | -     | 6.13   | 5.53  | -     |
| Critical Hdwy Stg 2  | -      | - | - | -      | - | - | 6.13   | 5.53  | -     | 6.13   | 5.53  | -     |
| Follow-up Hdwy       | 2.227  | - | - | 2.227  | - | - | 3.527  | 4.027 | 3.327 | 3.527  | 4.027 | 3.327 |
| Pot Cap-1 Maneuver   | 1300   | - | - | 1255   | - | - | 392    | 398   | 750   | 406    | 404   | 802   |
| Stage 1              | -      | - | - | -      | - | - | 660    | 628   | -     | 753    | 699   | -     |
| Stage 2              | -      | - | - | -      | - | - | 727    | 682   | -     | 656    | 620   | -     |
| Platoon blocked, %   | -      | - | - | -      | - | - | -      | -     | -     | -      | -     | -     |
| Mov Cap-1 Maneuver   | 1288   | - | - | 1243   | - | - | 335    | 375   | 743   | 370    | 381   | 794   |
| Mov Cap-2 Maneuver   | -      | - | - | -      | - | - | 335    | 375   | -     | 370    | 381   | -     |
| Stage 1              | -      | - | - | -      | - | - | 633    | 602   | -     | 722    | 687   | -     |
| Stage 2              | -      | - | - | -      | - | - | 651    | 670   | -     | 606    | 594   | -     |

| Approach             | EB  |  |  | WB  |  |  | NB |  |  | SB   |  |  |
|----------------------|-----|--|--|-----|--|--|----|--|--|------|--|--|
| HCM Control Delay, s | 0.8 |  |  | 0.2 |  |  | 15 |  |  | 17.5 |  |  |
| HCM LOS              |     |  |  |     |  |  | C  |  |  | C    |  |  |

| Minor Lane/Major Mvmt | NBLn1 | EBL   | EBT | EBR | WBL   | WBT | WBR | SBLn1 |
|-----------------------|-------|-------|-----|-----|-------|-----|-----|-------|
| Capacity (veh/h)      | 407   | 1288  | -   | -   | 1243  | -   | -   | 446   |
| HCM Lane V/C Ratio    | 0.118 | 0.026 | -   | -   | 0.005 | -   | -   | 0.357 |
| HCM Control Delay (s) | 15    | 7.9   | 0   | -   | 7.9   | 0   | -   | 17.5  |
| HCM Lane LOS          | C     | A     | A   | -   | A     | A   | -   | C     |
| HCM 95th %tile Q(veh) | 0.4   | 0.1   | -   | -   | 0     | -   | -   | 1.6   |

HCM 6th TWSC  
5: Road 159 & Depot Drive

05/10/2019

| Intersection             |      |      |      |      |      |      |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Int Delay, s/veh         | 5.4  |      |      |      |      |      |      |      |      |      |      |      |
| Movement                 | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  | SEL  | SET  | SER  | NWL  | NWT  | NWR  |
| Lane Configurations      |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h       | 11   | 40   | 0    | 19   | 42   | 3    | 3    | 19   | 10   | 0    | 23   | 23   |
| Future Vol, veh/h        | 11   | 40   | 0    | 19   | 42   | 3    | 3    | 19   | 10   | 0    | 23   | 23   |
| Conflicting Peds, #/hr   | 10   | 0    | 10   | 10   | 0    | 10   | 10   | 0    | 10   | 10   | 0    | 10   |
| Sign Control             | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized           | -    | -    | None |
| Storage Length           | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    |
| Grade, %                 | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    |
| Peak Hour Factor         | 85   | 85   | 85   | 79   | 79   | 79   | 73   | 73   | 73   | 77   | 77   | 77   |
| Heavy Vehicles, %        | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow                | 13   | 47   | 0    | 24   | 53   | 4    | 4    | 26   | 14   | 0    | 30   | 30   |

| Major/Minor          | Major1 |   | Major2 |       | Minor2 |   | Minor1 |       |       |       |       |       |
|----------------------|--------|---|--------|-------|--------|---|--------|-------|-------|-------|-------|-------|
| Conflicting Flow All | 67     | 0 | 0      | 57    | 0      | 0 | 226    | 196   | 75    | 216   | 198   | 67    |
| Stage 1              | -      | - | -      | -     | -      | - | 113    | 113   | -     | 83    | 83    | -     |
| Stage 2              | -      | - | -      | -     | -      | - | 113    | 83    | -     | 133   | 115   | -     |
| Critical Hdwy        | 4.13   | - | -      | 4.13  | -      | - | 7.13   | 6.53  | 6.23  | 7.13  | 6.53  | 6.23  |
| Critical Hdwy Stg 1  | -      | - | -      | -     | -      | - | 6.13   | 5.53  | -     | 6.13  | 5.53  | -     |
| Critical Hdwy Stg 2  | -      | - | -      | -     | -      | - | 6.13   | 5.53  | -     | 6.13  | 5.53  | -     |
| Follow-up Hdwy       | 2.227  | - | -      | 2.227 | -      | - | 3.527  | 4.027 | 3.327 | 3.527 | 4.027 | 3.327 |
| Pot Cap-1 Maneuver   | 1528   | - | -      | 1541  | -      | - | 727    | 698   | 984   | 738   | 696   | 994   |
| Stage 1              | -      | - | -      | -     | -      | - | 890    | 800   | -     | 923   | 824   | -     |
| Stage 2              | -      | - | -      | -     | -      | - | 890    | 824   | -     | 868   | 798   | -     |
| Platoon blocked, %   | -      | - | -      | -     | -      | - | -      | -     | -     | -     | -     | -     |
| Mov Cap-1 Maneuver   | 1513   | - | -      | 1526  | -      | - | 655    | 667   | 965   | 680   | 665   | 975   |
| Mov Cap-2 Maneuver   | -      | - | -      | -     | -      | - | 655    | 667   | -     | 680   | 665   | -     |
| Stage 1              | -      | - | -      | -     | -      | - | 874    | 779   | -     | 906   | 808   | -     |
| Stage 2              | -      | - | -      | -     | -      | - | 816    | 808   | -     | 806   | 777   | -     |

| Approach             | NB  | SB  | SE   | NW  |
|----------------------|-----|-----|------|-----|
| HCM Control Delay, s | 1.6 | 2.2 | 10.2 | 9.9 |
| HCM LOS              |     |     | B    | A   |

| Minor Lane/Major Mvmt | NBL   | NBT | NBRNWLn1 | SELn1 | SBL   | SBT   | SBR |
|-----------------------|-------|-----|----------|-------|-------|-------|-----|
| Capacity (veh/h)      | 1513  | -   | -        | 791   | 737   | 1526  | -   |
| HCM Lane V/C Ratio    | 0.009 | -   | -        | 0.076 | 0.059 | 0.016 | -   |
| HCM Control Delay (s) | 7.4   | 0   | -        | 9.9   | 10.2  | 7.4   | 0   |
| HCM Lane LOS          | A     | A   | -        | A     | B     | A     | A   |
| HCM 95th %tile Q(veh) | 0     | -   | -        | 0.2   | 0.2   | 0     | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 0.6  |      |      |      |      |      |
| Movement                 | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
| Lane Configurations      | T    |      |      | T    |      | T    |
| Traffic Vol, veh/h       | 4    | 9    | 11   | 288  | 271  | 6    |
| Future Vol, veh/h        | 4    | 9    | 11   | 288  | 271  | 6    |
| Conflicting Peds, #/hr   | 0    | 0    | 10   | 0    | 0    | 10   |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 54   | 54   | 92   | 92   | 86   | 86   |
| Heavy Vehicles, %        | 3    | 3    | 6    | 6    | 6    | 6    |
| Mvmt Flow                | 7    | 17   | 12   | 313  | 315  | 7    |

| Major/Minor          | Minor2 | Major1 | Major2 |   |   |   |
|----------------------|--------|--------|--------|---|---|---|
| Conflicting Flow All | 666    | 329    | 332    | 0 | - | 0 |
| Stage 1              | 329    | -      | -      | - | - | - |
| Stage 2              | 337    | -      | -      | - | - | - |
| Critical Hdwy        | 6.43   | 6.23   | 4.16   | - | - | - |
| Critical Hdwy Stg 1  | 5.43   | -      | -      | - | - | - |
| Critical Hdwy Stg 2  | 5.43   | -      | -      | - | - | - |
| Follow-up Hdwy       | 3.527  | 3.327  | 2.254  | - | - | - |
| Pot Cap-1 Maneuver   | 423    | 710    | 1205   | - | - | - |
| Stage 1              | 727    | -      | -      | - | - | - |
| Stage 2              | 721    | -      | -      | - | - | - |
| Platoon blocked, %   |        |        |        | - | - | - |
| Mov Cap-1 Maneuver   | 409    | 703    | 1194   | - | - | - |
| Mov Cap-2 Maneuver   | 409    | -      | -      | - | - | - |
| Stage 1              | 711    | -      | -      | - | - | - |
| Stage 2              | 714    | -      | -      | - | - | - |

| Approach             | EB   | NB  | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 11.5 | 0.3 | 0  |
| HCM LOS              | B    |     |    |

| Minor Lane/Major Mvmt | NBL  | NBT | EBLn1 | SBT | SBR |
|-----------------------|------|-----|-------|-----|-----|
| Capacity (veh/h)      | 1194 | -   | 576   | -   | -   |
| HCM Lane V/C Ratio    | 0.01 | -   | 0.042 | -   | -   |
| HCM Control Delay (s) | 8    | 0   | 11.5  | -   | -   |
| HCM Lane LOS          | A    | A   | B     | -   | -   |
| HCM 95th %tile Q(veh) | 0    | -   | 0.1   | -   | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 0.6  |      |      |      |      |      |
| Movement                 | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
| Lane Configurations      | T    |      |      | T    |      | T    |
| Traffic Vol, veh/h       | 6    | 13   | 12   | 286  | 275  | 10   |
| Future Vol, veh/h        | 6    | 13   | 12   | 286  | 275  | 10   |
| Conflicting Peds, #/hr   | 0    | 0    | 10   | 0    | 0    | 10   |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 68   | 68   | 91   | 91   | 84   | 84   |
| Heavy Vehicles, %        | 3    | 3    | 6    | 6    | 6    | 6    |
| Mvmt Flow                | 9    | 19   | 13   | 314  | 327  | 12   |

| Major/Minor          | Minor2 | Major1 | Major2 |   |   |   |
|----------------------|--------|--------|--------|---|---|---|
| Conflicting Flow All | 683    | 343    | 349    | 0 | - | 0 |
| Stage 1              | 343    | -      | -      | - | - | - |
| Stage 2              | 340    | -      | -      | - | - | - |
| Critical Hdwy        | 6.43   | 6.23   | 4.16   | - | - | - |
| Critical Hdwy Stg 1  | 5.43   | -      | -      | - | - | - |
| Critical Hdwy Stg 2  | 5.43   | -      | -      | - | - | - |
| Follow-up Hdwy       | 3.527  | 3.327  | 2.254  | - | - | - |
| Pot Cap-1 Maneuver   | 413    | 697    | 1188   | - | - | - |
| Stage 1              | 716    | -      | -      | - | - | - |
| Stage 2              | 719    | -      | -      | - | - | - |
| Platoon blocked, %   |        |        |        | - | - | - |
| Mov Cap-1 Maneuver   | 399    | 690    | 1177   | - | - | - |
| Mov Cap-2 Maneuver   | 399    | -      | -      | - | - | - |
| Stage 1              | 700    | -      | -      | - | - | - |
| Stage 2              | 712    | -      | -      | - | - | - |

| Approach             | EB   | NB  | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 11.8 | 0.3 | 0  |
| HCM LOS              | B    |     |    |

| Minor Lane/Major Mvmt | NBL   | NBT | EBLn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h)      | 1177  | -   | 561   | -   | -   |
| HCM Lane V/C Ratio    | 0.011 | -   | 0.05  | -   | -   |
| HCM Control Delay (s) | 8.1   | 0   | 11.8  | -   | -   |
| HCM Lane LOS          | A     | A   | B     | -   | -   |
| HCM 95th %tile Q(veh) | 0     | -   | 0.2   | -   | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 1.1  |      |      |      |      |      |
| Movement                 | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
| Lane Configurations      | W    |      |      | W    | W    |      |
| Traffic Vol, veh/h       | 10   | 27   | 21   | 300  | 249  | 25   |
| Future Vol, veh/h        | 10   | 27   | 21   | 300  | 249  | 25   |
| Conflicting Peds, #/hr   | 0    | 0    | 10   | 0    | 0    | 10   |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 71   | 71   | 91   | 91   | 87   | 87   |
| Heavy Vehicles, %        | 3    | 3    | 6    | 6    | 6    | 6    |
| Mvmt Flow                | 14   | 38   | 23   | 330  | 286  | 29   |

| Major/Minor          | Minor2 | Major1 | Major2 |   |   |   |
|----------------------|--------|--------|--------|---|---|---|
| Conflicting Flow All | 687    | 311    | 325    | 0 | - | 0 |
| Stage 1              | 311    | -      | -      | - | - | - |
| Stage 2              | 376    | -      | -      | - | - | - |
| Critical Hdwy        | 6.43   | 6.23   | 4.16   | - | - | - |
| Critical Hdwy Stg 1  | 5.43   | -      | -      | - | - | - |
| Critical Hdwy Stg 2  | 5.43   | -      | -      | - | - | - |
| Follow-up Hdwy       | 3.527  | 3.327  | 2.254  | - | - | - |
| Pot Cap-1 Maneuver   | 411    | 727    | 1213   | - | - | - |
| Stage 1              | 741    | -      | -      | - | - | - |
| Stage 2              | 692    | -      | -      | - | - | - |
| Platoon blocked, %   |        |        |        | - | - | - |
| Mov Cap-1 Maneuver   | 394    | 720    | 1201   | - | - | - |
| Mov Cap-2 Maneuver   | 394    | -      | -      | - | - | - |
| Stage 1              | 717    | -      | -      | - | - | - |
| Stage 2              | 685    | -      | -      | - | - | - |

| Approach             | EB   | NB  | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 11.7 | 0.5 | 0  |
| HCM LOS              | B    |     |    |

| Minor Lane/Major Mvmt | NBL   | NBT | EBLn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h)      | 1201  | -   | 588   | -   | -   |
| HCM Lane V/C Ratio    | 0.019 | -   | 0.089 | -   | -   |
| HCM Control Delay (s) | 8.1   | 0   | 11.7  | -   | -   |
| HCM Lane LOS          | A     | A   | B     | -   | -   |
| HCM 95th %tile Q(veh) | 0.1   | -   | 0.3   | -   | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 0.7  |      |      |      |      |      |
| Movement                 | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
| Lane Configurations      | T    |      |      | T    |      | T    |
| Traffic Vol, veh/h       | 11   | 14   | 12   | 306  | 266  | 12   |
| Future Vol, veh/h        | 11   | 14   | 12   | 306  | 266  | 12   |
| Conflicting Peds, #/hr   | 0    | 0    | 10   | 0    | 0    | 10   |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 78   | 78   | 91   | 91   | 84   | 84   |
| Heavy Vehicles, %        | 3    | 3    | 6    | 6    | 6    | 6    |
| Mvmt Flow                | 14   | 18   | 13   | 336  | 317  | 14   |

| Major/Minor          | Minor2 | Major1 | Major2 |   |   |   |
|----------------------|--------|--------|--------|---|---|---|
| Conflicting Flow All | 696    | 334    | 341    | 0 | - | 0 |
| Stage 1              | 334    | -      | -      | - | - | - |
| Stage 2              | 362    | -      | -      | - | - | - |
| Critical Hdwy        | 6.43   | 6.23   | 4.16   | - | - | - |
| Critical Hdwy Stg 1  | 5.43   | -      | -      | - | - | - |
| Critical Hdwy Stg 2  | 5.43   | -      | -      | - | - | - |
| Follow-up Hdwy       | 3.527  | 3.327  | 2.254  | - | - | - |
| Pot Cap-1 Maneuver   | 406    | 706    | 1196   | - | - | - |
| Stage 1              | 723    | -      | -      | - | - | - |
| Stage 2              | 702    | -      | -      | - | - | - |
| Platoon blocked, %   |        |        |        | - | - | - |
| Mov Cap-1 Maneuver   | 393    | 699    | 1185   | - | - | - |
| Mov Cap-2 Maneuver   | 393    | -      | -      | - | - | - |
| Stage 1              | 706    | -      | -      | - | - | - |
| Stage 2              | 695    | -      | -      | - | - | - |

| Approach             | EB   | NB  | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 12.4 | 0.3 | 0  |
| HCM LOS              | B    |     |    |

| Minor Lane/Major Mvmt | NBL   | NBT | EBLn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h)      | 1185  | -   | 521   | -   | -   |
| HCM Lane V/C Ratio    | 0.011 | -   | 0.062 | -   | -   |
| HCM Control Delay (s) | 8.1   | 0   | 12.4  | -   | -   |
| HCM Lane LOS          | A     | A   | B     | -   | -   |
| HCM 95th %tile Q(veh) | 0     | -   | 0.2   | -   | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 2    |      |      |      |      |      |
| Movement                 | NBL  | NBT  | SBT  | SBR  | SEL  | SER  |
| Lane Configurations      |      | ↕    | ↕    |      | ↕    |      |
| Traffic Vol, veh/h       | 47   | 173  | 130  | 4    | 3    | 47   |
| Future Vol, veh/h        | 47   | 173  | 130  | 4    | 3    | 47   |
| Conflicting Peds, #/hr   | 10   | 0    | 0    | 10   | 0    | 0    |
| Sign Control             | Free | Free | Free | Free | Stop | Stop |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | -    | -    | -    | -    | 0    | -    |
| Veh in Median Storage, # | -    | 0    | 0    | -    | 0    | -    |
| Grade, %                 | -    | 0    | 0    | -    | 0    | -    |
| Peak Hour Factor         | 94   | 94   | 84   | 84   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow                | 50   | 184  | 155  | 5    | 3    | 51   |

| Major/Minor          | Major1 | Major2 | Minor2 |   |             |
|----------------------|--------|--------|--------|---|-------------|
| Conflicting Flow All | 170    | 0      | -      | 0 | 452 168     |
| Stage 1              | -      | -      | -      | - | 168 -       |
| Stage 2              | -      | -      | -      | - | 284 -       |
| Critical Hdwy        | 4.13   | -      | -      | - | 6.43 6.23   |
| Critical Hdwy Stg 1  | -      | -      | -      | - | 5.43 -      |
| Critical Hdwy Stg 2  | -      | -      | -      | - | 5.43 -      |
| Follow-up Hdwy       | 2.227  | -      | -      | - | 3.527 3.327 |
| Pot Cap-1 Maneuver   | 1401   | -      | -      | - | 564 874     |
| Stage 1              | -      | -      | -      | - | 859 -       |
| Stage 2              | -      | -      | -      | - | 762 -       |
| Platoon blocked, %   |        | -      | -      | - |             |
| Mov Cap-1 Maneuver   | 1388   | -      | -      | - | 531 866     |
| Mov Cap-2 Maneuver   | -      | -      | -      | - | 531 -       |
| Stage 1              | -      | -      | -      | - | 816 -       |
| Stage 2              | -      | -      | -      | - | 754 -       |

| Approach             | NB  | SB | SE  |
|----------------------|-----|----|-----|
| HCM Control Delay, s | 1.6 | 0  | 9.6 |
| HCM LOS              |     |    | A   |

| Minor Lane/Major Mvmt | NBL   | NBT | SELn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h)      | 1388  | -   | 834   | -   | -   |
| HCM Lane V/C Ratio    | 0.036 | -   | 0.065 | -   | -   |
| HCM Control Delay (s) | 7.7   | 0   | 9.6   | -   | -   |
| HCM Lane LOS          | A     | A   | A     | -   | -   |
| HCM 95th %tile Q(veh) | 0.1   | -   | 0.2   | -   | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 0.8  |      |      |      |      |      |
| Movement                 | WBL  | WBR  | NBT  | NBR  | SBL  | SBT  |
| Lane Configurations      | W    |      | T    |      |      | T    |
| Traffic Vol, veh/h       | 2    | 7    | 61   | 5    | 4    | 62   |
| Future Vol, veh/h        | 2    | 7    | 61   | 5    | 4    | 62   |
| Conflicting Peds, #/hr   | 10   | 10   | 0    | 10   | 10   | 0    |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | 0    | -    | -    | 0    |
| Grade, %                 | 0    | -    | 0    | -    | -    | 0    |
| Peak Hour Factor         | 92   | 92   | 85   | 85   | 79   | 79   |
| Heavy Vehicles, %        | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow                | 2    | 8    | 72   | 6    | 5    | 78   |

| Major/Minor          | Minor1 | Major1 | Major2 |   |       |
|----------------------|--------|--------|--------|---|-------|
| Conflicting Flow All | 183    | 95     | 0      | 0 | 88    |
| Stage 1              | 85     | -      | -      | - | -     |
| Stage 2              | 98     | -      | -      | - | -     |
| Critical Hdwy        | 6.43   | 6.23   | -      | - | 4.13  |
| Critical Hdwy Stg 1  | 5.43   | -      | -      | - | -     |
| Critical Hdwy Stg 2  | 5.43   | -      | -      | - | -     |
| Follow-up Hdwy       | 3.527  | 3.327  | -      | - | 2.227 |
| Pot Cap-1 Maneuver   | 804    | 959    | -      | - | 1501  |
| Stage 1              | 936    | -      | -      | - | -     |
| Stage 2              | 923    | -      | -      | - | -     |
| Platoon blocked, %   |        |        | -      | - | -     |
| Mov Cap-1 Maneuver   | 785    | 941    | -      | - | 1487  |
| Mov Cap-2 Maneuver   | 785    | -      | -      | - | -     |
| Stage 1              | 923    | -      | -      | - | -     |
| Stage 2              | 914    | -      | -      | - | -     |

| Approach             | WB | NB | SB  |
|----------------------|----|----|-----|
| HCM Control Delay, s | 9  | 0  | 0.5 |
| HCM LOS              | A  |    |     |

| Minor Lane/Major Mvmt | NBT | NBRWBLn1 | SBL   | SBT   |
|-----------------------|-----|----------|-------|-------|
| Capacity (veh/h)      | -   | -        | 901   | 1487  |
| HCM Lane V/C Ratio    | -   | -        | 0.011 | 0.003 |
| HCM Control Delay (s) | -   | -        | 9     | 7.4   |
| HCM Lane LOS          | -   | -        | A     | A     |
| HCM 95th %tile Q(veh) | -   | -        | 0     | 0     |

# CUMULATIVE YEAR 2040 CONDITIONS WORKSHEETS

| Intersection              |      |
|---------------------------|------|
| Intersection Delay, s/veh | 10.7 |
| Intersection LOS          | B    |

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h  | 6    | 119  | 29   | 193  | 127  | 3    | 39   | 17   | 131  | 3    | 14   | 6    |
| Future Vol, veh/h   | 6    | 119  | 29   | 193  | 127  | 3    | 39   | 17   | 131  | 3    | 14   | 6    |
| Peak Hour Factor    | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, %   | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow           | 7    | 129  | 32   | 210  | 138  | 3    | 42   | 18   | 142  | 3    | 15   | 7    |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB  | WB   | NB  | SB  |
|----------------------------|-----|------|-----|-----|
| Opposing Approach          | WB  | EB   | SB  | NB  |
| Opposing Lanes             | 1   | 1    | 1   | 1   |
| Conflicting Approach Left  | SB  | NB   | EB  | WB  |
| Conflicting Lanes Left     | 1   | 1    | 1   | 1   |
| Conflicting Approach Right | NB  | SB   | WB  | EB  |
| Conflicting Lanes Right    | 1   | 1    | 1   | 1   |
| HCM Control Delay          | 9.3 | 12.1 | 9.7 | 8.7 |
| HCM LOS                    | A   | B    | A   | A   |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 21%   | 4%    | 60%   | 13%   |
| Vol Thru, %            | 9%    | 77%   | 39%   | 61%   |
| Vol Right, %           | 70%   | 19%   | 1%    | 26%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 187   | 154   | 323   | 23    |
| LT Vol                 | 39    | 6     | 193   | 3     |
| Through Vol            | 17    | 119   | 127   | 14    |
| RT Vol                 | 131   | 29    | 3     | 6     |
| Lane Flow Rate         | 203   | 167   | 351   | 25    |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.273 | 0.225 | 0.47  | 0.037 |
| Departure Headway (Hd) | 4.838 | 4.834 | 4.824 | 5.353 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 738   | 737   | 741   | 662   |
| Service Time           | 2.903 | 2.905 | 2.887 | 3.446 |
| HCM Lane V/C Ratio     | 0.275 | 0.227 | 0.474 | 0.038 |
| HCM Control Delay      | 9.7   | 9.3   | 12.1  | 8.7   |
| HCM Lane LOS           | A     | A     | B     | A     |
| HCM 95th-tile Q        | 1.1   | 0.9   | 2.5   | 0.1   |

| Intersection              |      |
|---------------------------|------|
| Intersection Delay, s/veh | 28.2 |
| Intersection LOS          | D    |

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      | ↕    | ↕    |      |      | ↕    | ↕    |      | ↕    |      |
| Traffic Vol, veh/h  | 100  | 161  | 11   | 122  | 156  | 23   | 25   | 243  | 83   | 34   | 218  | 96   |
| Future Vol, veh/h   | 100  | 161  | 11   | 122  | 156  | 23   | 25   | 243  | 83   | 34   | 218  | 96   |
| Peak Hour Factor    | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, %   | 3    | 3    | 3    | 6    | 6    | 6    | 6    | 6    | 6    | 3    | 3    | 3    |
| Mvmt Flow           | 109  | 175  | 12   | 133  | 170  | 25   | 27   | 264  | 90   | 37   | 237  | 104  |
| Number of Lanes     | 0    | 1    | 0    | 1    | 1    | 0    | 0    | 1    | 1    | 0    | 1    | 0    |

| Approach                   | EB   | WB   | NB | SB   |
|----------------------------|------|------|----|------|
| Opposing Approach          | WB   | EB   | SB | NB   |
| Opposing Lanes             | 2    | 1    | 1  | 2    |
| Conflicting Approach Left  | SB   | NB   | EB | WB   |
| Conflicting Lanes Left     | 1    | 2    | 1  | 2    |
| Conflicting Approach Right | NB   | SB   | WB | EB   |
| Conflicting Lanes Right    | 2    | 1    | 2  | 1    |
| HCM Control Delay          | 29.8 | 17.3 | 23 | 41.6 |
| HCM LOS                    | D    | C    | C  | E    |

| Lane                   | NBLn1 | NBLn2 | EBLn1 | WBLn1 | WBLn2 | SBLn1 |
|------------------------|-------|-------|-------|-------|-------|-------|
| Vol Left, %            | 9%    | 0%    | 37%   | 100%  | 0%    | 10%   |
| Vol Thru, %            | 91%   | 0%    | 59%   | 0%    | 87%   | 63%   |
| Vol Right, %           | 0%    | 100%  | 4%    | 0%    | 13%   | 28%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 268   | 83    | 272   | 122   | 179   | 348   |
| LT Vol                 | 25    | 0     | 100   | 122   | 0     | 34    |
| Through Vol            | 243   | 0     | 161   | 0     | 156   | 218   |
| RT Vol                 | 0     | 83    | 11    | 0     | 23    | 96    |
| Lane Flow Rate         | 291   | 90    | 296   | 133   | 195   | 378   |
| Geometry Grp           | 7     | 7     | 6     | 7     | 7     | 6     |
| Degree of Util (X)     | 0.67  | 0.188 | 0.704 | 0.332 | 0.454 | 0.844 |
| Departure Headway (Hd) | 8.281 | 7.508 | 8.571 | 9.01  | 8.399 | 8.034 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 437   | 476   | 420   | 398   | 428   | 450   |
| Service Time           | 6.05  | 5.278 | 6.647 | 6.785 | 6.173 | 6.102 |
| HCM Lane V/C Ratio     | 0.666 | 0.189 | 0.705 | 0.334 | 0.456 | 0.84  |
| HCM Control Delay      | 26.4  | 12    | 29.8  | 16.2  | 18    | 41.6  |
| HCM Lane LOS           | D     | B     | D     | C     | C     | E     |
| HCM 95th-tile Q        | 4.8   | 0.7   | 5.3   | 1.4   | 2.3   | 8.3   |

HCM 6th TWSC  
1: Road 156 & Avenue 332

05/10/2019

| Intersection             |      |      |       |      |      |       |      |      |      |      |      |      |
|--------------------------|------|------|-------|------|------|-------|------|------|------|------|------|------|
| Int Delay, s/veh         | 3.8  |      |       |      |      |       |      |      |      |      |      |      |
| Movement                 | EBL  | EBT  | EBR   | WBL  | WBT  | WBR   | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations      |      | ↕    | ↕     |      | ↕    | ↕     |      | ↕    |      |      | ↕    | ↕    |
| Traffic Vol, veh/h       | 3    | 5    | 8     | 49   | 12   | 20    | 2    | 71   | 51   | 19   | 71   | 1    |
| Future Vol, veh/h        | 3    | 5    | 8     | 49   | 12   | 20    | 2    | 71   | 51   | 19   | 71   | 1    |
| Conflicting Peds, #/hr   | 10   | 0    | 10    | 10   | 0    | 10    | 10   | 0    | 10   | 10   | 0    | 10   |
| Sign Control             | Stop | Stop | Stop  | Stop | Stop | Stop  | Free | Free | Free | Free | Free | Free |
| RT Channelized           | -    | -    | Yield | -    | -    | Yield | -    | -    | None | -    | -    | None |
| Storage Length           | -    | -    | 75    | -    | -    | 125   | -    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | -    | 0    | -     | -    | 0    | -     | -    | 0    | -    | -    | 0    | -    |
| Grade, %                 | -    | 0    | -     | -    | 0    | -     | -    | 0    | -    | -    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92    | 92   | 92   | 92    | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 3     | 3    | 3    | 3     | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow                | 3    | 5    | 9     | 53   | 13   | 22    | 2    | 77   | 55   | 21   | 77   | 1    |

| Major/Minor          | Minor2 |       | Minor1 |       | Major1 |       |       | Major2 |   |       |   |   |
|----------------------|--------|-------|--------|-------|--------|-------|-------|--------|---|-------|---|---|
| Conflicting Flow All | 255    | 276   | 98     | 251   | 249    | 125   | 88    | 0      | 0 | 142   | 0 | 0 |
| Stage 1              | 130    | 130   | -      | 119   | 119    | -     | -     | -      | - | -     | - | - |
| Stage 2              | 125    | 146   | -      | 132   | 130    | -     | -     | -      | - | -     | - | - |
| Critical Hdwy        | 7.13   | 6.53  | 6.23   | 7.13  | 6.53   | 6.23  | 4.13  | -      | - | 4.13  | - | - |
| Critical Hdwy Stg 1  | 6.13   | 5.53  | -      | 6.13  | 5.53   | -     | -     | -      | - | -     | - | - |
| Critical Hdwy Stg 2  | 6.13   | 5.53  | -      | 6.13  | 5.53   | -     | -     | -      | - | -     | - | - |
| Follow-up Hdwy       | 3.527  | 4.027 | 3.327  | 3.527 | 4.027  | 3.327 | 2.227 | -      | - | 2.227 | - | - |
| Pot Cap-1 Maneuver   | 696    | 630   | 955    | 700   | 652    | 923   | 1501  | -      | - | 1435  | - | - |
| Stage 1              | 871    | 787   | -      | 883   | 795    | -     | -     | -      | - | -     | - | - |
| Stage 2              | 877    | 774   | -      | 869   | 787    | -     | -     | -      | - | -     | - | - |
| Platoon blocked, %   |        |       |        |       |        |       |       | -      | - | -     | - | - |
| Mov Cap-1 Maneuver   | 648    | 607   | 937    | 668   | 629    | 906   | 1487  | -      | - | 1421  | - | - |
| Mov Cap-2 Maneuver   | 648    | 607   | -      | 668   | 629    | -     | -     | -      | - | -     | - | - |
| Stage 1              | 861    | 767   | -      | 873   | 786    | -     | -     | -      | - | -     | - | - |
| Stage 2              | 833    | 765   | -      | 834   | 767    | -     | -     | -      | - | -     | - | - |

| Approach             | EB  | WB   | NB  | SB  |
|----------------------|-----|------|-----|-----|
| HCM Control Delay, s | 9.9 | 10.6 | 0.1 | 1.6 |
| HCM LOS              | A   | B    |     |     |

| Minor Lane/Major Mvmt | NBL   | NBT | NBR | EBLn1 | EBLn2 | WBLn1 | WBLn2 | SBL   | SBT | SBR |
|-----------------------|-------|-----|-----|-------|-------|-------|-------|-------|-----|-----|
| Capacity (veh/h)      | 1487  | -   | -   | 622   | 937   | 660   | 906   | 1421  | -   | -   |
| HCM Lane V/C Ratio    | 0.001 | -   | -   | 0.014 | 0.009 | 0.1   | 0.024 | 0.015 | -   | -   |
| HCM Control Delay (s) | 7.4   | 0   | -   | 10.9  | 8.9   | 11.1  | 9.1   | 7.6   | 0   | -   |
| HCM Lane LOS          | A     | A   | -   | B     | A     | B     | A     | A     | A   | -   |
| HCM 95th %tile Q(veh) | 0     | -   | -   | 0     | 0     | 0.3   | 0.1   | 0     | -   | -   |

HCM 6th TWSC  
3: Road 156 & Avenue 328

05/10/2019

| Intersection             |      |      |      |      |      |      |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Int Delay, s/veh         | 4.6  |      |      |      |      |      |      |      |      |      |      |      |
| Movement                 | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations      |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h       | 56   | 288  | 15   | 6    | 322  | 49   | 23   | 9    | 5    | 42   | 17   | 83   |
| Future Vol, veh/h        | 56   | 288  | 15   | 6    | 322  | 49   | 23   | 9    | 5    | 42   | 17   | 83   |
| Conflicting Peds, #/hr   | 10   | 0    | 10   | 10   | 0    | 10   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized           | -    | -    | None |
| Storage Length           | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    |
| Grade, %                 | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow                | 61   | 313  | 16   | 7    | 350  | 53   | 25   | 10   | 5    | 46   | 18   | 90   |

| Major/Minor          | Major1 |   | Major2 |       | Minor1 |   | Minor2 |       |       |       |       |       |
|----------------------|--------|---|--------|-------|--------|---|--------|-------|-------|-------|-------|-------|
| Conflicting Flow All | 413    | 0 | 0      | 339   | 0      | 0 | 898    | 880   | 331   | 852   | 862   | 387   |
| Stage 1              | -      | - | -      | -     | -      | - | 453    | 453   | -     | 401   | 401   | -     |
| Stage 2              | -      | - | -      | -     | -      | - | 445    | 427   | -     | 451   | 461   | -     |
| Critical Hdwy        | 4.13   | - | -      | 4.13  | -      | - | 7.13   | 6.53  | 6.23  | 7.13  | 6.53  | 6.23  |
| Critical Hdwy Stg 1  | -      | - | -      | -     | -      | - | 6.13   | 5.53  | -     | 6.13  | 5.53  | -     |
| Critical Hdwy Stg 2  | -      | - | -      | -     | -      | - | 6.13   | 5.53  | -     | 6.13  | 5.53  | -     |
| Follow-up Hdwy       | 2.227  | - | -      | 2.227 | -      | - | 3.527  | 4.027 | 3.327 | 3.527 | 4.027 | 3.327 |
| Pot Cap-1 Maneuver   | 1141   | - | -      | 1215  | -      | - | 259    | 285   | 708   | 278   | 292   | 659   |
| Stage 1              | -      | - | -      | -     | -      | - | 584    | 568   | -     | 624   | 599   | -     |
| Stage 2              | -      | - | -      | -     | -      | - | 590    | 584   | -     | 586   | 564   | -     |
| Platoon blocked, %   | -      | - | -      | -     | -      | - | -      | -     | -     | -     | -     | -     |
| Mov Cap-1 Maneuver   | 1130   | - | -      | 1203  | -      | - | 198    | 259   | 701   | 250   | 265   | 653   |
| Mov Cap-2 Maneuver   | -      | - | -      | -     | -      | - | 198    | 259   | -     | 250   | 265   | -     |
| Stage 1              | -      | - | -      | -     | -      | - | 540    | 525   | -     | 577   | 588   | -     |
| Stage 2              | -      | - | -      | -     | -      | - | 489    | 573   | -     | 533   | 522   | -     |

| Approach             | EB  |  | WB  |  | NB   |  | SB   |  |
|----------------------|-----|--|-----|--|------|--|------|--|
| HCM Control Delay, s | 1.3 |  | 0.1 |  | 23.6 |  | 19.8 |  |
| HCM LOS              |     |  |     |  | C    |  | C    |  |

| Minor Lane/Major Mvmt | NBLn1 | EBL   | EBT | EBR | WBL   | WBT | WBR | SBLn1 |
|-----------------------|-------|-------|-----|-----|-------|-----|-----|-------|
| Capacity (veh/h)      | 234   | 1130  | -   | -   | 1203  | -   | -   | 395   |
| HCM Lane V/C Ratio    | 0.172 | 0.054 | -   | -   | 0.005 | -   | -   | 0.391 |
| HCM Control Delay (s) | 23.6  | 8.4   | 0   | -   | 8     | 0   | -   | 19.8  |
| HCM Lane LOS          | C     | A     | A   | -   | A     | A   | -   | C     |
| HCM 95th %tile Q(veh) | 0.6   | 0.2   | -   | -   | 0     | -   | -   | 1.8   |

HCM 6th TWSC  
5: Road 159 & Depot Drive

05/10/2019

| Intersection             |      |      |      |      |      |      |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Int Delay, s/veh         | 4.1  |      |      |      |      |      |      |      |      |      |      |      |
| Movement                 | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  | SEL  | SET  | SER  | NWL  | NWT  | NWR  |
| Lane Configurations      |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h       | 8    | 49   | 2    | 11   | 57   | 3    | 1    | 23   | 14   | 5    | 17   | 8    |
| Future Vol, veh/h        | 8    | 49   | 2    | 11   | 57   | 3    | 1    | 23   | 14   | 5    | 17   | 8    |
| Conflicting Peds, #/hr   | 10   | 0    | 10   | 10   | 0    | 10   | 10   | 0    | 10   | 10   | 0    | 10   |
| Sign Control             | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized           | -    | -    | None |
| Storage Length           | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    |
| Grade, %                 | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow                | 9    | 53   | 2    | 12   | 62   | 3    | 1    | 25   | 15   | 5    | 18   | 9    |

| Major/Minor          | Major1 |   | Major2 |       | Minor2 |   |       | Minor1 |       |       |       |       |
|----------------------|--------|---|--------|-------|--------|---|-------|--------|-------|-------|-------|-------|
| Conflicting Flow All | 75     | 0 | 0      | 65    | 0      | 0 | 194   | 181    | 84    | 200   | 181   | 74    |
| Stage 1              | -      | - | -      | -     | -      | - | 98    | 98     | -     | 82    | 82    | -     |
| Stage 2              | -      | - | -      | -     | -      | - | 96    | 83     | -     | 118   | 99    | -     |
| Critical Hdwy        | 4.13   | - | -      | 4.13  | -      | - | 7.13  | 6.53   | 6.23  | 7.13  | 6.53  | 6.23  |
| Critical Hdwy Stg 1  | -      | - | -      | -     | -      | - | 6.13  | 5.53   | -     | 6.13  | 5.53  | -     |
| Critical Hdwy Stg 2  | -      | - | -      | -     | -      | - | 6.13  | 5.53   | -     | 6.13  | 5.53  | -     |
| Follow-up Hdwy       | 2.227  | - | -      | 2.227 | -      | - | 3.527 | 4.027  | 3.327 | 3.527 | 4.027 | 3.327 |
| Pot Cap-1 Maneuver   | 1518   | - | -      | 1531  | -      | - | 763   | 711    | 972   | 756   | 711   | 985   |
| Stage 1              | -      | - | -      | -     | -      | - | 906   | 812    | -     | 924   | 825   | -     |
| Stage 2              | -      | - | -      | -     | -      | - | 908   | 824    | -     | 884   | 811   | -     |
| Platoon blocked, %   | -      | - | -      | -     | -      | - | -     | -      | -     | -     | -     | -     |
| Mov Cap-1 Maneuver   | 1504   | - | -      | 1516  | -      | - | 719   | 687    | 954   | 702   | 687   | 966   |
| Mov Cap-2 Maneuver   | -      | - | -      | -     | -      | - | 719   | 687    | -     | 702   | 687   | -     |
| Stage 1              | -      | - | -      | -     | -      | - | 892   | 797    | -     | 910   | 812   | -     |
| Stage 2              | -      | - | -      | -     | -      | - | 866   | 811    | -     | 828   | 796   | -     |

| Approach             | NB | SB  | SE | NW |
|----------------------|----|-----|----|----|
| HCM Control Delay, s | 1  | 1.1 | 10 | 10 |
| HCM LOS              |    |     | B  | B  |

| Minor Lane/Major Mvmt | NBL   | NBT | NBRNWLn1 | SELn1 | SBL   | SBT   | SBR |
|-----------------------|-------|-----|----------|-------|-------|-------|-----|
| Capacity (veh/h)      | 1504  | -   | -        | 747   | 767   | 1516  | -   |
| HCM Lane V/C Ratio    | 0.006 | -   | -        | 0.044 | 0.054 | 0.008 | -   |
| HCM Control Delay (s) | 7.4   | 0   | -        | 10    | 10    | 7.4   | 0   |
| HCM Lane LOS          | A     | A   | -        | B     | B     | A     | A   |
| HCM 95th %tile Q(veh) | 0     | -   | -        | 0.1   | 0.2   | 0     | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 0.5  |      |      |      |      |      |
| Movement                 | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
| Lane Configurations      | T    |      | T    |      | T    |      |
| Traffic Vol, veh/h       | 15   | 12   | 5    | 366  | 485  | 8    |
| Future Vol, veh/h        | 15   | 12   | 5    | 366  | 485  | 8    |
| Conflicting Peds, #/hr   | 0    | 0    | 10   | 0    | 0    | 10   |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 6    | 6    | 6    | 6    |
| Mvmt Flow                | 16   | 13   | 5    | 398  | 527  | 9    |

| Major/Minor          | Minor2 | Major1 | Major2 |   |   |   |
|----------------------|--------|--------|--------|---|---|---|
| Conflicting Flow All | 950    | 542    | 546    | 0 | - | 0 |
| Stage 1              | 542    | -      | -      | - | - | - |
| Stage 2              | 408    | -      | -      | - | - | - |
| Critical Hdwy        | 6.43   | 6.23   | 4.16   | - | - | - |
| Critical Hdwy Stg 1  | 5.43   | -      | -      | - | - | - |
| Critical Hdwy Stg 2  | 5.43   | -      | -      | - | - | - |
| Follow-up Hdwy       | 3.527  | 3.327  | 2.254  | - | - | - |
| Pot Cap-1 Maneuver   | 287    | 538    | 1003   | - | - | - |
| Stage 1              | 581    | -      | -      | - | - | - |
| Stage 2              | 669    | -      | -      | - | - | - |
| Platoon blocked, %   |        |        |        | - | - | - |
| Mov Cap-1 Maneuver   | 280    | 533    | 993    | - | - | - |
| Mov Cap-2 Maneuver   | 280    | -      | -      | - | - | - |
| Stage 1              | 572    | -      | -      | - | - | - |
| Stage 2              | 662    | -      | -      | - | - | - |

| Approach             | EB   | NB  | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 16.1 | 0.1 | 0  |
| HCM LOS              | C    |     |    |

| Minor Lane/Major Mvmt | NBL   | NBT | EBLn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h)      | 993   | -   | 355   | -   | -   |
| HCM Lane V/C Ratio    | 0.005 | -   | 0.083 | -   | -   |
| HCM Control Delay (s) | 8.6   | 0   | 16.1  | -   | -   |
| HCM Lane LOS          | A     | A   | C     | -   | -   |
| HCM 95th %tile Q(veh) | 0     | -   | 0.3   | -   | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 0.8  |      |      |      |      |      |
| Movement                 | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
| Lane Configurations      | T    |      |      | T    |      | T    |
| Traffic Vol, veh/h       | 15   | 31   | 5    | 351  | 484  | 12   |
| Future Vol, veh/h        | 15   | 31   | 5    | 351  | 484  | 12   |
| Conflicting Peds, #/hr   | 0    | 0    | 10   | 0    | 0    | 10   |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 6    | 6    | 6    | 6    |
| Mvmt Flow                | 16   | 34   | 5    | 382  | 526  | 13   |

| Major/Minor          | Minor2 | Major1 | Major2 |   |   |   |
|----------------------|--------|--------|--------|---|---|---|
| Conflicting Flow All | 935    | 543    | 549    | 0 | - | 0 |
| Stage 1              | 543    | -      | -      | - | - | - |
| Stage 2              | 392    | -      | -      | - | - | - |
| Critical Hdwy        | 6.43   | 6.23   | 4.16   | - | - | - |
| Critical Hdwy Stg 1  | 5.43   | -      | -      | - | - | - |
| Critical Hdwy Stg 2  | 5.43   | -      | -      | - | - | - |
| Follow-up Hdwy       | 3.527  | 3.327  | 2.254  | - | - | - |
| Pot Cap-1 Maneuver   | 293    | 538    | 1001   | - | - | - |
| Stage 1              | 580    | -      | -      | - | - | - |
| Stage 2              | 681    | -      | -      | - | - | - |
| Platoon blocked, %   |        |        |        | - | - | - |
| Mov Cap-1 Maneuver   | 285    | 533    | 991    | - | - | - |
| Mov Cap-2 Maneuver   | 285    | -      | -      | - | - | - |
| Stage 1              | 571    | -      | -      | - | - | - |
| Stage 2              | 674    | -      | -      | - | - | - |

| Approach             | EB   | NB  | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 14.9 | 0.1 | 0  |
| HCM LOS              | B    |     |    |

| Minor Lane/Major Mvmt | NBL   | NBT | EBLn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h)      | 991   | -   | 415   | -   | -   |
| HCM Lane V/C Ratio    | 0.005 | -   | 0.12  | -   | -   |
| HCM Control Delay (s) | 8.7   | 0   | 14.9  | -   | -   |
| HCM Lane LOS          | A     | A   | B     | -   | -   |
| HCM 95th %tile Q(veh) | 0     | -   | 0.4   | -   | -   |

HCM 6th TWSC  
8: Road 160 & Beechwood Avenue

05/10/2019

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 1.1  |      |      |      |      |      |
| Movement                 | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
| Lane Configurations      | T    |      | T    |      | T    |      |
| Traffic Vol, veh/h       | 29   | 23   | 14   | 334  | 489  | 28   |
| Future Vol, veh/h        | 29   | 23   | 14   | 334  | 489  | 28   |
| Conflicting Peds, #/hr   | 0    | 0    | 10   | 0    | 0    | 10   |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 6    | 6    | 6    | 6    |
| Mvmt Flow                | 32   | 25   | 15   | 363  | 532  | 30   |

| Major/Minor          | Minor2 | Major1 | Major2 |   |   |   |
|----------------------|--------|--------|--------|---|---|---|
| Conflicting Flow All | 950    | 557    | 572    | 0 | - | 0 |
| Stage 1              | 557    | -      | -      | - | - | - |
| Stage 2              | 393    | -      | -      | - | - | - |
| Critical Hdwy        | 6.43   | 6.23   | 4.16   | - | - | - |
| Critical Hdwy Stg 1  | 5.43   | -      | -      | - | - | - |
| Critical Hdwy Stg 2  | 5.43   | -      | -      | - | - | - |
| Follow-up Hdwy       | 3.527  | 3.327  | 2.254  | - | - | - |
| Pot Cap-1 Maneuver   | 287    | 528    | 981    | - | - | - |
| Stage 1              | 572    | -      | -      | - | - | - |
| Stage 2              | 680    | -      | -      | - | - | - |
| Platoon blocked, %   |        |        |        | - | - | - |
| Mov Cap-1 Maneuver   | 276    | 523    | 972    | - | - | - |
| Mov Cap-2 Maneuver   | 276    | -      | -      | - | - | - |
| Stage 1              | 555    | -      | -      | - | - | - |
| Stage 2              | 673    | -      | -      | - | - | - |

| Approach             | EB   | NB  | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 17.3 | 0.4 | 0  |
| HCM LOS              | C    |     |    |

| Minor Lane/Major Mvmt | NBL   | NBT | EBLn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h)      | 972   | -   | 349   | -   | -   |
| HCM Lane V/C Ratio    | 0.016 | -   | 0.162 | -   | -   |
| HCM Control Delay (s) | 8.8   | 0   | 17.3  | -   | -   |
| HCM Lane LOS          | A     | A   | C     | -   | -   |
| HCM 95th %tile Q(veh) | 0     | -   | 0.6   | -   | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 1    |      |      |      |      |      |
| Movement                 | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
| Lane Configurations      | T    |      |      | T    |      | T    |
| Traffic Vol, veh/h       | 26   | 20   | 11   | 322  | 504  | 15   |
| Future Vol, veh/h        | 26   | 20   | 11   | 322  | 504  | 15   |
| Conflicting Peds, #/hr   | 0    | 0    | 10   | 0    | 0    | 10   |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 6    | 6    | 6    | 6    |
| Mvmt Flow                | 28   | 22   | 12   | 350  | 548  | 16   |

| Major/Minor          | Minor2 | Major1 | Major2 |   |   |   |
|----------------------|--------|--------|--------|---|---|---|
| Conflicting Flow All | 940    | 566    | 574    | 0 | - | 0 |
| Stage 1              | 566    | -      | -      | - | - | - |
| Stage 2              | 374    | -      | -      | - | - | - |
| Critical Hdwy        | 6.43   | 6.23   | 4.16   | - | - | - |
| Critical Hdwy Stg 1  | 5.43   | -      | -      | - | - | - |
| Critical Hdwy Stg 2  | 5.43   | -      | -      | - | - | - |
| Follow-up Hdwy       | 3.527  | 3.327  | 2.254  | - | - | - |
| Pot Cap-1 Maneuver   | 291    | 522    | 979    | - | - | - |
| Stage 1              | 566    | -      | -      | - | - | - |
| Stage 2              | 693    | -      | -      | - | - | - |
| Platoon blocked, %   |        |        |        | - | - | - |
| Mov Cap-1 Maneuver   | 281    | 517    | 970    | - | - | - |
| Mov Cap-2 Maneuver   | 281    | -      | -      | - | - | - |
| Stage 1              | 552    | -      | -      | - | - | - |
| Stage 2              | 686    | -      | -      | - | - | - |

| Approach             | EB | NB  | SB |
|----------------------|----|-----|----|
| HCM Control Delay, s | 17 | 0.3 | 0  |
| HCM LOS              | C  |     |    |

| Minor Lane/Major Mvmt | NBL   | NBT | EBLn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h)      | 970   | -   | 351   | -   | -   |
| HCM Lane V/C Ratio    | 0.012 | -   | 0.142 | -   | -   |
| HCM Control Delay (s) | 8.8   | 0   | 17    | -   | -   |
| HCM Lane LOS          | A     | A   | C     | -   | -   |
| HCM 95th %tile Q(veh) | 0     | -   | 0.5   | -   | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 0.9  |      |      |      |      |      |
| Movement                 | NBL  | NBT  | SBT  | SBR  | SEL  | SER  |
| Lane Configurations      |      | ↶    | ↷    |      | ↶    | ↷    |
| Traffic Vol, veh/h       | 26   | 340  | 314  | 3    | 3    | 34   |
| Future Vol, veh/h        | 26   | 340  | 314  | 3    | 3    | 34   |
| Conflicting Peds, #/hr   | 10   | 0    | 0    | 10   | 0    | 0    |
| Sign Control             | Free | Free | Free | Free | Stop | Stop |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | -    | -    | -    | -    | 0    | -    |
| Veh in Median Storage, # | -    | 0    | 0    | -    | 0    | -    |
| Grade, %                 | -    | 0    | 0    | -    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow                | 28   | 370  | 341  | 3    | 3    | 37   |

| Major/Minor          | Major1 | Major2 | Minor2 |   |             |
|----------------------|--------|--------|--------|---|-------------|
| Conflicting Flow All | 354    | 0      | -      | 0 | 779 353     |
| Stage 1              | -      | -      | -      | - | 353 -       |
| Stage 2              | -      | -      | -      | - | 426 -       |
| Critical Hdwy        | 4.13   | -      | -      | - | 6.43 6.23   |
| Critical Hdwy Stg 1  | -      | -      | -      | - | 5.43 -      |
| Critical Hdwy Stg 2  | -      | -      | -      | - | 5.43 -      |
| Follow-up Hdwy       | 2.227  | -      | -      | - | 3.527 3.327 |
| Pot Cap-1 Maneuver   | 1199   | -      | -      | - | 363 688     |
| Stage 1              | -      | -      | -      | - | 709 -       |
| Stage 2              | -      | -      | -      | - | 657 -       |
| Platoon blocked, %   |        | -      | -      | - |             |
| Mov Cap-1 Maneuver   | 1188   | -      | -      | - | 345 681     |
| Mov Cap-2 Maneuver   | -      | -      | -      | - | 345 -       |
| Stage 1              | -      | -      | -      | - | 681 -       |
| Stage 2              | -      | -      | -      | - | 650 -       |

| Approach             | NB  | SB | SE   |
|----------------------|-----|----|------|
| HCM Control Delay, s | 0.6 | 0  | 11.1 |
| HCM LOS              |     |    | B    |

| Minor Lane/Major Mvmt | NBL   | NBT | SELn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h)      | 1188  | -   | 631   | -   | -   |
| HCM Lane V/C Ratio    | 0.024 | -   | 0.064 | -   | -   |
| HCM Control Delay (s) | 8.1   | 0   | 11.1  | -   | -   |
| HCM Lane LOS          | A     | A   | B     | -   | -   |
| HCM 95th %tile Q(veh) | 0.1   | -   | 0.2   | -   | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 0.9  |      |      |      |      |      |
| Movement                 | WBL  | WBR  | NBT  | NBR  | SBL  | SBT  |
| Lane Configurations      |      |      |      |      |      |      |
| Traffic Vol, veh/h       | 3    | 3    | 57   | 1    | 11   | 68   |
| Future Vol, veh/h        | 3    | 3    | 57   | 1    | 11   | 68   |
| Conflicting Peds, #/hr   | 10   | 10   | 0    | 10   | 10   | 0    |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | 0    | -    | -    | 0    |
| Grade, %                 | 0    | -    | 0    | -    | -    | 0    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow                | 3    | 3    | 62   | 1    | 12   | 74   |

| Major/Minor          | Minor1 | Major1 | Major2 |   |       |
|----------------------|--------|--------|--------|---|-------|
| Conflicting Flow All | 181    | 83     | 0      | 0 | 73    |
| Stage 1              | 73     | -      | -      | - | -     |
| Stage 2              | 108    | -      | -      | - | -     |
| Critical Hdwy        | 6.43   | 6.23   | -      | - | 4.13  |
| Critical Hdwy Stg 1  | 5.43   | -      | -      | - | -     |
| Critical Hdwy Stg 2  | 5.43   | -      | -      | - | -     |
| Follow-up Hdwy       | 3.527  | 3.327  | -      | - | 2.227 |
| Pot Cap-1 Maneuver   | 806    | 974    | -      | - | 1520  |
| Stage 1              | 947    | -      | -      | - | -     |
| Stage 2              | 914    | -      | -      | - | -     |
| Platoon blocked, %   |        |        | -      | - | -     |
| Mov Cap-1 Maneuver   | 783    | 956    | -      | - | 1506  |
| Mov Cap-2 Maneuver   | 783    | -      | -      | - | -     |
| Stage 1              | 930    | -      | -      | - | -     |
| Stage 2              | 905    | -      | -      | - | -     |

| Approach             | WB  | NB | SB |
|----------------------|-----|----|----|
| HCM Control Delay, s | 9.2 | 0  | 1  |
| HCM LOS              | A   |    |    |

| Minor Lane/Major Mvmt | NBT | NBRWBLn1 | SBL   | SBT   |
|-----------------------|-----|----------|-------|-------|
| Capacity (veh/h)      | -   | -        | 861   | 1506  |
| HCM Lane V/C Ratio    | -   | -        | 0.008 | 0.008 |
| HCM Control Delay (s) | -   | -        | 9.2   | 7.4   |
| HCM Lane LOS          | -   | -        | A     | A     |
| HCM 95th %tile Q(veh) | -   | -        | 0     | 0     |

| Intersection              |     |
|---------------------------|-----|
| Intersection Delay, s/veh | 7.7 |
| Intersection LOS          | A   |

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h  | 5    | 23   | 40   | 39   | 29   | 2    | 53   | 28   | 25   | 2    | 15   | 9    |
| Future Vol, veh/h   | 5    | 23   | 40   | 39   | 29   | 2    | 53   | 28   | 25   | 2    | 15   | 9    |
| Peak Hour Factor    | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, %   | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow           | 5    | 25   | 43   | 42   | 32   | 2    | 58   | 30   | 27   | 2    | 16   | 10   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB  | WB  | NB  | SB  |
|----------------------------|-----|-----|-----|-----|
| Opposing Approach          | WB  | EB  | SB  | NB  |
| Opposing Lanes             | 1   | 1   | 1   | 1   |
| Conflicting Approach Left  | SB  | NB  | EB  | WB  |
| Conflicting Lanes Left     | 1   | 1   | 1   | 1   |
| Conflicting Approach Right | NB  | SB  | WB  | EB  |
| Conflicting Lanes Right    | 1   | 1   | 1   | 1   |
| HCM Control Delay          | 7.4 | 7.9 | 7.9 | 7.4 |
| HCM LOS                    | A   | A   | A   | A   |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 50%   | 7%    | 56%   | 8%    |
| Vol Thru, %            | 26%   | 34%   | 41%   | 58%   |
| Vol Right, %           | 24%   | 59%   | 3%    | 35%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 106   | 68    | 70    | 26    |
| LT Vol                 | 53    | 5     | 39    | 2     |
| Through Vol            | 28    | 23    | 29    | 15    |
| RT Vol                 | 25    | 40    | 2     | 9     |
| Lane Flow Rate         | 115   | 74    | 76    | 28    |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.134 | 0.08  | 0.092 | 0.033 |
| Departure Headway (Hd) | 4.191 | 3.92  | 4.352 | 4.213 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 845   | 897   | 811   | 855   |
| Service Time           | 2.272 | 2.02  | 2.443 | 2.213 |
| HCM Lane V/C Ratio     | 0.136 | 0.082 | 0.094 | 0.033 |
| HCM Control Delay      | 7.9   | 7.4   | 7.9   | 7.4   |
| HCM Lane LOS           | A     | A     | A     | A     |
| HCM 95th-tile Q        | 0.5   | 0.3   | 0.3   | 0.1   |

| Intersection              |      |
|---------------------------|------|
| Intersection Delay, s/veh | 23.5 |
| Intersection LOS          | C    |

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      | ↕    | ↕    |      |      | ↕    | ↕    |      | ↕    |      |
| Traffic Vol, veh/h  | 74   | 196  | 11   | 145  | 182  | 68   | 34   | 198  | 117  | 53   | 167  | 54   |
| Future Vol, veh/h   | 74   | 196  | 11   | 145  | 182  | 68   | 34   | 198  | 117  | 53   | 167  | 54   |
| Peak Hour Factor    | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, %   | 3    | 3    | 3    | 6    | 6    | 6    | 6    | 6    | 6    | 3    | 3    | 3    |
| Mvmt Flow           | 80   | 213  | 12   | 158  | 198  | 74   | 37   | 215  | 127  | 58   | 182  | 59   |
| Number of Lanes     | 0    | 1    | 0    | 1    | 1    | 0    | 0    | 1    | 1    | 0    | 1    | 0    |

| Approach                   | EB   | WB | NB   | SB   |
|----------------------------|------|----|------|------|
| Opposing Approach          | WB   | EB | SB   | NB   |
| Opposing Lanes             | 2    | 1  | 1    | 2    |
| Conflicting Approach Left  | SB   | NB | EB   | WB   |
| Conflicting Lanes Left     | 1    | 2  | 1    | 2    |
| Conflicting Approach Right | NB   | SB | WB   | EB   |
| Conflicting Lanes Right    | 2    | 1  | 2    | 1    |
| HCM Control Delay          | 29.5 | 20 | 19.1 | 27.9 |
| HCM LOS                    | D    | C  | C    | D    |

| Lane                   | NBLn1 | NBLn2 | EBLn1 | WBLn1 | WBLn2 | SBLn1 |
|------------------------|-------|-------|-------|-------|-------|-------|
| Vol Left, %            | 15%   | 0%    | 26%   | 100%  | 0%    | 19%   |
| Vol Thru, %            | 85%   | 0%    | 70%   | 0%    | 73%   | 61%   |
| Vol Right, %           | 0%    | 100%  | 4%    | 0%    | 27%   | 20%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 232   | 117   | 281   | 145   | 250   | 274   |
| LT Vol                 | 34    | 0     | 74    | 145   | 0     | 53    |
| Through Vol            | 198   | 0     | 196   | 0     | 182   | 167   |
| RT Vol                 | 0     | 117   | 11    | 0     | 68    | 54    |
| Lane Flow Rate         | 252   | 127   | 305   | 158   | 272   | 298   |
| Geometry Grp           | 7     | 7     | 6     | 7     | 7     | 6     |
| Degree of Util (X)     | 0.584 | 0.266 | 0.709 | 0.378 | 0.599 | 0.688 |
| Departure Headway (Hd) | 8.338 | 7.539 | 8.361 | 8.644 | 7.931 | 8.318 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 434   | 476   | 431   | 416   | 454   | 435   |
| Service Time           | 6.094 | 5.294 | 6.42  | 6.399 | 5.686 | 6.375 |
| HCM Lane V/C Ratio     | 0.581 | 0.267 | 0.708 | 0.38  | 0.599 | 0.685 |
| HCM Control Delay      | 22.2  | 13    | 29.5  | 16.6  | 21.9  | 27.9  |
| HCM Lane LOS           | C     | B     | D     | C     | C     | D     |
| HCM 95th-tile Q        | 3.6   | 1.1   | 5.4   | 1.7   | 3.8   | 5.1   |

HCM 6th TWSC  
1: Road 156 & Avenue 332

05/10/2019

| Intersection             |      |      |       |      |      |       |      |      |      |      |      |      |
|--------------------------|------|------|-------|------|------|-------|------|------|------|------|------|------|
| Int Delay, s/veh         | 2.9  |      |       |      |      |       |      |      |      |      |      |      |
| Movement                 | EBL  | EBT  | EBR   | WBL  | WBT  | WBR   | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations      |      | ↕    | ↗     |      | ↕    | ↗     |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h       | 1    | 2    | 2     | 29   | 5    | 25    | 3    | 77   | 31   | 48   | 156  | 3    |
| Future Vol, veh/h        | 1    | 2    | 2     | 29   | 5    | 25    | 3    | 77   | 31   | 48   | 156  | 3    |
| Conflicting Peds, #/hr   | 10   | 0    | 10    | 10   | 0    | 10    | 10   | 0    | 10   | 10   | 0    | 10   |
| Sign Control             | Stop | Stop | Stop  | Stop | Stop | Stop  | Free | Free | Free | Free | Free | Free |
| RT Channelized           | -    | -    | Yield | -    | -    | Yield | -    | -    | None | -    | -    | None |
| Storage Length           | -    | -    | 75    | -    | -    | 125   | -    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | -    | 0    | -     | -    | 0    | -     | -    | 0    | -    | -    | 0    | -    |
| Grade, %                 | -    | 0    | -     | -    | 0    | -     | -    | 0    | -    | -    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92    | 92   | 92   | 92    | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 3     | 3    | 3    | 3     | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow                | 1    | 2    | 2     | 32   | 5    | 27    | 3    | 84   | 34   | 52   | 170  | 3    |

| Major/Minor          | Minor2 |       | Minor1 |       | Major1 |       |       | Major2 |   |       |   |   |
|----------------------|--------|-------|--------|-------|--------|-------|-------|--------|---|-------|---|---|
| Conflicting Flow All | 406    | 420   | 192    | 404   | 404    | 121   | 183   | 0      | 0 | 128   | 0 | 0 |
| Stage 1              | 286    | 286   | -      | 117   | 117    | -     | -     | -      | - | -     | - | - |
| Stage 2              | 120    | 134   | -      | 287   | 287    | -     | -     | -      | - | -     | - | - |
| Critical Hdwy        | 7.13   | 6.53  | 6.23   | 7.13  | 6.53   | 6.23  | 4.13  | -      | - | 4.13  | - | - |
| Critical Hdwy Stg 1  | 6.13   | 5.53  | -      | 6.13  | 5.53   | -     | -     | -      | - | -     | - | - |
| Critical Hdwy Stg 2  | 6.13   | 5.53  | -      | 6.13  | 5.53   | -     | -     | -      | - | -     | - | - |
| Follow-up Hdwy       | 3.527  | 4.027 | 3.327  | 3.527 | 4.027  | 3.327 | 2.227 | -      | - | 2.227 | - | - |
| Pot Cap-1 Maneuver   | 554    | 523   | 847    | 555   | 534    | 928   | 1386  | -      | - | 1452  | - | - |
| Stage 1              | 719    | 673   | -      | 885   | 797    | -     | -     | -      | - | -     | - | - |
| Stage 2              | 882    | 784   | -      | 718   | 673    | -     | -     | -      | - | -     | - | - |
| Platoon blocked, %   |        |       |        |       |        |       |       | -      | - | -     | - | - |
| Mov Cap-1 Maneuver   | 506    | 491   | 831    | 524   | 501    | 910   | 1373  | -      | - | 1438  | - | - |
| Mov Cap-2 Maneuver   | 506    | 491   | -      | 524   | 501    | -     | -     | -      | - | -     | - | - |
| Stage 1              | 710    | 639   | -      | 874   | 787    | -     | -     | -      | - | -     | - | - |
| Stage 2              | 840    | 775   | -      | 679   | 639    | -     | -     | -      | - | -     | - | - |

| Approach             | EB   |  | WB   |  | NB  |  | SB  |  |
|----------------------|------|--|------|--|-----|--|-----|--|
| HCM Control Delay, s | 11.1 |  | 11.1 |  | 0.2 |  | 1.8 |  |
| HCM LOS              | B    |  | B    |  |     |  |     |  |

| Minor Lane/Major Mvmt | NBL   | NBT | NBR | EBLn1 | EBLn2 | WBLn1 | WBLn2 | SBL   | SBT | SBR |
|-----------------------|-------|-----|-----|-------|-------|-------|-------|-------|-----|-----|
| Capacity (veh/h)      | 1373  | -   | -   | 496   | 831   | 520   | 910   | 1438  | -   | -   |
| HCM Lane V/C Ratio    | 0.002 | -   | -   | 0.007 | 0.003 | 0.071 | 0.03  | 0.036 | -   | -   |
| HCM Control Delay (s) | 7.6   | 0   | -   | 12.3  | 9.3   | 12.5  | 9.1   | 7.6   | 0   | -   |
| HCM Lane LOS          | A     | A   | -   | B     | A     | B     | A     | A     | A   | -   |
| HCM 95th %tile Q(veh) | 0     | -   | -   | 0     | 0     | 0.2   | 0.1   | 0.1   | -   | -   |

| Intersection             |      |      |      |      |      |      |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Int Delay, s/veh         | 11.5 |      |      |      |      |      |      |      |      |      |      |      |
| Movement                 | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations      |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h       | 45   | 351  | 34   | 9    | 281  | 70   | 23   | 23   | 15   | 107  | 34   | 63   |
| Future Vol, veh/h        | 45   | 351  | 34   | 9    | 281  | 70   | 23   | 23   | 15   | 107  | 34   | 63   |
| Conflicting Peds, #/hr   | 10   | 0    | 10   | 10   | 0    | 10   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized           | -    | -    | None |
| Storage Length           | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    |
| Grade, %                 | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow                | 49   | 382  | 37   | 10   | 305  | 76   | 25   | 25   | 16   | 116  | 37   | 68   |

| Major/Minor          | Major1 |   | Major2 |       | Minor1 |   | Minor2 |       |       |       |       |       |
|----------------------|--------|---|--------|-------|--------|---|--------|-------|-------|-------|-------|-------|
| Conflicting Flow All | 391    | 0 | 0      | 429   | 0      | 0 | 925    | 920   | 411   | 892   | 900   | 353   |
| Stage 1              | -      | - | -      | -     | -      | - | 509    | 509   | -     | 373   | 373   | -     |
| Stage 2              | -      | - | -      | -     | -      | - | 416    | 411   | -     | 519   | 527   | -     |
| Critical Hdwy        | 4.13   | - | -      | 4.13  | -      | - | 7.13   | 6.53  | 6.23  | 7.13  | 6.53  | 6.23  |
| Critical Hdwy Stg 1  | -      | - | -      | -     | -      | - | 6.13   | 5.53  | -     | 6.13  | 5.53  | -     |
| Critical Hdwy Stg 2  | -      | - | -      | -     | -      | - | 6.13   | 5.53  | -     | 6.13  | 5.53  | -     |
| Follow-up Hdwy       | 2.227  | - | -      | 2.227 | -      | - | 3.527  | 4.027 | 3.327 | 3.527 | 4.027 | 3.327 |
| Pot Cap-1 Maneuver   | 1162   | - | -      | 1125  | -      | - | 248    | 270   | 639   | 262   | 277   | 688   |
| Stage 1              | -      | - | -      | -     | -      | - | 545    | 536   | -     | 646   | 617   | -     |
| Stage 2              | -      | - | -      | -     | -      | - | 612    | 593   | -     | 538   | 527   | -     |
| Platoon blocked, %   | -      | - | -      | -     | -      | - | -      | -     | -     | -     | -     | -     |
| Mov Cap-1 Maneuver   | 1151   | - | -      | 1114  | -      | - | 186    | 247   | 633   | 221   | 253   | 681   |
| Mov Cap-2 Maneuver   | -      | - | -      | -     | -      | - | 186    | 247   | -     | 221   | 253   | -     |
| Stage 1              | -      | - | -      | -     | -      | - | 510    | 501   | -     | 604   | 603   | -     |
| Stage 2              | -      | - | -      | -     | -      | - | 511    | 580   | -     | 470   | 493   | -     |

| Approach             | EB  |  | WB  |  | NB   |  | SB   |  |
|----------------------|-----|--|-----|--|------|--|------|--|
| HCM Control Delay, s | 0.9 |  | 0.2 |  | 24.1 |  | 49.9 |  |
| HCM LOS              |     |  |     |  | C    |  | E    |  |

| Minor Lane/Major Mvmt | NBLn1 | EBL   | EBT | EBR | WBL   | WBT | WBR | SBLn1 |
|-----------------------|-------|-------|-----|-----|-------|-----|-----|-------|
| Capacity (veh/h)      | 254   | 1151  | -   | -   | 1114  | -   | -   | 287   |
| HCM Lane V/C Ratio    | 0.261 | 0.042 | -   | -   | 0.009 | -   | -   | 0.773 |
| HCM Control Delay (s) | 24.1  | 8.3   | 0   | -   | 8.3   | 0   | -   | 49.9  |
| HCM Lane LOS          |       | C     | A   | A   | -     | A   | -   | E     |
| HCM 95th %tile Q(veh) |       | 1     | 0.1 | -   | -     | 0   | -   | 5.9   |

| Intersection             |      |      |      |      |      |      |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Int Delay, s/veh         | 5.5  |      |      |      |      |      |      |      |      |      |      |      |
| Movement                 | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  | SEL  | SET  | SER  | NWL  | NWT  | NWR  |
| Lane Configurations      |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h       | 17   | 62   | 1    | 29   | 65   | 5    | 5    | 29   | 15   | 1    | 36   | 36   |
| Future Vol, veh/h        | 17   | 62   | 1    | 29   | 65   | 5    | 5    | 29   | 15   | 1    | 36   | 36   |
| Conflicting Peds, #/hr   | 10   | 0    | 10   | 10   | 0    | 10   | 10   | 0    | 10   | 10   | 0    | 10   |
| Sign Control             | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized           | -    | -    | None |
| Storage Length           | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    |
| Grade, %                 | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow                | 18   | 67   | 1    | 32   | 71   | 5    | 5    | 32   | 16   | 1    | 39   | 39   |

| Major/Minor          | Major1 |   | Major2 |       | Minor2 |   | Minor1 |       |       |       |       |       |
|----------------------|--------|---|--------|-------|--------|---|--------|-------|-------|-------|-------|-------|
| Conflicting Flow All | 86     | 0 | 0      | 78    | 0      | 0 | 301    | 262   | 94    | 286   | 264   | 88    |
| Stage 1              | -      | - | -      | -     | -      | - | 148    | 148   | -     | 114   | 114   | -     |
| Stage 2              | -      | - | -      | -     | -      | - | 153    | 114   | -     | 172   | 150   | -     |
| Critical Hdwy        | 4.13   | - | -      | 4.13  | -      | - | 7.13   | 6.53  | 6.23  | 7.13  | 6.53  | 6.23  |
| Critical Hdwy Stg 1  | -      | - | -      | -     | -      | - | 6.13   | 5.53  | -     | 6.13  | 5.53  | -     |
| Critical Hdwy Stg 2  | -      | - | -      | -     | -      | - | 6.13   | 5.53  | -     | 6.13  | 5.53  | -     |
| Follow-up Hdwy       | 2.227  | - | -      | 2.227 | -      | - | 3.527  | 4.027 | 3.327 | 3.527 | 4.027 | 3.327 |
| Pot Cap-1 Maneuver   | 1504   | - | -      | 1514  | -      | - | 649    | 641   | 960   | 664   | 640   | 968   |
| Stage 1              | -      | - | -      | -     | -      | - | 852    | 773   | -     | 888   | 799   | -     |
| Stage 2              | -      | - | -      | -     | -      | - | 847    | 799   | -     | 828   | 771   | -     |
| Platoon blocked, %   | -      | - | -      | -     | -      | - | -      | -     | -     | -     | -     | -     |
| Mov Cap-1 Maneuver   | 1490   | - | -      | 1500  | -      | - | 565    | 606   | 942   | 598   | 605   | 950   |
| Mov Cap-2 Maneuver   | -      | - | -      | -     | -      | - | 565    | 606   | -     | 598   | 605   | -     |
| Stage 1              | -      | - | -      | -     | -      | - | 833    | 748   | -     | 868   | 781   | -     |
| Stage 2              | -      | - | -      | -     | -      | - | 754    | 781   | -     | 755   | 746   | -     |

| Approach             | NB  |  | SB  |  | SE   |  | NW   |  |
|----------------------|-----|--|-----|--|------|--|------|--|
| HCM Control Delay, s | 1.6 |  | 2.2 |  | 10.8 |  | 10.5 |  |
| HCM LOS              |     |  |     |  | B    |  | B    |  |

| Minor Lane/Major Mvmt | NBL   | NBT | NBRNWLn1 | SELn1 | SBL   | SBT   | SBR |
|-----------------------|-------|-----|----------|-------|-------|-------|-----|
| Capacity (veh/h)      | 1490  | -   | -        | 737   | 675   | 1500  | -   |
| HCM Lane V/C Ratio    | 0.012 | -   | -        | 0.108 | 0.079 | 0.021 | -   |
| HCM Control Delay (s) | 7.4   | 0   | -        | 10.5  | 10.8  | 7.5   | 0   |
| HCM Lane LOS          | A     | A   | -        | B     | B     | A     | A   |
| HCM 95th %tile Q(veh) | 0     | -   | -        | 0.4   | 0.3   | 0.1   | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 0.5  |      |      |      |      |      |
| Movement                 | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
| Lane Configurations      | T    |      | T    |      | T    |      |
| Traffic Vol, veh/h       | 6    | 14   | 17   | 445  | 419  | 9    |
| Future Vol, veh/h        | 6    | 14   | 17   | 445  | 419  | 9    |
| Conflicting Peds, #/hr   | 0    | 0    | 10   | 0    | 0    | 10   |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 6    | 6    | 6    | 6    |
| Mvmt Flow                | 7    | 15   | 18   | 484  | 455  | 10   |

| Major/Minor          | Minor2 | Major1 | Major2 |   |   |   |
|----------------------|--------|--------|--------|---|---|---|
| Conflicting Flow All | 990    | 470    | 475    | 0 | - | 0 |
| Stage 1              | 470    | -      | -      | - | - | - |
| Stage 2              | 520    | -      | -      | - | - | - |
| Critical Hdwy        | 6.43   | 6.23   | 4.16   | - | - | - |
| Critical Hdwy Stg 1  | 5.43   | -      | -      | - | - | - |
| Critical Hdwy Stg 2  | 5.43   | -      | -      | - | - | - |
| Follow-up Hdwy       | 3.527  | 3.327  | 2.254  | - | - | - |
| Pot Cap-1 Maneuver   | 272    | 591    | 1066   | - | - | - |
| Stage 1              | 627    | -      | -      | - | - | - |
| Stage 2              | 595    | -      | -      | - | - | - |
| Platoon blocked, %   |        |        |        | - | - | - |
| Mov Cap-1 Maneuver   | 261    | 585    | 1056   | - | - | - |
| Mov Cap-2 Maneuver   | 261    | -      | -      | - | - | - |
| Stage 1              | 606    | -      | -      | - | - | - |
| Stage 2              | 589    | -      | -      | - | - | - |

| Approach             | EB   | NB  | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 13.9 | 0.3 | 0  |
| HCM LOS              | B    |     |    |

| Minor Lane/Major Mvmt | NBL   | NBT | EBLn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h)      | 1056  | -   | 426   | -   | -   |
| HCM Lane V/C Ratio    | 0.017 | -   | 0.051 | -   | -   |
| HCM Control Delay (s) | 8.5   | 0   | 13.9  | -   | -   |
| HCM Lane LOS          | A     | A   | B     | -   | -   |
| HCM 95th %tile Q(veh) | 0.1   | -   | 0.2   | -   | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 0.6  |      |      |      |      |      |
| Movement                 | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
| Lane Configurations      | T    |      |      | T    |      | T    |
| Traffic Vol, veh/h       | 9    | 20   | 19   | 442  | 425  | 15   |
| Future Vol, veh/h        | 9    | 20   | 19   | 442  | 425  | 15   |
| Conflicting Peds, #/hr   | 0    | 0    | 10   | 0    | 0    | 10   |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 6    | 6    | 6    | 6    |
| Mvmt Flow                | 10   | 22   | 21   | 480  | 462  | 16   |

| Major/Minor          | Minor2 | Major1 | Major2 |   |   |   |
|----------------------|--------|--------|--------|---|---|---|
| Conflicting Flow All | 1002   | 480    | 488    | 0 | - | 0 |
| Stage 1              | 480    | -      | -      | - | - | - |
| Stage 2              | 522    | -      | -      | - | - | - |
| Critical Hdwy        | 6.43   | 6.23   | 4.16   | - | - | - |
| Critical Hdwy Stg 1  | 5.43   | -      | -      | - | - | - |
| Critical Hdwy Stg 2  | 5.43   | -      | -      | - | - | - |
| Follow-up Hdwy       | 3.527  | 3.327  | 2.254  | - | - | - |
| Pot Cap-1 Maneuver   | 268    | 584    | 1055   | - | - | - |
| Stage 1              | 620    | -      | -      | - | - | - |
| Stage 2              | 593    | -      | -      | - | - | - |
| Platoon blocked, %   |        |        |        | - | - | - |
| Mov Cap-1 Maneuver   | 256    | 578    | 1045   | - | - | - |
| Mov Cap-2 Maneuver   | 256    | -      | -      | - | - | - |
| Stage 1              | 597    | -      | -      | - | - | - |
| Stage 2              | 587    | -      | -      | - | - | - |

| Approach             | EB   | NB  | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 14.4 | 0.4 | 0  |
| HCM LOS              | B    |     |    |

| Minor Lane/Major Mvmt | NBL  | NBT | EBLn1 | SBT | SBR |
|-----------------------|------|-----|-------|-----|-----|
| Capacity (veh/h)      | 1045 | -   | 416   | -   | -   |
| HCM Lane V/C Ratio    | 0.02 | -   | 0.076 | -   | -   |
| HCM Control Delay (s) | 8.5  | 0   | 14.4  | -   | -   |
| HCM Lane LOS          | A    | A   | B     | -   | -   |
| HCM 95th %tile Q(veh) | 0.1  | -   | 0.2   | -   | -   |

HCM 6th TWSC  
8: Road 160 & Beechwood Avenue

05/10/2019

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 1.1  |      |      |      |      |      |
| Movement                 | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
| Lane Configurations      | T    |      | T    |      | T    |      |
| Traffic Vol, veh/h       | 15   | 42   | 32   | 464  | 385  | 39   |
| Future Vol, veh/h        | 15   | 42   | 32   | 464  | 385  | 39   |
| Conflicting Peds, #/hr   | 0    | 0    | 10   | 0    | 0    | 10   |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 6    | 6    | 6    | 6    |
| Mvmt Flow                | 16   | 46   | 35   | 504  | 418  | 42   |

| Major/Minor          | Minor2 | Major1 | Major2 |   |   |   |
|----------------------|--------|--------|--------|---|---|---|
| Conflicting Flow All | 1023   | 449    | 470    | 0 | - | 0 |
| Stage 1              | 449    | -      | -      | - | - | - |
| Stage 2              | 574    | -      | -      | - | - | - |
| Critical Hdwy        | 6.43   | 6.23   | 4.16   | - | - | - |
| Critical Hdwy Stg 1  | 5.43   | -      | -      | - | - | - |
| Critical Hdwy Stg 2  | 5.43   | -      | -      | - | - | - |
| Follow-up Hdwy       | 3.527  | 3.327  | 2.254  | - | - | - |
| Pot Cap-1 Maneuver   | 260    | 608    | 1071   | - | - | - |
| Stage 1              | 641    | -      | -      | - | - | - |
| Stage 2              | 561    | -      | -      | - | - | - |
| Platoon blocked, %   |        |        |        | - | - | - |
| Mov Cap-1 Maneuver   | 243    | 602    | 1061   | - | - | - |
| Mov Cap-2 Maneuver   | 243    | -      | -      | - | - | - |
| Stage 1              | 605    | -      | -      | - | - | - |
| Stage 2              | 555    | -      | -      | - | - | - |

| Approach             | EB   | NB  | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 14.7 | 0.5 | 0  |
| HCM LOS              | B    |     |    |

| Minor Lane/Major Mvmt | NBL   | NBT | EBLn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h)      | 1061  | -   | 433   | -   | -   |
| HCM Lane V/C Ratio    | 0.033 | -   | 0.143 | -   | -   |
| HCM Control Delay (s) | 8.5   | 0   | 14.7  | -   | -   |
| HCM Lane LOS          | A     | A   | B     | -   | -   |
| HCM 95th %tile Q(veh) | 0.1   | -   | 0.5   | -   | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 0.8  |      |      |      |      |      |
| Movement                 | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
| Lane Configurations      | T    |      |      | T    |      | T    |
| Traffic Vol, veh/h       | 17   | 22   | 19   | 473  | 411  | 19   |
| Future Vol, veh/h        | 17   | 22   | 19   | 473  | 411  | 19   |
| Conflicting Peds, #/hr   | 0    | 0    | 10   | 0    | 0    | 10   |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 6    | 6    | 6    | 6    |
| Mvmt Flow                | 18   | 24   | 21   | 514  | 447  | 21   |

| Major/Minor          | Minor2 | Major1 |       | Major2 |   |
|----------------------|--------|--------|-------|--------|---|
| Conflicting Flow All | 1024   | 468    | 478   | 0      | 0 |
| Stage 1              | 468    | -      | -     | -      | - |
| Stage 2              | 556    | -      | -     | -      | - |
| Critical Hdwy        | 6.43   | 6.23   | 4.16  | -      | - |
| Critical Hdwy Stg 1  | 5.43   | -      | -     | -      | - |
| Critical Hdwy Stg 2  | 5.43   | -      | -     | -      | - |
| Follow-up Hdwy       | 3.527  | 3.327  | 2.254 | -      | - |
| Pot Cap-1 Maneuver   | 260    | 593    | 1064  | -      | - |
| Stage 1              | 628    | -      | -     | -      | - |
| Stage 2              | 572    | -      | -     | -      | - |
| Platoon blocked, %   |        |        |       | -      | - |
| Mov Cap-1 Maneuver   | 248    | 587    | 1054  | -      | - |
| Mov Cap-2 Maneuver   | 248    | -      | -     | -      | - |
| Stage 1              | 604    | -      | -     | -      | - |
| Stage 2              | 566    | -      | -     | -      | - |

| Approach             | EB   | NB  | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 16.1 | 0.3 | 0  |
| HCM LOS              | C    |     |    |

| Minor Lane/Major Mvmt | NBL  | NBT | EBLn1 | SBT | SBR |
|-----------------------|------|-----|-------|-----|-----|
| Capacity (veh/h)      | 1054 | -   | 368   | -   | -   |
| HCM Lane V/C Ratio    | 0.02 | -   | 0.115 | -   | -   |
| HCM Control Delay (s) | 8.5  | 0   | 16.1  | -   | -   |
| HCM Lane LOS          | A    | A   | C     | -   | -   |
| HCM 95th %tile Q(veh) | 0.1  | -   | 0.4   | -   | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 2.2  |      |      |      |      |      |
| Movement                 | NBL  | NBT  | SBT  | SBR  | SEL  | SER  |
| Lane Configurations      |      | ↶    | ↷    |      | ↶    | ↷    |
| Traffic Vol, veh/h       | 73   | 267  | 201  | 6    | 5    | 73   |
| Future Vol, veh/h        | 73   | 267  | 201  | 6    | 5    | 73   |
| Conflicting Peds, #/hr   | 10   | 0    | 0    | 10   | 0    | 0    |
| Sign Control             | Free | Free | Free | Free | Stop | Stop |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | -    | -    | -    | -    | 0    | -    |
| Veh in Median Storage, # | -    | 0    | 0    | -    | 0    | -    |
| Grade, %                 | -    | 0    | 0    | -    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow                | 79   | 290  | 218  | 7    | 5    | 79   |

| Major/Minor          | Major1 | Major2 | Minor2 |   |             |
|----------------------|--------|--------|--------|---|-------------|
| Conflicting Flow All | 235    | 0      | -      | 0 | 680 232     |
| Stage 1              | -      | -      | -      | - | 232 -       |
| Stage 2              | -      | -      | -      | - | 448 -       |
| Critical Hdwy        | 4.13   | -      | -      | - | 6.43 6.23   |
| Critical Hdwy Stg 1  | -      | -      | -      | - | 5.43 -      |
| Critical Hdwy Stg 2  | -      | -      | -      | - | 5.43 -      |
| Follow-up Hdwy       | 2.227  | -      | -      | - | 3.527 3.327 |
| Pot Cap-1 Maneuver   | 1326   | -      | -      | - | 415 805     |
| Stage 1              | -      | -      | -      | - | 804 -       |
| Stage 2              | -      | -      | -      | - | 642 -       |
| Platoon blocked, %   |        | -      | -      | - |             |
| Mov Cap-1 Maneuver   | 1313   | -      | -      | - | 378 797     |
| Mov Cap-2 Maneuver   | -      | -      | -      | - | 378 -       |
| Stage 1              | -      | -      | -      | - | 739 -       |
| Stage 2              | -      | -      | -      | - | 636 -       |

| Approach             | NB  | SB | SE   |
|----------------------|-----|----|------|
| HCM Control Delay, s | 1.7 | 0  | 10.5 |
| HCM LOS              |     |    | B    |

| Minor Lane/Major Mvmt | NBL  | NBT | SELn1 | SBT | SBR |
|-----------------------|------|-----|-------|-----|-----|
| Capacity (veh/h)      | 1313 | -   | 744   | -   | -   |
| HCM Lane V/C Ratio    | 0.06 | -   | 0.114 | -   | -   |
| HCM Control Delay (s) | 7.9  | 0   | 10.5  | -   | -   |
| HCM Lane LOS          | A    | A   | B     | -   | -   |
| HCM 95th %tile Q(veh) | 0.2  | -   | 0.4   | -   | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 0.8  |      |      |      |      |      |
| Movement                 | WBL  | WBR  | NBT  | NBR  | SBL  | SBT  |
| Lane Configurations      |      |      |      |      |      |      |
| Traffic Vol, veh/h       | 3    | 11   | 94   | 8    | 6    | 96   |
| Future Vol, veh/h        | 3    | 11   | 94   | 8    | 6    | 96   |
| Conflicting Peds, #/hr   | 10   | 10   | 0    | 10   | 10   | 0    |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | 0    | -    | -    | 0    |
| Grade, %                 | 0    | -    | 0    | -    | -    | 0    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow                | 3    | 12   | 102  | 9    | 7    | 104  |

| Major/Minor          | Minor1 | Major1 | Major2 |   |       |
|----------------------|--------|--------|--------|---|-------|
| Conflicting Flow All | 245    | 127    | 0      | 0 | 121   |
| Stage 1              | 117    | -      | -      | - | -     |
| Stage 2              | 128    | -      | -      | - | -     |
| Critical Hdwy        | 6.43   | 6.23   | -      | - | 4.13  |
| Critical Hdwy Stg 1  | 5.43   | -      | -      | - | -     |
| Critical Hdwy Stg 2  | 5.43   | -      | -      | - | -     |
| Follow-up Hdwy       | 3.527  | 3.327  | -      | - | 2.227 |
| Pot Cap-1 Maneuver   | 741    | 921    | -      | - | 1460  |
| Stage 1              | 906    | -      | -      | - | -     |
| Stage 2              | 895    | -      | -      | - | -     |
| Platoon blocked, %   |        |        | -      | - | -     |
| Mov Cap-1 Maneuver   | 722    | 904    | -      | - | 1446  |
| Mov Cap-2 Maneuver   | 722    | -      | -      | - | -     |
| Stage 1              | 892    | -      | -      | - | -     |
| Stage 2              | 886    | -      | -      | - | -     |

| Approach             | WB  | NB | SB  |
|----------------------|-----|----|-----|
| HCM Control Delay, s | 9.3 | 0  | 0.4 |
| HCM LOS              | A   |    |     |

| Minor Lane/Major Mvmt | NBT | NBRWBLn1 | SBL   | SBT   |
|-----------------------|-----|----------|-------|-------|
| Capacity (veh/h)      | -   | -        | 858   | 1446  |
| HCM Lane V/C Ratio    | -   | -        | 0.018 | 0.005 |
| HCM Control Delay (s) | -   | -        | 9.3   | 7.5   |
| HCM Lane LOS          | -   | -        | A     | A     |
| HCM 95th %tile Q(veh) | -   | -        | 0.1   | 0     |

| Intersection              |      |
|---------------------------|------|
| Intersection Delay, s/veh | 11.7 |
| Intersection LOS          | B    |

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h  | 7    | 133  | 33   | 215  | 141  | 3    | 43   | 19   | 146  | 3    | 15   | 7    |
| Future Vol, veh/h   | 7    | 133  | 33   | 215  | 141  | 3    | 43   | 19   | 146  | 3    | 15   | 7    |
| Peak Hour Factor    | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, %   | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow           | 8    | 145  | 36   | 234  | 153  | 3    | 47   | 21   | 159  | 3    | 16   | 8    |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB  | WB   | NB   | SB  |
|----------------------------|-----|------|------|-----|
| Opposing Approach          | WB  | EB   | SB   | NB  |
| Opposing Lanes             | 1   | 1    | 1    | 1   |
| Conflicting Approach Left  | SB  | NB   | EB   | WB  |
| Conflicting Lanes Left     | 1   | 1    | 1    | 1   |
| Conflicting Approach Right | NB  | SB   | WB   | EB  |
| Conflicting Lanes Right    | 1   | 1    | 1    | 1   |
| HCM Control Delay          | 9.8 | 13.6 | 10.4 | 8.9 |
| HCM LOS                    | A   | B    | B    | A   |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 21%   | 4%    | 60%   | 12%   |
| Vol Thru, %            | 9%    | 77%   | 39%   | 60%   |
| Vol Right, %           | 70%   | 19%   | 1%    | 28%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 208   | 173   | 359   | 25    |
| LT Vol                 | 43    | 7     | 215   | 3     |
| Through Vol            | 19    | 133   | 141   | 15    |
| RT Vol                 | 146   | 33    | 3     | 7     |
| Lane Flow Rate         | 226   | 188   | 390   | 27    |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.314 | 0.26  | 0.535 | 0.043 |
| Departure Headway (Hd) | 4.993 | 4.971 | 4.934 | 5.68  |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 712   | 713   | 722   | 634   |
| Service Time           | 3.085 | 3.07  | 3.018 | 3.68  |
| HCM Lane V/C Ratio     | 0.317 | 0.264 | 0.54  | 0.043 |
| HCM Control Delay      | 10.4  | 9.8   | 13.6  | 8.9   |
| HCM Lane LOS           | B     | A     | B     | A     |
| HCM 95th-tile Q        | 1.3   | 1     | 3.2   | 0.1   |

| Intersection              |      |
|---------------------------|------|
| Intersection Delay, s/veh | 48.3 |
| Intersection LOS          | E    |

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      | ↕    | ↕    |      |      | ↕    | ↕    |      | ↕    |      |
| Traffic Vol, veh/h  | 112  | 179  | 12   | 136  | 174  | 26   | 28   | 270  | 93   | 38   | 243  | 107  |
| Future Vol, veh/h   | 112  | 179  | 12   | 136  | 174  | 26   | 28   | 270  | 93   | 38   | 243  | 107  |
| Peak Hour Factor    | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, %   | 3    | 3    | 3    | 6    | 6    | 6    | 6    | 6    | 6    | 3    | 3    | 3    |
| Mvmt Flow           | 122  | 195  | 13   | 148  | 189  | 28   | 30   | 293  | 101  | 41   | 264  | 116  |
| Number of Lanes     | 0    | 1    | 0    | 1    | 1    | 0    | 0    | 1    | 1    | 0    | 1    | 0    |

| Approach                   | EB   | WB   | NB   | SB   |
|----------------------------|------|------|------|------|
| Opposing Approach          | WB   | EB   | SB   | NB   |
| Opposing Lanes             | 2    | 1    | 1    | 2    |
| Conflicting Approach Left  | SB   | NB   | EB   | WB   |
| Conflicting Lanes Left     | 1    | 2    | 1    | 2    |
| Conflicting Approach Right | NB   | SB   | WB   | EB   |
| Conflicting Lanes Right    | 2    | 1    | 2    | 1    |
| HCM Control Delay          | 47.5 | 21.4 | 33.9 | 86.6 |
| HCM LOS                    | E    | C    | D    | F    |

| Lane                   | NBLn1 | NBLn2 | EBLn1 | WBLn1  | WBLn2 | SBLn1 |
|------------------------|-------|-------|-------|--------|-------|-------|
| Vol Left, %            | 9%    | 0%    | 37%   | 100%   | 0%    | 10%   |
| Vol Thru, %            | 91%   | 0%    | 59%   | 0%     | 87%   | 63%   |
| Vol Right, %           | 0%    | 100%  | 4%    | 0%     | 13%   | 28%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop   | Stop  | Stop  |
| Traffic Vol by Lane    | 298   | 93    | 303   | 136    | 200   | 388   |
| LT Vol                 | 28    | 0     | 112   | 136    | 0     | 38    |
| Through Vol            | 270   | 0     | 179   | 0      | 174   | 243   |
| RT Vol                 | 0     | 93    | 12    | 0      | 26    | 107   |
| Lane Flow Rate         | 324   | 101   | 329   | 148    | 217   | 422   |
| Geometry Grp           | 7     | 7     | 6     | 7      | 7     | 6     |
| Degree of Util (X)     | 0.802 | 0.228 | 0.846 | 0.398  | 0.547 | 1.042 |
| Departure Headway (Hd) | 9.215 | 8.436 | 9.574 | 10.006 | 9.388 | 8.892 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes    | Yes   | Yes   |
| Cap                    | 395   | 429   | 382   | 362    | 387   | 409   |
| Service Time           | 6.915 | 6.136 | 7.574 | 7.706  | 7.088 | 6.892 |
| HCM Lane V/C Ratio     | 0.82  | 0.235 | 0.861 | 0.409  | 0.561 | 1.032 |
| HCM Control Delay      | 40.2  | 13.6  | 47.5  | 19.2   | 22.9  | 86.6  |
| HCM Lane LOS           | E     | B     | E     | C      | C     | F     |
| HCM 95th-tile Q        | 7     | 0.9   | 7.9   | 1.9    | 3.2   | 13.7  |

HCM 6th TWSC  
1: Road 156 & Avenue 332

05/10/2019

| Intersection             |      |      |       |      |      |       |      |      |      |      |      |      |
|--------------------------|------|------|-------|------|------|-------|------|------|------|------|------|------|
| Int Delay, s/veh         | 3.8  |      |       |      |      |       |      |      |      |      |      |      |
| Movement                 | EBL  | EBT  | EBR   | WBL  | WBT  | WBR   | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations      |      | ↕    | ↗     |      | ↕    | ↗     |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h       | 3    | 5    | 9     | 55   | 14   | 22    | 2    | 79   | 57   | 21   | 79   | 1    |
| Future Vol, veh/h        | 3    | 5    | 9     | 55   | 14   | 22    | 2    | 79   | 57   | 21   | 79   | 1    |
| Conflicting Peds, #/hr   | 10   | 0    | 10    | 10   | 0    | 10    | 10   | 0    | 10   | 10   | 0    | 10   |
| Sign Control             | Stop | Stop | Stop  | Stop | Stop | Stop  | Free | Free | Free | Free | Free | Free |
| RT Channelized           | -    | -    | Yield | -    | -    | Yield | -    | -    | None | -    | -    | None |
| Storage Length           | -    | -    | 75    | -    | -    | 125   | -    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | -    | 0    | -     | -    | 0    | -     | -    | 0    | -    | -    | 0    | -    |
| Grade, %                 | -    | 0    | -     | -    | 0    | -     | -    | 0    | -    | -    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92    | 92   | 92   | 92    | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 3     | 3    | 3    | 3     | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow                | 3    | 5    | 10    | 60   | 15   | 24    | 2    | 86   | 62   | 23   | 86   | 1    |

| Major/Minor          | Minor2 |       | Minor1 |       | Major1 |       |       | Major2 |   |       |   |   |
|----------------------|--------|-------|--------|-------|--------|-------|-------|--------|---|-------|---|---|
| Conflicting Flow All | 282    | 305   | 107    | 276   | 274    | 137   | 97    | 0      | 0 | 158   | 0 | 0 |
| Stage 1              | 143    | 143   | -      | 131   | 131    | -     | -     | -      | - | -     | - | - |
| Stage 2              | 139    | 162   | -      | 145   | 143    | -     | -     | -      | - | -     | - | - |
| Critical Hdwy        | 7.13   | 6.53  | 6.23   | 7.13  | 6.53   | 6.23  | 4.13  | -      | - | 4.13  | - | - |
| Critical Hdwy Stg 1  | 6.13   | 5.53  | -      | 6.13  | 5.53   | -     | -     | -      | - | -     | - | - |
| Critical Hdwy Stg 2  | 6.13   | 5.53  | -      | 6.13  | 5.53   | -     | -     | -      | - | -     | - | - |
| Follow-up Hdwy       | 3.527  | 4.027 | 3.327  | 3.527 | 4.027  | 3.327 | 2.227 | -      | - | 2.227 | - | - |
| Pot Cap-1 Maneuver   | 668    | 607   | 944    | 674   | 631    | 909   | 1490  | -      | - | 1416  | - | - |
| Stage 1              | 857    | 777   | -      | 870   | 786    | -     | -     | -      | - | -     | - | - |
| Stage 2              | 862    | 762   | -      | 855   | 777    | -     | -     | -      | - | -     | - | - |
| Platoon blocked, %   |        |       |        |       |        |       |       | -      | - | -     | - | - |
| Mov Cap-1 Maneuver   | 617    | 584   | 926    | 641   | 607    | 892   | 1476  | -      | - | 1403  | - | - |
| Mov Cap-2 Maneuver   | 617    | 584   | -      | 641   | 607    | -     | -     | -      | - | -     | - | - |
| Stage 1              | 848    | 756   | -      | 860   | 777    | -     | -     | -      | - | -     | - | - |
| Stage 2              | 814    | 754   | -      | 818   | 756    | -     | -     | -      | - | -     | - | - |

| Approach             | EB  | WB   | NB  | SB  |
|----------------------|-----|------|-----|-----|
| HCM Control Delay, s | 9.9 | 10.8 | 0.1 | 1.6 |
| HCM LOS              | A   | B    |     |     |

| Minor Lane/Major Mvmt | NBL   | NBT | NBR | EBLn1 | EBLn2 | WBLn1 | WBLn2 | SBL   | SBT | SBR |
|-----------------------|-------|-----|-----|-------|-------|-------|-------|-------|-----|-----|
| Capacity (veh/h)      | 1476  | -   | -   | 596   | 926   | 634   | 892   | 1403  | -   | -   |
| HCM Lane V/C Ratio    | 0.001 | -   | -   | 0.015 | 0.011 | 0.118 | 0.027 | 0.016 | -   | -   |
| HCM Control Delay (s) | 7.4   | 0   | -   | 11.1  | 8.9   | 11.4  | 9.1   | 7.6   | 0   | -   |
| HCM Lane LOS          | A     | A   | -   | B     | A     | B     | A     | A     | A   | -   |
| HCM 95th %tile Q(veh) | 0     | -   | -   | 0     | 0     | 0.4   | 0.1   | 0.1   | -   | -   |

HCM 6th TWSC  
3: Road 156 & Avenue 328

05/10/2019

| Intersection             |      |      |      |      |      |      |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Int Delay, s/veh         | 5.6  |      |      |      |      |      |      |      |      |      |      |      |
| Movement                 | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations      |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h       | 62   | 320  | 17   | 7    | 358  | 55   | 26   | 10   | 5    | 46   | 19   | 93   |
| Future Vol, veh/h        | 62   | 320  | 17   | 7    | 358  | 55   | 26   | 10   | 5    | 46   | 19   | 93   |
| Conflicting Peds, #/hr   | 10   | 0    | 10   | 10   | 0    | 10   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized           | -    | -    | None |
| Storage Length           | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    |
| Grade, %                 | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow                | 67   | 348  | 18   | 8    | 389  | 60   | 28   | 11   | 5    | 50   | 21   | 101  |

| Major/Minor          | Major1 |   |   | Major2 |   |   | Minor1 |       |       | Minor2 |       |       |
|----------------------|--------|---|---|--------|---|---|--------|-------|-------|--------|-------|-------|
| Conflicting Flow All | 459    | 0 | 0 | 376    | 0 | 0 | 997    | 976   | 367   | 944    | 955   | 429   |
| Stage 1              | -      | - | - | -      | - | - | 501    | 501   | -     | 445    | 445   | -     |
| Stage 2              | -      | - | - | -      | - | - | 496    | 475   | -     | 499    | 510   | -     |
| Critical Hdwy        | 4.13   | - | - | 4.13   | - | - | 7.13   | 6.53  | 6.23  | 7.13   | 6.53  | 6.23  |
| Critical Hdwy Stg 1  | -      | - | - | -      | - | - | 6.13   | 5.53  | -     | 6.13   | 5.53  | -     |
| Critical Hdwy Stg 2  | -      | - | - | -      | - | - | 6.13   | 5.53  | -     | 6.13   | 5.53  | -     |
| Follow-up Hdwy       | 2.227  | - | - | 2.227  | - | - | 3.527  | 4.027 | 3.327 | 3.527  | 4.027 | 3.327 |
| Pot Cap-1 Maneuver   | 1097   | - | - | 1177   | - | - | 222    | 250   | 676   | 241    | 257   | 624   |
| Stage 1              | -      | - | - | -      | - | - | 550    | 541   | -     | 590    | 573   | -     |
| Stage 2              | -      | - | - | -      | - | - | 554    | 556   | -     | 552    | 536   | -     |
| Platoon blocked, %   | -      | - | - | -      | - | - | -      | -     | -     | -      | -     | -     |
| Mov Cap-1 Maneuver   | 1087   | - | - | 1166   | - | - | 160    | 224   | 670   | 213    | 230   | 618   |
| Mov Cap-2 Maneuver   | -      | - | - | -      | - | - | 160    | 224   | -     | 213    | 230   | -     |
| Stage 1              | -      | - | - | -      | - | - | 502    | 494   | -     | 539    | 562   | -     |
| Stage 2              | -      | - | - | -      | - | - | 442    | 545   | -     | 494    | 489   | -     |

| Approach             | EB  |  |  | WB  |  |  | NB   |  |  | SB   |  |  |
|----------------------|-----|--|--|-----|--|--|------|--|--|------|--|--|
| HCM Control Delay, s | 1.3 |  |  | 0.1 |  |  | 29.5 |  |  | 24.6 |  |  |
| HCM LOS              |     |  |  |     |  |  | D    |  |  | C    |  |  |

| Minor Lane/Major Mvmt | NBLn1 | EBL   | EBT | EBR | WBL   | WBT | WBR | SBLn1 |
|-----------------------|-------|-------|-----|-----|-------|-----|-----|-------|
| Capacity (veh/h)      | 191   | 1087  | -   | -   | 1166  | -   | -   | 352   |
| HCM Lane V/C Ratio    | 0.233 | 0.062 | -   | -   | 0.007 | -   | -   | 0.488 |
| HCM Control Delay (s) | 29.5  | 8.5   | 0   | -   | 8.1   | 0   | -   | 24.6  |
| HCM Lane LOS          | D     | A     | A   | -   | A     | A   | -   | C     |
| HCM 95th %tile Q(veh) | 0.9   | 0.2   | -   | -   | 0     | -   | -   | 2.6   |

HCM 6th TWSC  
5: Road 159 & Depot Drive

05/10/2019

| Intersection             |      |      |      |      |      |      |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Int Delay, s/veh         | 4.2  |      |      |      |      |      |      |      |      |      |      |      |
| Movement                 | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  | SEL  | SET  | SER  | NWL  | NWT  | NWR  |
| Lane Configurations      |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h       | 9    | 55   | 2    | 12   | 64   | 3    | 1    | 26   | 15   | 5    | 19   | 9    |
| Future Vol, veh/h        | 9    | 55   | 2    | 12   | 64   | 3    | 1    | 26   | 15   | 5    | 19   | 9    |
| Conflicting Peds, #/hr   | 10   | 0    | 10   | 10   | 0    | 10   | 10   | 0    | 10   | 10   | 0    | 10   |
| Sign Control             | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized           | -    | -    | None |
| Storage Length           | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    |
| Grade, %                 | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow                | 10   | 60   | 2    | 13   | 70   | 3    | 1    | 28   | 16   | 5    | 21   | 10   |

| Major/Minor          | Major1 |   | Major2 |       | Minor2 |   | Minor1 |       |       |       |       |       |
|----------------------|--------|---|--------|-------|--------|---|--------|-------|-------|-------|-------|-------|
| Conflicting Flow All | 83     | 0 | 0      | 72    | 0      | 0 | 215    | 200   | 92    | 221   | 200   | 81    |
| Stage 1              | -      | - | -      | -     | -      | - | 108    | 108   | -     | 91    | 91    | -     |
| Stage 2              | -      | - | -      | -     | -      | - | 107    | 92    | -     | 130   | 109   | -     |
| Critical Hdwy        | 4.13   | - | -      | 4.13  | -      | - | 7.13   | 6.53  | 6.23  | 7.13  | 6.53  | 6.23  |
| Critical Hdwy Stg 1  | -      | - | -      | -     | -      | - | 6.13   | 5.53  | -     | 6.13  | 5.53  | -     |
| Critical Hdwy Stg 2  | -      | - | -      | -     | -      | - | 6.13   | 5.53  | -     | 6.13  | 5.53  | -     |
| Follow-up Hdwy       | 2.227  | - | -      | 2.227 | -      | - | 3.527  | 4.027 | 3.327 | 3.527 | 4.027 | 3.327 |
| Pot Cap-1 Maneuver   | 1508   | - | -      | 1522  | -      | - | 739    | 694   | 963   | 733   | 694   | 976   |
| Stage 1              | -      | - | -      | -     | -      | - | 895    | 804   | -     | 914   | 818   | -     |
| Stage 2              | -      | - | -      | -     | -      | - | 896    | 817   | -     | 871   | 803   | -     |
| Platoon blocked, %   | -      | - | -      | -     | -      | - | -      | -     | -     | -     | -     | -     |
| Mov Cap-1 Maneuver   | 1494   | - | -      | 1508  | -      | - | 692    | 669   | 945   | 676   | 669   | 957   |
| Mov Cap-2 Maneuver   | -      | - | -      | -     | -      | - | 692    | 669   | -     | 676   | 669   | -     |
| Stage 1              | -      | - | -      | -     | -      | - | 881    | 789   | -     | 899   | 804   | -     |
| Stage 2              | -      | - | -      | -     | -      | - | 850    | 803   | -     | 810   | 788   | -     |

| Approach             | NB | SB  | SE   | NW   |
|----------------------|----|-----|------|------|
| HCM Control Delay, s | 1  | 1.1 | 10.1 | 10.2 |
| HCM LOS              |    |     | B    | B    |

| Minor Lane/Major Mvmt | NBL   | NBT | NBRNWLn1 | SELn1 | SBL   | SBT   | SBR |
|-----------------------|-------|-----|----------|-------|-------|-------|-----|
| Capacity (veh/h)      | 1494  | -   | -        | 730   | 748   | 1508  | -   |
| HCM Lane V/C Ratio    | 0.007 | -   | -        | 0.049 | 0.061 | 0.009 | -   |
| HCM Control Delay (s) | 7.4   | 0   | -        | 10.2  | 10.1  | 7.4   | 0   |
| HCM Lane LOS          | A     | A   | -        | B     | B     | A     | A   |
| HCM 95th %tile Q(veh) | 0     | -   | -        | 0.2   | 0.2   | 0     | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 0.6  |      |      |      |      |      |
| Movement                 | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
| Lane Configurations      | T    |      |      | T    |      | T    |
| Traffic Vol, veh/h       | 17   | 14   | 5    | 408  | 541  | 9    |
| Future Vol, veh/h        | 17   | 14   | 5    | 408  | 541  | 9    |
| Conflicting Peds, #/hr   | 0    | 0    | 10   | 0    | 0    | 10   |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 6    | 6    | 6    | 6    |
| Mvmt Flow                | 18   | 15   | 5    | 443  | 588  | 10   |

| Major/Minor          | Minor2 | Major1 | Major2 |   |   |   |
|----------------------|--------|--------|--------|---|---|---|
| Conflicting Flow All | 1056   | 603    | 608    | 0 | - | 0 |
| Stage 1              | 603    | -      | -      | - | - | - |
| Stage 2              | 453    | -      | -      | - | - | - |
| Critical Hdwy        | 6.43   | 6.23   | 4.16   | - | - | - |
| Critical Hdwy Stg 1  | 5.43   | -      | -      | - | - | - |
| Critical Hdwy Stg 2  | 5.43   | -      | -      | - | - | - |
| Follow-up Hdwy       | 3.527  | 3.327  | 2.254  | - | - | - |
| Pot Cap-1 Maneuver   | 248    | 497    | 951    | - | - | - |
| Stage 1              | 544    | -      | -      | - | - | - |
| Stage 2              | 638    | -      | -      | - | - | - |
| Platoon blocked, %   |        |        |        | - | - | - |
| Mov Cap-1 Maneuver   | 241    | 492    | 942    | - | - | - |
| Mov Cap-2 Maneuver   | 241    | -      | -      | - | - | - |
| Stage 1              | 535    | -      | -      | - | - | - |
| Stage 2              | 632    | -      | -      | - | - | - |

| Approach             | EB   | NB  | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 17.9 | 0.1 | 0  |
| HCM LOS              | C    |     |    |

| Minor Lane/Major Mvmt | NBL   | NBT | EBLn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h)      | 942   | -   | 313   | -   | -   |
| HCM Lane V/C Ratio    | 0.006 | -   | 0.108 | -   | -   |
| HCM Control Delay (s) | 8.8   | 0   | 17.9  | -   | -   |
| HCM Lane LOS          | A     | A   | C     | -   | -   |
| HCM 95th %tile Q(veh) | 0     | -   | 0.4   | -   | -   |

| Intersection             |   |      |      |   |   |      |
|--------------------------|---|------|------|---|---|------|
| Int Delay, s/veh         | 0.9   |      |      |   |   |      |
| Movement                 | EBL   | EBR  | NBL  | NBT   | SBT   | SBR  |
| Lane Configurations      |  |      |      |  |  |      |
| Traffic Vol, veh/h       | 17  | 34   | 5    | 391   | 539   | 14   |
| Future Vol, veh/h        | 17  | 34   | 5    | 391   | 539   | 14   |
| Conflicting Peds, #/hr   | 0   | 0    | 10   | 0   | 0   | 10   |
| Sign Control             | Stop  | Stop | Free | Free  | Free  | Free |
| RT Channelized           | -   | None | -    | None  | -   | None |
| Storage Length           | 0   | -    | -    | -   | -   | -    |
| Veh in Median Storage, # | 0   | -    | -    | 0   | 0   | -    |
| Grade, %                 | 0   | -    | -    | 0   | 0   | -    |
| Peak Hour Factor         | 92  | 92   | 92   | 92  | 92  | 92   |
| Heavy Vehicles, %        | 3   | 3    | 6    | 6   | 6   | 6    |
| Mvmt Flow                | 18  | 37   | 5    | 425   | 586   | 15   |

| Major/Minor          | Minor2 | Major1 | Major2 |   |   |   |
|----------------------|--------|--------|--------|---|---|---|
| Conflicting Flow All | 1039   | 604    | 611    | 0 | - | 0 |
| Stage 1              | 604    | -      | -      | - | - | - |
| Stage 2              | 435    | -      | -      | - | - | - |
| Critical Hdwy        | 6.43   | 6.23   | 4.16   | - | - | - |
| Critical Hdwy Stg 1  | 5.43   | -      | -      | - | - | - |
| Critical Hdwy Stg 2  | 5.43   | -      | -      | - | - | - |
| Follow-up Hdwy       | 3.527  | 3.327  | 2.254  | - | - | - |
| Pot Cap-1 Maneuver   | 254    | 496    | 949    | - | - | - |
| Stage 1              | 544    | -      | -      | - | - | - |
| Stage 2              | 650    | -      | -      | - | - | - |
| Platoon blocked, %   |        |        |        | - | - | - |
| Mov Cap-1 Maneuver   | 247    | 491    | 940    | - | - | - |
| Mov Cap-2 Maneuver   | 247    | -      | -      | - | - | - |
| Stage 1              | 535    | -      | -      | - | - | - |
| Stage 2              | 644    | -      | -      | - | - | - |

| Approach             | EB   | NB  | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 16.5 | 0.1 | 0  |
| HCM LOS              | C    |     |    |

| Minor Lane/Major Mvmt | NBL   | NBT | EBLn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h)      | 940   | -   | 369   | -   | -   |
| HCM Lane V/C Ratio    | 0.006 | -   | 0.15  | -   | -   |
| HCM Control Delay (s) | 8.9   | 0   | 16.5  | -   | -   |
| HCM Lane LOS          | A     | A   | C     | -   | -   |
| HCM 95th %tile Q(veh) | 0     | -   | 0.5   | -   | -   |

HCM 6th TWSC  
8: Road 160 & Beechwood Avenue

05/10/2019

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 1.3  |      |      |      |      |      |
| Movement                 | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
| Lane Configurations      | T    |      | T    |      | T    |      |
| Traffic Vol, veh/h       | 33   | 26   | 15   | 372  | 544  | 31   |
| Future Vol, veh/h        | 33   | 26   | 15   | 372  | 544  | 31   |
| Conflicting Peds, #/hr   | 0    | 0    | 10   | 0    | 0    | 10   |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 6    | 6    | 6    | 6    |
| Mvmt Flow                | 36   | 28   | 16   | 404  | 591  | 34   |

| Major/Minor          | Minor2 | Major1 | Major2 |   |   |   |
|----------------------|--------|--------|--------|---|---|---|
| Conflicting Flow All | 1054   | 618    | 635    | 0 | - | 0 |
| Stage 1              | 618    | -      | -      | - | - | - |
| Stage 2              | 436    | -      | -      | - | - | - |
| Critical Hdwy        | 6.43   | 6.23   | 4.16   | - | - | - |
| Critical Hdwy Stg 1  | 5.43   | -      | -      | - | - | - |
| Critical Hdwy Stg 2  | 5.43   | -      | -      | - | - | - |
| Follow-up Hdwy       | 3.527  | 3.327  | 2.254  | - | - | - |
| Pot Cap-1 Maneuver   | 249    | 487    | 929    | - | - | - |
| Stage 1              | 536    | -      | -      | - | - | - |
| Stage 2              | 650    | -      | -      | - | - | - |
| Platoon blocked, %   |        |        |        | - | - | - |
| Mov Cap-1 Maneuver   | 239    | 482    | 920    | - | - | - |
| Mov Cap-2 Maneuver   | 239    | -      | -      | - | - | - |
| Stage 1              | 519    | -      | -      | - | - | - |
| Stage 2              | 644    | -      | -      | - | - | - |

| Approach             | EB   | NB  | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 19.8 | 0.3 | 0  |
| HCM LOS              | C    |     |    |

| Minor Lane/Major Mvmt | NBL   | NBT | EBLn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h)      | 920   | -   | 307   | -   | -   |
| HCM Lane V/C Ratio    | 0.018 | -   | 0.209 | -   | -   |
| HCM Control Delay (s) | 9     | 0   | 19.8  | -   | -   |
| HCM Lane LOS          | A     | A   | C     | -   | -   |
| HCM 95th %tile Q(veh) | 0.1   | -   | 0.8   | -   | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 1.1  |      |      |      |      |      |
| Movement                 | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
| Lane Configurations      | T    |      |      | T    |      |      |
| Traffic Vol, veh/h       | 29   | 22   | 12   | 358  | 561  | 17   |
| Future Vol, veh/h        | 29   | 22   | 12   | 358  | 561  | 17   |
| Conflicting Peds, #/hr   | 0    | 0    | 10   | 0    | 0    | 10   |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 6    | 6    | 6    | 6    |
| Mvmt Flow                | 32   | 24   | 13   | 389  | 610  | 18   |

| Major/Minor          | Minor2 | Major1 | Major2 |   |   |   |
|----------------------|--------|--------|--------|---|---|---|
| Conflicting Flow All | 1044   | 629    | 638    | 0 | - | 0 |
| Stage 1              | 629    | -      | -      | - | - | - |
| Stage 2              | 415    | -      | -      | - | - | - |
| Critical Hdwy        | 6.43   | 6.23   | 4.16   | - | - | - |
| Critical Hdwy Stg 1  | 5.43   | -      | -      | - | - | - |
| Critical Hdwy Stg 2  | 5.43   | -      | -      | - | - | - |
| Follow-up Hdwy       | 3.527  | 3.327  | 2.254  | - | - | - |
| Pot Cap-1 Maneuver   | 253    | 480    | 927    | - | - | - |
| Stage 1              | 529    | -      | -      | - | - | - |
| Stage 2              | 664    | -      | -      | - | - | - |
| Platoon blocked, %   |        |        |        | - | - | - |
| Mov Cap-1 Maneuver   | 243    | 475    | 918    | - | - | - |
| Mov Cap-2 Maneuver   | 243    | -      | -      | - | - | - |
| Stage 1              | 514    | -      | -      | - | - | - |
| Stage 2              | 657    | -      | -      | - | - | - |

| Approach             | EB   | NB  | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 19.2 | 0.3 | 0  |
| HCM LOS              | C    |     |    |

| Minor Lane/Major Mvmt | NBL   | NBT | EBLn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h)      | 918   | -   | 308   | -   | -   |
| HCM Lane V/C Ratio    | 0.014 | -   | 0.18  | -   | -   |
| HCM Control Delay (s) | 9     | 0   | 19.2  | -   | -   |
| HCM Lane LOS          | A     | A   | C     | -   | -   |
| HCM 95th %tile Q(veh) | 0     | -   | 0.6   | -   | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 0.9  |      |      |      |      |      |
| Movement                 | NBL  | NBT  | SBT  | SBR  | SEL  | SER  |
| Lane Configurations      |      | ↕    | ↕    |      | ↕    |      |
| Traffic Vol, veh/h       | 29   | 379  | 349  | 3    | 3    | 38   |
| Future Vol, veh/h        | 29   | 379  | 349  | 3    | 3    | 38   |
| Conflicting Peds, #/hr   | 10   | 0    | 0    | 10   | 0    | 0    |
| Sign Control             | Free | Free | Free | Free | Stop | Stop |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | -    | -    | -    | -    | 0    | -    |
| Veh in Median Storage, # | -    | 0    | 0    | -    | 0    | -    |
| Grade, %                 | -    | 0    | 0    | -    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow                | 32   | 412  | 379  | 3    | 3    | 41   |

| Major/Minor          | Major1 | Major2 | Minor2 |   |             |
|----------------------|--------|--------|--------|---|-------------|
| Conflicting Flow All | 392    | 0      | -      | 0 | 867 391     |
| Stage 1              | -      | -      | -      | - | 391 -       |
| Stage 2              | -      | -      | -      | - | 476 -       |
| Critical Hdwy        | 4.13   | -      | -      | - | 6.43 6.23   |
| Critical Hdwy Stg 1  | -      | -      | -      | - | 5.43 -      |
| Critical Hdwy Stg 2  | -      | -      | -      | - | 5.43 -      |
| Follow-up Hdwy       | 2.227  | -      | -      | - | 3.527 3.327 |
| Pot Cap-1 Maneuver   | 1161   | -      | -      | - | 322 655     |
| Stage 1              | -      | -      | -      | - | 681 -       |
| Stage 2              | -      | -      | -      | - | 623 -       |
| Platoon blocked, %   |        | -      | -      | - |             |
| Mov Cap-1 Maneuver   | 1150   | -      | -      | - | 304 649     |
| Mov Cap-2 Maneuver   | -      | -      | -      | - | 304 -       |
| Stage 1              | -      | -      | -      | - | 650 -       |
| Stage 2              | -      | -      | -      | - | 617 -       |

| Approach             | NB  | SB | SE   |
|----------------------|-----|----|------|
| HCM Control Delay, s | 0.6 | 0  | 11.5 |
| HCM LOS              |     |    | B    |

| Minor Lane/Major Mvmt | NBL   | NBT | SELn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h)      | 1150  | -   | 599   | -   | -   |
| HCM Lane V/C Ratio    | 0.027 | -   | 0.074 | -   | -   |
| HCM Control Delay (s) | 8.2   | 0   | 11.5  | -   | -   |
| HCM Lane LOS          | A     | A   | B     | -   | -   |
| HCM 95th %tile Q(veh) | 0.1   | -   | 0.2   | -   | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 0.9  |      |      |      |      |      |
| Movement                 | WBL  | WBR  | NBT  | NBR  | SBL  | SBT  |
| Lane Configurations      |      |      |      |      |      |      |
| Traffic Vol, veh/h       | 3    | 3    | 64   | 1    | 12   | 76   |
| Future Vol, veh/h        | 3    | 3    | 64   | 1    | 12   | 76   |
| Conflicting Peds, #/hr   | 10   | 10   | 0    | 10   | 10   | 0    |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | 0    | -    | -    | 0    |
| Grade, %                 | 0    | -    | 0    | -    | -    | 0    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow                | 3    | 3    | 70   | 1    | 13   | 83   |

| Major/Minor          | Minor1 | Major1 | Major2 |   |       |
|----------------------|--------|--------|--------|---|-------|
| Conflicting Flow All | 200    | 91     | 0      | 0 | 81    |
| Stage 1              | 81     | -      | -      | - | -     |
| Stage 2              | 119    | -      | -      | - | -     |
| Critical Hdwy        | 6.43   | 6.23   | -      | - | 4.13  |
| Critical Hdwy Stg 1  | 5.43   | -      | -      | - | -     |
| Critical Hdwy Stg 2  | 5.43   | -      | -      | - | -     |
| Follow-up Hdwy       | 3.527  | 3.327  | -      | - | 2.227 |
| Pot Cap-1 Maneuver   | 786    | 964    | -      | - | 1510  |
| Stage 1              | 940    | -      | -      | - | -     |
| Stage 2              | 904    | -      | -      | - | -     |
| Platoon blocked, %   |        |        | -      | - | -     |
| Mov Cap-1 Maneuver   | 763    | 946    | -      | - | 1496  |
| Mov Cap-2 Maneuver   | 763    | -      | -      | - | -     |
| Stage 1              | 922    | -      | -      | - | -     |
| Stage 2              | 895    | -      | -      | - | -     |

| Approach             | WB  | NB | SB |
|----------------------|-----|----|----|
| HCM Control Delay, s | 9.3 | 0  | 1  |
| HCM LOS              | A   |    |    |

| Minor Lane/Major Mvmt | NBT | NBRWBLn1 | SBL   | SBT   |
|-----------------------|-----|----------|-------|-------|
| Capacity (veh/h)      | -   | -        | 845   | 1496  |
| HCM Lane V/C Ratio    | -   | -        | 0.008 | 0.009 |
| HCM Control Delay (s) | -   | -        | 9.3   | 7.4   |
| HCM Lane LOS          | -   | -        | A     | A     |
| HCM 95th %tile Q(veh) | -   | -        | 0     | 0     |

| Intersection              |     |
|---------------------------|-----|
| Intersection Delay, s/veh | 7.7 |
| Intersection LOS          | A   |

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h  | 5    | 26   | 45   | 2    | 33   | 43   | 59   | 31   | 28   | 2    | 17   | 10   |
| Future Vol, veh/h   | 5    | 26   | 45   | 2    | 33   | 43   | 59   | 31   | 28   | 2    | 17   | 10   |
| Peak Hour Factor    | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, %   | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow           | 5    | 28   | 49   | 2    | 36   | 47   | 64   | 34   | 30   | 2    | 18   | 11   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB  | WB  | NB  | SB  |
|----------------------------|-----|-----|-----|-----|
| Opposing Approach          | WB  | EB  | SB  | NB  |
| Opposing Lanes             | 1   | 1   | 1   | 1   |
| Conflicting Approach Left  | SB  | NB  | EB  | WB  |
| Conflicting Lanes Left     | 1   | 1   | 1   | 1   |
| Conflicting Approach Right | NB  | SB  | WB  | EB  |
| Conflicting Lanes Right    | 1   | 1   | 1   | 1   |
| HCM Control Delay          | 7.5 | 7.5 | 8.1 | 7.4 |
| HCM LOS                    | A   | A   | A   | A   |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 50%   | 7%    | 3%    | 7%    |
| Vol Thru, %            | 26%   | 34%   | 42%   | 59%   |
| Vol Right, %           | 24%   | 59%   | 55%   | 34%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 118   | 76    | 78    | 29    |
| LT Vol                 | 59    | 5     | 2     | 2     |
| Through Vol            | 31    | 26    | 33    | 17    |
| RT Vol                 | 28    | 45    | 43    | 10    |
| Lane Flow Rate         | 128   | 83    | 85    | 32    |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.15  | 0.093 | 0.096 | 0.037 |
| Departure Headway (Hd) | 4.22  | 4.054 | 4.069 | 4.25  |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 838   | 888   | 885   | 845   |
| Service Time           | 2.307 | 2.059 | 2.072 | 2.26  |
| HCM Lane V/C Ratio     | 0.153 | 0.093 | 0.096 | 0.038 |
| HCM Control Delay      | 8.1   | 7.5   | 7.5   | 7.4   |
| HCM Lane LOS           | A     | A     | A     | A     |
| HCM 95th-tile Q        | 0.5   | 0.3   | 0.3   | 0.1   |

| Intersection              |    |
|---------------------------|----|
| Intersection Delay, s/veh | 37 |
| Intersection LOS          | E  |

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      | ↕    | ↕    |      |      | ↕    | ↕    |      | ↕    |      |
| Traffic Vol, veh/h  | 83   | 219  | 12   | 162  | 203  | 76   | 38   | 220  | 131  | 59   | 186  | 60   |
| Future Vol, veh/h   | 83   | 219  | 12   | 162  | 203  | 76   | 38   | 220  | 131  | 59   | 186  | 60   |
| Peak Hour Factor    | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, %   | 3    | 3    | 3    | 6    | 6    | 6    | 6    | 6    | 6    | 3    | 3    | 3    |
| Mvmt Flow           | 90   | 238  | 13   | 176  | 221  | 83   | 41   | 239  | 142  | 64   | 202  | 65   |
| Number of Lanes     | 0    | 1    | 0    | 1    | 1    | 0    | 0    | 1    | 1    | 0    | 1    | 0    |

| Approach                   | EB   | WB   | NB   | SB   |
|----------------------------|------|------|------|------|
| Opposing Approach          | WB   | EB   | SB   | NB   |
| Opposing Lanes             | 2    | 1    | 1    | 2    |
| Conflicting Approach Left  | SB   | NB   | EB   | WB   |
| Conflicting Lanes Left     | 1    | 2    | 1    | 2    |
| Conflicting Approach Right | NB   | SB   | WB   | EB   |
| Conflicting Lanes Right    | 2    | 1    | 2    | 1    |
| HCM Control Delay          | 51.9 | 28.6 | 26.6 | 47.2 |
| HCM LOS                    | F    | D    | D    | E    |

| Lane                   | NBLn1 | NBLn2 | EBLn1 | WBLn1 | WBLn2 | SBLn1 |
|------------------------|-------|-------|-------|-------|-------|-------|
| Vol Left, %            | 15%   | 0%    | 26%   | 100%  | 0%    | 19%   |
| Vol Thru, %            | 85%   | 0%    | 70%   | 0%    | 73%   | 61%   |
| Vol Right, %           | 0%    | 100%  | 4%    | 0%    | 27%   | 20%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 258   | 131   | 314   | 162   | 279   | 305   |
| LT Vol                 | 38    | 0     | 83    | 162   | 0     | 59    |
| Through Vol            | 220   | 0     | 219   | 0     | 203   | 186   |
| RT Vol                 | 0     | 131   | 12    | 0     | 76    | 60    |
| Lane Flow Rate         | 280   | 142   | 341   | 176   | 303   | 332   |
| Geometry Grp           | 7     | 7     | 6     | 7     | 7     | 6     |
| Degree of Util (X)     | 0.719 | 0.333 | 0.88  | 0.467 | 0.744 | 0.851 |
| Departure Headway (Hd) | 9.224 | 8.418 | 9.283 | 9.546 | 8.827 | 9.246 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 393   | 427   | 389   | 379   | 409   | 391   |
| Service Time           | 6.976 | 6.17  | 7.337 | 7.298 | 6.579 | 7.302 |
| HCM Lane V/C Ratio     | 0.712 | 0.333 | 0.877 | 0.464 | 0.741 | 0.849 |
| HCM Control Delay      | 32.4  | 15.3  | 51.9  | 20.4  | 33.3  | 47.2  |
| HCM Lane LOS           | D     | C     | F     | C     | D     | E     |
| HCM 95th-tile Q        | 5.5   | 1.4   | 8.8   | 2.4   | 6     | 8.1   |

HCM 6th TWSC  
1: Road 156 & Avenue 332

05/10/2019

| Intersection             |      |      |       |      |      |       |      |      |      |      |      |      |
|--------------------------|------|------|-------|------|------|-------|------|------|------|------|------|------|
| Int Delay, s/veh         | 2.9  |      |       |      |      |       |      |      |      |      |      |      |
| Movement                 | EBL  | EBT  | EBR   | WBL  | WBT  | WBR   | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations      |      | ↕    | ↕     |      | ↕    | ↕     |      | ↕    |      |      | ↕    | ↕    |
| Traffic Vol, veh/h       | 1    | 2    | 2     | 33   | 5    | 28    | 3    | 86   | 34   | 53   | 174  | 3    |
| Future Vol, veh/h        | 1    | 2    | 2     | 33   | 5    | 28    | 3    | 86   | 34   | 53   | 174  | 3    |
| Conflicting Peds, #/hr   | 10   | 0    | 10    | 10   | 0    | 10    | 10   | 0    | 10   | 10   | 0    | 10   |
| Sign Control             | Stop | Stop | Stop  | Stop | Stop | Stop  | Free | Free | Free | Free | Free | Free |
| RT Channelized           | -    | -    | Yield | -    | -    | Yield | -    | -    | None | -    | -    | None |
| Storage Length           | -    | -    | 75    | -    | -    | 125   | -    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | -    | 0    | -     | -    | 0    | -     | -    | 0    | -    | -    | 0    | -    |
| Grade, %                 | -    | 0    | -     | -    | 0    | -     | -    | 0    | -    | -    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92    | 92   | 92   | 92    | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 3     | 3    | 3    | 3     | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow                | 1    | 2    | 2     | 36   | 5    | 30    | 3    | 93   | 37   | 58   | 189  | 3    |

| Major/Minor          | Minor2 |       | Minor1 |       | Major1 |       |       | Major2 |   |       |   |   |
|----------------------|--------|-------|--------|-------|--------|-------|-------|--------|---|-------|---|---|
| Conflicting Flow All | 447    | 463   | 211    | 446   | 446    | 132   | 202   | 0      | 0 | 140   | 0 | 0 |
| Stage 1              | 317    | 317   | -      | 128   | 128    | -     | -     | -      | - | -     | - | - |
| Stage 2              | 130    | 146   | -      | 318   | 318    | -     | -     | -      | - | -     | - | - |
| Critical Hdwy        | 7.13   | 6.53  | 6.23   | 7.13  | 6.53   | 6.23  | 4.13  | -      | - | 4.13  | - | - |
| Critical Hdwy Stg 1  | 6.13   | 5.53  | -      | 6.13  | 5.53   | -     | -     | -      | - | -     | - | - |
| Critical Hdwy Stg 2  | 6.13   | 5.53  | -      | 6.13  | 5.53   | -     | -     | -      | - | -     | - | - |
| Follow-up Hdwy       | 3.527  | 4.027 | 3.327  | 3.527 | 4.027  | 3.327 | 2.227 | -      | - | 2.227 | - | - |
| Pot Cap-1 Maneuver   | 520    | 495   | 827    | 521   | 506    | 915   | 1364  | -      | - | 1437  | - | - |
| Stage 1              | 692    | 652   | -      | 873   | 788    | -     | -     | -      | - | -     | - | - |
| Stage 2              | 871    | 774   | -      | 691   | 652    | -     | -     | -      | - | -     | - | - |
| Platoon blocked, %   |        |       |        |       |        |       |       | -      | - | -     | - | - |
| Mov Cap-1 Maneuver   | 471    | 462   | 811    | 489   | 472    | 898   | 1351  | -      | - | 1423  | - | - |
| Mov Cap-2 Maneuver   | 471    | 462   | -      | 489   | 472    | -     | -     | -      | - | -     | - | - |
| Stage 1              | 684    | 615   | -      | 863   | 779    | -     | -     | -      | - | -     | - | - |
| Stage 2              | 826    | 765   | -      | 649   | 615    | -     | -     | -      | - | -     | - | - |

| Approach             | EB   |  | WB   |  | NB  |  | SB  |  |
|----------------------|------|--|------|--|-----|--|-----|--|
| HCM Control Delay, s | 11.5 |  | 11.4 |  | 0.2 |  | 1.8 |  |
| HCM LOS              | B    |  | B    |  |     |  |     |  |

| Minor Lane/Major Mvmt | NBL   | NBT | NBR | EBLn1 | EBLn2 | WBLn1 | WBLn2 | SBL  | SBT | SBR |
|-----------------------|-------|-----|-----|-------|-------|-------|-------|------|-----|-----|
| Capacity (veh/h)      | 1351  | -   | -   | 465   | 811   | 487   | 898   | 1423 | -   | -   |
| HCM Lane V/C Ratio    | 0.002 | -   | -   | 0.007 | 0.003 | 0.085 | 0.034 | 0.04 | -   | -   |
| HCM Control Delay (s) | 7.7   | 0   | -   | 12.8  | 9.5   | 13.1  | 9.1   | 7.6  | 0   | -   |
| HCM Lane LOS          | A     | A   | -   | B     | A     | B     | A     | A    | A   | -   |
| HCM 95th %tile Q(veh) | 0     | -   | -   | 0     | 0     | 0.3   | 0.1   | 0.1  | -   | -   |

HCM 6th TWSC  
3: Road 156 & Avenue 328

05/10/2019

| Intersection             |      |      |      |      |      |      |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Int Delay, s/veh         | 23   |      |      |      |      |      |      |      |      |      |      |      |
| Movement                 | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations      |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h       | 50   | 391  | 38   | 10   | 313  | 77   | 26   | 26   | 17   | 119  | 38   | 71   |
| Future Vol, veh/h        | 50   | 391  | 38   | 10   | 313  | 77   | 26   | 26   | 17   | 119  | 38   | 71   |
| Conflicting Peds, #/hr   | 10   | 0    | 10   | 10   | 0    | 10   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized           | -    | -    | None |
| Storage Length           | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    |
| Grade, %                 | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow                | 54   | 425  | 41   | 11   | 340  | 84   | 28   | 28   | 18   | 129  | 41   | 77   |

| Major/Minor          | Major1 |   | Major2 |       | Minor1 |   | Minor2 |       |       |       |       |       |
|----------------------|--------|---|--------|-------|--------|---|--------|-------|-------|-------|-------|-------|
| Conflicting Flow All | 434    | 0 | 0      | 476   | 0      | 0 | 1027   | 1020  | 456   | 991   | 998   | 392   |
| Stage 1              | -      | - | -      | -     | -      | - | 564    | 564   | -     | 414   | 414   | -     |
| Stage 2              | -      | - | -      | -     | -      | - | 463    | 456   | -     | 577   | 584   | -     |
| Critical Hdwy        | 4.13   | - | -      | 4.13  | -      | - | 7.13   | 6.53  | 6.23  | 7.13  | 6.53  | 6.23  |
| Critical Hdwy Stg 1  | -      | - | -      | -     | -      | - | 6.13   | 5.53  | -     | 6.13  | 5.53  | -     |
| Critical Hdwy Stg 2  | -      | - | -      | -     | -      | - | 6.13   | 5.53  | -     | 6.13  | 5.53  | -     |
| Follow-up Hdwy       | 2.227  | - | -      | 2.227 | -      | - | 3.527  | 4.027 | 3.327 | 3.527 | 4.027 | 3.327 |
| Pot Cap-1 Maneuver   | 1120   | - | -      | 1081  | -      | - | 212    | 236   | 602   | 224   | 243   | 655   |
| Stage 1              | -      | - | -      | -     | -      | - | 509    | 507   | -     | 614   | 591   | -     |
| Stage 2              | -      | - | -      | -     | -      | - | 577    | 566   | -     | 500   | 496   | -     |
| Platoon blocked, %   | -      | - | -      | -     | -      | - | -      | -     | -     | -     | -     | -     |
| Mov Cap-1 Maneuver   | 1109   | - | -      | 1071  | -      | - | 149    | 213   | 596   | 182   | 219   | 649   |
| Mov Cap-2 Maneuver   | -      | - | -      | -     | -      | - | 149    | 213   | -     | 182   | 219   | -     |
| Stage 1              | -      | - | -      | -     | -      | - | 471    | 469   | -     | 568   | 577   | -     |
| Stage 2              | -      | - | -      | -     | -      | - | 465    | 552   | -     | 425   | 459   | -     |

| Approach             | EB  |  | WB  |  | NB |  | SB    |  |
|----------------------|-----|--|-----|--|----|--|-------|--|
| HCM Control Delay, s | 0.9 |  | 0.2 |  | 31 |  | 106.9 |  |
| HCM LOS              |     |  |     |  | D  |  | F     |  |

| Minor Lane/Major Mvmt | NBLn1 | EBL   | EBT | EBR | WBL  | WBT | WBR | SBLn1 |
|-----------------------|-------|-------|-----|-----|------|-----|-----|-------|
| Capacity (veh/h)      | 212   | 1109  | -   | -   | 1071 | -   | -   | 243   |
| HCM Lane V/C Ratio    | 0.354 | 0.049 | -   | -   | 0.01 | -   | -   | 1.02  |
| HCM Control Delay (s) | 31    | 8.4   | 0   | -   | 8.4  | 0   | -   | 106.9 |
| HCM Lane LOS          | D     | A     | A   | -   | A    | A   | -   | F     |
| HCM 95th %tile Q(veh) | 1.5   | 0.2   | -   | -   | 0    | -   | -   | 9.9   |

| Intersection             |      |      |      |      |      |      |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Int Delay, s/veh         | 5.6  |      |      |      |      |      |      |      |      |      |      |      |
| Movement                 | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  | SEL  | SET  | SER  | NWL  | NWT  | NWR  |
| Lane Configurations      |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h       | 19   | 69   | 1    | 33   | 72   | 5    | 5    | 33   | 17   | 1    | 40   | 40   |
| Future Vol, veh/h        | 19   | 69   | 1    | 33   | 72   | 5    | 5    | 33   | 17   | 1    | 40   | 40   |
| Conflicting Peds, #/hr   | 10   | 0    | 10   | 10   | 0    | 10   | 10   | 0    | 10   | 10   | 0    | 10   |
| Sign Control             | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized           | -    | -    | None |
| Storage Length           | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    |
| Grade, %                 | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow                | 21   | 75   | 1    | 36   | 78   | 5    | 5    | 36   | 18   | 1    | 43   | 43   |

| Major/Minor          | Major1 |   | Major2 |       | Minor2 |   |       | Minor1 |       |       |       |       |
|----------------------|--------|---|--------|-------|--------|---|-------|--------|-------|-------|-------|-------|
| Conflicting Flow All | 93     | 0 | 0      | 86    | 0      | 0 | 334   | 291    | 101   | 318   | 293   | 96    |
| Stage 1              | -      | - | -      | -     | -      | - | 163   | 163    | -     | 128   | 128   | -     |
| Stage 2              | -      | - | -      | -     | -      | - | 171   | 128    | -     | 190   | 165   | -     |
| Critical Hdwy        | 4.13   | - | -      | 4.13  | -      | - | 7.13  | 6.53   | 6.23  | 7.13  | 6.53  | 6.23  |
| Critical Hdwy Stg 1  | -      | - | -      | -     | -      | - | 6.13  | 5.53   | -     | 6.13  | 5.53  | -     |
| Critical Hdwy Stg 2  | -      | - | -      | -     | -      | - | 6.13  | 5.53   | -     | 6.13  | 5.53  | -     |
| Follow-up Hdwy       | 2.227  | - | -      | 2.227 | -      | - | 3.527 | 4.027  | 3.327 | 3.527 | 4.027 | 3.327 |
| Pot Cap-1 Maneuver   | 1495   | - | -      | 1504  | -      | - | 618   | 618    | 952   | 633   | 616   | 958   |
| Stage 1              | -      | - | -      | -     | -      | - | 837   | 761    | -     | 873   | 788   | -     |
| Stage 2              | -      | - | -      | -     | -      | - | 829   | 788    | -     | 809   | 760   | -     |
| Platoon blocked, %   | -      | - | -      | -     | -      | - | -     | -      | -     | -     | -     | -     |
| Mov Cap-1 Maneuver   | 1481   | - | -      | 1490  | -      | - | 529   | 582    | 934   | 563   | 580   | 940   |
| Mov Cap-2 Maneuver   | -      | - | -      | -     | -      | - | 529   | 582    | -     | 563   | 580   | -     |
| Stage 1              | -      | - | -      | -     | -      | - | 817   | 734    | -     | 852   | 768   | -     |
| Stage 2              | -      | - | -      | -     | -      | - | 728   | 768    | -     | 728   | 733   | -     |

| Approach             | NB  | SB  | SE   | NW   |
|----------------------|-----|-----|------|------|
| HCM Control Delay, s | 1.6 | 2.2 | 11.1 | 10.7 |
| HCM LOS              |     |     | B    | B    |

| Minor Lane/Major Mvmt | NBL   | NBT | NBRNWLn1 | SELn1 | SBL   | SBT   | SBR |
|-----------------------|-------|-----|----------|-------|-------|-------|-----|
| Capacity (veh/h)      | 1481  | -   | -        | 715   | 652   | 1490  | -   |
| HCM Lane V/C Ratio    | 0.014 | -   | -        | 0.123 | 0.092 | 0.024 | -   |
| HCM Control Delay (s) | 7.5   | 0   | -        | 10.7  | 11.1  | 7.5   | 0   |
| HCM Lane LOS          | A     | A   | -        | B     | B     | A     | A   |
| HCM 95th %tile Q(veh) | 0     | -   | -        | 0.4   | 0.3   | 0.1   | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 0.5  |      |      |      |      |      |
| Movement                 | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
| Lane Configurations      | T    |      | L    |      | T    |      |
| Traffic Vol, veh/h       | 7    | 15   | 19   | 496  | 467  | 10   |
| Future Vol, veh/h        | 7    | 15   | 19   | 496  | 467  | 10   |
| Conflicting Peds, #/hr   | 0    | 0    | 10   | 0    | 0    | 10   |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 6    | 6    | 6    | 6    |
| Mvmt Flow                | 8    | 16   | 21   | 539  | 508  | 11   |

| Major/Minor          | Minor2 | Major1 | Major2 |   |   |   |
|----------------------|--------|--------|--------|---|---|---|
| Conflicting Flow All | 1105   | 524    | 529    | 0 | - | 0 |
| Stage 1              | 524    | -      | -      | - | - | - |
| Stage 2              | 581    | -      | -      | - | - | - |
| Critical Hdwy        | 6.43   | 6.23   | 4.16   | - | - | - |
| Critical Hdwy Stg 1  | 5.43   | -      | -      | - | - | - |
| Critical Hdwy Stg 2  | 5.43   | -      | -      | - | - | - |
| Follow-up Hdwy       | 3.527  | 3.327  | 2.254  | - | - | - |
| Pot Cap-1 Maneuver   | 232    | 551    | 1018   | - | - | - |
| Stage 1              | 592    | -      | -      | - | - | - |
| Stage 2              | 557    | -      | -      | - | - | - |
| Platoon blocked, %   |        |        |        | - | - | - |
| Mov Cap-1 Maneuver   | 221    | 546    | 1008   | - | - | - |
| Mov Cap-2 Maneuver   | 221    | -      | -      | - | - | - |
| Stage 1              | 568    | -      | -      | - | - | - |
| Stage 2              | 551    | -      | -      | - | - | - |

| Approach             | EB   | NB  | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 15.3 | 0.3 | 0  |
| HCM LOS              | C    |     |    |

| Minor Lane/Major Mvmt | NBL  | NBT | EBLn1 | SBT | SBR |
|-----------------------|------|-----|-------|-----|-----|
| Capacity (veh/h)      | 1008 | -   | 372   | -   | -   |
| HCM Lane V/C Ratio    | 0.02 | -   | 0.064 | -   | -   |
| HCM Control Delay (s) | 8.6  | 0   | 15.3  | -   | -   |
| HCM Lane LOS          | A    | A   | C     | -   | -   |
| HCM 95th %tile Q(veh) | 0.1  | -   | 0.2   | -   | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 0.7  |      |      |      |      |      |
| Movement                 | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
| Lane Configurations      | T    |      |      | T    |      | T    |
| Traffic Vol, veh/h       | 10   | 22   | 21   | 492  | 473  | 17   |
| Future Vol, veh/h        | 10   | 22   | 21   | 492  | 473  | 17   |
| Conflicting Peds, #/hr   | 0    | 0    | 10   | 0    | 0    | 10   |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 6    | 6    | 6    | 6    |
| Mvmt Flow                | 11   | 24   | 23   | 535  | 514  | 18   |

| Major/Minor          | Minor2 | Major1 | Major2 |   |   |   |
|----------------------|--------|--------|--------|---|---|---|
| Conflicting Flow All | 1114   | 533    | 542    | 0 | - | 0 |
| Stage 1              | 533    | -      | -      | - | - | - |
| Stage 2              | 581    | -      | -      | - | - | - |
| Critical Hdwy        | 6.43   | 6.23   | 4.16   | - | - | - |
| Critical Hdwy Stg 1  | 5.43   | -      | -      | - | - | - |
| Critical Hdwy Stg 2  | 5.43   | -      | -      | - | - | - |
| Follow-up Hdwy       | 3.527  | 3.327  | 2.254  | - | - | - |
| Pot Cap-1 Maneuver   | 229    | 545    | 1007   | - | - | - |
| Stage 1              | 586    | -      | -      | - | - | - |
| Stage 2              | 557    | -      | -      | - | - | - |
| Platoon blocked, %   |        |        |        | - | - | - |
| Mov Cap-1 Maneuver   | 217    | 540    | 997    | - | - | - |
| Mov Cap-2 Maneuver   | 217    | -      | -      | - | - | - |
| Stage 1              | 561    | -      | -      | - | - | - |
| Stage 2              | 551    | -      | -      | - | - | - |

| Approach             | EB   | NB  | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 15.8 | 0.4 | 0  |
| HCM LOS              | C    |     |    |

| Minor Lane/Major Mvmt | NBL   | NBT | EBLn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h)      | 997   | -   | 369   | -   | -   |
| HCM Lane V/C Ratio    | 0.023 | -   | 0.094 | -   | -   |
| HCM Control Delay (s) | 8.7   | 0   | 15.8  | -   | -   |
| HCM Lane LOS          | A     | A   | C     | -   | -   |
| HCM 95th %tile Q(veh) | 0.1   | -   | 0.3   | -   | -   |

HCM 6th TWSC  
8: Road 160 & Beechwood Avenue

05/10/2019

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 1.3  |      |      |      |      |      |
| Movement                 | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
| Lane Configurations      |      |      |      |      |      |      |
| Traffic Vol, veh/h       | 17   | 46   | 36   | 516  | 429  | 43   |
| Future Vol, veh/h        | 17   | 46   | 36   | 516  | 429  | 43   |
| Conflicting Peds, #/hr   | 0    | 0    | 10   | 0    | 0    | 10   |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 6    | 6    | 6    | 6    |
| Mvmt Flow                | 18   | 50   | 39   | 561  | 466  | 47   |

| Major/Minor          | Minor2 | Major1 | Major2 |   |   |   |
|----------------------|--------|--------|--------|---|---|---|
| Conflicting Flow All | 1139   | 500    | 523    | 0 | - | 0 |
| Stage 1              | 500    | -      | -      | - | - | - |
| Stage 2              | 639    | -      | -      | - | - | - |
| Critical Hdwy        | 6.43   | 6.23   | 4.16   | - | - | - |
| Critical Hdwy Stg 1  | 5.43   | -      | -      | - | - | - |
| Critical Hdwy Stg 2  | 5.43   | -      | -      | - | - | - |
| Follow-up Hdwy       | 3.527  | 3.327  | 2.254  | - | - | - |
| Pot Cap-1 Maneuver   | 222    | 569    | 1023   | - | - | - |
| Stage 1              | 607    | -      | -      | - | - | - |
| Stage 2              | 524    | -      | -      | - | - | - |
| Platoon blocked, %   |        |        |        | - | - | - |
| Mov Cap-1 Maneuver   | 205    | 564    | 1013   | - | - | - |
| Mov Cap-2 Maneuver   | 205    | -      | -      | - | - | - |
| Stage 1              | 568    | -      | -      | - | - | - |
| Stage 2              | 519    | -      | -      | - | - | - |

| Approach             | EB   | NB  | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 16.4 | 0.6 | 0  |
| HCM LOS              | C    |     |    |

| Minor Lane/Major Mvmt | NBL   | NBT | EBLn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h)      | 1013  | -   | 383   | -   | -   |
| HCM Lane V/C Ratio    | 0.039 | -   | 0.179 | -   | -   |
| HCM Control Delay (s) | 8.7   | 0   | 16.4  | -   | -   |
| HCM Lane LOS          | A     | A   | C     | -   | -   |
| HCM 95th %tile Q(veh) | 0.1   | -   | 0.6   | -   | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 0.9  |      |      |      |      |      |
| Movement                 | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
| Lane Configurations      | T    |      |      | T    |      | T    |
| Traffic Vol, veh/h       | 19   | 24   | 21   | 527  | 458  | 21   |
| Future Vol, veh/h        | 19   | 24   | 21   | 527  | 458  | 21   |
| Conflicting Peds, #/hr   | 0    | 0    | 10   | 0    | 0    | 10   |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 6    | 6    | 6    | 6    |
| Mvmt Flow                | 21   | 26   | 23   | 573  | 498  | 23   |

| Major/Minor          | Minor2 | Major1 | Major2 |   |   |   |
|----------------------|--------|--------|--------|---|---|---|
| Conflicting Flow All | 1139   | 520    | 531    | 0 | - | 0 |
| Stage 1              | 520    | -      | -      | - | - | - |
| Stage 2              | 619    | -      | -      | - | - | - |
| Critical Hdwy        | 6.43   | 6.23   | 4.16   | - | - | - |
| Critical Hdwy Stg 1  | 5.43   | -      | -      | - | - | - |
| Critical Hdwy Stg 2  | 5.43   | -      | -      | - | - | - |
| Follow-up Hdwy       | 3.527  | 3.327  | 2.254  | - | - | - |
| Pot Cap-1 Maneuver   | 222    | 554    | 1016   | - | - | - |
| Stage 1              | 595    | -      | -      | - | - | - |
| Stage 2              | 535    | -      | -      | - | - | - |
| Platoon blocked, %   |        |        |        | - | - | - |
| Mov Cap-1 Maneuver   | 210    | 549    | 1006   | - | - | - |
| Mov Cap-2 Maneuver   | 210    | -      | -      | - | - | - |
| Stage 1              | 569    | -      | -      | - | - | - |
| Stage 2              | 530    | -      | -      | - | - | - |

| Approach             | EB   | NB  | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 18.2 | 0.3 | 0  |
| HCM LOS              | C    |     |    |

| Minor Lane/Major Mvmt | NBL   | NBT | EBLn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h)      | 1006  | -   | 320   | -   | -   |
| HCM Lane V/C Ratio    | 0.023 | -   | 0.146 | -   | -   |
| HCM Control Delay (s) | 8.7   | 0   | 18.2  | -   | -   |
| HCM Lane LOS          | A     | A   | C     | -   | -   |
| HCM 95th %tile Q(veh) | 0.1   | -   | 0.5   | -   | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 2.3  |      |      |      |      |      |
| Movement                 | NBL  | NBT  | SBT  | SBR  | SEL  | SER  |
| Lane Configurations      |      | ↶    | ↷    |      | ↶    | ↷    |
| Traffic Vol, veh/h       | 81   | 298  | 224  | 7    | 5    | 81   |
| Future Vol, veh/h        | 81   | 298  | 224  | 7    | 5    | 81   |
| Conflicting Peds, #/hr   | 10   | 0    | 0    | 10   | 0    | 0    |
| Sign Control             | Free | Free | Free | Free | Stop | Stop |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | -    | -    | -    | -    | 0    | -    |
| Veh in Median Storage, # | -    | 0    | 0    | -    | 0    | -    |
| Grade, %                 | -    | 0    | 0    | -    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow                | 88   | 324  | 243  | 8    | 5    | 88   |

| Major/Minor          | Major1 | Major2 | Minor2 |   |             |
|----------------------|--------|--------|--------|---|-------------|
| Conflicting Flow All | 261    | 0      | -      | 0 | 757 257     |
| Stage 1              | -      | -      | -      | - | 257 -       |
| Stage 2              | -      | -      | -      | - | 500 -       |
| Critical Hdwy        | 4.13   | -      | -      | - | 6.43 6.23   |
| Critical Hdwy Stg 1  | -      | -      | -      | - | 5.43 -      |
| Critical Hdwy Stg 2  | -      | -      | -      | - | 5.43 -      |
| Follow-up Hdwy       | 2.227  | -      | -      | - | 3.527 3.327 |
| Pot Cap-1 Maneuver   | 1298   | -      | -      | - | 374 779     |
| Stage 1              | -      | -      | -      | - | 784 -       |
| Stage 2              | -      | -      | -      | - | 607 -       |
| Platoon blocked, %   |        | -      | -      | - |             |
| Mov Cap-1 Maneuver   | 1286   | -      | -      | - | 336 772     |
| Mov Cap-2 Maneuver   | -      | -      | -      | - | 336 -       |
| Stage 1              | -      | -      | -      | - | 712 -       |
| Stage 2              | -      | -      | -      | - | 601 -       |

| Approach             | NB  | SB | SE   |
|----------------------|-----|----|------|
| HCM Control Delay, s | 1.7 | 0  | 10.8 |
| HCM LOS              |     |    | B    |

| Minor Lane/Major Mvmt | NBL   | NBT | SELn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h)      | 1286  | -   | 718   | -   | -   |
| HCM Lane V/C Ratio    | 0.068 | -   | 0.13  | -   | -   |
| HCM Control Delay (s) | 8     | 0   | 10.8  | -   | -   |
| HCM Lane LOS          | A     | A   | B     | -   | -   |
| HCM 95th %tile Q(veh) | 0.2   | -   | 0.4   | -   | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 0.8  |      |      |      |      |      |
| Movement                 | WBL  | WBR  | NBT  | NBR  | SBL  | SBT  |
| Lane Configurations      | W    |      | T    |      |      | T    |
| Traffic Vol, veh/h       | 3    | 12   | 105  | 9    | 7    | 107  |
| Future Vol, veh/h        | 3    | 12   | 105  | 9    | 7    | 107  |
| Conflicting Peds, #/hr   | 10   | 10   | 0    | 10   | 10   | 0    |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | 0    | -    | -    | 0    |
| Grade, %                 | 0    | -    | 0    | -    | -    | 0    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow                | 3    | 13   | 114  | 10   | 8    | 116  |

| Major/Minor          | Minor1 | Major1 | Major2 |   |       |
|----------------------|--------|--------|--------|---|-------|
| Conflicting Flow All | 271    | 139    | 0      | 0 | 134   |
| Stage 1              | 129    | -      | -      | - | -     |
| Stage 2              | 142    | -      | -      | - | -     |
| Critical Hdwy        | 6.43   | 6.23   | -      | - | 4.13  |
| Critical Hdwy Stg 1  | 5.43   | -      | -      | - | -     |
| Critical Hdwy Stg 2  | 5.43   | -      | -      | - | -     |
| Follow-up Hdwy       | 3.527  | 3.327  | -      | - | 2.227 |
| Pot Cap-1 Maneuver   | 716    | 907    | -      | - | 1444  |
| Stage 1              | 894    | -      | -      | - | -     |
| Stage 2              | 883    | -      | -      | - | -     |
| Platoon blocked, %   |        |        | -      | - | -     |
| Mov Cap-1 Maneuver   | 697    | 890    | -      | - | 1430  |
| Mov Cap-2 Maneuver   | 697    | -      | -      | - | -     |
| Stage 1              | 880    | -      | -      | - | -     |
| Stage 2              | 874    | -      | -      | - | -     |

| Approach             | WB  | NB | SB  |
|----------------------|-----|----|-----|
| HCM Control Delay, s | 9.4 | 0  | 0.5 |
| HCM LOS              | A   |    |     |

| Minor Lane/Major Mvmt | NBT | NBRWBLn1 | SBL   | SBT   |
|-----------------------|-----|----------|-------|-------|
| Capacity (veh/h)      | -   | -        | 843   | 1430  |
| HCM Lane V/C Ratio    | -   | -        | 0.019 | 0.005 |
| HCM Control Delay (s) | -   | -        | 9.4   | 7.5   |
| HCM Lane LOS          | -   | -        | A     | A     |
| HCM 95th %tile Q(veh) | -   | -        | 0.1   | 0     |

| Intersection              |      |
|---------------------------|------|
| Intersection Delay, s/veh | 13.6 |
| Intersection LOS          | B    |

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h  | 56   | 288  | 15   | 6    | 322  | 49   | 23   | 9    | 5    | 42   | 17   | 83   |
| Future Vol, veh/h   | 56   | 288  | 15   | 6    | 322  | 49   | 23   | 9    | 5    | 42   | 17   | 83   |
| Peak Hour Factor    | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, %   | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow           | 61   | 313  | 16   | 7    | 350  | 53   | 25   | 10   | 5    | 46   | 18   | 90   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB   | WB   | NB  | SB   |
|----------------------------|------|------|-----|------|
| Opposing Approach          | WB   | EB   | SB  | NB   |
| Opposing Lanes             | 1    | 1    | 1   | 1    |
| Conflicting Approach Left  | SB   | NB   | EB  | WB   |
| Conflicting Lanes Left     | 1    | 1    | 1   | 1    |
| Conflicting Approach Right | NB   | SB   | WB  | EB   |
| Conflicting Lanes Right    | 1    | 1    | 1   | 1    |
| HCM Control Delay          | 14.3 | 14.5 | 9.9 | 10.6 |
| HCM LOS                    | B    | B    | A   | B    |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 62%   | 16%   | 2%    | 30%   |
| Vol Thru, %            | 24%   | 80%   | 85%   | 12%   |
| Vol Right, %           | 14%   | 4%    | 13%   | 58%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 37    | 359   | 377   | 142   |
| LT Vol                 | 23    | 56    | 6     | 42    |
| Through Vol            | 9     | 288   | 322   | 17    |
| RT Vol                 | 5     | 15    | 49    | 83    |
| Lane Flow Rate         | 40    | 390   | 410   | 154   |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.071 | 0.552 | 0.569 | 0.245 |
| Departure Headway (Hd) | 6.321 | 5.095 | 4.998 | 5.709 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 565   | 706   | 721   | 628   |
| Service Time           | 4.374 | 3.127 | 3.028 | 3.75  |
| HCM Lane V/C Ratio     | 0.071 | 0.552 | 0.569 | 0.245 |
| HCM Control Delay      | 9.9   | 14.3  | 14.5  | 10.6  |
| HCM Lane LOS           | A     | B     | B     | B     |
| HCM 95th-tile Q        | 0.2   | 3.4   | 3.6   | 1     |

| Intersection              |      |
|---------------------------|------|
| Intersection Delay, s/veh | 20.7 |
| Intersection LOS          | C    |

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      | ↕    | ↕    |      |      | ↕    | ↕    |      | ↕    | ↕    |
| Traffic Vol, veh/h  | 100  | 161  | 11   | 122  | 156  | 23   | 25   | 243  | 83   | 34   | 218  | 96   |
| Future Vol, veh/h   | 100  | 161  | 11   | 122  | 156  | 23   | 25   | 243  | 83   | 34   | 218  | 96   |
| Peak Hour Factor    | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, %   | 3    | 3    | 3    | 6    | 6    | 6    | 6    | 6    | 6    | 3    | 3    | 3    |
| Mvmt Flow           | 109  | 175  | 12   | 133  | 170  | 25   | 27   | 264  | 90   | 37   | 237  | 104  |
| Number of Lanes     | 0    | 1    | 0    | 1    | 1    | 0    | 0    | 1    | 1    | 0    | 1    | 1    |

| Approach                   | EB   | WB   | NB   | SB   |
|----------------------------|------|------|------|------|
| Opposing Approach          | WB   | EB   | SB   | NB   |
| Opposing Lanes             | 2    | 1    | 2    | 2    |
| Conflicting Approach Left  | SB   | NB   | EB   | WB   |
| Conflicting Lanes Left     | 2    | 2    | 1    | 2    |
| Conflicting Approach Right | NB   | SB   | WB   | EB   |
| Conflicting Lanes Right    | 2    | 2    | 2    | 1    |
| HCM Control Delay          | 26.4 | 16.2 | 21.4 | 19.6 |
| HCM LOS                    | D    | C    | C    | C    |

| Lane                   | NBLn1 | NBLn2 | EBLn1 | WBLn1 | WBLn2 | SBLn1 | SBLn2 |
|------------------------|-------|-------|-------|-------|-------|-------|-------|
| Vol Left, %            | 9%    | 0%    | 37%   | 100%  | 0%    | 13%   | 0%    |
| Vol Thru, %            | 91%   | 0%    | 59%   | 0%    | 87%   | 87%   | 0%    |
| Vol Right, %           | 0%    | 100%  | 4%    | 0%    | 13%   | 0%    | 100%  |
| Sign Control           | Stop  |
| Traffic Vol by Lane    | 268   | 83    | 272   | 122   | 179   | 252   | 96    |
| LT Vol                 | 25    | 0     | 100   | 122   | 0     | 34    | 0     |
| Through Vol            | 243   | 0     | 161   | 0     | 156   | 218   | 0     |
| RT Vol                 | 0     | 83    | 11    | 0     | 23    | 0     | 96    |
| Lane Flow Rate         | 291   | 90    | 296   | 133   | 195   | 274   | 104   |
| Geometry Grp           | 7     | 7     | 6     | 7     | 7     | 7     | 7     |
| Degree of Util (X)     | 0.649 | 0.182 | 0.671 | 0.319 | 0.434 | 0.61  | 0.209 |
| Departure Headway (Hd) | 8.021 | 7.248 | 8.165 | 8.647 | 8.038 | 8.017 | 7.223 |
| Convergence, Y/N       | Yes   |
| Cap                    | 452   | 496   | 443   | 416   | 448   | 452   | 498   |
| Service Time           | 5.751 | 4.979 | 6.2   | 6.396 | 5.787 | 5.75  | 4.956 |
| HCM Lane V/C Ratio     | 0.644 | 0.181 | 0.668 | 0.32  | 0.435 | 0.606 | 0.209 |
| HCM Control Delay      | 24.4  | 11.6  | 26.4  | 15.4  | 16.8  | 22.5  | 11.9  |
| HCM Lane LOS           | C     | B     | D     | C     | C     | C     | B     |
| HCM 95th-tile Q        | 4.5   | 0.7   | 4.8   | 1.4   | 2.2   | 4     | 0.8   |

| Intersection              |      |
|---------------------------|------|
| Intersection Delay, s/veh | 17.5 |
| Intersection LOS          | C    |

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h  | 45   | 351  | 34   | 9    | 281  | 70   | 23   | 23   | 15   | 107  | 34   | 63   |
| Future Vol, veh/h   | 45   | 351  | 34   | 9    | 281  | 70   | 23   | 23   | 15   | 107  | 34   | 63   |
| Peak Hour Factor    | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, %   | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow           | 49   | 382  | 37   | 10   | 305  | 76   | 25   | 25   | 16   | 116  | 37   | 68   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB   | WB   | NB   | SB   |
|----------------------------|------|------|------|------|
| Opposing Approach          | WB   | EB   | SB   | NB   |
| Opposing Lanes             | 1    | 1    | 1    | 1    |
| Conflicting Approach Left  | SB   | NB   | EB   | WB   |
| Conflicting Lanes Left     | 1    | 1    | 1    | 1    |
| Conflicting Approach Right | NB   | SB   | WB   | EB   |
| Conflicting Lanes Right    | 1    | 1    | 1    | 1    |
| HCM Control Delay          | 21.1 | 16.6 | 10.8 | 13.3 |
| HCM LOS                    | C    | C    | B    | B    |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 38%   | 10%   | 3%    | 52%   |
| Vol Thru, %            | 38%   | 82%   | 78%   | 17%   |
| Vol Right, %           | 25%   | 8%    | 19%   | 31%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 61    | 430   | 360   | 204   |
| LT Vol                 | 23    | 45    | 9     | 107   |
| Through Vol            | 23    | 351   | 281   | 34    |
| RT Vol                 | 15    | 34    | 70    | 63    |
| Lane Flow Rate         | 66    | 467   | 391   | 222   |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.126 | 0.712 | 0.6   | 0.387 |
| Departure Headway (Hd) | 6.857 | 5.483 | 5.516 | 6.282 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 526   | 654   | 650   | 568   |
| Service Time           | 4.857 | 3.559 | 3.596 | 4.375 |
| HCM Lane V/C Ratio     | 0.125 | 0.714 | 0.602 | 0.391 |
| HCM Control Delay      | 10.8  | 21.1  | 16.6  | 13.3  |
| HCM Lane LOS           | B     | C     | C     | B     |
| HCM 95th-tile Q        | 0.4   | 5.9   | 4     | 1.8   |

| Intersection              |      |
|---------------------------|------|
| Intersection Delay, s/veh | 20.4 |
| Intersection LOS          | C    |

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      | ↕    | ↕    |      |      | ↕    | ↕    |      | ↕    | ↕    |
| Traffic Vol, veh/h  | 74   | 196  | 11   | 145  | 182  | 68   | 34   | 198  | 117  | 53   | 167  | 54   |
| Future Vol, veh/h   | 74   | 196  | 11   | 145  | 182  | 68   | 34   | 198  | 117  | 53   | 167  | 54   |
| Peak Hour Factor    | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, %   | 3    | 3    | 3    | 6    | 6    | 6    | 6    | 6    | 6    | 3    | 3    | 3    |
| Mvmt Flow           | 80   | 213  | 12   | 158  | 198  | 74   | 37   | 215  | 127  | 58   | 182  | 59   |
| Number of Lanes     | 0    | 1    | 0    | 1    | 1    | 0    | 0    | 1    | 1    | 0    | 1    | 1    |

| Approach                   | EB   | WB   | NB   | SB   |
|----------------------------|------|------|------|------|
| Opposing Approach          | WB   | EB   | SB   | NB   |
| Opposing Lanes             | 2    | 1    | 2    | 2    |
| Conflicting Approach Left  | SB   | NB   | EB   | WB   |
| Conflicting Lanes Left     | 2    | 2    | 1    | 2    |
| Conflicting Approach Right | NB   | SB   | WB   | EB   |
| Conflicting Lanes Right    | 2    | 2    | 2    | 1    |
| HCM Control Delay          | 26.8 | 18.8 | 18.3 | 18.8 |
| HCM LOS                    | D    | C    | C    | C    |

| Lane                   | NBLn1 | NBLn2 | EBLn1 | WBLn1 | WBLn2 | SBLn1 | SBLn2 |
|------------------------|-------|-------|-------|-------|-------|-------|-------|
| Vol Left, %            | 15%   | 0%    | 26%   | 100%  | 0%    | 24%   | 0%    |
| Vol Thru, %            | 85%   | 0%    | 70%   | 0%    | 73%   | 76%   | 0%    |
| Vol Right, %           | 0%    | 100%  | 4%    | 0%    | 27%   | 0%    | 100%  |
| Sign Control           | Stop  |
| Traffic Vol by Lane    | 232   | 117   | 281   | 145   | 250   | 220   | 54    |
| LT Vol                 | 34    | 0     | 74    | 145   | 0     | 53    | 0     |
| Through Vol            | 198   | 0     | 196   | 0     | 182   | 167   | 0     |
| RT Vol                 | 0     | 117   | 11    | 0     | 68    | 0     | 54    |
| Lane Flow Rate         | 252   | 127   | 305   | 158   | 272   | 239   | 59    |
| Geometry Grp           | 7     | 7     | 6     | 7     | 7     | 7     | 7     |
| Degree of Util (X)     | 0.567 | 0.258 | 0.681 | 0.366 | 0.577 | 0.547 | 0.12  |
| Departure Headway (Hd) | 8.097 | 7.297 | 8.024 | 8.352 | 7.641 | 8.238 | 7.388 |
| Convergence, Y/N       | Yes   |
| Cap                    | 444   | 488   | 449   | 429   | 470   | 435   | 482   |
| Service Time           | 5.893 | 5.092 | 6.12  | 6.147 | 5.436 | 6.038 | 5.187 |
| HCM Lane V/C Ratio     | 0.568 | 0.26  | 0.679 | 0.368 | 0.579 | 0.549 | 0.122 |
| HCM Control Delay      | 21.1  | 12.6  | 26.8  | 15.9  | 20.5  | 20.7  | 11.2  |
| HCM Lane LOS           | C     | B     | D     | C     | C     | C     | B     |
| HCM 95th-tile Q        | 3.4   | 1     | 5     | 1.7   | 3.6   | 3.2   | 0.4   |

| Intersection              |      |
|---------------------------|------|
| Intersection Delay, s/veh | 16.2 |
| Intersection LOS          | C    |

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h  | 62   | 320  | 17   | 7    | 358  | 55   | 26   | 10   | 5    | 46   | 19   | 93   |
| Future Vol, veh/h   | 62   | 320  | 17   | 7    | 358  | 55   | 26   | 10   | 5    | 46   | 19   | 93   |
| Peak Hour Factor    | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, %   | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow           | 67   | 348  | 18   | 8    | 389  | 60   | 28   | 11   | 5    | 50   | 21   | 101  |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB   | WB   | NB   | SB   |
|----------------------------|------|------|------|------|
| Opposing Approach          | WB   | EB   | SB   | NB   |
| Opposing Lanes             | 1    | 1    | 1    | 1    |
| Conflicting Approach Left  | SB   | NB   | EB   | WB   |
| Conflicting Lanes Left     | 1    | 1    | 1    | 1    |
| Conflicting Approach Right | NB   | SB   | WB   | EB   |
| Conflicting Lanes Right    | 1    | 1    | 1    | 1    |
| HCM Control Delay          | 17.2 | 17.7 | 10.4 | 11.5 |
| HCM LOS                    | C    | C    | B    | B    |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 63%   | 16%   | 2%    | 29%   |
| Vol Thru, %            | 24%   | 80%   | 85%   | 12%   |
| Vol Right, %           | 12%   | 4%    | 13%   | 59%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 41    | 399   | 420   | 158   |
| LT Vol                 | 26    | 62    | 7     | 46    |
| Through Vol            | 10    | 320   | 358   | 19    |
| RT Vol                 | 5     | 17    | 55    | 93    |
| Lane Flow Rate         | 45    | 434   | 457   | 172   |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.083 | 0.637 | 0.657 | 0.286 |
| Departure Headway (Hd) | 6.688 | 5.286 | 5.183 | 5.986 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 533   | 681   | 694   | 598   |
| Service Time           | 4.769 | 3.332 | 3.23  | 4.047 |
| HCM Lane V/C Ratio     | 0.084 | 0.637 | 0.659 | 0.288 |
| HCM Control Delay      | 10.4  | 17.2  | 17.7  | 11.5  |
| HCM Lane LOS           | B     | C     | C     | B     |
| HCM 95th-tile Q        | 0.3   | 4.6   | 4.9   | 1.2   |

| Intersection              |      |
|---------------------------|------|
| Intersection Delay, s/veh | 22.4 |
| Intersection LOS          | C    |

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      |      |      |      |      |      |      |      |      |      |      |      |
| Traffic Vol, veh/h  | 112  | 179  | 12   | 136  | 174  | 26   | 28   | 270  | 93   | 38   | 243  | 107  |
| Future Vol, veh/h   | 112  | 179  | 12   | 136  | 174  | 26   | 28   | 270  | 93   | 38   | 243  | 107  |
| Peak Hour Factor    | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, %   | 3    | 3    | 3    | 6    | 6    | 6    | 6    | 6    | 6    | 3    | 3    | 3    |
| Mvmt Flow           | 122  | 195  | 13   | 148  | 189  | 28   | 30   | 293  | 101  | 41   | 264  | 116  |
| Number of Lanes     | 1    | 1    | 0    | 1    | 1    | 0    | 0    | 1    | 1    | 0    | 1    | 1    |

| Approach                   | EB   | WB   | NB   | SB   |
|----------------------------|------|------|------|------|
| Opposing Approach          | WB   | EB   | SB   | NB   |
| Opposing Lanes             | 2    | 2    | 2    | 2    |
| Conflicting Approach Left  | SB   | NB   | EB   | WB   |
| Conflicting Lanes Left     | 2    | 2    | 2    | 2    |
| Conflicting Approach Right | NB   | SB   | WB   | EB   |
| Conflicting Lanes Right    | 2    | 2    | 2    | 2    |
| HCM Control Delay          | 17.9 | 18.5 | 27.3 | 24.3 |
| HCM LOS                    | C    | C    | D    | C    |

| Lane                   | NBLn1 | NBLn2 | EBLn1 | EBLn2 | WBLn1 | WBLn2 | SBLn1 | SBLn2 |
|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Vol Left, %            | 9%    | 0%    | 100%  | 0%    | 100%  | 0%    | 14%   | 0%    |
| Vol Thru, %            | 91%   | 0%    | 0%    | 94%   | 0%    | 87%   | 86%   | 0%    |
| Vol Right, %           | 0%    | 100%  | 0%    | 6%    | 0%    | 13%   | 0%    | 100%  |
| Sign Control           | Stop  |
| Traffic Vol by Lane    | 298   | 93    | 112   | 191   | 136   | 200   | 281   | 107   |
| LT Vol                 | 28    | 0     | 112   | 0     | 136   | 0     | 38    | 0     |
| Through Vol            | 270   | 0     | 0     | 179   | 0     | 174   | 243   | 0     |
| RT Vol                 | 0     | 93    | 0     | 12    | 0     | 26    | 0     | 107   |
| Lane Flow Rate         | 324   | 101   | 122   | 208   | 148   | 217   | 305   | 116   |
| Geometry Grp           | 7     | 7     | 7     | 7     | 7     | 7     | 7     | 7     |
| Degree of Util (X)     | 0.749 | 0.212 | 0.306 | 0.489 | 0.37  | 0.508 | 0.706 | 0.243 |
| Departure Headway (Hd) | 8.327 | 7.554 | 9.053 | 8.488 | 9.019 | 8.406 | 8.326 | 7.531 |
| Convergence, Y/N       | Yes   |
| Cap                    | 437   | 477   | 397   | 426   | 399   | 428   | 437   | 479   |
| Service Time           | 6.042 | 5.269 | 6.803 | 6.238 | 6.768 | 6.154 | 6.042 | 5.247 |
| HCM Lane V/C Ratio     | 0.741 | 0.212 | 0.307 | 0.488 | 0.371 | 0.507 | 0.698 | 0.242 |
| HCM Control Delay      | 32    | 12.3  | 15.8  | 19.1  | 17    | 19.6  | 28.7  | 12.7  |
| HCM Lane LOS           | D     | B     | C     | C     | C     | C     | D     | B     |
| HCM 95th-tile Q        | 6.2   | 0.8   | 1.3   | 2.6   | 1.7   | 2.8   | 5.4   | 0.9   |

| Intersection              |      |
|---------------------------|------|
| Intersection Delay, s/veh | 25.3 |
| Intersection LOS          | D    |

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h  | 50   | 391  | 38   | 10   | 313  | 77   | 26   | 26   | 17   | 119  | 38   | 71   |
| Future Vol, veh/h   | 50   | 391  | 38   | 10   | 313  | 77   | 26   | 26   | 17   | 119  | 38   | 71   |
| Peak Hour Factor    | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, %   | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Mvmt Flow           | 54   | 425  | 41   | 11   | 340  | 84   | 28   | 28   | 18   | 129  | 41   | 77   |
| Number of Lanes     | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 0    |

| Approach                   | EB   | WB   | NB   | SB   |
|----------------------------|------|------|------|------|
| Opposing Approach          | WB   | EB   | SB   | NB   |
| Opposing Lanes             | 1    | 1    | 1    | 1    |
| Conflicting Approach Left  | SB   | NB   | EB   | WB   |
| Conflicting Lanes Left     | 1    | 1    | 1    | 1    |
| Conflicting Approach Right | NB   | SB   | WB   | EB   |
| Conflicting Lanes Right    | 1    | 1    | 1    | 1    |
| HCM Control Delay          | 33.8 | 22.9 | 11.9 | 15.7 |
| HCM LOS                    | D    | C    | B    | C    |

| Lane                   | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|------------------------|-------|-------|-------|-------|
| Vol Left, %            | 38%   | 10%   | 3%    | 52%   |
| Vol Thru, %            | 38%   | 82%   | 78%   | 17%   |
| Vol Right, %           | 25%   | 8%    | 19%   | 31%   |
| Sign Control           | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 69    | 479   | 400   | 228   |
| LT Vol                 | 26    | 50    | 10    | 119   |
| Through Vol            | 26    | 391   | 313   | 38    |
| RT Vol                 | 17    | 38    | 77    | 71    |
| Lane Flow Rate         | 75    | 521   | 435   | 248   |
| Geometry Grp           | 1     | 1     | 1     | 1     |
| Degree of Util (X)     | 0.155 | 0.852 | 0.72  | 0.468 |
| Departure Headway (Hd) | 7.439 | 5.892 | 5.959 | 6.794 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 480   | 614   | 604   | 530   |
| Service Time           | 5.521 | 3.941 | 4.011 | 4.852 |
| HCM Lane V/C Ratio     | 0.156 | 0.849 | 0.72  | 0.468 |
| HCM Control Delay      | 11.9  | 33.8  | 22.9  | 15.7  |
| HCM Lane LOS           | B     | D     | C     | C     |
| HCM 95th-tile Q        | 0.5   | 9.4   | 6     | 2.5   |

| Intersection              |      |
|---------------------------|------|
| Intersection Delay, s/veh | 22.6 |
| Intersection LOS          | C    |

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | ↶    | ↷    |      | ↶    | ↷    |      |      | ↶    | ↷    |      | ↶    | ↷    |
| Traffic Vol, veh/h  | 83   | 219  | 12   | 162  | 203  | 76   | 38   | 220  | 131  | 59   | 186  | 60   |
| Future Vol, veh/h   | 83   | 219  | 12   | 162  | 203  | 76   | 38   | 220  | 131  | 59   | 186  | 60   |
| Peak Hour Factor    | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, %   | 3    | 3    | 3    | 6    | 6    | 6    | 6    | 6    | 6    | 3    | 3    | 3    |
| Mvmt Flow           | 90   | 238  | 13   | 176  | 221  | 83   | 41   | 239  | 142  | 64   | 202  | 65   |
| Number of Lanes     | 1    | 1    | 0    | 1    | 1    | 0    | 0    | 1    | 1    | 0    | 1    | 1    |

| Approach                   | EB   | WB   | NB   | SB   |
|----------------------------|------|------|------|------|
| Opposing Approach          | WB   | EB   | SB   | NB   |
| Opposing Lanes             | 2    | 2    | 2    | 2    |
| Conflicting Approach Left  | SB   | NB   | EB   | WB   |
| Conflicting Lanes Left     | 2    | 2    | 2    | 2    |
| Conflicting Approach Right | NB   | SB   | WB   | EB   |
| Conflicting Lanes Right    | 2    | 2    | 2    | 2    |
| HCM Control Delay          | 20.8 | 23.7 | 22.4 | 23.1 |
| HCM LOS                    | C    | C    | C    | C    |

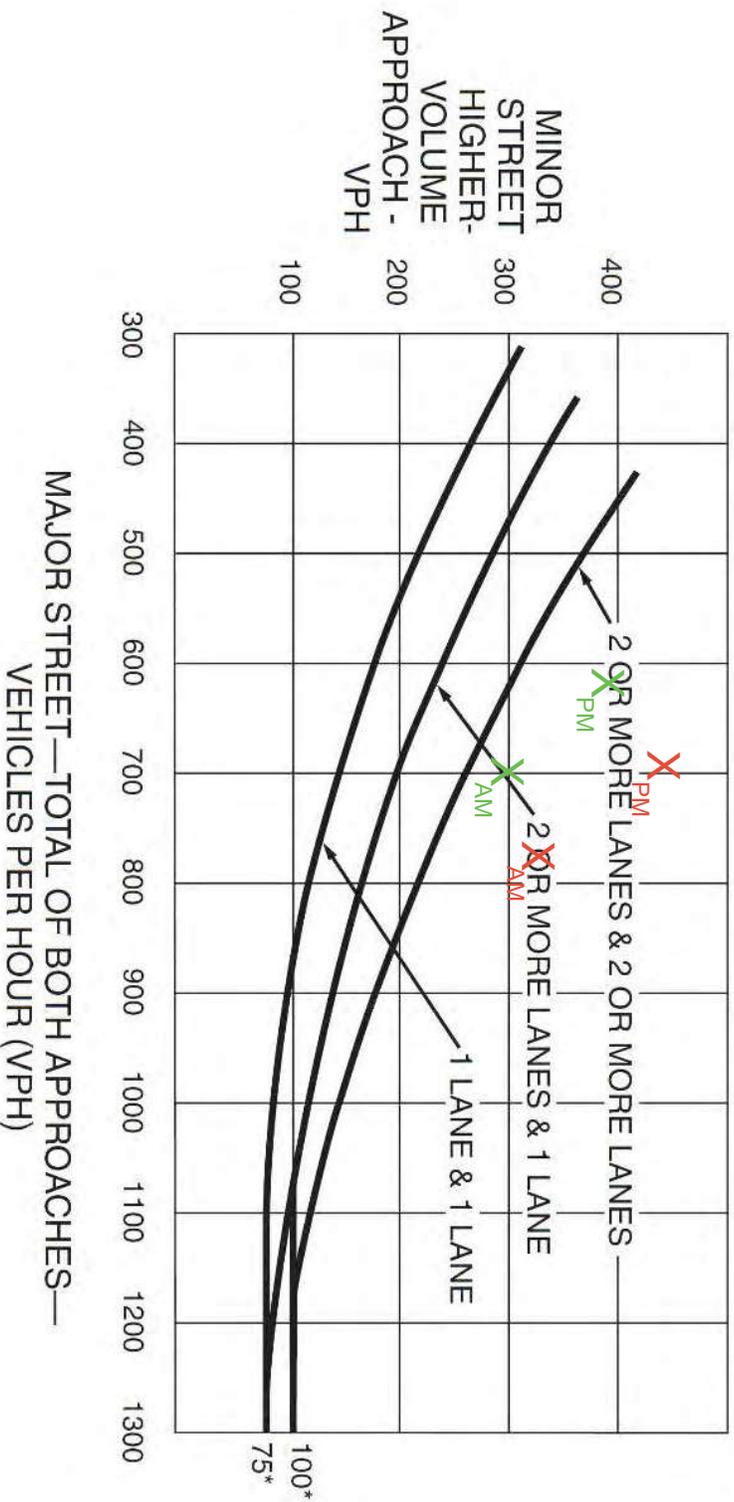
| Lane                   | NBLn1 | NBLn2 | EBLn1 | EBLn2 | WBLn1 | WBLn2 | SBLn1 | SBLn2 |
|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Vol Left, %            | 15%   | 0%    | 100%  | 0%    | 100%  | 0%    | 24%   | 0%    |
| Vol Thru, %            | 85%   | 0%    | 0%    | 95%   | 0%    | 73%   | 76%   | 0%    |
| Vol Right, %           | 0%    | 100%  | 0%    | 5%    | 0%    | 27%   | 0%    | 100%  |
| Sign Control           | Stop  |
| Traffic Vol by Lane    | 258   | 131   | 83    | 231   | 162   | 279   | 245   | 60    |
| LT Vol                 | 38    | 0     | 83    | 0     | 162   | 0     | 59    | 0     |
| Through Vol            | 220   | 0     | 0     | 219   | 0     | 203   | 186   | 0     |
| RT Vol                 | 0     | 131   | 0     | 12    | 0     | 76    | 0     | 60    |
| Lane Flow Rate         | 280   | 142   | 90    | 251   | 176   | 303   | 266   | 65    |
| Geometry Grp           | 7     | 7     | 7     | 7     | 7     | 7     | 7     | 7     |
| Degree of Util (X)     | 0.665 | 0.306 | 0.227 | 0.594 | 0.433 | 0.685 | 0.643 | 0.142 |
| Departure Headway (Hd) | 8.542 | 7.74  | 9.072 | 8.515 | 8.851 | 8.136 | 8.699 | 7.847 |
| Convergence, Y/N       | Yes   |
| Cap                    | 423   | 464   | 396   | 424   | 407   | 446   | 415   | 457   |
| Service Time           | 6.283 | 5.48  | 6.814 | 6.257 | 6.592 | 5.877 | 6.441 | 5.589 |
| HCM Lane V/C Ratio     | 0.662 | 0.306 | 0.227 | 0.592 | 0.432 | 0.679 | 0.641 | 0.142 |
| HCM Control Delay      | 26.7  | 13.9  | 14.5  | 23    | 18.2  | 26.9  | 25.9  | 11.9  |
| HCM Lane LOS           | D     | B     | B     | C     | C     | D     | D     | B     |
| HCM 95th-tile Q        | 4.7   | 1.3   | 0.9   | 3.7   | 2.1   | 5.1   | 4.4   | 0.5   |

# **APPENDIX D**

Peak Hour Traffic Signal Warrant Worksheets

# AVENUE 328 / ROAD 160

**Figure 4C-4. Warrant 3, Peak Hour (70% Factor)**  
 (COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



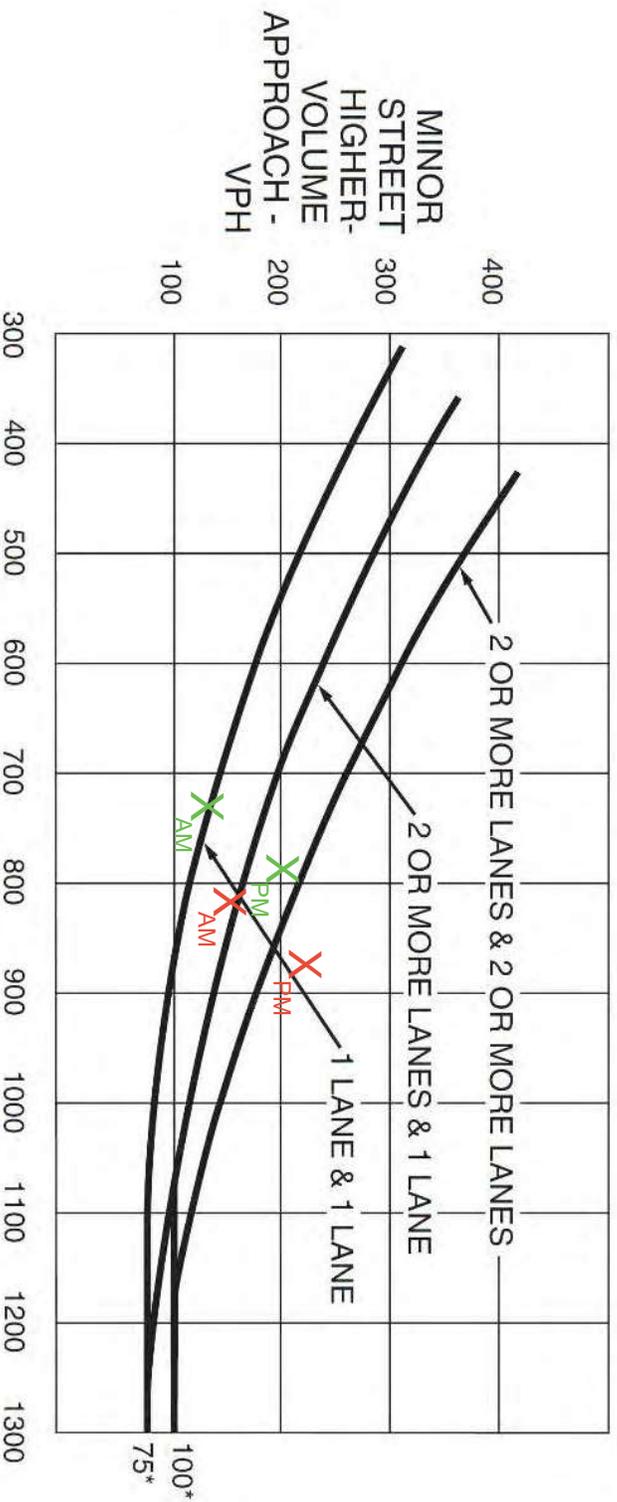
\*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

| LEGEND          |                           |
|-----------------|---------------------------|
| X <sub>AM</sub> | Future Year 2040 No Build |
| X <sub>PM</sub> | Future Year 2040 Build    |

# AVENUE 328 / ROAD 156

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



MAJOR STREET—TOTAL OF BOTH APPROACHES—  
VEHICLES PER HOUR (VPH)

\*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

| LEGEND          |                           |
|-----------------|---------------------------|
| X <sub>AM</sub> | Future Year 2040 No Build |
| X <sub>PM</sub> | Future Year 2040 Build    |

# Attachment “F”

---

## Wildfire Maps

## FIRE HAZARD SEVERITY ZONES IN SRA

Adopted by CAL FIRE on November 7, 2007

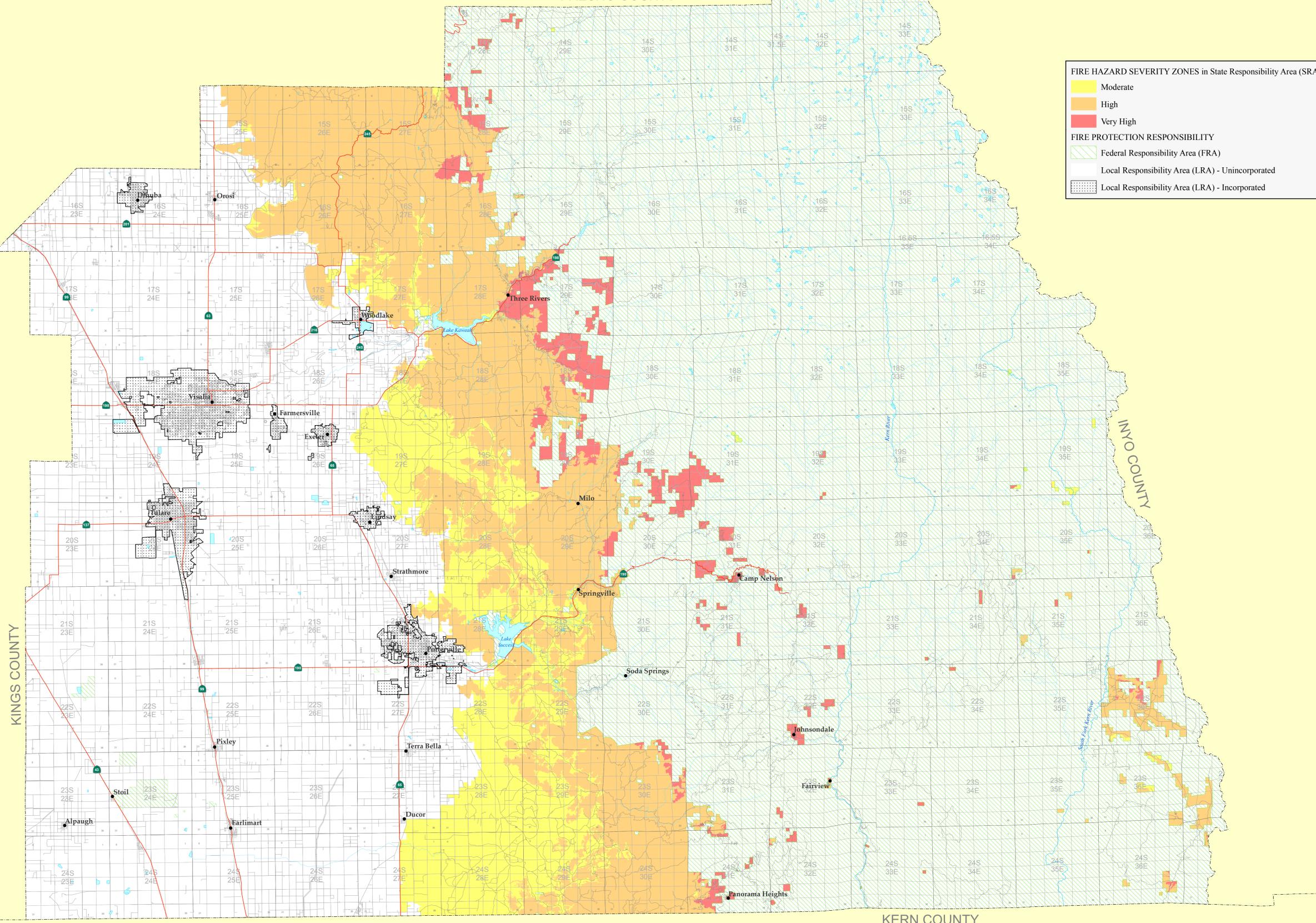
FRESNO COUNTY

**FIRE HAZARD SEVERITY ZONES in State Responsibility Area (SRA)**

- Moderate
- High
- Very High

**FIRE PROTECTION RESPONSIBILITY**

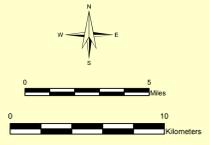
- Federal Responsibility Area (FRA)
- Local Responsibility Area (LRA) - Unincorporated
- Local Responsibility Area (LRA) - Incorporated



KINGS COUNTY

INYO COUNTY

KERN COUNTY



Projection Albers, NAD 1927  
Scale 1: 175,000  
at 38" x 35"  
November 06, 2007

Public Resources Code 4201-4204 direct the California Department of Forestry and Fire Protection (CAL FIRE) to map fire hazard within State Responsibility Areas (SRA), based on relevant factors such as fuels, terrain, and weather. These statutes were passed after significant wildland-urban interface fires, consequently these hazards are described according to their potential for causing ignitions to buildings. These zones referred to as Fire Hazard Severity Zones (FHSZ), provide the basis for application of various mitigation strategies to reduce risks to buildings associated with wildland fires. The zones also relate to the requirements for building codes designed to reduce the ignition potential to buildings in the wildland-urban interface zones.

These maps have been created by CAL FIRE's Fire and Resource Assessment Program (FRAP) using data and models describing development patterns, estimated fire behavior characteristics based on potential fuels over a 30-50 year time horizon, and expected burn probabilities to quantify the likelihood and nature of vegetation fire exposure to new construction. Details on the project and specific modeling methodology can be found at <http://frap.cdf.ca.gov/projects/hazardmethods.htm>.

The version of the map shown here represents the official "Maps of Fire Hazard Severity Zones in the State Responsibility Area of California" as required by Public Resources Code 4201-4204 and entitled in the California Code of Regulation, Title 14, Section 1290 Fire Hazard Severity Zones, and as adopted by CAL FIRE on November 7, 2007.

An interactive system for viewing map data is hosted by the UC Center for Fire at <http://firecenter.berkeley.edu/frap/>.

Questions can be directed to David Sapsis, at 916.445.5360, [dave.sapsis@fire.ca.gov](mailto:dave.sapsis@fire.ca.gov).

The State of California and the Department of Forestry and Fire Protection make no representations or warranties regarding the accuracy of data or maps. Neither the State nor the Department shall be liable under any circumstances for any direct, special, incidental, or consequential damages with respect to any claim by any user or third party on account of, or arising from, the use of data or maps.

Obtain FRAP maps, data, metadata and publications on the Internet at <http://frap.cdf.ca.gov>  
For more information, contact CAL FIRE-FRAP, PO Box 944246, Sacramento, CA 94244-2460, (916) 327-3939.

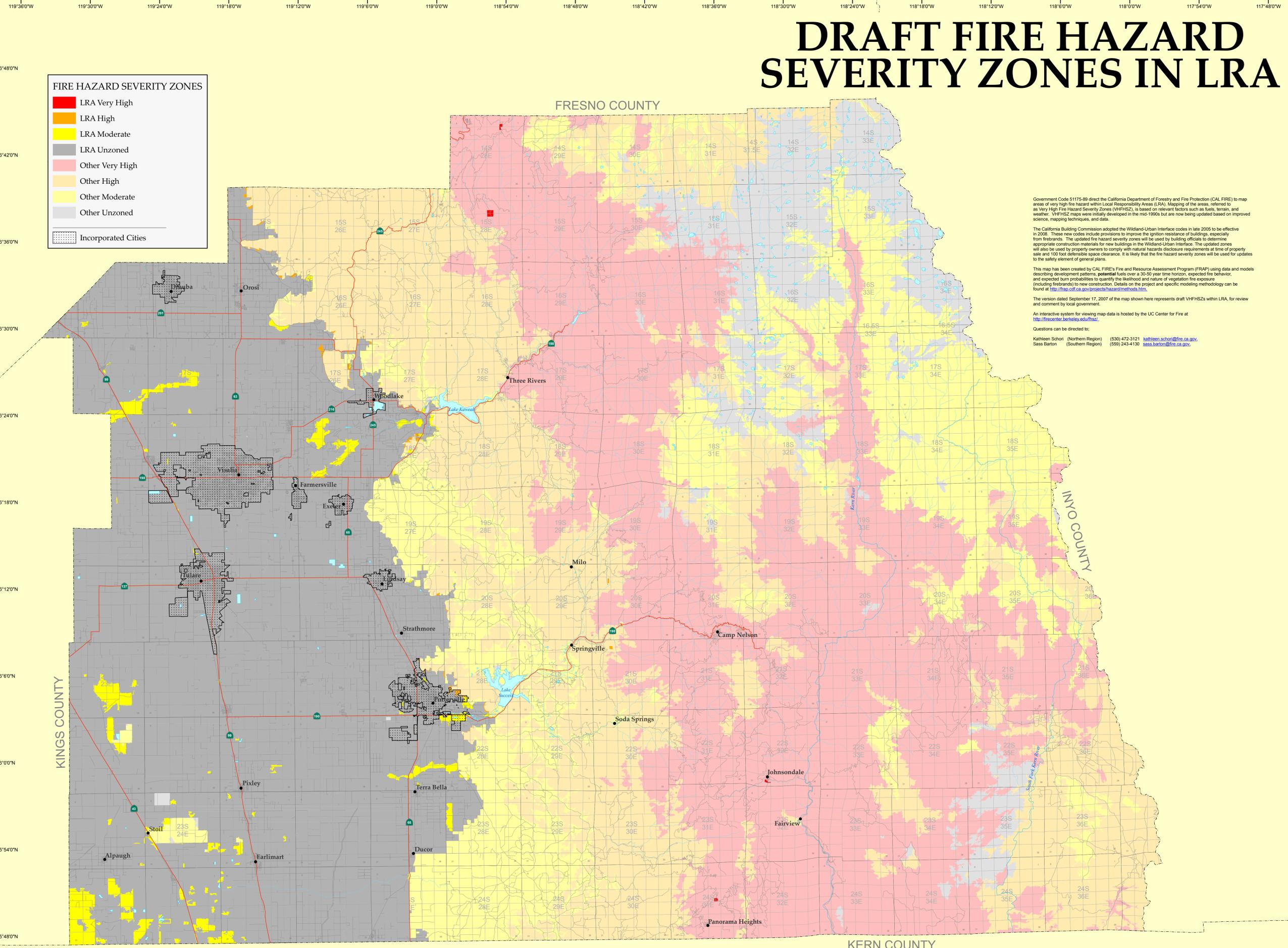
Arnold Schwarzenegger, Governor,  
State of California  
Mike Chrisman, Secretary for Resources,  
The Resources Agency  
Ruben Grijalva, Director,  
Department of Forestry and Fire Protection

MAP ID: FHSZS\_MAP  
DATA SOURCES  
CAL FIRE Fire Hazard Severity Zones (FHSZS06\_3)  
CAL FIRE State Responsibility Areas (SRA05\_5)  
CAL FIRE Incorporated Cities (Incorp07\_3)  
PLSS (1:100,000 USGS, Land Grants with CAL FIRE grid)

## DRAFT FIRE HAZARD SEVERITY ZONES IN LRA

**FIRE HAZARD SEVERITY ZONES**

- LRA Very High
- LRA High
- LRA Moderate
- LRA Unzoned
- Other Very High
- Other High
- Other Moderate
- Other Unzoned
- Incorporated Cities



Government Code 51175-89 direct the California Department of Forestry and Fire Protection (CAL FIRE) to map areas of very high fire hazard within Local Responsibility Areas (LRA). Mapping of the areas, referred to as Very High Fire Hazard Severity Zones (VHFHSZ), is based on relevant factors such as fuels, terrain, and weather. VHFHSZ maps were initially developed in the mid-1990s but are now being updated based on improved science, mapping techniques, and data.

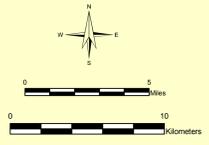
The California Building Commission adopted the Wildland-Urban Interface codes in late 2005 to be effective in 2008. These new codes include provisions to improve the ignition resistance of buildings, especially from firebrands. The updated fire hazard severity zones will be used by building officials to determine appropriate construction materials for new buildings in the Wildland-Urban Interface. The updated zones will also be used by property owners to comply with natural hazards disclosure requirements at time of property sale and 100 foot defensible space clearance. It is likely that the fire hazard severity zones will be used for updates to the safety element of general plans.

This map has been created by CAL FIRE's Fire and Resource Assessment Program (FRAP) using data and models describing development patterns, potential fuels over a 30-50 year time horizon, expected fire behavior, and expected burn probabilities to quantify the likelihood and nature of vegetation fire exposure (including firebrands) to new construction. Details on the project and specific modeling methodology can be found at <http://fire.cdf.ca.gov/docs/hazardmethods.htm>.

The version dated September 17, 2007 of the map shown here represents draft VHFHSZs within LRA, for review and comment by local government.

An interactive system for viewing map data is hosted by the UC Center for Fire at <http://firecenter.berkeley.edu/hsaz/>.

Questions can be directed to:  
 Kathleen Schori (Northern Region) (530) 472-3121 [kathleen.schori@fire.ca.gov](mailto:kathleen.schori@fire.ca.gov)  
 Sassi Barton (Southern Region) (559) 243-4130 [sassi.barton@fire.ca.gov](mailto:sassi.barton@fire.ca.gov)



Projection Albers, NAD 1927  
 Scale 1: 175,000  
 at 38" x 35"  
 October 05, 2007

The State of California and the Department of Forestry and Fire Protection make no representations or warranties regarding the accuracy of data or maps. Neither the State nor the Department shall be liable under any circumstances for any direct, special, incidental, or consequential damages with respect to any claim by any user or third party on account of, or arising from, the use of data or maps.

Obtain FRAP maps, data, metadata and publications on the Internet at <http://frap.cdf.ca.gov>  
 For more information, contact CAL FIRE-FRAP, PO Box 944246, Sacramento, CA 94244-2460, (916) 327-3939.

Arnold Schwarzenegger, Governor,  
 State of California  
 Mike Chrisman, Secretary for Resources,  
 The Resources Agency  
 Ruben Grijalva, Director,  
 Department of Forestry and Fire Protection

MAP ID: FHSZL06\_1\_MAP  
 DATA SOURCES  
 CAL FIRE Fire Hazard Severity Zones (FHSZL06\_1)  
 CAL FIRE State Responsibility Areas (SRA05\_4)  
 CAL FIRE Incorporated Cities (Incorp07\_2)  
 PLS (1:100,000 USGS, Land Grants with CAL FIRE grid)

# Attachment “G”

---

## Mitigation Monitoring and Reporting Program

## Mitigation Monitoring and Reporting Program

| Mitigation Measure/Condition of Approval   | When Monitoring is to Occur                            | Frequency of Monitoring | Agency Responsible for Monitoring | Method to Verify Compliance | Verification of Compliance |      |         |
|--|--|-------------------------|-----------------------------------|-----------------------------|----------------------------|------|---------|
|  |  |                         |                                   |                             | Initials                   | Date | Remarks |
| <b>BIOLOGICAL RESOURCES</b>  |  |                         |                                   |                             |                            |      |         |
| <i>Measures for Special Status Plant Species</i>   |  |                         |                                   |                             |                            |      |         |
| BIO-1  | Pre-construction Survey –<br>See Attached Tech Memo    |                         |                                   |                             |                            |      |         |
| <i>Measures for Special Status Animal Species</i>  |  |                         |                                   |                             |                            |      |         |
| BIO-2  | Pre-construction Survey –<br>See Attached Tech Memo    |                         |                                   |                             |                            |      |         |
| <i>Measures for Special Status Plant and Animal Species Identified in Pre-construction Surveys</i> |  |                         |                                   |                             |                            |      |         |
| BIO-3  | Employee Education Program –<br>See Attached Tech Memo |                         |                                   |                             |                            |      |         |
| <i>Measures for Nesting Raptors and Migratory Birds</i>  |  |                         |                                   |                             |                            |      |         |
| BIO-4  | Avoidance –<br>See Attached Tech Memo                  |                         |                                   |                             |                            |      |         |
| BIO-5  | Pre-construction Survey –<br>See Attached Tech Memo    |                         |                                   |                             |                            |      |         |
| BIO-6  | Pre-construction Survey –<br>See Attached Tech Memo    |                         |                                   |                             |                            |      |         |
| BIO-7  | Buffers –<br>See Attached Tech Memo                    |                         |                                   |                             |                            |      |         |
| <i>Measures for San Joaquin Kit Fox</i>  |  |                         |                                   |                             |                            |      |         |
| BIO-8  | Pre-construction Survey –<br>See Attached Tech Memo    |                         |                                   |                             |                            |      |         |
| BIO-9  | Avoidance –<br>See Attached Tech Memo                  |                         |                                   |                             |                            |      |         |
| BIO-10   | Minimization –<br>See Attached Tech Memo               |                         |                                   |                             |                            |      |         |
| BIO-11   | Mortality Reporting –<br>See Attached Tech Memo        |                         |                                   |                             |                            |      |         |
| <i>Measures for American Badger</i>  |  |                         |                                   |                             |                            |      |         |
| BIO-12   | Pre-construction Survey –<br>See Attached Tech Memo    |                         |                                   |                             |                            |      |         |
| BIO-13   | Avoidance –<br>See Attached Tech Memo                  |                         |                                   |                             |                            |      |         |
| <i>Measures for Roosting Bats</i>  |  |                         |                                   |                             |                            |      |         |
| BIO-14   | Temporal Avoidance –<br>See Attached Tech Memo         |                         |                                   |                             |                            |      |         |

## Mitigation Monitoring and Reporting Program

| Mitigation Measure/Condition of Approval |  | When Monitoring is to Occur | Frequency of Monitoring | Agency Responsible for Monitoring | Method to Verify Compliance | Verification of Compliance |      |         |
|--|--|-----------------------------|-------------------------|-----------------------------------|-----------------------------|----------------------------|------|---------|
|  |  |                             |                         |                                   |                             | Initials                   | Date | Remarks |
| BIO-15                                   | Pre-construction Survey – See Attached Tech Memo   |                             |                         |                                   |                             |                            |      |         |
| BIO-16                                   | Minimization – See Attached Tech Memo  |                             |                         |                                   |                             |                            |      |         |
| BIO-17                                   | Avoidance of Maternity Roosts – See Attached Tech Memo   |                             |                         |                                   |                             |                            |      |         |
| <b><i>Measures for Burrowing Owl</i></b> |  |                             |                         |                                   |                             |                            |      |         |
| BIO-18                                   | Pre-construction Survey – See Attached Tech Memo   |                             |                         |                                   |                             |                            |      |         |
| BIO-19                                   | Buffers – See Attached Tech Memo   |                             |                         |                                   |                             |                            |      |         |
| BIO-20                                   | Passive Relocation of Owls – See Attached Tech Memo  |                             |                         |                                   |                             |                            |      |         |
| <b>CULTURAL RESOURCES</b>                |  |                             |                         |                                   |                             |                            |      |         |
| CUL-1                                    | If, in the course of construction or operation within the Project area, any archaeological, historical, or paleontological resources are uncovered, discovered, or otherwise detected or observed, activities within fifty (50) feet of the find shall be ceased. A qualified archaeologist/paleontologist shall be contacted and advise the County of the site's significance. If the findings are deemed significant by the Tulare County Resources Management Agency, appropriate mitigation measures shall be required prior to any resumption of work in the affected area of the proposed Project. Where feasible, mitigation achieving preservation in place will be implemented. Preservation in place may be accomplished by, but is not limited to: planning construction to avoid archaeological/paleontological sites or covering archaeological/paleontological sites with a layer of chemically stable |                             |                         |                                   |                             |                            |      |         |

## Mitigation Monitoring and Reporting Program

| Mitigation Measure/Condition of Approval |   | When Monitoring is to Occur | Frequency of Monitoring | Agency Responsible for Monitoring | Method to Verify Compliance | Verification of Compliance |      |         |
|--|---|-----------------------------|-------------------------|-----------------------------------|-----------------------------|----------------------------|------|---------|
|  |   |                             |                         |                                   |                             | Initials                   | Date | Remarks |
|  | soil prior to building on the site. If significant resources are encountered, the feasibility of various methods of achieving preservation in place shall be considered, and an appropriate method of achieving preservation in place shall be selected and implemented, if feasible. If preservation in place is not feasible, other mitigation shall be implemented to minimize impacts to the site, such as data recovery efforts that will adequately recover scientifically consequential information from and about the site. Mitigation shall be consistent with CEQA Guidelines section 15126.4(b)(3).                |                             |                         |                                   |                             |                            |      |         |
| CUL-2                                    | If cultural/archeological/paleontological resources are encountered during project-specific construction or land modification activities, work shall stop and the County shall be notified at once to assess the nature, extent, and potential significance of any cultural resources. If such resources are determined to be significant, appropriate actions shall be determined. Depending upon the nature of the find, mitigation could involve avoidance, documentation, or other appropriate actions to be determined by a qualified archaeologist. For example, activities within 50 feet of the find shall be ceased. |                             |                         |                                   |                             |                            |      |         |
| <b>TRAFFIC</b>                           |   |                             |                         |                                   |                             |                            |      |         |
| TR-1                                     | Avenue 328 / Road 156: <ul style="list-style-type: none"> <li>Install Four-Way Stop</li> </ul>  |                             |                         |                                   |                             |                            |      |         |
| TR-2                                     | Avenue 328 / Road 160: <ul style="list-style-type: none"> <li>Widen the southbound</li> </ul>   |                             |                         |                                   |                             |                            |      |         |

## Mitigation Monitoring and Reporting Program

| Mitigation Measure/Condition of Approval |  | When Monitoring is to Occur | Frequency of Monitoring | Agency Responsible for Monitoring | Method to Verify Compliance | Verification of Compliance |      |         |
|--|--|-----------------------------|-------------------------|-----------------------------------|-----------------------------|----------------------------|------|---------|
|  |  |                             |                         |                                   |                             | Initials                   | Date | Remarks |
|  | approach to 1 shared left-through lane and 1 right turn lane (adding 1 right turn lane)  |                             |                         |                                   |                             |                            |      |         |
| TR-3                                     | Avenue 328 / Road 156: <ul style="list-style-type: none"> <li>See TR-1</li> </ul>  |                             |                         |                                   |                             |                            |      |         |
| TR-4                                     | Avenue 328 / Road 160: <ul style="list-style-type: none"> <li>Widen the southbound approach to 1 shared left-through lane and 1 right turn lane (adding 1 right turn lane)</li> <li>Widen the eastbound approach to 1 left turn lane and 1 through lane with a shared right (adding 1 left turn lane)</li> </ul>   |                             |                         |                                   |                             |                            |      |         |
| <b>TRIBAL CULTURAL RESOURCES</b>         |  |                             |                         |                                   |                             |                            |      |         |
| CUL-1                                    | See CUL-1  |                             |                         |                                   |                             |                            |      |         |
| CUL-2                                    | See CUL-2  |                             |                         |                                   |                             |                            |      |         |
| TCR-1                                    | Consistent with Section 7050.5 of the California Health and Safety Code and (CEQA Guidelines) Section 15064.5, if human remains of Native American origin are discovered during Project construction, it is necessary to comply with State laws relating to the disposition of Native American burials, which fall within the jurisdiction of the Native American Heritage Commission (Public Resources Code Sec. 5097). In the event of the accidental discovery or recognition of any human remains in any |                             |                         |                                   |                             |                            |      |         |

## Mitigation Monitoring and Reporting Program

| Mitigation Measure/Condition of Approval   | When Monitoring is to Occur | Frequency of Monitoring | Agency Responsible for Monitoring | Method to Verify Compliance | Verification of Compliance |      |         |
|--|-----------------------------|-------------------------|-----------------------------------|-----------------------------|----------------------------|------|---------|
|  |                             |                         |                                   |                             | Initials                   | Date | Remarks |
| <p>location other than a dedicated cemetery, the following steps should be taken:</p> <ol style="list-style-type: none"> <li>1. There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:               <ol style="list-style-type: none"> <li>a. The Tulare County Coroner/Sheriff must be contacted to determine that no investigation of the cause of death is required; and</li> <li>b. If the coroner determines the remains to be Native American:                   <ol style="list-style-type: none"> <li>i. The coroner shall contact the Native American Heritage Commission within 24 hours.</li> <li>ii. The Native American Heritage Commission shall identify the person or persons it believes to be the most likely descended from the deceased Native American.</li> <li>iii. The most likely descendent may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public</li> </ol> </li> </ol> </li> </ol> |                             |                         |                                   |                             |                            |      |         |

## Mitigation Monitoring and Reporting Program

| Mitigation Measure/Condition of Approval |   | When Monitoring is to Occur | Frequency of Monitoring | Agency Responsible for Monitoring | Method to Verify Compliance | Verification of Compliance |      |         |
|--|---|-----------------------------|-------------------------|-----------------------------------|-----------------------------|----------------------------|------|---------|
|  |   |                             |                         |                                   |                             | Initials                   | Date | Remarks |
|  | Resources Code section 5097.98, or<br>2. Where the following conditions occur, the landowner or his authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance.<br>a. The Native American Heritage Commission is unable to identify a most likely descendent or the most likely descendent failed to make a recommendation within 24 hours after being notified by the commission.<br>b. The descendant fails to make a recommendation; or<br>c. The landowner or his authorized representative rejects the recommendation of the descendent. |                             |                         |                                   |                             |                            |      |         |