BELLEVUE RANCH PROJECT

General Plan Amendment No. 17-02, Site Utilization Plan Revision No. 12 to Planned Development (P-D) No. 42 and Environmental Review No. 17-07

Addendum to the Adopted Merced Vision 2030 General Plan Environmental Impact Report SCH #2008071069

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ATTACHMENT 17

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1.0 INTRODUCTION

This Addendum has been prepared in accordance with the California Environmental Quality Act (CEQA) Statutes and Guidelines. This document has been prepared to serve as an Addendum to the previously certified 2030 General Plan Environmental Impact Report (EIR)(State Clearinghouse Number 2008071069) for the City of Merced 2030 General Plan, adopted by the Merced City Council on January 4, 2012 as per Resolution No. 2011-63.

The City of Merced is the Lead Agency for the environmental review of the proposed project modifications (Modified Project). For the purposes of this Addendum, the Project will be referred to as "Bellevue Ranch."

The Addendum addresses the Modified Project in relation to the Original Project analyzed in the previously certified EIR prepared for the 2030 General Plan. CEQA Guidelines Section 15164 describes the circumstances that require preparation of an Addendum as:

> *An addendum to an adopted negative declaration may be prepared only if minor technical changes or additions are necessary or none of the conditions described in Section 15162 calling for the preparation of a subsequent EIR or negative declaration have occurred.*
>
> *A brief explanation of the decision not to prepare a subsequent EIR pursuant to Section 15162 should be included in an addendum to an EIR, the lead agency's findings on the project, or elsewhere in the record.*

Information and technical analyses from the previously certified EIR are utilized throughout this Addendum. Relevant passages and information from the previously certified EIR are cited and available for review at:

City of Merced
Development Services Department
678 West 18th Street
Merced, CA 95340
https://www.cityofmerced.org/departments/development-services/planning-division/merced-vision-2030-general-plan

1.1 PURPOSE OF THE EIR ADDENDUM

In determining whether an Addendum is the appropriate document to analyze the proposed modifications to the project and its approval, CEQA Guidelines Section 15164 (Addendum to an EIR or Negative Declaration) states:

a) The lead agency or a responsible agency shall prepare an addendum to a previously certified EIR if some changes or additions are necessary but none of the conditions described in Section 15162 calling for preparation of a subsequent EIR have occurred.

b) An addendum to an adopted negative declaration may be prepared if only minor technical changes or additions are necessary or none of the conditions described in Section 15162 calling or the preparation of a subsequent EIR or negative declaration have occurred.

c) An addendum need not be circulated for public review but can be included in or attached to the final EIR or adopted negative declaration.

d) The decision-making body shall consider the addendum with the final EIR or adopted negative declaration prior to making a decision on the project.

e) A brief explanation of the decision not to prepare a subsequent EIR pursuant to Section 15162 should be included in an addendum to an EIR, the lead agency's required findings on the project, or elsewhere in the record. The explanation must be supported by substantial evidence.

1.2 BASIS FOR DECISION TO PREPARE AN ADDENDUM

When an environmental impact report has been certified for a project, Public Resources Code Section 21166 and CEQA Guidelines Sections 15162 and 15164 set forth the criteria for determining whether a subsequent EIR, subsequent negative declaration, addendum, or no further documentation be prepared in support of further agency action on the project. Under these Guidelines, a subsequent EIR or negative declaration shall be prepared if any of the following criteria are met:

(a) When an EIR has been certified or negative declaration adopted for a project, no subsequent EIR shall be prepared for that project unless the lead agency determines, on the basis of substantial evidence in the light of the whole record, one or more of the following:

(1) Substantial changes are proposed in the project which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;

(2) Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or

(3) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the negative declaration was adopted, shows any of the following:

(A) The project will have one or more significant effects not discussed in the previous EIR or negative declaration;

(B) Significant effects previously examined will be substantially more severe than shown in the previous EIR;

(C) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or

(D) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

(b) If changes to a project or its circumstances occur, or new information becomes available after adoption of a negative declaration, the lead agency shall prepare a subsequent EIR if required under subdivision (a). Otherwise, the lead agency shall determine whether to prepare a subsequent negative declaration, and addendum, or no further documentation.

The Modified Project is described in Section 2.0 of this Addendum. Based on a review of the Modified Project, no new significant environmental effects, no substantial increase in the severity of previously identified environmental effects, and no new information of substantial importance that would require major changes to the project pursuant to CEQA Guidelines Section 15162(a) have been identified. Therefore, an Addendum to the 2030 General Plan's certified EIR is the appropriate level of environmental review in accordance with CEQA Statutes and Guidelines.

2.0 PROPOSED MODIFICATIONS AND PROJECT DESCRIPTION

INTRODUCTION

2.1 ORIGINAL PROJECT

As discussed previously, the Merced Vision 2030 General Plan and associated EIR was adopted by the Merced City Council on January 4, 2012, as per Resolution No. 2011-63. An EIR was also previously prepared and certified for the Bellevue Ranch Master Development Plan (BRMDP) as part of the preparation and approval of the BRMDP in 1995. The Project Description of the General Plan Draft EIR can be found in Chapter Two of the Draft EIR, and is available at the following link:

https://www.cityofmerced.org/home/showpublisheddocument/4878/637031513984930000

While the Original Project consists of the City's Vision 2030 General Plan and General Plan EIR, the requested action consists of a General Plan Amendment and Site Utilization Plan (SUP) Revision affecting land use designations and the phasing of backbone infrastructure within the BRMDP. Specifically, the requested action pertains to "Villages" within the BRMDP. Table 2-1, below, provides the existing General Plan land use designation for the "Villages" included as part of this requested action. Approximately 155.87-acres are included as part of the Original Project and as part of the Modified Project.

Table 2-1 – Existing 2030 General Plan Land Use Designations

Village	Acres	Existing General Plan Land Use Designation
18B	2.05	Open Space/Park Recreation
19A and 19B	10.55	Open Space/Park Recreation
21A and 21B	20.35	Regional Community Commercial
22A and 22B	17.07	HMDR
R Street Multi-Family Village	5.81	Open Space/Park Recreation
25A	7.26	LMDR
25B	12.30	LMDR
26	13.3	LMDR
28 B	6.77	LMDR
Lot D1	1.21	Neighborhood Commercial
Lot D2	3.67	LMDR
Lot D3	1.16	LDR
Lot F	1.92	LDR
Lot G	9.42	LDR
Lot H	0.70	LMDR
Lot J	1.45	LDR
34A and 34 B	9.42	VR
Lot B	1.46	LDR
35 A	3.73	HMDR
35 B	15.55	Neighborhood Commercial
Totals	**155.87**	-

Under the current Vision 2030 General Plan, build out of the Project area would result in the following:

- 77 Low Density Residential Units;
- 301 Low to Medium Density Residential Units;
- 416 High to Medium Density Residential Units;
- 94 Village Residential Units;
- 271,611 square feet (sf) of Regional Community Commercial land uses;
- 182,577 sf of Neighborhood Commercial uses; and,
- 18.41-acres of Open Space/Park Recreation.

In total, the Original Project will result in 818 residential units, 404,128 sf of commercial uses, and 18.41-acres of open space and park recreational uses.

2.2 MODIFIED PROJECT

The Modified Project consists of the installation of site improvements and equipment to allow the amendment of various land uses within the BRMDP, including, but not limited to, amendments for Villages 18, 19A and 19B, 21, 22A and 22B, R Street Multi-Family, 25, 26, 28A, 28B, 30, Lot J, 34A, 34B,

35A, and 35B. Under existing General Plan and BRMDP land use designations, these Villages could accommodate 818 dwelling units. With the Modified Project, the proposed land use designations would allow for the development of 741 dwelling units. Thus, under the Modified Project, build-out would result in less dwelling units than what was previously contemplated in the General Plan EIR and BRMDP EIR. Future development within these Villages will be consistent with the adopted densities prescribed by the Merced Vision 2030 General Plan and BRMDP.

The Modified Project's proposed land uses are illustrated in Figure 1 – Proposed Land Uses. In addition, the proposed land use amendments and land use matrix is provided herein as Appendix A. At full build-out, the Modified Project would result in the following:

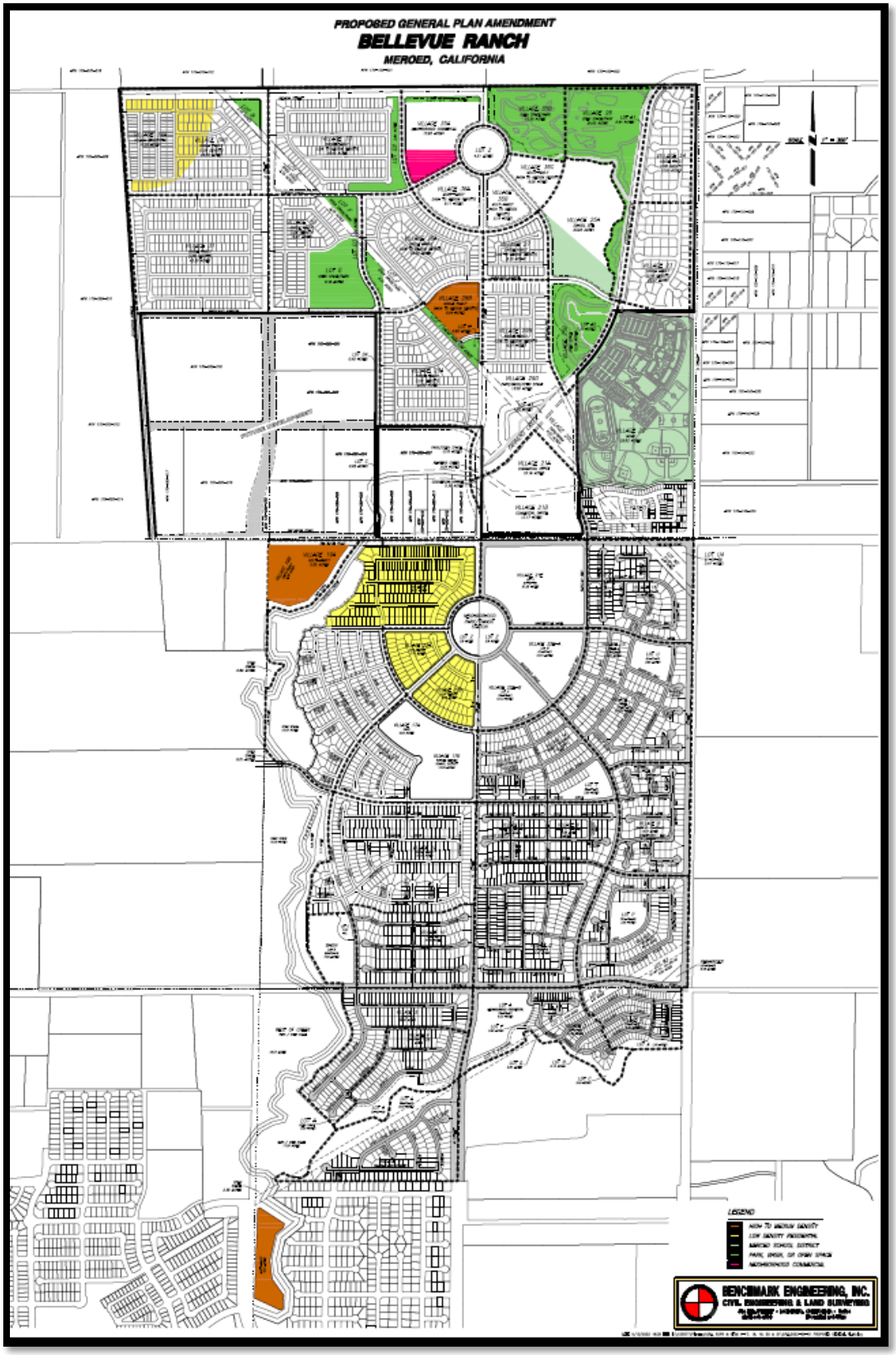
- 47 Low Density Residential Units;
- 232 Low to Medium Density Residential Units;
- 462 High to Medium Density Residential Units;
- 0 sf of Regional Community Commercial uses;
- 40,620 sf of Neighborhood Commercial uses;
- 7.26-acres designated as School; and,
- 72.86-acres of Open Space/Park Recreation.

In total, the Modified Project will result in 741 residential units (77 unit decrease from the Original Project), 40,620 sf of commercial uses (363,508 sf decrease from the Original Project), and 72.86-acres of open space/park recreation uses (a 54.45-acre increase from the Original Project).

The Modified Project also includes an SUP revision to Table 6.1 of the BRMDP to update and clarify backbone infrastructure installation thresholds for specific BRMDP Villages. The previously adopted Table 6.1 dated August 2008 and further refined in June 2018 is being modified to clarify inconsistencies presented in the notes of Table 6.1.

The proposed revisions to Table 6.1 are included as Appendix B of this document.

Figure 1 – Proposed Land Uses



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3.0 ENVIRONMENTAL ANALYSIS

This Chapter provides an analysis and cites substantial evidence that supports the County's determination that the Modified Project to the Original Project does not meet the criteria for preparing a subsequent or supplemental Negative Declaration under CEQA Guidelines Section 15162.

As discussed in Section 2.0, *Project Description,* the Modified Project includes an amendment to the Vision 2030 General Plan Land Use Element that allows for the development of 1,188 residential dwelling units, 161,934 square feet and commercial and office building space, and 52.50-acres of parks and open space. This development yield is substantially less than what is currently allowable by the Vision 2030 General Plan, as detailed in Section 2.0. The Modified Project will not cause a new significant impact or substantially increase the severity of a previously identified significant impact from the Original Project IS/MND (CEQA Guidelines Section 15162 that would require major revisions to the certified Vision 2030 General Plan EIR.

The Modified Project does not cause a new significant impact or substantially increase the severity of a previously identified significant impact, and there have been no other changes in the circumstances that meet this criterion (CEQA Guidelines Section 15162[a][2]). There have been no changes in the environmental conditions on the property not contemplated and analyzed in the EIR that would result in new or substantially more severe environmental impacts.

There is no new information of substantial importance (which was not known or could not have been known at the time of the application, that identifies: a new significant impact (condition "A" under CEQA Guidelines Section 15162[a][3]); a substantial increase in the severity of a previously identified significant impact (condition "B" CEQA Guidelines Section 15162[a][3]); mitigation measures or alternatives previously found infeasible that would now be feasible and would substantially reduce one or more significant effects; or mitigation measures or alternatives which are considerably different from those analyzed in the EIR which would substantially reduce one or more significant effects on the environment (conditions "C" and "D" CEQA Guidelines Section 15162[a][3]). None of the "new information" conditions listed in the CEQA Guidelines Section 15162[a][3] are present here to trigger the need for a Subsequent or Supplemental EIR.

CEQA Guidelines Section 15164(b) states that *"an addendum to an adopted negative declaration may be prepared if only minor technical changes or additions are necessary or none of the conditions described in Section 15162 calling for the preparation of a subsequent EIR or negative declaration have occurred."* An addendum is appropriate here because as explained above, none of the conditions calling for preparation of a Subsequent EIR have occurred.

To confirm the applicability of the findings provided within the Addendum, the Modified Project as discussed in Section 2.0, above, have been evaluated for potential impacts to the Vision 2030 General Plan EIR. It was determined that the amendments would have no effect on the analyses in the Vision

2030 General Plan EIR for the following environmental resources as there would be no change to the project area or overall construction activities. The amendments would not create any new or different impact to geology and soils, mineral resources, agricultural resources, hydrology and water quality, air quality, climate, land use and planning, population and housing, utilities and service systems, recreation, noise, visual quality, hazards and hazardous materials, economics, or energy consumption, or contribute to cumulative impacts in these resource areas. Therefore, these resource areas are not further discussed in this Addendum:

- Aesthetics
- Agricultural and Forest Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Geology and Soils
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Noise
- Population and Housing
- Recreation
- Public Services
- Utilities and Service Systems

The following environmental resource areas may be affected by the Modified Project, and these resource areas have therefore been assessed in this Addendum:

- Greenhouse Gas Emissions
- Traffic and Circulation

The section below identifies the environmental topics addressed in the EIR, provides a summary of impacts associated with the Original Project, as described in the EIR, and includes an analysis of the potential impacts associated with the Modified Project when compared to the Original Project. Note that the environmental topics for these environmental resource areas have been updated to be consistent with CEQA Guidelines Appendix G.

3.1 GREENHOUSE GAS EMISSIONS

Would the Proposed Project/Action:	*New Potentially Significant Impact*	*New Less Than Significant With Mitigation Incorporated Impact*	*New Less Than Significant Impact*	*Same Impact as Previous EIR*	*Less Than in Previous EIR*
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?					X
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?					X

Original Project Analysis:

The following analysis for the Original Project is taken from and can be found in the Vision 2030 General Plan Draft EIR, Chapter 3.17.

Emissions of Greenhouse Gases from the Vision 2030 General Plan

GHG emissions associated with the Project were estimated using CO_2 emissions as a proxy for all GHG emissions. This is consistent with the current reporting protocol of the California Climate Action Registry (CCAR). Calculations of GHG emissions typically focus on CO_2 because it is the most commonly produced GHG in terms of both number of sources and volume generated, and because it is among the easiest GHGs to measure; however, it is important to note that other GHGs have a higher global warming potential than CO_2. For example, as stated previously, 1 lb of methane has an equivalent global warming potential of 21 lb. of CO_2 (*CalEPA. Climate Action Team Report.* March 2006).

http://www.climatechange.ca.gov/climate_action_team/reports/2006report/2006-04-03_FINAL_CAT_REPORT.PDF)

Nonetheless, emissions of other GHGs from the Project (and from almost all GHG emissions sources) would be low relative to emissions of CO_2 and would not contribute significantly to the overall generation of GHGs from the project.

Although the CCAR provides a methodology for calculating GHG emissions, the process is designed to be applied to a single or limited number of entities or operations where detailed information on emissions sources is available (e.g., usage of electricity and natural gas, numbers and types of vehicles and equipment in a fleet, type and usage of heating and cooling systems, emissions from manufacturing processes). Information at this level of detail is not available for the Project area. For example, the ultimate GHG

emissions from the approximately 486 acres of additional commercial uses in the proposed General Plan could vary substantially depending on the type and amount of office and commercial uses that are developed, the density of employees in each facility, the hours of operation for each facility, and other factors. Similarly, GHG emissions from the proposed residences could vary substantially based on numerous factors, such as the sizes of homes, the type and extent of energy efficiency measures that might incorporated into each home's design, the type and size of appliances installed in the home, and whether solar energy facilities are included on any of the residences. Given the lack of detailed design and operational information available at this time for facilities in the Project area, the CCAR emissions inventory methodology is not appropriate for estimating GHG emissions from the project.

Additionally, it should also be noted that the emissions described above do not take into account reductions in GHG emissions resulting from implementation of AB 32. Stationary emissions sources on the project site resulting from energy usage and stationary sources that serve the project site's energy needs will be subject to emissions reductions requirements of AB 32. The extent of these reductions has yet to be quantified by ARB. At the time of project buildout, overall CO_2 emissions attributable to the Project could be substantially less than current emission assumptions might indicate. Similarly, if GHG emissions reductions for vehicles are enacted, through either the requirements of AB 1493 or AB 32 or a federal regulation, CO_2 emissions from the Project would be further reduced. If regulations proposed to comply with AB 1493 survive current legal challenges, by project buildout CO_2 emissions from vehicles associated with the project could be 20% to 30% less than under current conditions.

Impact #3.17-1: Development of the Project could potentially result in a cumulatively considerable incremental contribution to the significant cumulative impact of global climate change.

Discussion/Conclusion: As described above in the "Environmental Setting" discussion, the cumulative increase in GHG concentrations in the atmosphere has resulted in and will continue to result in increases in global average temperature and associated shifts in climate and environmental conditions. Multiple adverse environmental effects are attributable to global climate change, such as sea level rise, increased incidence, and intensity of severe weather events (e.g., heavy rainfall, droughts), and extirpation or extinction of plant and wildlife species. Given the significant adverse environmental effects linked to global climate change induced by GHGs, the emission of GHGs is considered a significant cumulative impact. Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors (California Energy Commission 2006a); therefore, the cumulative global emissions of GHGs contributing to global climate change can be attributed to every nation, region, and city, and individual on Earth. The challenge in assessing the significance of an individual project's contribution to global GHG emissions and associated global climate change impacts is to determine whether a project's GHG emissions which, it can be argued, are at a micro-scale relative to global emissions result in a cumulatively considerable incremental contribution to a significant cumulative macro-scale impact.

Global climate change is projected to affect water resources in California; for example, an increase in the global average temperature is projected to result in a decreased volume of precipitation falling as snow in

California and an overall reduction in snowpack in the Sierra Nevada. Snowpack in the Sierra Nevada provides both water supply (runoff) and storage (within the snowpack before melting) and is a major source of water supply for the state. Although current forecasts vary (see, e.g., Department of Water Resources [hereafter "DWR" 2006], this phenomenon could lead to significant challenges in securing an adequate water supply for a growing population and California's agricultural industry. An increase in precipitation falling as rain rather than snow could also lead to increased potential for floods because water that would normally be held in the Sierra Nevada until spring could flow into the Central Valley concurrently with winter storm events. This scenario would place more pressure on California's levee/flood control system.

Global change is expected to influence many interconnected phenomena, which will in turn affect the rate of climate change itself. Faced with this overwhelmingly complex system, scientists who model climate change must make decisions about how to simplify the phenomenon, such as assuming a fixed rate of temperature change or a certain level of aerosol production or a particular theory of cloud formation. These assumptions make the models applicable to aspects of the changing ecosystem, given a good guess about how the future will be. Rather than try to be predictive, the models represent possible scenarios that come with a set of presuppositions. Even when results are quantified, such quantifications are meaningless unless viewed in the light of those presuppositions. For these reasons, a range of models must be examined when trying to assess the potential effects of climate change and the resulting analysis is most appropriately qualitive (See Intergovernmental Panel on Climate Change (IPCC) 2001). This section, therefore, provides a qualitative analysis of the impacts of global climate change as they affect water resources in California and in the project area.

When discussing global climate impacts in industrialized nations, such impacts are significantly driven by population / demand (e.g., demand for residential and commercial building arises from society's demand for the additional housing and provider of basic services). Therefore, society's increasing population is the underlying trigger to any greenhouse gas emissions associated with housing construction.

In the majority of studies on greenhouse gas emissions, traffic associated with development of residential and commercial buildings due to increasing populations is considered the primary contributor to operational greenhouse gas emissions. Additionally, an increase in stationary source emissions from commercial buildings and residential homes (natural gas, landscape maintenance equipment, etc.) is anticipated from buildout under the General Plan.

Even if it were assumed that the proposed plan's contribution to global climate change was a significant environmental impact, the impact would be considered unavoidable. Because global climate change is a global issue that can only be addressed through regional, state, national, and international cooperation, plan specific impacts are extremely difficult to determine. Until the SJVAPCD modifies regulations to address the emission of greenhouse gases, specific mitigations that would address climate change locally are speculative. As the SJVAPCD modifies its plans and policies to address global warming considerations, CEQA documents will have to consider those plans and policies when assessing projects. The air quality impact analysis in Section 3.3 and in this section include mitigation measures at the local level to reduce atmospheric greenhouse gas emissions in accordance with existing plans and policies to address global climate change. However, development under the proposed General Plan in combination with growth and development at the regional level, would result in a ***significant, cumulatively considerable, and unavoidable*** impact.

Mitigation Measures

Even with the proposed policies and implementation actions in the proposed General Plan, the impact will remain ***significant, cumulatively considerable, and unavoidable.*** No mitigation measures are available.

Impact #3.17-2: Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Discussion/Conclusion: Implementation of General Plan policies designed to reduce greenhouse gas emissions to the extent practicable will ensure City of Merced General Plan consistency with applicable plans, policies or regulations adopted for the purpose of reducing the emissions of greenhouse gases. This impact is ***less than significant.***

Impact #3.17-3: Climate change could potentially result in an impact on City of Merced water resources.

Discussions/Conclusion: From a statewide perspective, global climate change could affect California's environmental resources through potential and uncertain changes related to future air temperatures and precipitation on their resulting impacts on water temperatures, reservoir operations, stream runoff, and sea levels. These changes in hydrological systems could threaten California's economy, public health, and environment. The types of potential climate effects that could occur on California's water resources include:

Water Supply. Several recent studies have shown that existing water supply systems are sensitive to climate change. Potential impacts of climate change on water supply and availability could directly and indirectly affect a wide range of institutional, economic, and societal factors. Much uncertainty remains with respect to the overall impact of global climate change on future water supplies. For example, models that predict drier conditions (i.e., parallel climate model [PCM] suggest decreased reservoir inflows and storage and decreased river flows, relative to current conditions. By comparison, models that predict wetter conditions (i.e., HadCM2) project increased reservoir inflows and storage, and increased river flows (Brekke, 2004). Both projections are equally probable based on which model is chosen for the analyses (Ibid.). Much uncertainty also exists with respect to how climate change will affect future demand for water supply (DWR 2006). Still, changes in the reliability of water yields from reservoirs could result from only small changes in inflows.

Surface Water Quality. Global climate change could affect surface water quality as well. Water quality is affected by several variables, including the physical characteristics of the watershed, water temperature, runoff rate and timing. A combination of a reduction in precipitation, the shift in volume and timing of runoff flows, and the increased temperature in lakes and rivers could affect several natural processes that eliminate pollutants in water bodies. For example, the overall decrease in stream flows could potentially concentrate pollutants and prevent the flushing of contaminants from point sources. Still, considerable work remains to determine the potential effect of global climate change to water quality.

Groundwater. Little work has been done on the effects of climate change on specific groundwater basins, groundwater quality or groundwater recharge characteristics. Changes in rainfall and changes in the timing of the groundwater recharge season would result in changes in recharge. Warmer temperatures could increase the period where water on the ground by reducing the soil freeze. Conversely, warmer temperatures could lead to higher evaporation or shorter rainfall seasons, which could mean that soil deficits would persist for longer time periods, shortening recharge seasons. Warmer, wetter winters would increase the amount of runoff available for groundwater recharge. This additional winter runoff, however, would be occurring at a time when some basins, particularly in Northern California, are being recharged at their maximum capacity. Reductions in spring runoff and higher evapotranspiration, on the other hand, could reduce the amount of water available for recharge. However, the extent to which climate will change and the impact of that change on groundwater are both unknown. A reduced snowpack, coupled with increased rainfall, could require a change in the operating procedures for California's existing dams and conveyance facilities.

Fisheries and Aquatic Resources. In California, the timing and amounts of water released from reservoirs and diverted from streams are constrained by their effects on various native fish, especially those that are listed under the federal and state endangered species acts as threatened or endangered. Several potential hydrological changes associated with global climate change could influence the ecology of aquatic life in California and have several negative effects on cold-water fish (DWR 2006). For example, if climate change raises air temperature by just a few degrees Celsius, this change could enough to raise the water temperatures above the tolerance of salmon and trout in many streams, favoring instead non-native fishes such as sunfish and carp (DWR 2006). Unsuitable summer temperatures would be particularly problematic for many of the threatened and endangered fish that spend summers in cold-water streams, either as adults, juveniles, or both (DWR 2006). In short, climate change could significantly affect threatened and endangered fish in California. It could also cause non-threatened and non-endangered fish to reach the point where they become designated as such (DWR 2006).

Flood Control, It is difficult to assess implications of climate change for flood frequency, in large part because of the absence of detailed regional precipitation information from climate models and because human settlement patterns and water-management choices can substantially influence overall flood risk. Still, increased amounts of winter runoff could be accompanied by increases in flood event severity and warrant additional dedication of wet season storage space for flood control as opposed to supply conservation. This need to manage water storage facilities to handle increased runoff could in turn lead to more frequent water shortages during high water demand periods. (Brekke 2004). It is recognized that these impacts would result in increased challenges for reservoir management and balancing the competing concerns of flood protection and water supply (DWR 2006).

Sudden Climate Change. Most global climate models project that anthropogenic climate change will be a continuous and gradual process through the end of this century (DWR 2006). California is expected to be able to adapt to the water supply challenges posed by climate change, even at some of the warmer and dryer projections for change. Sudden and unexpected changes in climate, however, could leave water managers unprepared and could, in extreme situations, have significant implications for California and its

water supplies. For example, there is speculation that some of the recent droughts that occurred in California and the western United States could have been due, at least in part, to oscillating oceanic conditions resulting from climate changes. The exact causes of these events are, however, unknown, and evidence suggests such events have occurred during at least the past 2,000 years (DWR 2006).

The following topics summarize current literature related to the impact of global climate change on water resources in California's Central Valley:

- **Climate Warming and Water Management Adaptation for California.** Tanaka et al. (2006) explored the ability of California's water supply system to adapt to long-term climatic and demographic changes using the California Value Integrated Network (CALVIN), statewide economic-engineering optimization model of water supply management. The results show agricultural water users in the Central Valley are the most sensitive to climate change, particularly under the driest and warmest scenario (i.e. PCM 2100), predicting a 37% reduction in of Valley agriculture water deliveries and a rise in Valley water scarcity cost by $1.7 billion. Though the results of the study are only preliminary, they suggest that California's water supply system appears "physically capable of adapting to significant changes in climate and population, albeit at a significant cost." Such adaptations of new technology.

- **Potential Implications of PCM Climate Change Scenarios for Sacramento-San Joaquin River Basin Hydrology and Water Resources.** VanRheenen et al. (2004) studied the potential effects of climate change on the hydrology and water resources of the Sacramento-San Joaquin River Basin using five PCM scenarios. The study concludes that most mitigation alternatives examined satisfied only 87 to 96% of environmental targets in the Sacramento system, and less than 80% in the San Joaquin system. Therefore, system infrastructure modifications and improvements could be necessary to accommodate the volumetric and temporal shifts in flows predicted to occur with future climates in the Sacramento-San Joaquin River basins.

- **Estimated Impacts of Climate Warming on California Water Availability Under Twelve Future Climate Scenarios.** Zhu et al (in press) studied climate warming impacts on water availability derived from modeled climate and warming stream flow estimates for six index California basins and distributed statewide temperature shift and precipitations changes for 12 climate scenarios. The index basins provide broad information for spatial estimates of the overall response of California's water supply and the potential range of impacts. The results identify a statewide trend of increased winter and spring runoff and decreased summer runoff. Approximate changes in water availability are estimated for each scenario, though without operations modeling. Even most scenarios with increased precipitation result in a decrease in available water. The result is due to the inability of current storage systems to catch increased winter stream flow to offset reduced summer runoff.

- **Trends in Snowfall versus Rainfall in the Western United States.** To better understand the nature of the observed changes in snowpack and stream flow timing in the west, Knowles et al. (2006) addressed historical changes in the relative contributions of rainfall and snowfall. The study documents a regional trend toward smaller ratios of winter-total snowfall water to winter-total precipitation during the period of 1949-2004. The trends toward decreased winter-total snowfall are a response to warming across the region, with the most significant decreases occurring where winter wet-day minimum temperatures were on average warmer than -5 degrees Celsius over the study period. The authors suggest that, if warming trends continue, the snowfall fraction of precipitation is likely to continue to decline, which combined with earlier melting of the remaining accumulations of snowpack, will diminish the West's natural freshwater storage capacity. This trend could, in turn, exacerbate tensions between flood control and storage priorities that many western reservoir managers face.

- **Climate Warming and Water Supply Management in California.** Medellin et al. (2006) use the CALVIN model under a high emissions "worst case" scenario, called a dry-warming scenario. The study found that climate change would reduce water deliveries 17% in 2050. The reduction in deliveries was not equally distributed, however, between urban and agricultural areas. Agricultural areas would see their water deliveries drop by 24% while urban areas would only see a reduction of 1%. There was also a geographic difference: urban scarcity was almost absent outside of southern California.

- **Climate scenarios for California.** Cayan et al. (2006b) considered two GHG emissions scenarios, a medium-high and a low. The study found that California will experience a warming trend from 2000 to 2100, with temperatures rising between 1.7 and 5.8^0 C, depending on the model and the scenario chosen. This increase in temperature could potentially impact snowpack levels as the state experiences less snow and more rain. The results also indicate that snowpack in the Sierra Nevada could be reduced 32 to 70%, depending on the model and scenario chosen. The study does not consider the ability of California's water supply system to adapt to these potential changes.

- **Our Changing Climate – Assessing the Risks to California, California Climate Change Center 2006 Biennial Report.** In 2003, the California Energy Commission's Public Interest Energy Research (PIER) program established the California Climate Change Center (CCCC) to conduct climate change research relevant to the state. Executive Order S-3-05 called for CalEPA to prepare biennial science reports on the potential impact of continued climate change on certain sectors of California's economy. CalEPA entrusted PIER and its CCCC to lead the effort. The climate change analysis contained in its first biennial science report is the product of a multi-institution collaboration among the California Air Resources Board, DWR, CEC, CalEPA and the Union of Concerned Scientists.

With respect to the most severe consequences of global climate change on California's water supplies, the study concludes that major changes in water management and allocation systems could be required in order to adapt to the change. As less winter precipitation falls as snow, and more as rain, water managers would have to balance the need to construct reservoirs for water supply with the need to maintain reservoir storage for winter flood control. The assessment suggests that additional storage could be developed, but with environmental and economic costs.

- **Climate Warming and California's Water Future.** Lund et al. (2003) examined the effects of a range of climate warming estimates on the long-term performance and management of California's water

system. The study estimates changes in California's water availability, including effects of forecasted changes in 2100 urban and agricultural water demands using a modified version of the CALVIN model. The main conclusions are summarized as follows:

- Methodologically, it is useful and realistic to include a wide range of hydrologic effects, changes in population and water demands, and changes in system operations in climate change studies;

- A broad range of climate warming scenarios show significant increase in wet season flows and significant decreases in spring snowmelt. The magnitude of climate change effects on water supplies is comparable to water demand increases from population growth in twenty-first century; and

- California's water system would be able to adapt to the severe population growth and climate change modeled. The adaptation would be costly, but it would not threaten the fundamental prosperity of the state, although it could have major impacts on the agricultural sector. The water management costs represent only a small proportion of California's current economy.

- Under the driest climate warming scenarios, Central Valley agricultural users could be quite vulnerable to climate change. Wetter hydrology could increase water availability for these users. The agricultural community would not be compensated for much of its loss under the dry scenario. The balance of climate change affects agricultural yield and water use in unclear. While higher temperatures could increase evapotranspiration, longer growing seasons and higher carbon dioxide concentrations could increase crop yield.

- Population growth is expected to be more problematic than climate change in Southern California. Population growth, conveyance limits on imports, and high economic value of water in Southern California, could lead to high implementation of wastewater reuse and substantial use of seawater desalination along the coast.

- Under some wet warming climate scenarios, flooding problems could be substantial. In certain cases, major expansions of downstream floodways and alterations in floodplain land use could become desirable.

- California's water system could economically adapt to all the climate warming scenarios examined in the study. New technologies for water supply, treatment, and water use efficiency, implementation of water transfers and conjunctive use, coordinated operation of reservoirs, improved flow forecasting, and the cooperation of local regional, state and federal government can help California adapt to population growth and global climate change. Even if these strategies are implemented, however, the costs of water management are expected to be high and there is likely to be less "slack" in the system compared to current operations and expectations.

As described by the literature survey above, overall, climate change is expected to have a greater effect in Southern California. In the Sacramento Valley/Sierra Nevada area, climate change will have a greater effect on agricultural users than urban users. For example, for 2020 conditions, where optimization is allowed (i.e., using the CALVIN model), scarcity is essentially zero in the Sacramento Valley for both urban and agricultural

users, and generally zero for urban users in the San Joaquin and Tulare Basins. Rather, most water scarcity will be felt by agricultural users in Southern California, though Southern California urban users, especially Coachella urban users, will also experience some scarcity. By the year 2050, urban water scarcity will remain almost entirely absent north of the Tehachapi Mountains, although agricultural water scarcity could increase in the Sacramento Valley to about 2% (Medellin et al. 2006; see also Tanaka et al. 2006 and Lund et al. 2003 for further discussion of global climate change impacts on agricultural uses).

Based on the conclusions of current literature regarding California's ability to adapt to global climate change, it is reasonably expected that, over time, the State's water system will be modified to be able to handle the projected climate changes, even under dry and/or warm climate scenarios (DWR 2006). Although coping with climate change effects on California's water supply could come at a considerable cost, based on a thorough investigation of the issue, it is reasonably expected that statewide implementation of some, if not several, of the wide variety of adaptation measures available to the state, will likely enable California's water system to reliably meet future water demands. For example, traditional water supply reservoir operations may be used, in conjunction with other adaptive actions, to offset the impacts of global warming on water supply (Medellin et al. 2006; see also Tanaka et al. 2006 and Lund et al. 2003). Other adaptive measures include getter urban and agricultural water use efficiency practices, conjunctive use of surface and ground waters, desalination, and water markets and portfolios (Medellin et al. 2006; see also Lund et al. 2003, Tanaka et al. 2006). More costly statewide adaptation measures could include construction of new reservoirs and enhancements to the state's levee system (California Energy Commission 2003). As described by Medellin et al. 2006, with adaptation to the climate, the water deliveries to urban centers are expected to decrease by only 1%, with Southern California shouldering the brunt of this decrease.

Although California could potentially experience an increased number of single-dry and multiply-dry years as a result of global climate change, based on current knowledge, it is reasonably expected that such increase would not significantly affect the reliability of the City of Merced's water supply, (due to the proposed Project's location in Central/Northern California and the reasonable expectation that California's water system can be modified to handle projected climate changes as explained above).

Because considerable uncertainty remains with respect to the overall impact of global climate changes on future water supply in California, it is unknown to what degree global climate change will impact the City of Merced water supply and availability in the future. However, based on consideration of the recent regional and local climate change studies described in the literature review above, it is reasonably expected that the impacts of global climate change on the City's water supply would be ***less than significant.***

Cumulative Impact Analysis

Policies of the proposed General Plan will reduce global climate change impacts; however, buildout under the proposed General Plan will nonetheless result in a substantial amount of GHG emissions contributing to global climate change. Because it cannot be determined to a reasonable degree of certainty that buildout under the proposed General Plan will not result in a cumulatively considerable incremental contribution to the significant cumulative impact of global climate change, the impacts of the proposed project on global climate change are a ***significant, unavoidable, and cumulative considerable*** impact.

Modified Project Analysis:

To evaluate the Proposed Project's potential impacts to greenhouse gas emissions, a Greenhouse Gas Assessment, dated May 5, 2023, prepared by Illingworth and Rodkin, Inc. (Appendix C) was prepared.

It is generally accepted that individual development projects, in and of themselves, are too small to have a perceptible effect on global climate. However, the greenhouse gas (GHG) emissions from each development project results in an incremental contribution to global warming and climate change. The scope of climate change is global, and the cumulative emissions of GHGs globally have resulted in cumulatively significant climate change impacts. Thus, in CEQA terms, GHG emissions associated with individual development projects are by nature cumulative in their effects. A significant impact would occur if the GHG emissions associated with the General Plan Amendment (GPA) represent a considerable contribution to the cumulatively significant impacts resulting from global climate change. As such, the focus of this analysis is to determine whether the GHG emissions associated with the GPA represent a considerable contribution to the cumulatively significant impacts resulting from global climate change.

GHG emissions associated with the Proposed Project would occur over the short-term from construction activities, consisting primarily of emissions from equipment exhaust, worker vehicles, and vendor vehicle trips. There would also be long-term emissions associated with vehicular traffic within the project vicinity, energy and water usage, and solid waste disposal.

SJVAPCD Methodologies

The SJVAPCD's *Guidance for Valley Land-Use Agencies in Addressing GHG Emissions Impacts for New Projects under CEQA* provides for three alternative methodologies for evaluating project's potential impact on climate change and determination reducing GHG emissions from a project to less-than-significant levels. These include: (1) Demonstrate compliance with a locally-adopted GHG reduction plan (i.e., CAP or PCAP); (2) Demonstrate implementation of a combination of Air District-approved and pre-qualified BPS which taken together are deemed to result in a 29 percent reduction in project GHG emissions relative to Business-As-Usual (BAU) conditions; or (3) For projects not implementing bps, quantification of project GHG emissions and comparison to GHG emissions from BAU conditions in order to demonstrate a 29 percent reductions in emissions relative to BAU conditions. BAU is defined as the operation of the proposed project with emissions factors from the 2002-2004 baseline period established by the AB 32 Scoping Plan. Land use projects not achieving the necessary reductions would be considered to have a significant impact. It is important to note that projects that require the preparation of an EIR for any reason are required to quantify GHG emissions, even if they are compliant with an adopted climate action plan or are implementing BPS.

CalEEMod Modeling

CalEEMod (Version 2020.4.0) was used to quantify GHG emissions from Proposed Project operations-related activities assuming full build-out of the project by 2035 and a BAU scenario using 2005 emissions factors. GHG emissions from the GPA would be generated primarily from autos driven by future residents, employees, customers, and vendors and for energy use associated with the land use changes. The land use types, size, and other area-specific information were input to the model. The use of this model for evaluating emissions from land use projects is recommended by the SJVAPCD.

CalEEMod Land Uses

The land uses associated with the Proposed Project were input into CalEEMod as summarized in Table 2-2 The amounts of each land use type were provided by the applicant. These were used for both the build- out (2035) and BAU (2005) scenarios.

Table 2-2 Land Uses Entered into CalEEMod

GPA Land Use Category	CalEEMod Land Use Type	Amount	Unit of Measure
Neighborhood Commercial	General Office Building	80.97	1,000-sf
Open Space/Park Recreation	City Park	52.5	Acres
High to Medium Density Residential	Apartments Low Rise	466	Dwelling Units
Low to Medium Residential	Condo/Townhouse	372	Dwelling Units
Low Density Residential	Single Family Housing	230	Dwellings
Village Residential	Single Family Housing	120	Dwellings
Neighborhood Commercial	Strip Mall	80.97	1,000-sf

The Proposed Project would change the amounts of several land use categories built in the plan area. CalEEMod uses specific land use categories to estimate emissions. Thus, the categories identified in the Proposed Project were related to the CalEEMod land use categories as shown in Table 2-2. Because the specific type of commercial land use are not known, GHG emissions are based on 50 percent being office uses and 50 percent being strip mall retail uses. These categories are used by the model to estimate GHG emissions related to mobile sources (i.e., traffic), energy use, waste, and water/wastewater.

Mobile Source Emissions

GHG emissions from on-road mobile sources (i.e., traffic) were estimated for both the 2035 build-out scenario and the BAU scenario using CalEEMod default emissions rates, trip generation rates, and trip lengths. Version 2020.4.0 of CalEEMod uses emissions factors from CARB's EMFAC2017 emissions model and ITE trip generation rates. More information on how the model calculates GHG emissions from traffic can be found in the model's technical documentation. Note that the mobile emissions modeling does not reflect the effect of California's recently adopted Advanced Clean Car, Phase II regulation that will require an increased phase in of electric vehicles from 35 percent in 2026 to 100 percent in 2035. The current version of CalEEMod that is based on EMFAC2017 underestimates the effect of this regulation. Future updates to the State's EMFAC model will reflect the effect of this regulation.

Energy

GHG emissions modeling includes those indirect emissions from electricity consumption. Default 2019 Title 24 Building Standards were used to estimate energy consumption. The 2035 build-out scenario used the CalEEMod default for Pacific Gas and Electric's (PG&E's) energy emission factor for CO_2 per megawatt of electricity produced and the default 2019 Title 24 Building Standards energy intensity factors. The PG&E factor is based on 2019 emissions rates. Note that PG&E's carbon intensity for delivered electricity has decreased

by 64 percent over the last ten (10) years. PG&E plans to achieve net zero emissions by 2050, by substantially reducing emissions by 2040 and neutralizing remaining emissions by 2050.

The BAU emissions estimate used default emission factor for PG&E in the previous version of the CalEEMod model (Version 2020.4.0) of 641.3 pounds of CO_2 per megawatt of electricity produced. This factor is based on PG&E's 2008 emissions rate.

Wood-Burning Devices

CalEEMod default inputs assume new residential construction would include woodburning fireplaces and stoves. The project would not include wood-burning devices, as these devices are prohibited by SJVAPCD Rule 4901. Therefore, the number of woodstoves and woodboring fireplaces in CalEEMod were set to zero and assigned as natural gas in both the 2035 build-out and BAU scenarios.

Water Usage and Wastewater

CalEEMod assigns water usage rates for the various land uses based on statewide rates developed prior to the model in 2008. Water/Wastewater use was changed to 100 percent aerobic conditions for both the 2035 build-out and BAU scenarios to represent the City's wastewater treatment plant conditions. The GPA area would not send wastewater to septic tanks or facultative lagoons.

Solid Waste

CalEEMod defaults were used to estimate GHG emissions associated with solid waste generation for both the 2035 build-out and BAU scenarios.

Summary of Computed GHG Emissions

The CalEEMod model estimated annual emissions associated with the GPA's 2035 build-out and the BAU scenario. In 2035, annual emissions are calculated to 13,725 MT of CO_{2e}, as shown in Table 2-3. The percent reduction when compared to the BAU scenario is estimated to be approximately 43 percent, 14 percent over the 29 percent reduction target. Therefore, per SJVAPCD methodologies for identifying Project- Specific GHG Emissions impacts per the *Guidance for Valley Land-Use Agencies in Addressing GHG Emissions Impacts for New Projects under CEQA,* the Proposed Project would have less-than-significant impact as it exceeds the 29 percent reduction in GHG emissions needed relative to BAU conditions. Accordingly, as compared to the Original Project, the Modified Project would have less potential impact to generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

Additionally, the Proposed Project is required to comply with the City's PCAP and UDM. The project check list includes several applicable strategies individual projects in the Project site can include to ensure adherence to in the City's CAP.

Table 2-3. Annual Project GHG Emissions (CO_{2e}) in Metric Tons

Source Category	BAU Emissions	2035 Project Emissions
Area	685	685
Energy Consumption	3,536	1,967
Mobile	18,873	10,392
Solid Waste Generation	458	458
Water Usage	414	223
Total	23,966	13,725
Percentage Reduction		42.7 percent
SJVAPCD Reduction Target for Project-Specific missions (for Projects not compliant with a CAP or not implementing BPS)		**29 percent**

The City of Merced has a CAP and a PCAP/UDM that enforce its building codes, which aim to reduce GHG emissions. Therefore, if individual projects included in the Proposed Project conform to City building Codes, the Proposed Project would conform with the CAP and would not conflict with local plans, policies, or regulations applicable to GHG emissions. The projects proposed as part of the overall Proposed Project would be constructed in conformance with at minimum the 2022 CalGreen and the Title 24 Building Codes, which require high-efficiency water fixtures, water-efficient irrigation systems, and compliance with current energy efficiency standards. Compliance with these standards ensures compliance with State and federal plans, policies and regulations applicable to GHG emissions. Accordingly, as compared to the Original Project, the Modified Project would have less potential impact to generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

3.2 TRAFFIC AND CIRCULATION

Would the Proposed Project/Action:	***New Potentially Significant Impact***	***New Less Than Significant With Mitigation Incorporated Impact***	***New Less Than Significant Impact***	***Same Impact as Previous EIR***	***Less Than in Previous EIR***
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?				X	
b) Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?			X		
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				X	
d) Result in inadequate emergency access?				X	

Original Project Analysis:

Impacts to Transportation/Traffic as a result of the City's 2030 General Plan is discussed in Section 3.15 of the Vision 2030 General Plan Environmental Impact Report (EIR). The 2030 General Plan EIR (Draft EIR) can viewed here:

https://www.cityofmerced.org/departments/development-services/planning-division/merced-vision-2030-general-plan-adoption/-folder-1177.

The City's Vision 2030 General Plan EIR study area included the planning area presented in the Circulation Diagram of the General Plan (Figure 3.15-1). The study locations are provided in Table 3.15-4 of the Draft EIR.

The Draft EIR concluded that implementation of Mitigation Measure No. 3.15-1a and the Goals, Policies, and Implementing Actions of the Merced Vision 2030 General Plan would reduce the impact of increased traffic on area roadways as the 2030 General Plan is implemented; however, absent funding guarantees for many of the roadway improvement projects identified in the traffic conditions analysis, as and referenced in Mitigation Measure No. 3.15-1a, traffic impacts associated with build-out of the

Vision 2030 General Plan are considered ***significant and unavoidable***.

The Draft EIR also concluded that compliance with the policies of the 2030 General Plan and the City's Roadway Design Standards will ensure that there will not be a significant increase in hazards due to design features or incompatible uses as the 2030 General Plan is implemented and the impact is ***less than significant***.

Finally, the 2030 General Plan Circulation Plan and Policies promote emergency vehicle access to all portions of the City and Plan Area and implementation of the 2030 General Plan will not result in inadequate emergency access. Roadway improvement standards adopted by the City provide for adequate street width and secondary access to ensure that emergency vehicles have adequate access to development throughout the Plan Area. The Draft EIR concluded the impact would be **less than significant**.

Modified Project Analysis:

This section of the CEQA Addendum analyzes the Modified Project's potential to conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b), which relates to a project's vehicle miles travelled (Traffic and Circulation Impact (b) set forth above). Traffic and Circulation impacts a, c and d are not evaluated further in the CEQA Addendum, as the City has determined that the Modified Project would have the same impact as analyzed in the EIR for the Original Project. To evaluate the Proposed Project's potential impacts to transportation/traffic, a Traffic Impact Study, dated May 10, 2023, and a Vehicle Miles Traveled (VMT) Project Comparison Assessment, dated October 24, 2023, was prepared. Both of these studies can be found in Appendix D of this document.

As noted above, a VMT Project Comparison Assessment was prepared for the Proposed Project. The table below depicts the results of the VMT analysis for the Proposed Project using the native trip generation rates in the Three County Model.

Table 2-4 – Bellevue Ranch VMT Analysis – Three County Trip Generation

Project Description	Weekly Project Generated VMT
Previously Approved BRMDP	666,916
Proposed BRMDP	595,087
Net Difference	**-71,829**

The trip generation differences for the previously approved BRMDP land use designations are described below.

- Previously approved BRMDP:
  - Model Trip Generation: 43,704 trips per weekday.
  - ITE Trip Generation: 89,146 trips per weekday.
  - ITE/Model ratio: 1.96

- Proposed BRMDP:
    - Model trip generation: 33,723 trips per weekday.
    - ITE trip generation: 72.933 trips per weekday.
    - ITE/Model ratio: 1.86.

The table below depicts the results of the VMT analysis for the Proposed Project by factoring the VMT estimates from the Three County Model by the ITE/Model ratio.

Table 2-5 – Bellevue Ranch VMT Analysis – ITE Factored Trip Generation

Project Description	Model Weekday Project Generated VMT	ITE/Model Trip Generation Ratio	ITE-Factored Weekday Project Generated VMT
Previously Approved BRMDP	666,916	1.96	1,308,325
Proposed BRMDP	595,087	1.86	1,106,898
Net Difference	**-71,829**	**-**	**-201,427**

The analysis presented in the tables above determined similar conclusions, the Proposed Project will generate less VMT than the previously approved BRMDP. This result is expected as the Proposed Project results in a significant reduction of development intensity. As such, this impact is considered less than significant.

REFERENCES

Merced Vision 2030 General Plan, dated January 2012.

Merced Vision 2030 General Plan Draft and Final Environmental Impact Report (SCH No. 2008071069), dated January 2012.

Bellevue Ranch General Plan Amendment Greenhouse Gas Assessment, dated May 5, 2023, prepared by Illingworth and Rodkin, Inc.

Traffic Impact Study, dated May 10, 2023 and a Vehicle Miles Traveled (VMT) Project Comparison Assessment dated October 24, 2023, prepared by Fehr and Peers

APPENDICES

Appendix A

Land Use Matrix

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Appendix B

SUP Revisions – Table 6.1 Modifications

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Appendix C

Bellevue Ranch General Plan Amendment Greenhouse Gas Assessment, dated May 5, 2023

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Appendix D

Traffic Impact Study, dated May 10, 2023 and a Vehicle Miles Traveled (VMT) Project Comparison Assessment dated September 1. 2023

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Bellevue Ranch – General Plan Amendment and SUP Revision
Draft Land Use Matrix
December 2023

Village	Acres	1995 MDP Land Use Designation	# of Lots/Units Under Existing MDP Land Use Designation	Commercial/Office Building Square Footage Under Existing MDP Land Use Designation	Existing General Plan Land Use Designation	Proposed General Plan Land Use Designation	# of Lots/Units Under Proposed GPA	Commercial/Office Building Square Footage Under Existing MDP Land Use Designation
18B	2.05	SFDPH	-	-	Open Space/Park Recreation	LMDR	11	
19A and 19B	10.55	SFDSH		-	Open Space/Park Recreation	HMDR	211	-
21A and 21B	20.35	Commercial	-	221,611	Regional Community Commercial	LMDR	137	-
22A and 22B	17.07	MF	341	-	HMDR	LMDR	84	-
R Street Multi-Family Village	5.81	Land originally part of Fahrens Creek Realignment	-	-	Open Space/Park Recreation	HMDR	116	-
25A	7.26	SFDPH	40	-	LMDR	School	-	-
25B	12.30	SFDPH	68	-	LMDR	Park/Open Space	-	-
26	24.02	SFDPH	132	-	LMDR	Park/Open Space	-	-
28 B	6.77	SFDPH	37	-	LMDR	HDMR	135	
Lot D1	1.21	NC	-	13,177	Neighborhood Commercial	Parks/Open Space	-	-
Lot D2	3.67	SFDPH	20		LMDR	Parks/Open Space	-	-
Lot D3	1.16	SFDSH	6	-	LDR	Park/Open Space	-	-
Lot F	1.92	SFDSH	10	-	LDR	Park/Open Space	-	-
Lot G	9.42	SFDSH	47	-	LDR	Park/Open Space	-	-
Lot H	0.70	SFDPH	4	-	LMDR	Parks/Open Space	-	-
Lot J	1.45	SFDSH	7	-	LDR	Park/Open Space	-	-
34A and 34B	9.42	SFDPH	94	-	VR	LDR	47	-
Lot B	1.46	SFDSH	7	-	LDR	Park/Open Space	-	-
35 A	3.73	MF	75		HMDR	Neighborhood Commercial	-	40,620
35 B	15.55	Commercial	-	169,340	Neighborhood Commercial	Park /Open Space	-	-
Totals	**155.87**		**818**	**404,128**	**-**	**-**	**741**	**40,620**

Notes:

LDR – Low Density Residential
LMDR – Low to Medium Density Residential
HMDR – High to Medium Density Residential
VR – Village Residential
SFDSH – Single Family Detached Standard Homes
SFDPH – Single Family Detached Patio Homes

Draft Land Use Matrix – by Land Use Designation

Land Use Designation	1995 MDP (Acres and Units/Square Feet)		Proposed General Plan Amendment (Acres and Units/Square Feet	
	Acres	**Units/Square Feet**	**Acres**	**Units/Square Feet**
Low Density Residential	15.41	77	9.42	47
Low to Medium Residential	54.72	301	39.47	232
High to Medium Density Residential	20.8	416	23.3	462
Regional Community Commercial	20.35	271,611 sf	-	-
Neighborhood Commercial	16.76	182,577 sf	13.65	40,620 sf
Village Residential	9.42	94	-	-
Open Space/Park Recreation	18.41	-	72.86	-
School	-	-	7.26	-
Total	**155.87**	**818 units + 404,128 sf**	**155.87**	**741 units + 40,620 sf**

Bellevue Ranch Master Development Plan (MDP) Table 6.1
Major Infrastructure Phasing

~~(Revised & Adopted by City Council on June 21, 2004)~~
~~(Revision & Adopted by Planning Staff on August 17, 2005)~~
(Revision & Adopted by Planning Commission on June 18, 2008)
(Revision to be presented to Planning Commission and City Council Fall of 2023)

The following table shows the same circulation and major infrastructure improvements listed in the MDP Table 6.1,adopted by the City Council May 15, 1995, in the columns for contiguous and non-contiguous improvements. Two new columns have been added to show the village interior improvements as well as concurrent construction phasing. This table indicates when certain improvements are **warranted** by Sub-Phase development. It does not address funding sources or the timing of available funding. In general, each Developer shall be responsible for construction of the warranted improvements, with the exception of wells, which the City will construct.

The Sub-Phases have been reorganized to show the order in which the Villages are now expected to be developed by Crosswinds and Woodside, for the area south of Bellevue Road. North of Bellevue Road the order shown in the adopted Table 6.1 shall be maintained except as noted. MDP Villages 6, 11, 13 and 19 have been excluded from this proposed sequence due to floodplain constraints.

The "Clarification Revision" of August 2008 to the 6-18-08 version of Table 6.1 clarifies inconsistencies presented by Notes #1 and #2. These notes referred to recommended improvements of the Fehr & Peers memorandum of 12-2-04. The notes stated that certain improvements were "revised" as recommended in said traffic report. However, the text within Table 6.1 did not reflect those changes. To view these referenced changes, one needs to look at Table 6 of the 12-2-04 memorandum. The August 2008 Table 6.1 presented here reconciles the inconsistencies by showing where modification to text in Table 6.1 would have to be made in order to be consistent with Staff accepted portions of Table 6 of the 12-2-04 memorandum.

NOTE: Table 6.1 was not officially amended to include these "clarifications." This document is prepared to show Staff's interpretation and affect of the 12-2-08 traffic study.

Color Coding of Responsible Areas:

Red Bold=Bellevue Ranch East Improvements (Crosswinds)
Green Bold=North Merced Major Roadway Improvement Impact Fee
Blue Underlined=Bellevue Ranch West Improvements (Woodside)
Black Bold=Bellevue Ranch Improvements, joint responsibility in Village 22
Black=Bellevue Ranch Improvements, North of Bellevue Road (unchanged since May 15, 1995).
[Phases are as noted on Minor Phasing Diagram in Master Development Plan—page 60 and Attachment B of Planning Commission Staff Report #04-13 2nd Addendum]

Bellevue Ranch Master Development Plan Table 6.1—Major Infrastructure Phasing				
Sub-Phase (Village)	**Contiguous Improvements**	**Non-Contiguous Improvements**	**Interior Improvements**	**Villages Able to Construct out of sequence with this sub-phase**
BIIP I	**None**	• **M St (Barclay Rd. to Lehigh)(1/2 street)** • **M St Cottonwood Creek Bridge (1/2 Street)** • **Well Site (G St/ Cardella Rd)**	• **BIIP I Collectors** • **Sewer, Drain and Water** • **Detention Basins DB-P, T and U** • **Storm Drain and Sewer Pump Stations Outfalls**	• **Village 15, 16, 8A, 14 and 9**
8A	**None**	**None**	• **V-8A streets and utilities**	• **Concurrent with BIIP I**
15	**None**	• **Fire Station Dedication**	• **Village-15 streets and utilities**	• **Concurrent with BIIP I**
1	• M St: Lehigh to Cottonwood Ck (1/2 Street) • M St: Cottonwood	• M St: Cottonwood Ck to Cardella Rd intersection (1/2 street)	• V-1 streets and utilities	• None Note: Sub-Phase (Village) 1 is not dependent on Sub-Phases BBIP I, 8A, and 15.
	Bridge (1/2 street) and bike crossing			
9	**None**	**None**	• **V-9 streets and utilities**	• **Concurrent with BIIP I**
3	• Cardella Road: M St to Bancroft Dr (1/2 street) • Cottonwood Ck bike path/imp. • Cardella Rd (Bancroft Dr to G St) (1/2 street)	None • Cardella Rd/Bancroft Signal (as part of the development of the commercial site).	• V-3 streets and utilities • V-11 drainage basin	• Village 2 Note: Sub-Phase (Village) 3 is not dependent on Sub-Phases BBIP I, 8A, 9, and 15.
2	• Cottonwood Ck bike path/improvements	None	• V-2 streets and utilities	• Concurrent with Village 3
5	• Cardella: (M St to Round Hill Dr (Freemark)) (4 lanes total) • Well site (Cardella Rd/Fahrens Ck.)	None	• V-5 streets and utilities	• Villages 4, 10, & 12 Note: Sub-Phase (Village) 5 is not dependent on Sub-Phases BBIP I, 8A, 15 and 9.
14	**None**	**None**	• **Village-14 streets and utilities**	• **Concurrent with BIIP I**

Sub-Phase (Village)	Contiguous Improvements	Non-Contiguous Improvements	Interior Improvements	Villages Able to Construct out of sequence with this sub-phase
16	• Well Site (G Street/Bellevue Road)	• M St: Cardella to Barclay (remainder to full improvements)	• Village-16 streets and utilities	• Concurrent with BIIP I
BIIP II	None	None	• BIIP II Collector Roadways • Sewer, Drain and Water	• Village 8B, 7 and Lot Q
4	• Cottonwood Ck pedestrian bridge	None	• V-4 streets and utilities	• Concurrent with Village 5
8B	None	None	• V-8B streets and utilities	• Concurrent with BIIP II
7	• Cardella Rd (M St to G St)(1/2 street) • Cardella Road/G Street signal		• V-7 streets and utilities	• Concurrent with BIIP II
10	None	None	• V-10 streets and utilities	• Concurrent with Villages 5 and BBIP I (M Street component only)
12	None	• M St/Cardella Rd signal[1],	• V-12 streets and utilities	• Concurrent with Village 10
17	None	• R St (Yosemite to Cardella)(4 lanes total) ~~1,8~~ 10 • Cardella Rd (Round Hill Dr (Freemark) to R St) (4 lanes total) ~~1,8~~ 10 • Fahrens Ck Bridge at /Cardella Rd (4 lanes total) ~~1,8~~ 14 • R St/Cardella Rd Signal[+] 11	• V-17 streets and utilities	• Villages 18 & 19 • Note: Sub-Phase (Village) 17 is not dependent on Sub-Phases BBIP I, 8A, 15, 9, 14, 16, BBIP II, 8B and 7. Excepting "M" Street portion of BBIP I.
18	None	• R Street: Cardella Rd to Franciscan Dr (4 lanes total)~~1,8~~ 10 • R Street: Franciscan Dr **(Arrow Wood)** to Bellevue Rd (4 lanes total)~~1,8~~ 10 • Cardella Rd/Bancroft Signal • Franciscan Dr **(Arrow Wood)**/R St signal ~~1,8~~ 11 • R St/Bellevue Rd Signal[+] 11 • Cardella Rd/Round Hill Dr (Freemark) signal	• V-18 streets and utilities	• Concurrent with Village 17 •

Bellevue Ranch Master Development Plan
Table 6.1—Major Infrastructure Phasing
Clarification Memorandum - August 2008, Page 3

Sub-Phase (Village)	Contiguous Improvements	Non-Contiguous Improvements	Interior Improvements	Villages Able to Construct out of sequence with this sub-phase

19	~~None~~ Bellevue Road Frontage	• Franciscan Dr **(Arrow Wood)** (Freemark Ave to R St)[1,8] [10] • Fahrens Creek Bridge at Franciscan Dr **(Arrow Wood)** [8] [10]	• V-19 streets and utilities	• Concurrent with Village 17
Lot Q	**None**	• **None**	• **Lot Q streets & utilities**	• **Concurrent with BIIP II**
22-East[6] (MFR)	• **M Street (Barclay Drive to Bellevue Road) (2 lanes) on east side including Transit Circle w/ V-21 segments** [8]	• **Bellevue/G Signal**[1, 8] • **Bellevue Rd: M St to G St (3 lanes)**[8, 9]	**None**	**None**
22-West (MFR)	• **M Street (Barclay Drive to Bellevue Road) (2 lanes) on west side including Transit Circle w/ V-21 segments** [8]	• **Well site (Bellevue/R St)**[7, 8] • **Bellevue Rd: R St to M St (3 lanes)**[8, 9]	**None**	**None**
21[6] (Comm)		• **M & Bellevue Signal**[1] [11] • **G St: Bellevue to Merced College (4 lanes total)**[3] [10] **or Measure V Funds** • **G & Foothill (Harvest) Signal**[1] [12] • **Fahrens Creek Bridge at Bellevue Rd(3 lanes)**[8] [13] • Cardella Rd/Round Hill Dr (Freemark) signal (at time western portion of V-21 is developed.	**None**	

Bellevue Ranch Master Development Plan
Table 6.1—Major Infrastructure Phasing
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Above Bellevue Road	Same as adopted in the MDP, 5/15/95 (see below)	**Non-Contiguous Improvements**	Each village's streets and utilities
20	• Fahrens Creek Bypass (Drainage Phase 3)	• Fahrens Creek Bypass (Phase 3)	• V. 20 streets and utilities
23	None	None	• V. 23 streets and utilities
24	• Well Site No. 6 • Old Lake Rd **(Nevada Street)** (2 lanes)	None	• V. 24 streets and utilities
25	• ~~Collector St./Fahrens Cr. Bridge (near Phase 23/24)~~ **(omit)** • Collector St **(Farmland Avenue)** /Fahrens Cr. Bridge (near Phase 20)	None	• V. 25 streets and utilities
26	• ~~Old Lake Rd: 2 lanes~~ **(omit)** • ~~Old Lake Rd/Fahrens Creek Bridge~~ **(omit)**	• G St: 2 lanes Old Lake Rd to Bellevue Rd (4 lanes total) • G St/Collector St Traffic Signal (near Phase 20/23) **(complete)**	• V. 26 streets and utilities
27	• M St: 2 lane ultimate section	• Collector St/Fahrens Cr. Bridge (near Phase 20/23) • N/S Collector/Bellevue Signal	• V. 27 streets and utilities
28	None	None	• V. 28 streets and utilities
29	• M St: 2 lane ultimate section	• ~~N/S Collector/Fahrens Creek Bridge (between M & R Sts.)~~ **(omit)** • M St: 2 lanes (So. To Bellevue) • M St/Fahrens Creek Bridge	• V. 29 streets and utilities

30	• R St: 2 lanes • Fire Station	• R St: 2 lanes ½ mile north of Bellevue to Bellevue Rd [10] • R St: 2 lanes Bellevue to ½ mile south of Bellevue (4 lanes total) [10] • ~~R St~~ **Bellevue**/Fahrens Creek Bridge: 2 lanes (4 lanes total)[13] • R St/Collector St Traffic Signal (near Phases 13/18)	• V. 30 streets and utilities
31	None	None	• V. 31 streets and utilities
32	None	None	• V. 32 streets and utilities
33	• R St: 2 lanes • Old Lake Rd: 2 lanes	• Old Lake Rd: 2 lanes (in Phase 35)	• V. 33 streets and utilities
34	None	None	• V. 34 streets and utilities
35	None	None	• V. 35 streets and utilities
36	None	None	• V. 36 streets and utilities

Notes:

1A. The ~~R Street improvements as well as the~~ staging of signal improvements, including the specified lane configurations throughout the plan area have been revised as recommended ~~by~~ in Table 6 of the memorandum dated December 2, 2004 entitled "Timing of off-site roadway improvements for Bellevue Ranch" prepared by Fehr & Peers, except that: (a) the signal at "M" Street and Cardella Road will remain as a requirement of Phase 12; (b) the signal at "G" Street and Bellevue will remain a Village 22-"East" requirement; (c) "G" Street road widening between Bellevue Road and Merced College will remain a Village 21 requirement; and the signal at Cardella Road and "G" Street will remain a Village 7 requirement.

1B. "R" Street will be constructed as shown in Table 6.1, not the Fehr & Peers memo dated 12-2-04.

2. ~~Not used.~~ "R" Street will be constructed as shown in Table 6.1; the Fehr & Peers memo dated 12-2-04 did not change the timing of this improvement.

3. The G Street improvements have not been revised as recommended ~~by~~ in Table 6 of the memorandum dated December 2, 2004 entitled "Timing of off-site roadway improvements for Bellevue Ranch" prepared by Fehr & Peers.

4. Projects revised due to lack of Corps of Engineers drainage projects:
   a. Cottonwood Creek Bypass (Drainage Phase 1, 2): By Bellevue Ranch West, Villages 1-3.
   b. Fahrens Creek Bypass (Drainage Phase 1, 2, 3): deleted

5. Project moved to a later phase: Bellevue Rd: M to R (last 1 of 6 lanes) is moved into Phase 3/4.

6. The timing and responsibility (Crosswinds or Woodside) for these improvements in Village 21 (commercial) will be determined at the time of conditional use permit approval for this village.

7. Well site may be required sooner if deemed necessary by the City Engineer.

8. Improvements shall be completed prior to occupancy of any unit in this village.

9. Frontage improvements per Table B (Attachment H) of PC Staff Report #07-32 – 3rd Addendum.

10. **North Merced Major Roadway Improvement Impact Fee (NMMRIIP)**

11. **To be installed at the time intersection improvements are made. PFFP Eligible.**

12. **To be installed as "warranted" per Traffic Study prepared by Traffic Engineering Consultant. PFFP Eligible.**

13. **City of Merced Capital Improvement Project PFFP Funds and Fees collected with Bellevue Ranch building permits.**

14. **City of Merced Capital Improvement Project utilizing PFFP funds.**

BELLEVUE RANCH GENERAL PLAN AMENDMENTS

GREENHOUSE GAS ASSESSMENT

Merced, California

May 5, 2023

Prepared for:

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INTRODUCTION

This report assesses the greenhouse gas (GHG) impacts associated with the proposed General Plan Amendments (GPA) for the Bellevue Ranch area located south of Bellevue Road and west of G Street in Merced, California. The Bellevue Ranch General Plan and subsequent development projects were entitled in 1995 when a GHG analysis was not required. Recently, the project owner has made changes to the approved plan (i.e., the proposed GPA) to reduce residential densities for seven yet-to-be developed parcels and replace some of the planned commercial/office development on seven yet-to-be developed parcels within the area to dedicated open/park space. Because of the proposed GPA, an amendment to the California Environmental Quality Act (CEQA) document is required, which triggers the need to analyze the GHG impacts of the portions of the plan which are being changed.

The approved 1995 plan included the following land uses spread amongst 238.86 acres of "Villages:"

- 212 Low Density Residential Units
- 789 Low to Medium Residential Units
- 472 High to Medium Density Residential Units
- 343 Village Residential Units
- 292,941 square-feet (sf) of Regional Community Commercial
- 301,653 sf of Neighborhood Commercial
- 5.81 acres of Open Space/Park Recreation

The GPA would revise these totals to include more open space, impacting 225.85 acres of "Villages:"

- 230 Low Density Residential Units
- 372 Low to Medium Residential Units
- 466 High to Medium Density Residential Units
- 120 Village Residential Units
- No (0 sf) Regional Community Commercial
- 161,934 sf of Neighborhood Commercial
- 52.5 acres of Open Space/Park Recreation

GREENHOUSE GASES (GHGs)

Gases that trap heat in the atmosphere, Greenhouse gases (GHGs), regulate the earth's temperature. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate. The most common GHGs are carbon dioxide (CO_2) and water vapor but there are also several others, most importantly methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). These are released into the earth's atmosphere through a variety of natural processes and human activities. Sources of GHGs are generally as follows:

- CO_2 and N_2O are byproducts of fossil fuel combustion.
- N_2O is associated with agricultural operations such as fertilization of crops.

- CH_4 is commonly created by off-gassing from agricultural practices (e.g., keeping livestock) and landfill operations.
- Chlorofluorocarbons (CFCs) were widely used as refrigerants, propellants, and cleaning solvents but their production has been stopped by international treaty.
- HFCs are now used as a substitute for CFCs in refrigeration and cooling.
- PFCs and sulfur hexafluoride emissions are commonly created by industries such as aluminum production and semi-conductor manufacturing.

Each GHG has its own potency and effect upon the earth's energy balance. This is expressed in terms of a global warming potential (GWP), with CO_2 being assigned a value of 1 and sulfur hexafluoride being several orders of magnitude stronger. In GHG emission inventories, the weight of each gas is multiplied by its GWP and is measured in units of CO_2 equivalents (CO_2e).

An expanding body of scientific research supports the theory that global climate change is currently affecting changes in weather patterns, average sea level, ocean acidification, chemical reaction rates, and precipitation rates, and that it will increasingly do so in the future. The climate and several naturally occurring resources within California are adversely affected by the global warming trend. Increased precipitation and sea level rise will increase coastal flooding, saltwater intrusion, and degradation of wetlands. Mass migration and/or loss of plant and animal species could also occur. Potential effects of global climate change that could adversely affect human health include more extreme heat waves and heat-related stress; an increase in climate-sensitive diseases; more frequent and intense natural disasters such as flooding, hurricanes, and drought; wildfires and increased levels of air pollution.

REGULATORY ACTIONS FOR GHG EMISSIONS

State of California

Executive Order S-3-05 – California GHG Reduction Targets

Executive Order (EO) S-3-05 was signed by Governor Arnold Schwarzenegger in 2005 to set GHG emission reduction targets for California. The three targets established by this EO are as follows: (1) reduce California's GHG emissions to 2000 levels by 2010, (2) reduce California's GHG emissions to 1990 levels by 2020, and (3) reduce California's GHG emissions by 80 percent below 1990 levels by 2050.

Assembly Bill 32 – California Global Warming Solutions Act (2006)

Assembly Bill (AB) 32, the Global Warming Solutions Act of 2006, codified the State's GHG emissions targets by directing the California Air Resources Board (CARB) to reduce the State's global warming emissions to 1990 levels by 2020. AB 32 was signed and passed into law by Governor Schwarzenegger on September 27, 2006. Since that time, the CARB, California Energy Commission (CEC), California Public Utilities Commission (CPUC), and Building Standards Commission have all developed regulations that will help meet the goals of AB 32 and Executive Order S-3-05, which has a target of reducing GHG emissions 80 percent below 1990 levels.

The first Scoping Plan for AB 32 was adopted by CARB in December 2008. It contained the State's main strategies to reduce GHGs from business-as-usual emissions projected in 2020 back down to 1990 levels. Business-as-usual (BAU) is the projected emissions in 2020, including increases in emissions caused by growth, without any GHG reduction measures. The Scoping Plan had a range of GHG reduction actions, including direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms such as a cap-and-trade system.

As directed by AB 32, CARB has also approved a statewide GHG emissions limit. On December 6, 2007, CARB staff resolved an amount of 427 million metric tons (MMT) of CO_2e as the total statewide GHG 1990 emissions level and 2020 emissions limit. The limit was a cumulative statewide limit, not a sector- or facility-specific limit. CARB updated the future 2020 BAU annual emissions forecast, due to the economic downturn in 2010, to 545 MMT of CO_2e. Two GHG emissions reduction measures that were not previously included in the 2008 Scoping Plan baseline inventory were included, further reducing the baseline inventory to 507 MMT of CO_2e. Thus, an estimated reduction of 80 MMT of CO_2e was necessary to reduce statewide emissions to meet the AB 32 target by 2020.

Senate Bill 375 – California's Regional Transportation and Land Use Planning Efforts (2008)

California enacted legislation (SB 375) to expand the efforts of AB 32 by controlling indirect GHG emissions caused by urban sprawl. SB 375 provided incentives for local governments and applicants to implement new conscientiously planned growth patterns. This included incentives for creating attractive, walkable, and sustainable communities and revitalizing existing communities. The legislation also allowed applicants to bypass certain environmental reviews under CEQA if they built projects consistent with the new sustainable community strategies. Development of more alternative transportation options that would reduce vehicle trips and miles traveled, along with traffic congestion, was encouraged. SB 375 enhanced CARB's ability to reach the AB 32 goals by directing the agency in developing regional GHG emission reduction targets to be achieved from the transportation sector for 2020 and 2035. CARB works with the metropolitan planning organizations to align their regional transportation, housing, and land use plans to reduce vehicle miles traveled (VMT) and demonstrate the region's ability to attain its GHG reduction targets.

Senate Bills 350 and 100 - Renewable Portfolio Standards

In September 2015, the California Legislature passed SB 350, which increased the states Renewables Portfolio Standard (RPS) for content of electrical generation from the 33 percent target for 2020 to a 50 percent renewables target by 2030.

In September 2018, SB 100 was signed by Governor Brown to revise California's RPS program goals, furthering California's focus on using renewable energy and carbon-free power sources for its energy needs. The bill requires all California utilities to supply a specific percentage of their retail sales from renewable resources by certain target years. By December 31, 2024, 44 percent of the retails sales would need to be from renewable energy sources, by December 31, 2026 the target would be 40 percent, by December 31, 2027 the target would be 52 percent, and by December 31, 2030 the target would be 60 percent. By December 31, 2045, all California utilities

would be required to supply retail electricity that is 100 percent carbon-free and sourced from eligible renewable energy resources to all California end-use customers.

SB 743 Transportation Impacts

Senate Bill 743 required lead agencies to abandon the old "level of service" metric for evaluating a project's transportation impacts, which was based solely on the amount of delay experienced by motor vehicles. In response, the Governor's Office of Planning and Research (OPR) developed a VMT metric that considered other factors such as reducing GHG emissions and developing multimodal transportation.[1] A VMT-per-capita metric was adopted into the CEQA Guidelines Section 15064.3 in November 2017. Given current baseline per-capita VMT levels computed by CARB in the 2017 Scoping Plan of 22.24 miles per day for light-duty vehicles and 24.61 miles per day for all vehicle types, the reductions needed to achieve the 2050 climate goal are 16.8 percent for light-duty vehicles and 14.3 percent for all vehicle types combined. Based on this analysis (as well as other factors), OPR recommended using a 15-percent reduction in per capita VMT as an appropriate threshold of significance for evaluating transportation impacts.

[1] Governor's Office of Planning and Research. 2018. *Technical Advisory on Evaluating Transportation Impacts in CEQA*. December.

Executive Order B-55-18 – Carbon Neutrality

In 2018, a new statewide goal was established to achieve carbon neutrality as soon as possible, but no later than 2045, and to maintain net negative emissions thereafter. CARB and other relevant state agencies are tasked with establishing sequestration targets and creating policies/programs that would meet this goal.

Executive Order B-30-15 & Senate Bill 32 - GHG Reduction Targets

In April 2015, Governor Brown signed EO B-30-15, which extended the goals of AB 32, setting a GHG emissions target at 40 percent of 1990 levels by 2030. On September 8, 2016, Governor Brown signed Senate Bill (SB) 32, which established the GHG reduction target of 40 percent of 1990 levels by 2030. In November 2017, CARB issued *California's 2017 Climate Change Scoping Plan*, replacing the 2008 Plan. [2]

In December 2022, CARB adopted a Scoping Plan Update to reflect the 2030 target set by Executive Order B-30-15 and codified by SB 32. The 2022 Plan Update:

- Identifies a path to keep California on track to meet its SB 32 GHG reduction target of at least 40 percent below 1990 emissions by 2030.
- Identifies a technologically feasible, cost-effective path to achieve carbon neutrality by 2045 or earlier.
- Focuses on strategies for reducing California's dependency on petroleum to provide consumers with clean energy options that address climate change, improve air quality, and support economic growth and clean sector jobs.
- Integrates equity and protecting California's most impacted communities as a driving principle.
- Incorporates the contribution of natural and working lands to the state's GHG emissions, as well as its role in achieving carbon neutrality.
- Relies on the most up to date science, including the need to deploy all viable tools, including carbon capture and sequestration as well as direct air capture.
- Evaluates multiple options for achieving our GHG and carbon neutrality targets, as well as the public health benefits and economic impacts associated with each.

The Scoping Plan Update lays out how the state can get to carbon neutrality by 2045 or earlier. It is also the first Scoping Plan that adds carbon neutrality as a science-based guide and touchstone beyond statutorily established emission reduction targets.[3]

The mid-term 2030 target is considered critical by CARB on the path to obtaining an even deeper GHG emissions target of 80 percent below 1990 levels by 2050, as directed in Executive Order S-3-05. The 2022 Scoping Plan Update outlines the suite of policy measures, regulations, planning efforts, and investments in clean technologies and infrastructure, providing a blueprint to continue

[2] California Air Resource Board, 2017. *California's 2017 Climate Change Scoping Plan: The Strategy for Achieving California's 2030 Greenhouse Gas Targets.* November. Web: https://ww2.arb.ca.gov/sites/default/files/classic//cc/scopingplan/scoping_plan_2017.pdf

[3] https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents

driving down GHG emissions and to not only obtain the statewide goals, but cost-effectively achieve carbon-neutrality by 2045 or earlier. In the 2022 Scoping Plan Update, CARB recommends:

- VMT per capita reduced 12% below 2019 levels by 2030 and 22% below 2019 levels by 2045.
- 100% of Light-duty vehicle sales are zero emissions vehicles (ZEV) by 2035.
- 100% of medium duty/heavy duty vehicle sales are ZEV by 2040.
- 100% of passenger and other locomotive sales are ZEV by 2030.
- 100% of line haul locomotive sales are ZEV by 2035.
- All electric appliances in new residential and commercial buildings beginning 2026 (residential) and 2029 (commercial).
- 80% of residential appliance sales are electric by 2030 and 100% of residential appliance sales are electric by 2035.
- 80% of commercial appliance sales are electric by 2030 and 100% of commercial appliance sales are electric by 2045.

California Building Standards Code – Title 24 Part 11 & Part 6

The California Green Building Standards Code (CALGreen Code) is part of the California Building Standards Code under Title 24, Part 11.[4] The CALGreen Code encourages sustainable construction standards that involve planning/design, energy efficiency, water efficiency resource efficiency, and environmental quality. These green building standard codes are mandatory statewide and are applicable to residential and non-residential developments. The most recent CALGreen Code (2022 California Building Standard Code) was effective as of January 1, 2023.

The California Building Energy Efficiency Standards (California Energy Code) is under Title 24, Part 6 and is overseen by the CEC. This code includes design requirements to conserve energy in new residential and non-residential developments, while being cost effective for homeowners. This Energy Code is enforced and verified by cities during the planning and building permit process. The current energy efficiency standards (2022 Energy Code) replaced the 2019 Energy Code as of January 1,2023. The 2022 Energy Code builds on California's technology innovations, encouraging inclusion of market-ready electric products in new construction, such as heat pumps for climate control and water heating. Under the 2022 standards, all new homes are required to be electric-ready. That means buildings with gas stoves have electrical panels and wiring to support a switch to electric stoves. This Energy code also strengthens ventilation standards to improve indoor air quality. This update provides crucial steps in the state's progress toward 100 percent clean carbon neutrality by midcentury.[5]

CEC studies have identified the most aggressive electrification scenario as putting the building sector on track to reach the carbon neutrality goal by 2045.[6] Installing new natural gas

[4] See: https://www.dgs.ca.gov/BSC/Resources/Page-Content/Building-Standards-Commission-Resources-List-Folder/CALGreen#:~:text=CALGreen%20is%20the%20first%2Din,to%201990%20levels%20by%202020.

[5] See: https://www.energy.ca.gov/sites/default/files/2021-08/CEC_2022_EnergyCodeUpdateSummary_ADA.pdf

[6] California Energy Commission. 2021. F*inal Commission Report: California Building Decarbonization Assessment.*

infrastructure in new buildings will interfere with this goal. To meet the State's goal, communities have been adopting "Reach" codes that prohibit natural gas connections in new and remodeled buildings.

Requirements for electric vehicle (EV) charging infrastructure are set forth in Title 24 of the California Code of Regulations and are regularly updated on a 3-year cycle. The CALGreen standards consist of a set of mandatory standards required for new development, as well as two more voluntary standards known as Tier 1 and Tier 2. The CalGreen 2022 standards require deployment of additional EV chargers in various building types, including multifamily residential and nonresidential land uses. They include requirements for both EV capable parking spaces and the installation of Level 2 EV supply equipment for multifamily residential and nonresidential buildings. The 2022 CALGreen standards include both mandatory requirements and more aggressive voluntary Tier 1 and Tier 2 provisions for both EV readiness and the actual installation of EV chargers. Providing EV charging infrastructure that meets current CALGreen requirements will not be sufficient to power the anticipated more extensive level of EV penetration in the future that is needed to meet SB 32 climate goals.

Advanced Clean Cars

The Advanced Clean Cars Program, originally adopted by CARB in 2012, was designed to bring together CARB's traditional passenger vehicle requirements to meet federal air quality standards and also support California's AB 32 goals to develop and implement programs to reduce GHG emissions back down to 1990 levels by 2020, a goal achieved in 2016 as a result of numerous emissions reduction programs.

This recent rule, *Advanced Clean Cars II (ACC II)* is phase two of the original rule. ACC II establishes a year-by-year process, starting in 2026, so all new cars and light trucks sold in California will be zero-emission vehicles by 2035. The regulation codifies the light-duty vehicle goals set out in Governor Newsom's Executive Order N-79-20. Currently, 16 percent of new light-duty vehicles sold in California are zero emissions or plug-in hybrids. By 2030, 68 percent of new vehicles sold in California would be zero emissions and 100 percent by 2035.

National and Statewide GHG Emissions

The U.S. EPA reported that in 2022, total gross nationwide GHG emissions were 5,215.6 million metric tons (MMT) CO_2e.[7] These emissions were lower than peak levels of 7,416 MMT that were emitted in 2007. CARB updates the statewide GHG emission inventory on an annual basis where the latest inventory includes 2000 through 2019 emissions.[8] In 2019, GHG emissions from statewide emitting activities were 418.2 MMT CO_2e. The 2019 emissions have decreased by 30 percent since peak levels in 2007 and are 7.2 MMT CO_2e lower than 2018 emissions level and

Publication Number CEC-400-2021-006-CMF.August

[7] United States Environmental Protection Agency, 2022. *Draft Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2020*. February. Web: https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks

[8] CARB. 2021. *California Greenhouse Gas Emission for 2000 to 2019*. Web: https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2019/ghg_inventory_trends_00-19.pdf

almost 13 MMT CO_2e below the State's 2020 GHG limit of 431 MMT CO_2e. Per capita GHG emissions in California have dropped from a 2001 peak of 14.0 MT CO_2e per person to 10.5 MT CO_2e per person in 2019.

San Joaquin Valley Air Pollution Control District

In August 2008, the San Joaquin Valley Air Pollution Control District (SJVAPCD) adopted the Climate Change Action Plan (CCAP). The goals of the CCAP are to establish the Air District's processes for assessing the significance of GHG impacts for projects permitted by the District; assist local land use agencies, developers, and the public by identifying and quantifying GHG emission reduction measures for development projects, and by providing tools to streamline evaluation of project specific GHG effects; ensure that collateral emissions from GHG emission reduction projects do not adversely impact public health or environmental justice communities in the Valley; and assist Valley businesses in complying with state law related to GHG emission reduction. In particular, the CCAP directed the SJVAPCD's Air Pollution Control Officer to develop guidance to assist Air District staff, Valley businesses, land use agencies, and other permitting agencies in addressing GHG emissions as part of the CEQA process. Pursuant to this directive, on December 17, 2009, SJVAPCD adopted *Guidance for Valley Land-Use Agencies in Addressing GHG Emissions Impacts for New Projects under CEQA* (described below). The CCAP also directs Air District staff to investigate and develop a GHG banking program, enhance the existing emissions inventory process to include GHG emissions reporting consistent with state requirements, and administer voluntary GHG emission reduction agreements.

SJVAPCD's Guidance for Addressing GHG Emissions Impacts under CEQA

Under its mandate to provide local agencies with assistance in complying with CEQA in climate change matters, the SJVAPCD developed its *Guidance for Valley Land-Use Agencies in Addressing GHG Emissions Impacts for New Projects under CEQA.* As a general principal to be applied in determining whether a proposed project would be deemed to have a less-than-significant impact on global climate change, a project must be in compliance with an approved GHG emission reduction plan that is supported by a CEQA-compliant environmental document or be determined to have reduced or mitigated GHG emissions by 29 percent relative to Business-As-Usual conditions, consistent with GHG emission reduction targets established in CARB's Scoping Plan for AB 32 implementation. The SJVAPCD guidance is intended to streamline the process of determining if project specific GHG emissions would have a significant effect. The proposed approach relies on the use of performance-based standards and their associated pre-quantified GHG emission reduction effectiveness (Best Performance Standards, or BPS). Establishing BPS is intended to help project proponents, lead agencies, and the public by proactively identifying effective, feasible mitigation measures. Emission reductions achieved through implementation of BPS would be pre-quantified, thus reducing the need for project specific quantification of GHG emissions. For land use development projects, BPS would include emissions reduction credits for project features such as bicycle racks and pedestrian access to public transit. Projects implementing a sufficient level of BPS 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. For all projects for which the lead agency has determined that an Environmental Impact Report (EIR) is required, quantification of GHG emissions would be required whether or not the project incorporates BPS. SJVAPCD's guidance document does not constitute a rule or regulation but is intended for use

by other agencies in their assessment of the significance of project impacts to global climate change under CEQA.

City of Merced

Merced Vision 2030 General Plan

The City's General Plan, *Merced Vision 2030*, serves as a blueprint for growth, establishing goals, objectives, and policies to guide planning decisions and provides the platform for local action in addressing air quality, energy, and climate change issues. *Merced Vision 2030* was adopted in 2012 and has a horizon year of 2030. Applicable goals, policies, and implementing actions presented in *Merced Vision 2030* are as follows:

Goal Area SD-1: Air Quality and Climate Change

- Policy SD-1.1: Accurately determine and fairly mitigate the local and regional air quality impacts of projects proposed in the City of Merced.
    - *Implementing Actions 1.1.a:* Implement uniform standards, analysis methods, and significance thresholds recommended by the Air District for mitigating air quality impacts resulting from development.
    - *Implementing Actions 1.1.b:* Ensure that significant air quality impacts identified during CEQA review are consistently and fairly mitigated.
    - *Implementing Actions 1.1.c:* All air quality mitigation measures should be feasible, implementable, and cost effective.
    - *Implementing Actions 1.1.d:* Work with the SJVAPCD to identify regional cumulative transportation and air quality impacts.
    - *Implementing Actions 1.1.e:* Reduce the air quality impacts of development projects that may be insignificant by themselves, but cumulatively are significant.
    - *Implementing Actions 1.1.f:* Encourage innovative measures to reduce air quality impacts by coordinating with the SJVAPCD, project applicants, and other interested parties.
    - *Implementing Actions 1.1.g:* Include the evaluation of Greenhouse Gas Emissions and Climate Change in environmental review documents prepared by the City.
- Policy SD-1.2: Coordinate local air quality programs with regional programs and those of neighboring jurisdictions.
    - *Implementing Actions 1.2.a:* Work with neighboring jurisdictions and affected agencies to address cross-jurisdictional and regional

transportation and air quality issues.

- *Implementing Actions 1.2.b:* Consult with the SJVAPCD during CEQA review for discretionary projects.

- Policy SD-1.3: Integrate land use planning, transportation planning, and air quality planning for the most efficient use of public resources and for a healthier environment.

- Policy SD-1.7: Develop and implement a Climate Action Plan for the City.

    - *Implementing Actions 1.7.a:* Work with neighboring jurisdictions and affected agencies to address cross-jurisdictional and regional transportation and air quality issues.

    - *Implementing Actions 1.7.b:* Once adopted, amend City policies and ordinances as needed to implement the goals, policies, and actions of the Climate Action Plan.

    - *Implementing Actions 1.7.c:* As part of the development of the Climate Action Plan and in the spirit of AB 32, The Global Warming Solutions Act of 2006, a variety of suggested measures from the California Climate Action Team Strategies and the Department of Justice Attorney General will be considered and evaluated by the City for possible future implementation.

    - *Implementing Actions 1.7.d:* In addition to the measures described in SD-1.7.c, during the preparation of the City's Climate Action Plan, the City will evaluate and consider additional policies and measures for possible future implementation.

- Policy SD-1.8: Implement Policies in Other General Plan Chapters to Address Air Quality and Greenhouse Gas Emissions Reduction Goals.

    - *Implementing Actions 1.8.a:* Continue implementation of land use, transportation, urban expansion, urban design, open space, and public facilities General Plan policies that address air quality goals.

    - *Implementing Actions 1.8.b:* Continue implementation of land use, transportation, urban expansion, urban design, open space, and public facilities General Plan policies that address greenhouse gas emissions reduction goals.

Climate Action Plan

On October 1, 2012, The City of Merced adopted its current Climate Action Plan (CAP). It includes goals, strategies, and actions to reduce GHG emissions to 1990 levels by the year 2020, consistent with the state objectives set forth in AB 32. The CAP's emission inventory for 2008

showed the City emitted 497,896 metric tons (MT) of CO_2e.[9] As a point of comparison, statewide emissions were about 444 million MT of CO_2e in 2011. Achieving the AB 32 target of reducing emissions to 1990 levels by 2020 required a 147,915 MT reduction of CO_2e. The majority of reductions were achieved through building energy conservation (30.5% reduction), renewable energy initiatives (23% reduction), and enhanced mobility (21% reduction). Future updates to the CAP can add later target years and additional strategies needed to achieve those targets beyond 2020.

In 2013, the City launched an effort, building upon the CAP, to create a suite of tools to identify and monitor near-term community GHG emission reduction efforts, adoption of new development-related codes, and to create an urban design manual that graphically demonstrates City development policies and codes in a user-friendly format. Collectively, these tools are referred to as the Programmatic Climate Action Plan, or PCAP. The PCAP provides a development checklist that streamlines the City's permitting process as it applies to CEQA-based GHG emission assessments. The Residential and Nonresidential Project Options Checklist, provided as *Attachment 1,* summarizes the criteria for a project to claim consistency with the CAP and thereby access CEQA permit streamlining for purposes of analyzing GHG emissions. Projects that demonstrate consistency with the CAP by meeting criteria on the checklist are eligible to rely on the City's analysis of GHG emissions for purposes of CEQA. Rather than prescribe a mandatory set of actions that all new projects must meet for CAP consistency, projects can choose from one of several options in the applicable checklist, also referred to as "performance measures." Where certain CAP performance measures also have a visual component, the City provides further guidance in the Unified Design Manual (UDM). Together, the Project Options checklists and UDM use a performance-based approach to identify measures and performance requirements for new projects seeking consistency with the CAP.[10]

Impact GHG-1: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

It is generally accepted that individual development projects, in and of themselves, are too small to have a perceptible effect on global climate. However, the GHG emissions from each development project results in an incremental contribution to global warming and climate change. The scope of climate change is global, and the cumulative emissions of GHGs globally have resulted in cumulatively significant climate change impacts. Thus, in CEQA terms, GHG emissions associated with individual development projects are by nature cumulative in their effects. A significant impact would occur if the GHG emissions associated with the GPA represent a considerable contribution to the cumulatively significant impacts resulting from global climate change. As such, the focus of this analysis is to determine whether the GHG emissions associated with the GPA represent a considerable contribution to the cumulatively significant impacts resulting from global climate change.

[9] City of Merced. 2012. *Merced Climate Action Plan*. October. Web: https://www.cityofmerced.org/departments/development-services/planning-division/climate-action-plan/-folder-1228.

[10] City of Merced. *Programmatic Climate Action Plan and Environmental Permit Streamlining*. Web: https://www.cityofmerced.org/departments/development-services/planning-division/programmatic-climate-action-plan.

GHG emissions associated with the proposed GPA would occur over the short-term from construction activities, consisting primarily of emissions from equipment exhaust, worker vehicles, and vendor vehicle trips. There would also be long-term emissions associated with vehicular traffic within the project vicinity, energy and water usage, and solid waste disposal.

SJVAPCD Methodologies

The SJVAPCD's *Guidance for Valley Land-Use Agencies in Addressing GHG Emissions Impacts for New Projects under CEQA* provides for three alternative methodologies for evaluating project's potential impact on climate change and determination reducing GHG emissions from a project to less-than-significant levels. These include: (1) Demonstrate compliance with a locally-adopted GHG reduction plan (i.e., City of Merced CAP or PCAP); (2) Demonstrate implementation of a combination of Air District-approved and pre-qualified BPS, which taken together are deemed to result in a 29 percent reduction in project GHG emissions relative to Business-As-Usual (BAU) conditions; or (3) For projects not implementing BPS, quantification of project GHG emissions and comparison to GHG emissions from BAU conditions in order to demonstrate a 29 percent reduction in emissions relative to BAU conditions. BAU is defined as the operation of the proposed project with emission factors from the 2002-2004 baseline period established by the AB 32 Scoping Plan. Land use projects not achieving the necessary reductions would be considered to have a significant impact. It is important to note that projects that require the preparation of an EIR for any reason are required to quantify GHG emissions, even if they are compliant with an adopted climate action plan or are implementing BPS.

CalEEMod Modeling

CalEEMod (Version 2020.4.0) was used to quantify GHG emissions from project operations-related activities assuming full build-out of the project by 2035 and a BAU scenario using 2005 emissions factors. GHG emissions from the GPA would be generated primarily from autos driven by future residents, employees, customers, and vendors and for energy use associated with the land use changes. The land use types, size, and other area-specific information were input to the model. The use of this model for evaluating emissions from land use projects is recommended by the SJVAPCD. Unless otherwise noted below, the CalEEMod model defaults for Merced County in 2035 and 2005 were used. CalEEMod model outputs are included in *Attachment 2*.

<u>CalEEMod Land Uses</u>

The land uses associated with the GPA were input into CalEEMod as summarized in Table 1. The amounts of each land use type were provided by the applicant.[11] These were used for both the build-out (2035) and BAU (2005) scenarios.

[11] Via email from Mark Niskanen, J.B. Anderson Lan Use Planning, March 30, 2023. Bellevue Ranch GPA Land Ise Matrix as finalized 3-30-23.docx.

Table 1. Land Uses Entered into CalEEMod

GPA Land Use Category	CalEEMod Land Use Type	Amount	Unit of Measure
Neighborhood Commercial	General Office Building	80.97	1,000-sf
Open Space/Park Recreation	City Park	52.5	Acres
High to Medium Density Residential	Apartments Low Rise	466	Dwelling Units
Low to Medium Residential	Condo/Townhouse	372	Dwelling Units
Low Density Residential	Single Family Housing	230	Dwellings
Village Residential	Single Family Housing	120	Dwellings
Neighborhood Commercial	Strip Mall	80.97	1,000-sf

The GPA would change the amounts of several land use categories built in the plan area. CalEEMod uses specific land use categories to estimate emissions. Thus, the categories identified in the GPA were related to the CalEEMod land use categories as shown in Table 1. Because the specific type of commercial land use was not identified by the applicant, it was assumed to be half (i.e., 50 percent) office and half (i.e., 50 percent) strip mall type retail use. These categories are used by the model to estimate GHG emissions related to mobile sources (i.e., traffic), energy use, waste, and water/wastewater.

Mobile Source Emissions

GHG emissions from on-road mobile sources (i.e., traffic) were estimated for both the 2035 build-out scenario and the BAU scenario using CalEEMod default emissions rates, trip generation rates, and trip lengths. Version 2020.4.0 of CalEEMod uses emissions factors from CARB's EMFAC2017 emissions model and ITE trip generation rates. More information on how the model calculates GHG emissions from traffic can be found in the model's technical documentation.[12] Note that the mobile emissions modeling does not reflect the effect of California's recently adopted Advanced Clean Car, Phase II regulation that will require an increased phase in of electric vehicles from 35 percent in 2026 to 100 percent in 2035. The current version of CalEEMod that is based on EMFAC2017 underestimates the effect of this regulation. Future updates to the State's EMFAC model will reflect the effect of this regulation.

Energy

GHG emissions modeling includes those indirect emissions from electricity consumption. Default 2019 Title 24 Building Standards were used to estimate energy consumption. The 2035 build-out scenario used the CalEEMod default for Pacific Gas and Electric's (PG&E's) energy emission factor for CO_2 per megawatt of electricity produced and the default 2019 Title 24 Building Standards energy intensity factors. The PG&E factor is based on 2019 emissions rates. Note that PG&E's carbon intensity for delivered electricity has decreased by 64 percent over the last 10 years. PG&E plans to achieve net zero emissions by 2050, by substantially reducing emissions by 2040 and neutralizing remaining emissions by 2050[13].

[12] Available at http://www.aqmd.gov/caleemod/user's-guide

[13] PG&E Climate Strategy Report. June 2022

The BAU emissions estimate used default emission factor for PG&E in the previous version of the CalEEMod model (Version 2016.3.2) of 641.3 pounds of CO_2 per megawatt of electricity produced. This factor is based on PG&E's 2008 emissions rate.

Wood-Burning Devices

CalEEMod default inputs assume new residential construction would include woodburning fireplaces and stoves. The project would not include wood-burning devices, as these devices are prohibited by SJVAPCD Rule 4901.[14] Therefore, the number of woodstoves and woodburning fireplaces in CalEEMod were set to zero and assigned as natural gas in both the 2035 build-out and BAU scenarios.

Water Usage and Wastewater

CalEEMod assigns water usage rates for the various land uses based on statewide rates developed prior to the model in 2008. Water/wastewater use was changed to 100 percent aerobic conditions for both the 2035 build-out and BAU scenarios to represent the City's wastewater treatment plant conditions. The GPA area would not send wastewater to septic tanks or facultative lagoons.

Solid Waste

CalEEMod defaults were used to estimate GHG emissions associated with solid waste generation for both the 2035 build-out and BAU scenarios.

Summary of Computed GHG Emissions

The CalEEMod model estimated annual emissions associated with the GPA's 2035 built-out and the BAU scenario. In 2035, annual emissions are calculated to be 13,725 MT of CO_2e, as shown in Table 2. The percent reduction when compared to the BAU scenario is estimated to be approximately 43 percent, 14 percent over the 29 percent reduction target. Therefore, per SJVAPCD methodologies for identifying Project-Specific GHG Emissions impacts per the *Guidance for Valley Land-Use Agencies in Addressing GHG Emissions Impacts for New Projects under CEQA*, the proposed GPA would have a *less-than-significant* impact as it exceeds the 29 percent reduction in GHG emissions needed relative to BAU conditions.

Additionally, the project is required to comply with the City's PCAP and UDM. The project check list (*Attachment 1*) includes several applicable strategies individual projects in the GPA area can include to ensure adherence to in the City's CAP.

[14] San Joaquin Valley Air Pollution Control District, https://ww2.valleyair.org/compliance/residential-wood-smoke-reduction-program/rule-4901-wood-burning-fireplaces-and-wood-burning-heaters/

TABLE 2. Annual Project GHG Emissions (CO_2e) in Metric Tons

Source Category	BAU Emissions	2035 Project Emissions
Area	685	685
Energy Consumption	3,536	1,967
Mobile	18,873	10,392
Solid Waste Generation	458	458
Water Usage	414	223
Total	23,966	13,725
Percent Reduction		42.7 percent
SJVAPCD Reduction Target for Project-Specific Emissions (for Projects not compliant with a CAP or not implementing BPS)		**29 percent**

Impact GHG-2: Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The City of Merced has a CAP and a PCAP/UDM that enforce its building codes, which aim to reduce GHG emissions. Therefore, if individual projects included in the GPA conform to City building Codes, the GPA would conform with the CAP and would not conflict with local plans, policies, or regulations applicable to GHG emissions. The projects proposed as part of the overall GPA would be constructed in conformance with at minimum the 2022 CalGreen and the Title 24 Building Codes, which requires high-efficiency water fixtures, water-efficient irrigation systems, and compliance with current energy efficiency standards. Compliance with these standards ensures compliance with State and federal plans, policies, and regulations applicable to GHG emissions.

Attachment 1: PCAP Checklists

Section IV: Performance-based Development

This section discusses the new performance-based development approach and its role in implementing the measures in the CAP that apply to new development projects. The Residential and Nonresidential Project Options checklists summarize the criteria for a project to claim consistency with the CAP and thereby access CEQA permit streamlining for purposes of analyzing GHG emissions. Projects that demonstrate consistency with the CAP by meeting criteria on these checklists are eligible to rely on the City's analysis of GHG emissions for purposes of CEQA. Rather than prescribe a mandatory set of actions that all new projects must meet for CAP consistency, projects can choose from one of several options in the applicable checklist, also referred to as "performance measures." Where certain CAP performance measures also have a visual component, the City provides further guidance in the UDM. Together, the Project Options checklists and UDM use a performance-based approach to identify measures and performance requirements for new projects seeking consistency with the CAP. The minimum options a project must meet for CAP consistency are summarized in the Project Options checklists. Additional information and suggestions are provided in the UDM to help the City further communicate desired outcomes to project applicants.

If new projects are subject to CEQA but do not wish to comply with the CAP or UDM, they may elect to conduct an analysis of GHG emissions and climate change as required by CEQA. Such projects are expected to meet all requirements of CEQA.

The performance-based approach allows projects seeking CAP consistency to choose measures that best meets the project's needs. These measures have already been analyzed by the City and would result in new development collectively achieving reductions that would contribute toward the City's GHG reduction target. The Project Options checklists summarize the options for new projects to comply with CAP measures. The checklists also identify where the UDM provides additional guidance to support projects as they seek to meet the criteria in the Project Options checklists. City staff will use the Project Options checklists and UDM as a basis for identifying conditions of approval for new projects seeking to demonstrate CAP consistency.

Performance Approach

New development projects can demonstrate compliance with the CAP by implementing a selection of specific reduction measures. Projects can choose to implement one of the options outlined below, each of which contains design criteria based on reduction measures from the CAP and PCAP. Projects can demonstrate compliance with the CAP by implementing all reduction measures in the selected option. Each option shows the criteria that would reduce the project's GHG emissions 29% below baseline levels consistent with Air District's recommended CEQA Assessment Guidance. While new projects will implement these measures on a case-by-case basis, when the total impact of each new project's GHG reductions is aggregated, collectively new development would achieve a measureable reduction in GHG emissions that helps the City achieve its adopted GHG reduction target of returning to 1990 GHG emissions levels by 2020. Additionally, the measure options allow projects to achieve GHG reductions that also meet the requirements of the San Joaquin Valley Air Pollution Control District (SJVAPCD) Indirect Source Review Program for new development. The SJVAPCD's Indirect Source Review rule requires that most projects reduce emissions of other air pollutants below specified levels or pay mitigation fees. The measures in the Project Options checklists are intended to help facilitate compliance with the Indirect Source Review rule and other regulations; however, projects that fully comply with the CAP are not necessarily fully compliant with SJVAPCD rules.

As stated above, to demonstrate consistency with the CAP, each project must fully implement all measures in one of the applicable options. However, projects are not prohibited from implementing individual measures that enable the project to potentially achieve reductions beyond what the CAP requires.

The reduction measures in the options are not a complete list of City requirements applicable to new development that reduce GHG emissions. For example, if a project chooses to demonstrate consistency by selecting Option 1, which only requires a renewable energy system of the specified size, the project may still be required to comply with existing City requirements that also help to reduce emissions. Reductions from these items have already been accounted for in the PCAP.

Residential and Nonresidential Project Options Checklists

The applicant will be asked to indicate the option the proposed project will include. Note that, in addition to the options for CAP consistency shown below, the City assumes credit for projects based on numerous regulations already under way. The following reductions from state-mandated actions are already attributed as credits toward the project for GHG reductions, and cannot be claimed as additional credits to meet the performance-based options below:

- Compliance with California's RPS, mandating that utilities procure 33% of their electricity from eligible renewable sources by the end of 2020.
- Vehicles with fuel efficiencies compliant with California's AB 1493 standards, and using fuel that meets the requirements of the state Low Carbon Fuel Standard.
- Compliance with the mandatory items of the California Building Standards Code, including all minimum energy efficiency requirements.

Projects cannot count these actions as additional credits for CAP consistency. Note that the performance-based approach also does not address reductions from water efficiency, reduced solid waste generation, and off-road equipment use; reductions from these items are achieved on a citywide basis year-by-year through other CAP implementation measures, which apply to both existing and new developments. The City implements these measures through other methods, rather than as conditions of approval on new development or remodels.

The options for performance-based compliance with the CAP are provided below in the Project Options checklists. The criteria for each option vary based on project type or the assumed level of participation. Each option provides a level playing field for new projects to select the types of GHG reduction measures that are most cost-effective or applicable to the project. While each option presents different criteria, each option would achieve a similar relative reduction of GHG emissions reductions. Based on analysis in the CAP, the City has determined that projects consistent with the criteria below are meeting the level of GHG reductions for new development identified in the CAP and contribute to the City's achievement of GHG reduction targets. Accordingly, the City will provide the opportunity for streamlining to projects that are consistent with one of the following options.

Note that each option for performance-based measures is further explained in the following tables and sections.

Project Options Checklists

Residential Project Options and Associated Measures					
#	GHG Reduction Measures	Option Set			
		1	2	3	4
1	Install a solar water heating system for indoor use for all units, and for any swimming pools included in the project.		✓	✓	
2	Construct all new buildings to CALGreen Tier 1 standards.				✓
3a	Establish an on-site renewable energy system: The system should be capable of producing at least 7,000 kWh annually for every residential unit (for a solar photovoltaic system, this is a 5 kW system per home).	✓			
3b	Establish an on-site renewable energy system: The system should be capable of producing at least 4,300 kWh annually per unit (for a solar photovoltaic system, this is a 3 kW system per home).		✓		
4a	Reduce vehicle trips (VMT) through measures that support alternative transportation options such as carpooling, walking and bicycling, and increased transit use. The project should use applicable designs from the UDM. A 15% reduction below average for project occupants should be 2,910 per person annually. *		✓		
4b	Reduce vehicle trips (VMT) through measures that support alternative transportation options such as carpooling, walking and bicycling, and increased transit use. The project should use applicable designs from the UDM. A 20% reduction below average for project occupants should be 2,730 per person annually. *			✓	
5	Utilize passive solar design techniques.			✓	
6	Be located in an area of moderate road connectivity with small block sizes, using concepts illustrated in the City's Unified Design Manual. †			✓	
7	Provide one EV charging station (Level 2 or Level 3) per unit.				✓
8	Plant trees to provide shade to building.				✓
*Note: The per person average VMT for project occupants is based on the average VMT for residents and employees in Merced. Depending on the specific size and land use of the development projects, actual per person VMT for individual project occupants may be higher or lower than the target average presented here. This data would typically be available in the common types of project analysis that applicants must submit to the San Joaquin Valley Air Pollution Control District for compliance with the Indirect Source Rule.					
†Note: "Moderate road connectivity," as identified by the California Air Pollution Control Officers Association, is at least 45 intersections per square mile.					

Residential Project: Applicant Selection of Option with Measures		
Option	Measure Set	Selection: The applicant signs here to denote which option and measures will be installed with the project
1	3a	
2	1, 3b, 4a	
3	1, 4b, 5, 6	
4	2, 7, 8	

Nonresidential Project Options and Associated Measures					
#	GHG Reduction Measures	Option Set			
		1	2	3	4
1	Install a solar water heating system for indoor use for all buildings.			✓	
2	Construct all new buildings to CALGreen Tier 1 standards.	✓	✓		
3a	Establish an on-site renewable energy system: The system should be capable of producing at least 14,400 kWh annually for every nonresidential building (for a solar photovoltaic system, this is a 10 kW system for every nonresidential building).				✓
3b	Establish an on-site renewable energy system: The system should be capable of producing at least 7,200 kWh annually for the average business (for a solar photovoltaic system, this is 5 kW for business).		✓		
4a	Reduce vehicle trips (VMT) through measures that support alternative transportation options such as carpooling, walking and bicycling, and increased transit use. The project should use applicable designs from the UDM. A 15% reduction below average for project occupants should be 2,910 per person annually. *		✓		
4b	Reduce vehicle trips (VMT) through measures that support alternative transportation options such as carpooling, walking and bicycling, and increased transit use. The project should use applicable designs from the UDM. A 25% reduction below average for project occupants should be 2,550 per person annually. *	✓			
5	Utilize passive solar design techniques.			✓	
6	Provide an EV charging station.			✓	
7	Be located in a mixed-use residential/commercial building, with no less than 25% of floor space devoted to either type of use.	✓			
*Note: The per person average VMT for project occupants is based on the average VMT for residents and employees in Merced. Depending on the specific size and land use of the development projects, actual per person VMT for individual project occupants may be higher or lower than the target average presented here. This data would typically be available in the common types of project analysis that applicants must submit to the San Joaquin Valley Air Pollution Control District for compliance with the Indirect Source Rule.					

Nonresidential Project: Applicant Selection of Option with Measures		
Option	Measure Set	Selection: The applicant signs here to denote which option and measures will be installed with the project
1	2, 4b, 7	
2	2, 3b, 4a	
3	1, 5, 6	
4	3a	

Attachment 2: CalEEMod Modeling Output

23-044 Belleuve Ranch GHG 2035 - Merced County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

23-044 Belleuve Ranch GHG 2035

Merced County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	80.97	1000sqft	6.83	80,967.00	0
City Park	52.50	Acre	52.50	2,286,900.00	0
Apartments Low Rise	466.00	Dwelling Unit	23.30	466,000.00	1333
Condo/Townhouse	372.00	Dwelling Unit	67.92	372,000.00	1064
Single Family Housing	230.00	Dwelling Unit	42.31	414,000.00	658
Single Family Housing	120.00	Dwelling Unit	10.04	216,000.00	343
Strip Mall	80.97	1000sqft	6.83	80,967.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	49
Climate Zone	3			**Operational Year**	2035
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

23-044 Belleuve Ranch GHG 2035 - Merced County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Land uses, lot acreages, some square footages, and number of dwelling units provided by draft land use matrix.

Construction Phase - Operational run - no construction.

Off-road Equipment - Operational run - no construction.

Grading -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	180.00	1.00
tblLandUse	LandUseSquareFeet	80,970.00	80,967.00
tblLandUse	LandUseSquareFeet	80,970.00	80,967.00
tblLandUse	LotAcreage	1.86	6.83
tblLandUse	LotAcreage	29.13	23.30
tblLandUse	LotAcreage	23.25	67.92
tblLandUse	LotAcreage	74.68	42.31
tblLandUse	LotAcreage	38.96	10.04
tblLandUse	LotAcreage	1.86	6.83
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblWoodstoves	NumberCatalytic	23.30	0.00
tblWoodstoves	NumberCatalytic	67.92	0.00
tblWoodstoves	NumberCatalytic	52.35	0.00
tblWoodstoves	NumberNoncatalytic	23.30	0.00
tblWoodstoves	NumberNoncatalytic	67.92	0.00
tblWoodstoves	NumberNoncatalytic	52.35	0.00

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23-044 Belleuve Ranch GHG 2035 - Merced County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.0 Emissions Summary

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	8.2080	0.6767	9.0368	4.1400e-003		0.0954	0.0954		0.0954	0.0954	0.0000	680.6858	680.6858	0.0265	0.0122	684.9883
Energy	0.1233	1.0591	0.4894	6.7200e-003		0.0852	0.0852		0.0852	0.0852	0.0000	1,952.1703	1,952.1703	0.1418	0.0367	1,966.66
Mobile	4.0217	10.0627	40.0687	0.1096	12.7332	0.0984	12.8315	3.4106	0.0928	3.5034	0.0000	10,183.3861	10,183.3861	0.4450	0.6634	10,392.20
Waste						0.0000	0.0000		0.0000	0.0000	184.8578	0.0000	184.8578	10.9248	0.0000	457.9773
Water						0.0000	0.0000		0.0000	0.0000	31.0248	89.0647	120.0895	3.2010	0.0770	223.0557
Total	**12.3529**	**11.7985**	**49.5949**	**0.1205**	**12.7332**	**0.2790**	**13.0122**	**3.4106**	**0.2734**	**3.6840**	**215.8826**	**12,905.3069**	**13,121.1895**	**14.7390**	**0.7893**	**13,724.8800**

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23-044 Belleuve Ranch GHG 2035 - Merced County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	8.2080	0.6767	9.0368	4.1400e-003		0.0954	0.0954		0.0954	0.0954	0.0000	680.6858	680.6858	0.0265	0.0122	684.9883
Energy	0.1233	1.0591	0.4894	6.7200e-003		0.0852	0.0852		0.0852	0.0852	0.0000	1,952.1703	1,952.1703	0.1418	0.0367	1,966.6598
Mobile	4.0217	10.0627	40.0687	0.1096	12.7332	0.0984	12.8315	3.4106	0.0928	3.5034	0.0000	10,183.3861	10,183.3861	0.4450	0.6634	10,392.1988
Waste						0.0000	0.0000		0.0000	0.0000	184.8578	0.0000	184.8578	10.9248	0.0000	457.9773
Water						0.0000	0.0000		0.0000	0.0000	31.0248	89.0647	120.0895	3.2010	0.0770	223.0557
Total	**12.3529**	**11.7985**	**49.5949**	**0.1205**	**12.7332**	**0.2790**	**13.0122**	**3.4106**	**0.2734**	**3.6840**	**215.8826**	**12,905.3069**	**13,121.1895**	**14.7390**	**0.7893**	**13,724.8800**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

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4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	4.0217	10.0627	40.0687	0.1096	12.7332	0.0984	12.8315	3.4106	0.0928	3.5034	0.0000	10,183.3861	10,183.3861	0.4450	0.6634	10,392.1988
Unmitigated	4.0217	10.0627	40.0687	0.1096	12.7332	0.0984	12.8315	3.4106	0.0928	3.5034	0.0000	10,183.3861	10,183.3861	0.4450	0.6634	10,392.1988

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	3,411.12	3,793.24	2926.48	9,892,942	9,892,942
City Park	40.95	102.90	114.98	128,892	128,892
Condo/Townhouse	2,723.04	3,028.08	2336.16	7,897,370	7,897,370
General Office Building	788.65	178.94	56.68	1,426,635	1,426,635
Single Family Housing	2,171.20	2,194.20	1966.50	6,248,469	6,248,469
Single Family Housing	1,132.80	1,144.80	1026.00	3,260,071	3,260,071
Strip Mall	3,588.59	3,403.98	1654.22	5,060,361	5,060,361
Total	13,856.35	13,846.14	10,081.01	33,914,740	33,914,740

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4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	10.80	7.30	7.50	46.90	17.40	35.70	86	11	3
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6
Condo/Townhouse	10.80	7.30	7.50	46.90	17.40	35.70	86	11	3
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4
Single Family Housing	10.80	7.30	7.50	46.90	17.40	35.70	86	11	3
Single Family Housing	10.80	7.30	7.50	46.90	17.40	35.70	86	11	3
Strip Mall	9.50	7.30	7.30	16.60	64.40	19.00	45	40	15

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.572265	0.048880	0.155752	0.113382	0.019331	0.005258	0.013588	0.047675	0.000843	0.000448	0.018651	0.001882	0.002045
City Park	0.572265	0.048880	0.155752	0.113382	0.019331	0.005258	0.013588	0.047675	0.000843	0.000448	0.018651	0.001882	0.002045
Condo/Townhouse	0.572265	0.048880	0.155752	0.113382	0.019331	0.005258	0.013588	0.047675	0.000843	0.000448	0.018651	0.001882	0.002045
General Office Building	0.572265	0.048880	0.155752	0.113382	0.019331	0.005258	0.013588	0.047675	0.000843	0.000448	0.018651	0.001882	0.002045
Single Family Housing	0.572265	0.048880	0.155752	0.113382	0.019331	0.005258	0.013588	0.047675	0.000843	0.000448	0.018651	0.001882	0.002045
Strip Mall	0.572265	0.048880	0.155752	0.113382	0.019331	0.005258	0.013588	0.047675	0.000843	0.000448	0.018651	0.001882	0.002045

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	732.1154	732.1154	0.1184	0.0144	739.3547
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	732.1154	732.1154	0.1184	0.0144	739.3547
NaturalGas Mitigated	0.1233	1.0591	0.4894	6.7200e-003		0.0852	0.0852		0.0852	0.0852	0.0000	1,220.0549	1,220.0549	0.0234	0.0224	1,227.3051
NaturalGas Unmitigated	0.1233	1.0591	0.4894	6.7200e-003		0.0852	0.0852		0.0852	0.0852	0.0000	1,220.0549	1,220.0549	0.0234	0.0224	1,227.3051

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5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	6.35951e+006	0.0343	0.2930	0.1247	1.8700e-003		0.0237	0.0237		0.0237	0.0237	0.0000	339.3677	339.3677	6.5000e-003	6.2200e-003	341.3844
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	6.18516e+006	0.0334	0.2850	0.1213	1.8200e-003		0.0230	0.0230		0.0230	0.0230	0.0000	330.0636	330.0636	6.3300e-003	6.0500e-003	332.0250
General Office Building	1.04609e+006	5.6400e-003	0.0513	0.0431	3.1000e-004		3.9000e-003	3.9000e-003		3.9000e-003	3.9000e-003	0.0000	55.8235	55.8235	1.0700e-003	1.0200e-003	56.1553
Single Family Housing	2.88451e+006	0.0156	0.1329	0.0566	8.5000e-004		0.0108	0.0108		0.0108	0.0108	0.0000	153.9282	153.9282	2.9500e-003	2.8200e-003	154.8429
Single Family Housing	5.52864e+006	0.0298	0.2548	0.1084	1.6300e-003		0.0206	0.0206		0.0206	0.0206	0.0000	295.0291	295.0291	5.6500e-003	5.4100e-003	296.7823
Strip Mall	859060	4.6300e-003	0.0421	0.0354	2.5000e-004		3.2000e-003	3.2000e-003		3.2000e-003	3.2000e-003	0.0000	45.8427	45.8427	8.8000e-004	8.4000e-004	46.1151
Total		**0.1233**	**1.0591**	**0.4894**	**6.7300e-003**		**0.0852**	**0.0852**		**0.0852**	**0.0852**	**0.0000**	**1,220.0549**	**1,220.0549**	**0.0234**	**0.0224**	**1,227.3051**

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Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	6.35951e+006	0.0343	0.2930	0.1247	1.8700e-003		0.0237	0.0237		0.0237	0.0237	0.0000	339.3677	339.3677	6.5000e-003	6.2200e-003	341.3844
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	6.18516e+006	0.0334	0.2850	0.1213	1.8200e-003		0.0230	0.0230		0.0230	0.0230	0.0000	330.0636	330.0636	6.3300e-003	6.0500e-003	332.0250
General Office Building	1.04609e+006	5.6400e-003	0.0513	0.0431	3.1000e-004		3.9000e-003	3.9000e-003		3.9000e-003	3.9000e-003	0.0000	55.8235	55.8235	1.0700e-003	1.0200e-003	56.1553
Single Family Housing	2.88451e+006	0.0156	0.1329	0.0566	8.5000e-004		0.0108	0.0108		0.0108	0.0108	0.0000	153.9282	153.9282	2.9500e-003	2.8200e-003	154.8429
Single Family Housing	5.52864e+006	0.0298	0.2548	0.1084	1.6300e-003		0.0206	0.0206		0.0206	0.0206	0.0000	295.0291	295.0291	5.6500e-003	5.4100e-003	296.7823
Strip Mall	859060	4.6300e-003	0.0421	0.0354	2.5000e-004		3.2000e-003	3.2000e-003		3.2000e-003	3.2000e-003	0.0000	45.8427	45.8427	8.8000e-004	8.4000e-004	46.1151
Total		**0.1233**	**1.0591**	**0.4894**	**6.7300e-003**		**0.0852**	**0.0852**		**0.0852**	**0.0852**	**0.0000**	**1,220.0549**	**1,220.0549**	**0.0234**	**0.0224**	**1,227.3051**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	1.92506e+006	178.1138	0.0288	3.4900e-003	179.8750
City Park	0	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	1.83977e+006	170.2229	0.0275	3.3400e-003	171.9061
General Office Building	715748	66.2237	0.0107	1.3000e-003	66.8786
Single Family Housing	1.83401e+006	169.6896	0.0275	3.3300e-003	171.3675
Single Family Housing	956875	88.5337	0.0143	1.7400e-003	89.4091
Strip Mall	641259	59.3317	9.6000e-003	1.1600e-003	59.9184
Total		**732.1154**	**0.1184**	**0.0144**	**739.3547**

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Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	1.92506e+006	178.1138	0.0288	3.4900e-003	179.8750
City Park	0	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	1.83977e+006	170.2229	0.0275	3.3400e-003	171.9061
General Office Building	715748	66.2237	0.0107	1.3000e-003	66.8786
Single Family Housing	1.83401e+006	169.6896	0.0275	3.3300e-003	171.3675
Single Family Housing	956875	88.5337	0.0143	1.7400e-003	89.4091
Strip Mall	641259	59.3317	9.6000e-003	1.1600e-003	59.9184
Total		**732.1154**	**0.1184**	**0.0144**	**739.3547**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	8.2080	0.6767	9.0368	4.1400e-003		0.0954	0.0954		0.0954	0.0954	0.0000	680.6858	680.6858	0.0265	0.0122	684.9883
Unmitigated	8.2080	0.6767	9.0368	4.1400e-003		0.0954	0.0954		0.0954	0.0954	0.0000	680.6858	680.6858	0.0265	0.0122	684.9883

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.4904					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	6.3872					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0673	0.5753	0.2448	3.6700e-003		0.0465	0.0465		0.0465	0.0465	0.0000	666.2730	666.2730	0.0128	0.0122	670.2323
Landscaping	0.2630	0.1014	8.7920	4.7000e-004		0.0489	0.0489		0.0489	0.0489	0.0000	14.4128	14.4128	0.0137	0.0000	14.7560
Total	**8.2080**	**0.6767**	**9.0368**	**4.1400e-003**		**0.0954**	**0.0954**		**0.0954**	**0.0954**	**0.0000**	**680.6858**	**680.6858**	**0.0265**	**0.0122**	**684.9883**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.4904					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	6.3872					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0673	0.5753	0.2448	3.6700e-003		0.0465	0.0465		0.0465	0.0465	0.0000	666.2730	666.2730	0.0128	0.0122	670.2323
Landscaping	0.2630	0.1014	8.7920	4.7000e-004		0.0489	0.0489		0.0489	0.0489	0.0000	14.4128	14.4128	0.0137	0.0000	14.7560
Total	**8.2080**	**0.6767**	**9.0368**	**4.1400e-003**		**0.0954**	**0.0954**		**0.0954**	**0.0954**	**0.0000**	**680.6858**	**680.6858**	**0.0265**	**0.0122**	**684.9883**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	120.0895	3.2010	0.0770	223.0557
Unmitigated	120.0895	3.2010	0.0770	223.0557

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	30.3618 / 19.1411	31.0314	0.9928	0.0238	62.9379
City Park	0 / 62.5528	20.2567	3.2800e-003	4.0000e-004	20.4570
Condo/Townhouse	24.2373 / 15.28	24.7719	0.7925	0.0190	50.2423
General Office Building	14.3911 / 8.82035	14.6268	0.4706	0.0113	29.7493
Single Family Housing	22.8039 / 14.3764	23.3069	0.7457	0.0179	47.2710
Strip Mall	5.99765 / 3.67598	6.0959	0.1961	4.7000e-003	12.3983
Total		**120.0895**	**3.2010**	**0.0770**	**223.0557**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	30.3618 / 19.1411	31.0314	0.9928	0.0238	62.9379
City Park	0 / 62.5528	20.2567	3.2800e-003	4.0000e-004	20.4570
Condo/Townhouse	24.2373 / 15.28	24.7719	0.7925	0.0190	50.2423
General Office Building	14.3911 / 8.82035	14.6268	0.4706	0.0113	29.7493
Single Family Housing	22.8039 / 14.3764	23.3069	0.7457	0.0179	47.2710
Strip Mall	5.99765 / 3.67598	6.0959	0.1961	4.7000e-003	12.3983
Total		**120.0895**	**3.2010**	**0.0770**	**223.0557**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	184.8578	10.9248	0.0000	457.9773
Unmitigated	184.8578	10.9248	0.0000	457.9773

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8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	214.36	43.5131	2.5716	0.0000	107.8020
City Park	4.51	0.9155	0.0541	0.0000	2.2681
Condo/Townhouse	171.12	34.7358	2.0528	0.0000	86.0565
General Office Building	75.3	15.2852	0.9033	0.0000	37.8685
Single Family Housing	360.36	73.1498	4.3230	0.0000	181.2256
Strip Mall	85.02	17.2583	1.0199	0.0000	42.7567
Total		**184.8578**	**10.9248**	**0.0000**	**457.9773**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	214.36	43.5131	2.5716	0.0000	107.8020
City Park	4.51	0.9155	0.0541	0.0000	2.2681
Condo/Townhouse	171.12	34.7358	2.0528	0.0000	86.0565
General Office Building	75.3	15.2852	0.9033	0.0000	37.8685
Single Family Housing	360.36	73.1498	4.3230	0.0000	181.2256
Strip Mall	85.02	17.2583	1.0199	0.0000	42.7567
Total		**184.8578**	**10.9248**	**0.0000**	**457.9773**

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9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	230.00	Dwelling Unit	42.31	414,000.00	658
Condo/Townhouse	372.00	Dwelling Unit	67.92	372,000.00	1064
Apartments Low Rise	466.00	Dwelling Unit	23.30	466,000.00	1333
General Office Building	80.97	1000sqft	6.83	80,967.00	0
Strip Mall	80.97	1000sqft	6.83	80,967.00	0
Single Family Housing	120.00	Dwelling Unit	10.04	216,000.00	343
City Park	52.50	Acre	52.50	2,286,900.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	49
Climate Zone	3			**Operational Year**	2005
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	641.3	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

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1.3 User Entered Comments & Non-Default Data

Project Characteristics - 2005 Emission factors

Land Use - 2005 Base line GHG. Land uses, lot acreage, unit amount, and some square footage from provided land use metrix.

Construction Phase - operational run - no construction.

Off-road Equipment - operational run - no construction

Grading -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	180.00	1.00
tblConstructionPhase	PhaseEndDate	11/3/2006	2/25/2005
tblConstructionPhase	PhaseStartDate	2/25/2006	2/25/2005
tblLandUse	LotAcreage	74.68	42.31
tblLandUse	LotAcreage	23.25	67.92
tblLandUse	LotAcreage	29.13	23.30
tblLandUse	LotAcreage	1.86	6.83
tblLandUse	LotAcreage	1.86	6.83
tblLandUse	LotAcreage	38.96	10.04
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblProjectCharacteristics	CO2IntensityFactor	203.98	641.3
tblWoodstoves	NumberCatalytic	23.30	0.00
tblWoodstoves	NumberCatalytic	67.92	0.00
tblWoodstoves	NumberCatalytic	52.35	0.00
tblWoodstoves	NumberNoncatalytic	23.30	0.00
tblWoodstoves	NumberNoncatalytic	67.92	0.00
tblWoodstoves	NumberNoncatalytic	52.35	0.00

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2.0 Emissions Summary

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	9.3815	0.7144	10.4777	4.1400e-003		0.0897	0.0897		0.0897	0.0897	0.0000	680.6858	680.6858	0.0359	0.0122	685.2225
Energy	0.1233	1.0591	0.4894	6.7200e-003		0.0852	0.0852		0.0852	0.0852	0.0000	3,521.7786	3,521.7786	0.1418	0.0367	3,536.2681
Mobile	25.4080	78.0699	274.7937	0.5221	12.7908	1.8207	14.6115	3.4368	1.7334	5.1702	0.0000	18,144.6591	18,144.6591	2.6358	2.2220	18,872.7030
Waste						0.0000	0.0000		0.0000	0.0000	184.8578	0.0000	184.8578	10.9248	0.0000	457.9773
Water						0.0000	0.0000		0.0000	0.0000	31.0248	280.0137	311.0385	3.2010	0.0770	414.0047
Total	**34.9128**	**79.8434**	**285.7607**	**0.5329**	**12.7908**	**1.9956**	**14.7864**	**3.4368**	**1.9083**	**5.3451**	**215.8826**	**22,627.1372**	**22,843.0198**	**16.9392**	**2.3479**	**23,966.1756**

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Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	9.3815	0.7144	10.4777	4.1400e-003		0.0897	0.0897		0.0897	0.0897	0.0000	680.6858	680.6858	0.0359	0.0122	685.2225
Energy	0.1233	1.0591	0.4894	6.7200e-003		0.0852	0.0852		0.0852	0.0852	0.0000	3,521.7786	3,521.7786	0.1418	0.0367	3,536.2681
Mobile	25.4080	78.0699	274.7937	0.5221	12.7908	1.8207	14.6115	3.4368	1.7334	5.1702	0.0000	18,144.6591	18,144.6591	2.6358	2.2220	18,872.7030
Waste						0.0000	0.0000		0.0000	0.0000	184.8578	0.0000	184.8578	10.9248	0.0000	457.9773
Water						0.0000	0.0000		0.0000	0.0000	31.0248	280.0137	311.0385	3.2010	0.0770	414.0047
Total	**34.9128**	**79.8434**	**285.7607**	**0.5329**	**12.7908**	**1.9956**	**14.7864**	**3.4368**	**1.9083**	**5.3451**	**215.8826**	**22,627.1372**	**22,843.0198**	**16.9392**	**2.3479**	**23,966.1756**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

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4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	25.4080	78.0699	274.7937	0.5221	12.7908	1.8207	14.6115	3.4368	1.7334	5.1702	0.0000	18,144.6591	18,144.6591	2.6358	2.2220	18,872.7030
Unmitigated	25.4080	78.0699	274.7937	0.5221	12.7908	1.8207	14.6115	3.4368	1.7334	5.1702	0.0000	18,144.6591	18,144.6591	2.6358	2.2220	18,872.7030

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	3,411.12	3,793.24	2926.48	9,892,942	9,892,942
City Park	40.95	102.90	114.98	128,892	128,892
Condo/Townhouse	2,723.04	3,028.08	2336.16	7,897,370	7,897,370
General Office Building	788.62	178.94	56.68	1,426,582	1,426,582
Single Family Housing	2,171.20	2,194.20	1966.50	6,248,469	6,248,469
Single Family Housing	1,132.80	1,144.80	1026.00	3,260,071	3,260,071
Strip Mall	3,588.46	3,403.85	1654.16	5,060,174	5,060,174
Total	13,856.19	13,846.01	10,080.95	33,914,500	33,914,500

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	10.80	7.30	7.50	46.90	17.40	35.70	86	11	3
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6
Condo/Townhouse	10.80	7.30	7.50	46.90	17.40	35.70	86	11	3
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4
Single Family Housing	10.80	7.30	7.50	46.90	17.40	35.70	86	11	3
Single Family Housing	10.80	7.30	7.50	46.90	17.40	35.70	86	11	3
Strip Mall	9.50	7.30	7.30	16.60	64.40	19.00	45	40	15

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4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.441636	0.082842	0.162061	0.177901	0.044041	0.006224	0.017387	0.036422	0.000946	0.000660	0.019425	0.001963	0.008492
City Park	0.441636	0.082842	0.162061	0.177901	0.044041	0.006224	0.017387	0.036422	0.000946	0.000660	0.019425	0.001963	0.008492
Condo/Townhouse	0.441636	0.082842	0.162061	0.177901	0.044041	0.006224	0.017387	0.036422	0.000946	0.000660	0.019425	0.001963	0.008492
General Office Building	0.441636	0.082842	0.162061	0.177901	0.044041	0.006224	0.017387	0.036422	0.000946	0.000660	0.019425	0.001963	0.008492
Single Family Housing	0.441636	0.082842	0.162061	0.177901	0.044041	0.006224	0.017387	0.036422	0.000946	0.000660	0.019425	0.001963	0.008492
Strip Mall	0.441636	0.082842	0.162061	0.177901	0.044041	0.006224	0.017387	0.036422	0.000946	0.000660	0.019425	0.001963	0.008492

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	2,301.7236	2,301.7236	0.1184	0.0144	2,308.9630
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	2,301.7236	2,301.7236	0.1184	0.0144	2,308.9630
NaturalGas Mitigated	0.1233	1.0591	0.4894	6.7200e-003		0.0852	0.0852		0.0852	0.0852	0.0000	1,220.0549	1,220.0549	0.0234	0.0224	1,227.3051
NaturalGas Unmitigated	0.1233	1.0591	0.4894	6.7200e-003		0.0852	0.0852		0.0852	0.0852	0.0000	1,220.0549	1,220.0549	0.0234	0.0224	1,227.3051

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5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	6.35951e+006	0.0343	0.2930	0.1247	1.8700e-003		0.0237	0.0237		0.0237	0.0237	0.0000	339.3677	339.3677	6.5000e-003	6.2200e-003	341.3844
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	6.18516e+006	0.0334	0.2850	0.1213	1.8200e-003		0.0230	0.0230		0.0230	0.0230	0.0000	330.0636	330.0636	6.3300e-003	6.0500e-003	332.0250
General Office Building	1.04609e+006	5.6400e-003	0.0513	0.0431	3.1000e-004		3.9000e-003	3.9000e-003		3.9000e-003	3.9000e-003	0.0000	55.8235	55.8235	1.0700e-003	1.0200e-003	56.1553
Single Family Housing	2.88451e+006	0.0156	0.1329	0.0566	8.5000e-004		0.0108	0.0108		0.0108	0.0108	0.0000	153.9282	153.9282	2.9500e-003	2.8200e-003	154.8429
Single Family Housing	5.52864e+006	0.0298	0.2548	0.1084	1.6300e-003		0.0206	0.0206		0.0206	0.0206	0.0000	295.0291	295.0291	5.6500e-003	5.4100e-003	296.7823
Strip Mall	859060	4.6300e-003	0.0421	0.0354	2.5000e-004		3.2000e-003	3.2000e-003		3.2000e-003	3.2000e-003	0.0000	45.8427	45.8427	8.8000e-004	8.4000e-004	46.1151
Total		**0.1233**	**1.0591**	**0.4894**	**6.7300e-003**		**0.0852**	**0.0852**		**0.0852**	**0.0852**	**0.0000**	**1,220.0549**	**1,220.0549**	**0.0234**	**0.0224**	**1,227.3051**

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Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	6.35951e+006	0.0343	0.2930	0.1247	1.8700e-003		0.0237	0.0237		0.0237	0.0237	0.0000	339.3677	339.3677	6.5000e-003	6.2200e-003	341.3844
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	6.18516e+006	0.0334	0.2850	0.1213	1.8200e-003		0.0230	0.0230		0.0230	0.0230	0.0000	330.0636	330.0636	6.3300e-003	6.0500e-003	332.0250
General Office Building	1.04609e+006	5.6400e-003	0.0513	0.0431	3.1000e-004		3.9000e-003	3.9000e-003		3.9000e-003	3.9000e-003	0.0000	55.8235	55.8235	1.0700e-003	1.0200e-003	56.1553
Single Family Housing	2.88451e+006	0.0156	0.1329	0.0566	8.5000e-004		0.0108	0.0108		0.0108	0.0108	0.0000	153.9282	153.9282	2.9500e-003	2.8200e-003	154.8429
Single Family Housing	5.52864e+006	0.0298	0.2548	0.1084	1.6300e-003		0.0206	0.0206		0.0206	0.0206	0.0000	295.0291	295.0291	5.6500e-003	5.4100e-003	296.7823
Strip Mall	859060	4.6300e-003	0.0421	0.0354	2.5000e-004		3.2000e-003	3.2000e-003		3.2000e-003	3.2000e-003	0.0000	45.8427	45.8427	8.8000e-004	8.4000e-004	46.1151
Total		**0.1233**	**1.0591**	**0.4894**	**6.7300e-003**		**0.0852**	**0.0852**		**0.0852**	**0.0852**	**0.0000**	**1,220.0549**	**1,220.0549**	**0.0234**	**0.0224**	**1,227.3051**

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5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	1.92506e+006	559.9784	0.0288	3.4900e-003	561.7396
City Park	0	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	1.83977e+006	535.1697	0.0275	3.3400e-003	536.8529
General Office Building	715748	208.2032	0.0107	1.3000e-003	208.8580
Single Family Housing	1.83401e+006	533.4932	0.0275	3.3300e-003	535.1711
Single Family Housing	956875	278.3443	0.0143	1.7400e-003	279.2197
Strip Mall	641259	186.5350	9.6000e-003	1.1600e-003	187.1216
Total		**2,301.7236**	**0.1184**	**0.0144**	**2,308.9630**

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Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	1.92506e+006	559.9784	0.0288	3.4900e-003	561.7396
City Park	0	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	1.83977e+006	535.1697	0.0275	3.3400e-003	536.8529
General Office Building	715748	208.2032	0.0107	1.3000e-003	208.8580
Single Family Housing	1.83401e+006	533.4932	0.0275	3.3300e-003	535.1711
Single Family Housing	956875	278.3443	0.0143	1.7400e-003	279.2197
Strip Mall	641259	186.5350	9.6000e-003	1.1600e-003	187.1216
Total		**2,301.7236**	**0.1184**	**0.0144**	**2,308.9630**

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6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	9.3815	0.7144	10.4777	4.1400e-003		0.0897	0.0897		0.0897	0.0897	0.0000	680.6858	680.6858	0.0359	0.0122	685.2225
Unmitigated	9.3815	0.7144	10.4777	4.1400e-003		0.0897	0.0897		0.0897	0.0897	0.0000	680.6858	680.6858	0.0359	0.0122	685.2225

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6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	2.4841					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	6.3872					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0673	0.5753	0.2448	3.6700e-003		0.0465	0.0465		0.0465	0.0465	0.0000	666.2730	666.2730	0.0128	0.0122	670.2323
Landscaping	0.4429	0.1391	10.2328	4.7000e-004		0.0432	0.0432		0.0432	0.0432	0.0000	14.4128	14.4128	0.0231	0.0000	14.9902
Total	**9.3815**	**0.7144**	**10.4776**	**4.1400e-003**		**0.0897**	**0.0897**		**0.0897**	**0.0897**	**0.0000**	**680.6858**	**680.6858**	**0.0359**	**0.0122**	**685.2225**

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Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	2.4841					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	6.3872					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0673	0.5753	0.2448	3.6700e-003		0.0465	0.0465		0.0465	0.0465	0.0000	666.2730	666.2730	0.0128	0.0122	670.2323
Landscaping	0.4429	0.1391	10.2328	4.7000e-004		0.0432	0.0432		0.0432	0.0432	0.0000	14.4128	14.4128	0.0231	0.0000	14.9902
Total	**9.3815**	**0.7144**	**10.4776**	**4.1400e-003**		**0.0897**	**0.0897**		**0.0897**	**0.0897**	**0.0000**	**680.6858**	**680.6858**	**0.0359**	**0.0122**	**685.2225**

23-044 Bellevue Ranch Merced GHG 2005 - Merced County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	311.0385	3.2010	0.0770	414.0047
Unmitigated	311.0385	3.2010	0.0770	414.0047

23-044 Bellevue Ranch Merced GHG 2005 - Merced County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	30.3618 / 19.1411	76.9096	0.9928	0.0238	108.8161
City Park	0 / 62.5528	63.6857	3.2800e-003	4.0000e-004	63.8860
Condo/Townhouse	24.2373 / 15.28	61.3956	0.7925	0.0190	86.8660
General Office Building	14.3911 / 8.82035	36.1973	0.4706	0.0113	51.3198
Single Family Housing	22.8039 / 14.3764	57.7647	0.7457	0.0179	81.7288
Strip Mall	5.99765 / 3.67598	15.0856	0.1961	4.7000e-003	21.3881
Total		**311.0385**	**3.2010**	**0.0770**	**414.0047**

23-044 Bellevue Ranch Merced GHG 2005 - Merced County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	30.3618 / 19.1411	76.9096	0.9928	0.0238	108.8161
City Park	0 / 62.5528	63.6857	3.2800e-003	4.0000e-004	63.8860
Condo/Townhouse	24.2373 / 15.28	61.3956	0.7925	0.0190	86.8660
General Office Building	14.3911 / 8.82035	36.1973	0.4706	0.0113	51.3198
Single Family Housing	22.8039 / 14.3764	57.7647	0.7457	0.0179	81.7288
Strip Mall	5.99765 / 3.67598	15.0856	0.1961	4.7000e-003	21.3881
Total		**311.0385**	**3.2010**	**0.0770**	**414.0047**

23-044 Bellevue Ranch Merced GHG 2005 - Merced County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	184.8578	10.9248	0.0000	457.9773
Unmitigated	184.8578	10.9248	0.0000	457.9773

23-044 Bellevue Ranch Merced GHG 2005 - Merced County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	214.36	43.5131	2.5716	0.0000	107.8020
City Park	4.51	0.9155	0.0541	0.0000	2.2681
Condo/Townhouse	171.12	34.7358	2.0528	0.0000	86.0565
General Office Building	75.3	15.2852	0.9033	0.0000	37.8685
Single Family Housing	360.36	73.1498	4.3230	0.0000	181.2256
Strip Mall	85.02	17.2583	1.0199	0.0000	42.7567
Total		**184.8578**	**10.9248**	**0.0000**	**457.9773**

23-044 Bellevue Ranch Merced GHG 2005 - Merced County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	214.36	43.5131	2.5716	0.0000	107.8020
City Park	4.51	0.9155	0.0541	0.0000	2.2681
Condo/Townhouse	171.12	34.7358	2.0528	0.0000	86.0565
General Office Building	75.3	15.2852	0.9033	0.0000	37.8685
Single Family Housing	360.36	73.1498	4.3230	0.0000	181.2256
Strip Mall	85.02	17.2583	1.0199	0.0000	42.7567
Total		**184.8578**	**10.9248**	**0.0000**	**457.9773**

23-044 Bellevue Ranch Merced GHG 2005 - Merced County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

TRAFFIC IMPACT ANALYSIS

FOR

BELLEVUE RANCH GENERAL PLAN AMENDMENT

Merced, CA

Prepared For:

Stonefield Homes
923 E. Pacheco Blvd.
Los Banos, CA 93635

Prepared By:

KD Anderson & Associates, Inc.
3853 Taylor Road, Suite G
Loomis, California 95650
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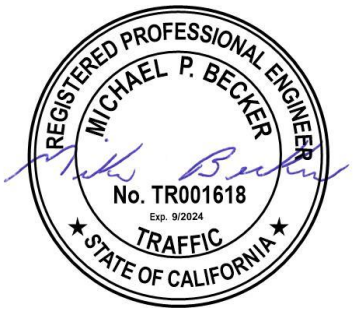

May 10, 2023

7043-05

Bellevue Ranch GPA TIA 5-10-23.doc

KD Anderson & Associates, Inc.
Transportation Engineers

APPENDIX D

TRAFFIC IMPACT ANALYSIS FOR
BELLEVUE RANCH GENERAL PLAN AMENDMENT

TABLE OF CONTENTS

KDA

TRAFFIC IMPACT ANALYSIS FOR
BELLEVUE RANCH GENERAL PLAN AMENDMENT
Merced, California

EXECUTIVE SUMMARY

This *Executive Summary* is a brief overview of the analysis presented in this traffic impact analysis (TIA). It is not intended to be a comprehensive description of the analysis. For more details, the reader is referred to the full description presented in the TIA.

This TIA presents an analysis of the traffic-related effects of proposed amendments to the Bellevue Ranch Master Development Plan (BRMDP).

Project Description

The BRMDP includes land use development on the north side of the City of Merced. The vicinity of the BRMDP is shown in Figure 1. The BRMDP was originally approved by the City of Merced in 1995. Since then, development of portions of the BRMDP has occurred, and the plan has been occasionally amended. The BRMDP includes a mix of residential and non-residential land use designations.

A revision to the currently-approved BRMDP is proposed, which would require an amendment to the City of Merced General Plan. The General Plan Amendment (GPA) would reflect a change in land use designations for some of the undeveloped portions of the BRMDP.

The net change in the BRMDP area from the currently-approved land uses to the proposed land uses would be:

- a reduction in single family dwelling units,
- a reduction in multiple-family dwelling units,
- a reduction in retail commercial land use,
- elimination of self-storage land use, and
- an increase in primary public school facilities.

Study Scope

At City of Merced staff direction, this TIA considers the following scenarios:

- Existing Conditions;

- Year 2035 Cumulative Conditions with the Approved Bellevue Ranch development and circulation plan; and

- Year 2035 Cumulative Conditions with the Proposed GPA land uses and circulation.

To identify the long-term cumulative effects of the proposed GPA, the analysis presented in this TIA compares traffic operations under 2035 with Approved BRMDP conditions to 2035 with Proposed BRMDP conditions.

Analysis of near-term future Existing conditions plus development of Proposed Bellevue Ranch land uses are addressed in a separate document, *Transportation Impact Analysis and Traffic Operational Analysis for Bellevue Ranch Master Development Plan Agreement Revisions to Table 6.1 – Circulation Improvements Phasing*.

Study Area

The analysis presented in this TIA is intended to address the effects of the proposed GPA within a study area that is applicable to the project location and scale of the project.

The study area includes 17 intersections, which were analyzed during the a.m. peak hour and p.m. peak hour.

The analysis also addresses the current conditions and project impacts to Arterial and Collector roadway segments based on daily traffic volume. The analysis addresses 35 roadway segments.

Alternative Transportation Modes

Alternative modes of transportation include pedestrian travel, bicycles, and public transit. These modes of travel are described in this TIA and recommended improvements are presented.

Proposed Master Development Plan Site Plan

The proposed BRMDP site plan is shown in Figure 2. The portion of the site plan south of Bellevue Road is shown in Figure 3. The portion north of Bellevue Road is shown in Figure 4.

VICINITY MAP

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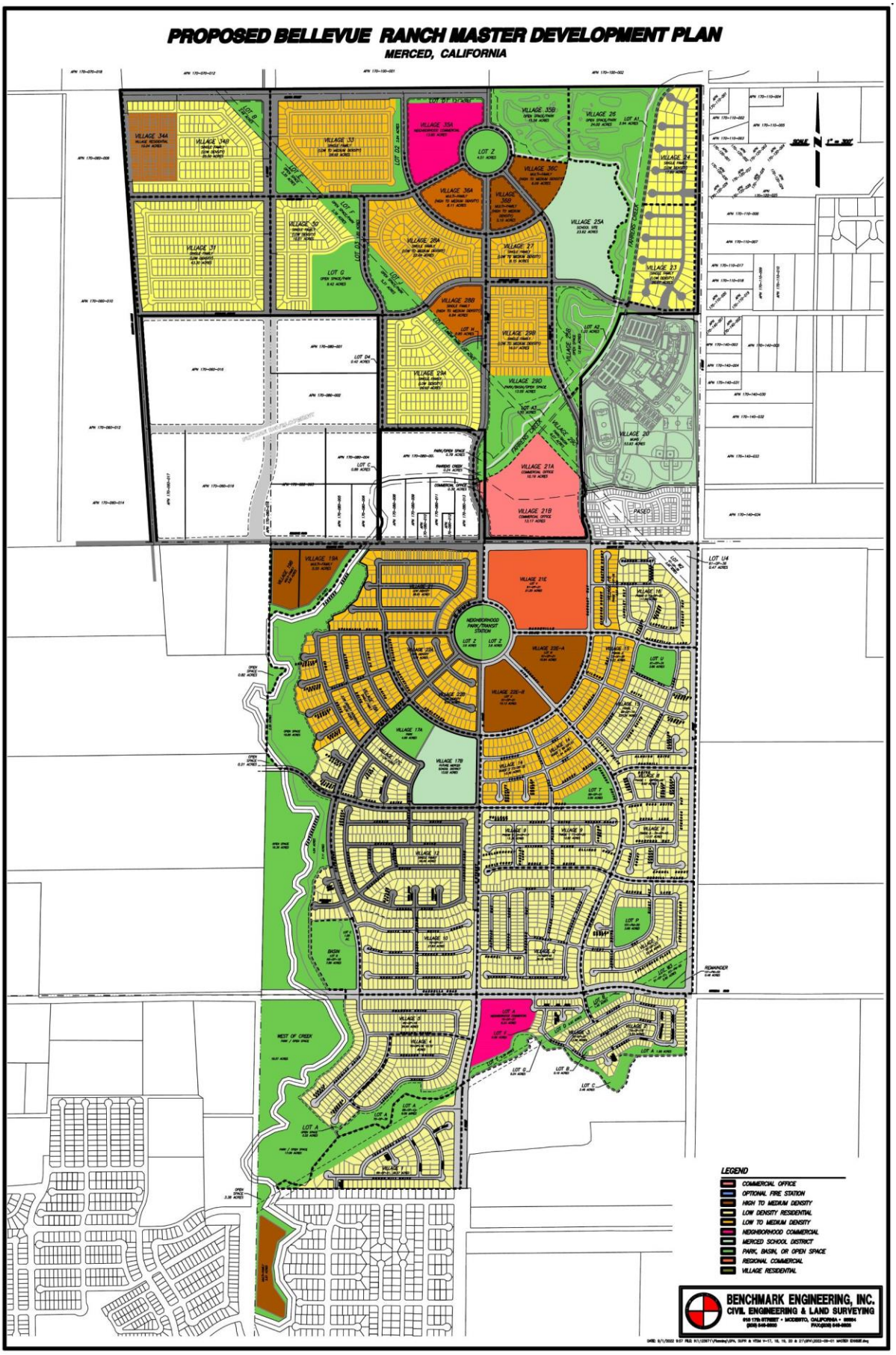
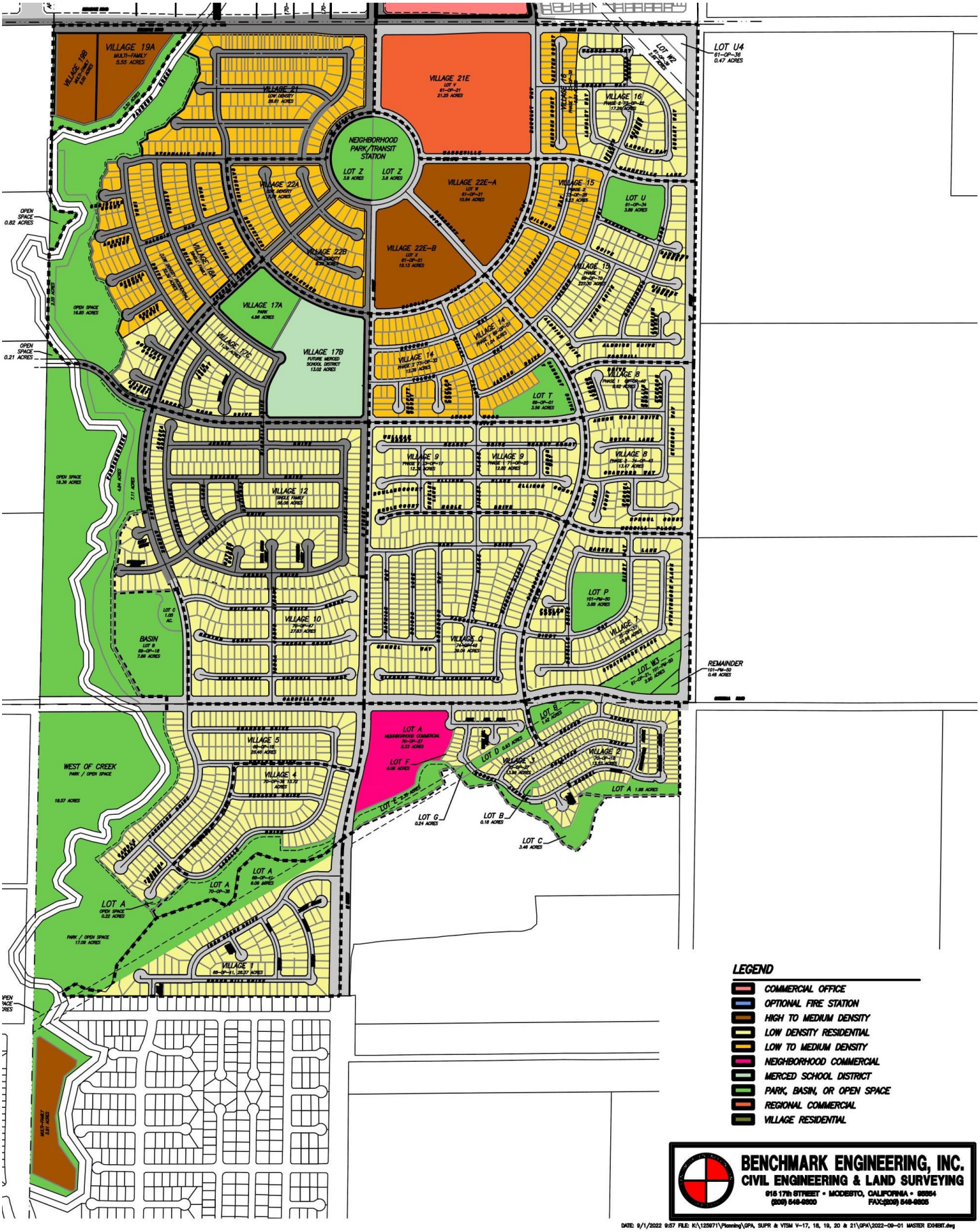
Transportation Engineers

7043-05 RA 5/10/2023

figure 1


PROPOSED BELLEVUE RANCH MASTER DEVELOPMENT PLAN
MERCED, CALIFORNIA
LEGEND
COMMERCIAL OFFICE
OPTIONAL FIRE STATION
HIGH TO MEDIUM DENSITY
LOW DENSITY RESIDENTIAL
LOW TO MEDIUM DENSITY
NEIGHBORHOOD COMMERCIAL
MERCED SCHOOL DISTRICT
PARK, BASIN, OR OPEN SPACE
REGIONAL COMMERCIAL
VILLAGE RESIDENTIAL
BENCHMARK ENGINEERING, INC.
CIVIL ENGINEERING & LAND SURVEYING

SITE PLAN



PROPOSED SITE PLAN (SOUTH OF BELLEVUE ROAD)

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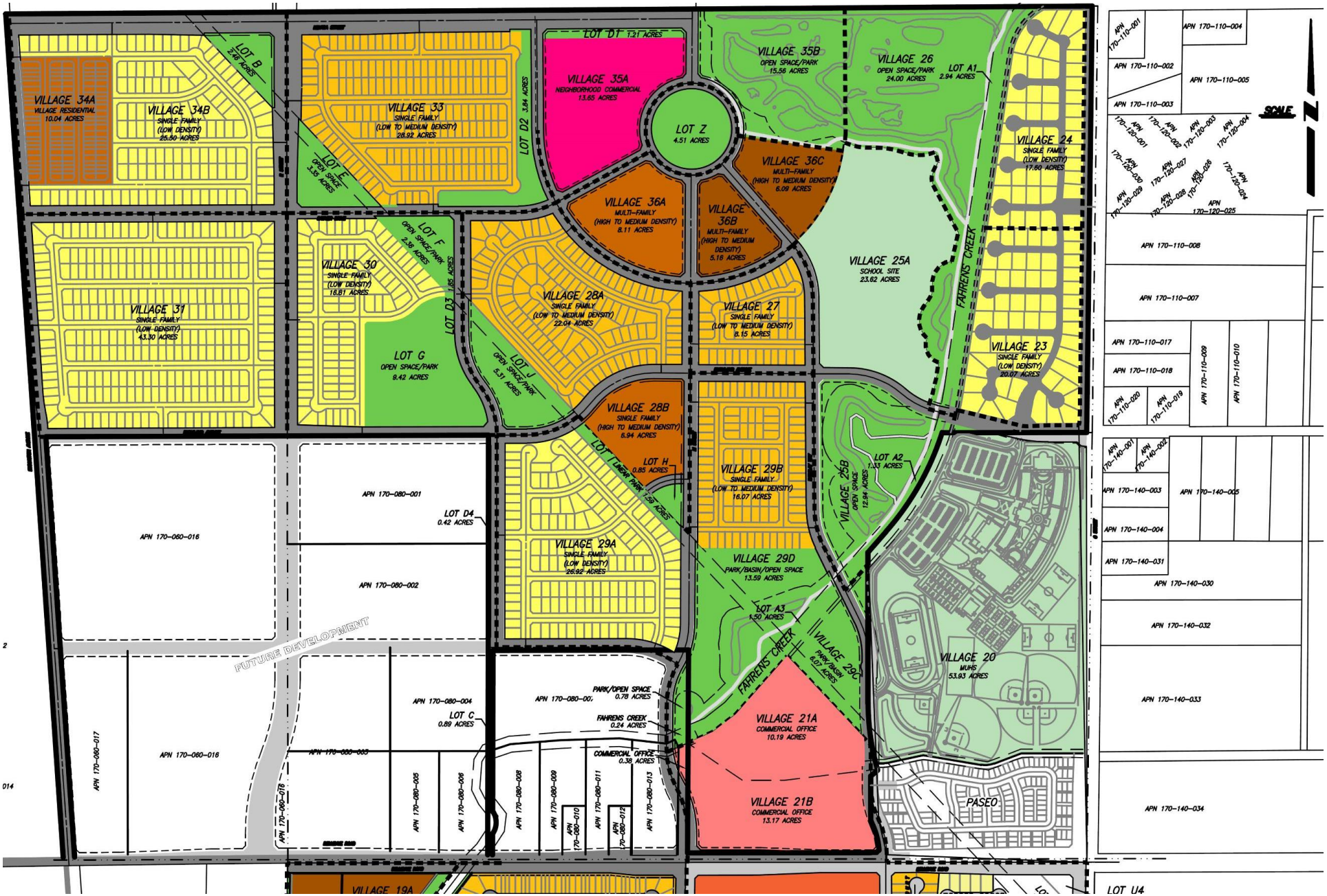
figure 3



PROPOSED SITE PLAN (NORTH OF BELLEVUE ROAD)

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figure 4

Existing Conditions

Levels of Service. The City of Merced has established Level of Service (LOS) D as the minimum acceptable standard for intersections and roadways.

With one exception, current traffic conditions in the study area are acceptable based on satisfaction of minimum City of Merced standards for intersection LOS. The exception is the Olive Avenue / G Street intersection which operates at LOS E in the a.m. peak hour. All of the study area roadway segments carry daily traffic volumes that indicate LOS D or better conditions under the Merced General Plan's thresholds.

Traffic Signal Warrants. The unsignalized State Route (SR) 59 / Bellevue Road intersection, and Bellevue Road / M Street intersection carry volumes that nearly satisfy warrants during the a.m. peak hour, but the M Street / Cardella Road intersection does not carry volumes that reach the level that satisfies peak hour traffic signal warrants during any time period.

Pedestrian Facilities. Sidewalks are generally absent along rural Merced County roads but are constructed as properties are annexed into the City of Merced and developed. Sidewalks are available along all the local and collector streets in the neighborhoods south of the project site where development has occurred. The traffic signals at Bellevue Road / Barclay Way and Bellevue Road / G Street also have crosswalks. Today there are no sidewalks along Bellevue Road west of Barclay Way.

Bicycle Facilities. The City of Merced General Plan includes the Bicycle Master Plan which identifies existing and planned facilities. Today Class II bike lanes exist on some of the developed collector streets south of the project site, on M Street and on the west side of G Street along the El Capitan High School (HS) frontage and south to Mercy Avenue. Both sides of G Street have bike lanes south of Mercy Avenue.

Transit Facilities. The public bus system, created in 1974, served the community as the Merced Transit System (MTS) / City Shuttle for more than two decades. Today the area of the project is served by *The Bus. Route M1 – Merced West, M2 R Street Shuttle, M3 M Street Shuttle and M4 G Street Shuttle* and *UC Merced* all reach the Yosemite Avenue / M Street intersection or travel along Yosemite Avenue by the site. All connect the site with the downtown Transportation Center on 16th Street. (Merced Transit Authority 2023)

Year 2035 Cumulative Conditions

Basis for Traffic Volumes. The Merced County Association of Governments (MCAG) Year 2035 travel demand forecast model was refined and used to develop background traffic volume projections that assume development of the BRMDP, as well as other area development. Forecasts were made with the approved BRMDP and with the proposed GPA.

Assumed Improvements. The following regional improvements were assumed for this cumulative analysis:

- MCAG RTP improvements are assumed in the MCAG traffic model
- Widen SR 59 to 4-lanes from W. 16th Street beyond Bellevue Road
- Campus Parkway extend to Yosemite Avenue
- Atwater-Merced Expressway (AME) extended to Bellevue Road
- Cardella Road extended from SR 59 to M Street as 4-lane road
- R Street extended to Bellevue Road as 4-lane road
- Bellevue Road widened east of SR 59 to 6-lane road

2035 With Approved BRMDP. Under 2035 Cumulative conditions with development of the Approved BRMDP, 15 of the 17 study intersections would operate under LOS considered unacceptable by the City of Merced during either the a.m. peak hour, p.m. peak hour, or both. Recommended improvements are presented in this TIA. All study roadway segments would operate under LOS considered acceptable by the City of Merced.

2035 With Proposed BRMDP. Under 2035 Cumulative conditions with development of the Proposed BRMDP, 14 of the 17 study intersections would operate under LOS considered unacceptable by the City of Merced during either the a.m. peak hour, p.m. peak hour, or both. At three of the study intersections, the increase in delay is considered appreciable. Recommended improvements are presented in this TIA. All study roadway segments would operate under LOS considered acceptable by the City of Merced.

TRAFFIC IMPACT ANALYSIS FOR
BELLEVUE RANCH GENERAL PLAN AMENDMENT
Merced, California

INTRODUCTION

The following presets a description of proposed amendments to the BRMDP, and the scope of the analysis presented in this TIA.

Project Description

The Bellevue Ranch project site is located on the north side of the City of Merced. The vicinity of the project site is shown in Figure 1. The BRMDP was originally approved by the City of Merced in 1995. Since then, development of portions of the BRMDP has occurred, and the plan has been occasionally amended. The BRMDP includes a mix of residential and non-residential land use designations.

A revision to the currently-approved BRMDP is proposed, which would require an amendment to the City of Merced General Plan. The GPA would reflect a change in land use designations for some of the undeveloped portions of the BRMDP.

Previously-approved land uses in the BRMDP include:

- 4,873 single family dwelling units,
- 1,675 multiple family dwelling units,
- 618,000 building square feet of retail commercial land use,
- 254,390 building square feet of commercial office land use,
- 54,450 building square feet of self-storage land use,
- primary public school facilities with 750 student enrollment, and
- high school facilities with 1,800 student enrollment.

Proposed land uses in the BRMDP include:

- 3,805 single family dwelling units,
- 1,317 multiple family dwelling units,
- 500,400 building square feet of retail commercial land use,
- 254,390 building square feet of commercial office land use,
- primary public school facilities with 1,500 student enrollment, and
- high school facilities with 1,800 student enrollment.

The net change in the BRMDP area from previously-approved land uses to proposed land uses would be:

- a reduction of 1,068 single family dwelling units,
- a reduction of 358 multiple-family dwelling units,
- a reduction 117,600 building square feet of retail commercial land use,
- elimination of self-storage land use, and
- an increase in primary public school facilities with 750 student enrollment.

Traffic Study Scope

This analysis is intended to evaluate the traffic-related effects of implementing the proposed BRMDP amendments within a range of relevant scenarios as required under City of Merced guidelines. The analysis considers traffic conditions occurring during weekday a.m. and p.m. peak hours, and during 24-hour daily periods.

At City of Merced staff direction, this TIA considers the following scenarios:

- Existing Conditions;
- Future Cumulative Conditions with the currently-approved BRMDP land use designations, and
- Future Cumulative Conditions with the proposed BRMDP amendments.

Analysis of near-term future Existing conditions plus development of Proposed Bellevue Ranch land uses are addressed in a separate document, *Transportation Impact Analysis and Traffic Operational Analysis for Bellevue Ranch Master Development Plan Agreement Revisions to Table 6.1 – Circulation Improvements Phasing*. The analysis of near-term scenarios is conducted with phased implementation of the BRMDP. The phased analysis was conducted to facilitate an update to Table 6.1 of the Bellevue Ranch Master Development Agreement.

Study Area

The study area includes the following 17 intersections, which were analyzed during the a.m. peak hour and p.m. peak hour. The locations of the study intersections are shown in Figure 5:

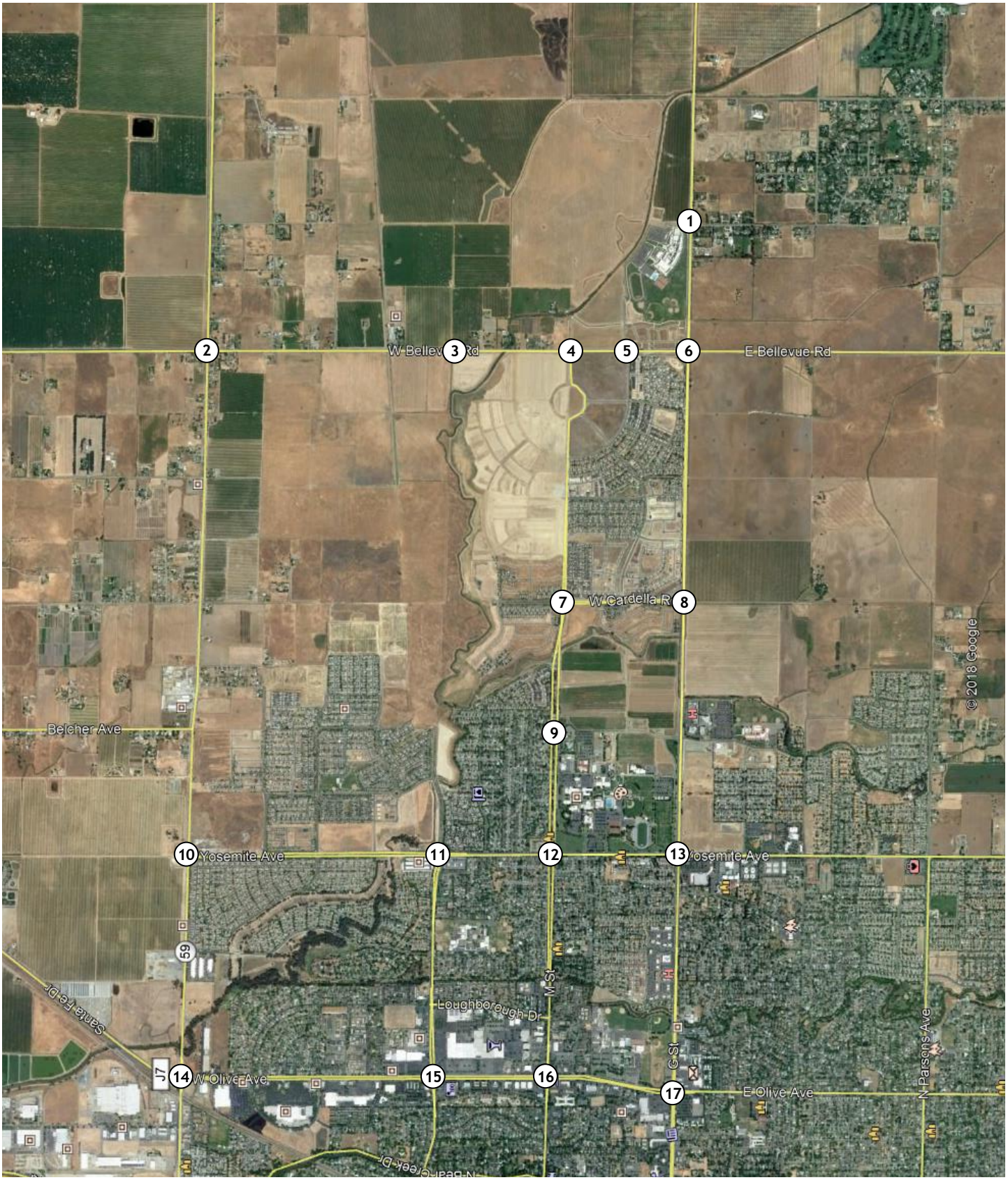
1. G Street / Farmland Avenue
2. Bellevue Road / SR 59
3. Bellevue Road / R Street (future)
4. Bellevue Road / M Street
5. Bellevue Road / Barclay Way
6. Bellevue Road / G Street
7. Cardella Road / M Street

8. Cardella Road / G Street
9. Lehigh Street / M Street
10. Yosemite Avenue / SR 59
11. Yosemite Avenue / R Street
12. Yosemite Avenue / M Street
13. Yosemite Avenue / G Street
14. Olive Avenue / SR 59
15. Olive Avenue / R Street
16. Olive Avenue / M Street
17. Olive Avenue / G Street

The analysis also addresses the current conditions and project effects to Arterial and Collector roadway segments based on daily traffic volume. The analysis addresses the following roadway segments:

- Old Lake Road from SR 59 to R Street
- Old Lake Road from R Street to M Street
- Old Lake Road from M Street to G Street
- Old Lake Road from G Street to Golf Road
- Farmland Avenue from M Street to El Capitan HS
- Farmland Avenue from El Capitan Entrance to G Street
- Farmland Avenue from G Street to Golf Road
- Bellevue Road from SR 59 to R Street
- Bellevue Road from R Street to M Street
- Bellevue Road from M Street to Barclay Way
- Bellevue Road from Barclay Way to G Street
- Bellevue Road from G Street to Golf Road
- SR 59 from Nevada Street to Bellevue Road
- SR 59 from Bellevue Road to Cardella Road
- SR 59 from Cardella Road to Belcher Road
- SR 59 from Belcher Road to Yosemite Avenue
- SR 59 from Yosemite Avenue to Olive Avenue
- R Street from Old Lake Road to Bellevue Road
- G Street from Old Lake Road to Farmland Avenue
- G Street from Farmland Avenue to Bellevue Road
- G Street from Bellevue Road to Cardella Road
- Barclay Way from Farmland Avenue to Bellevue Road
- Barclay Way from Bellevue Road to M Street
- Cardella Road from SR 59 to R Street
- Cardella Road from R Street to M Street
- Cardella Road from M Street to G Street
- M Street from Old Lake Road to Bellevue Road
- M Street from Bellevue Road to Cardella Road

- M Street from Cardella Road to University Drive
- M Street from University Drive to Yosemite Avenue
- San Jose Avenue from University Drive to Yosemite Avenue
- Yosemite Avenue from SR 59 to R Street
- Yosemite Avenue from R Street to M Street
- Yosemite Avenue from M Street to G Street
- Yosemite Avenue from G Street to Parsons Avenue



STUDY INTERSECTIONS

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Transportation Engineers

7043-05 RA 5/10/2023

figure 5

EXISTING SETTING

This section of the TIA presents a description of existing conditions in the study area. Information presented in this section of the study is based on new traffic count data collected in 2022 to account for the effects of recent development in the BRMDP and state-mandated changes to the schedule at El Capitan High School.

Study Area - Roadways

This study area addresses roadway segments and intersections near the project that may be affected by the proposed project. Numerous arterial roadways provide regional access to the north Merced area. The following is a description of roadways that provide regional and local access to the proposed project site.

State Route 59. SR 59 is an important route through Merced County which links the City of Merced with SR 152 at the Madera County line and extends north to the Snelling area of northern Merced County. SR 59 is a Major Arterial in the Merced General Plan (128' ROW). In the vicinity of the BRMDP, SR 59 is a two-lane conventional highway which is being incrementally widened to a four-lane section as funds become available. Implementation of improvements to SR 59 has been constrained by the UPRR at a two-lane at-grade crossing roughly midway between the Olive Avenue and Cooper Avenue – Willowbrook Drive intersections and by the two-lane structure across Rascal Creek north of Olive Avenue.

Traffic volume count data collected for this TIA indicates a daily volume of 12,705 vehicles per day between Yosemite Avenue and Belcher Road, with the volume dropping to 4,572 vehicles per day between Belcher Road and Bellevue Road.

Bellevue Road. Bellevue Road is an east-west Major Arterial that traverses Merced in the area roughly a mile north of Yosemite Avenue. Bellevue Road originates at an interchange on SR 99 in western Atwater and continues beyond the city across Merced County to an intersection on SR 59. Bellevue Road continues through the City of Merced to its eastern terminus at Lake Road and UC Merced. Ultimately the road is to be a six-lane facility under the Merced General Plan. Today the portion of Bellevue Road near SR 59 is a two-lane facility, although portions near the G Street intersection have been widened to its ultimate width as adjoining development has occurred. The speed limit on Bellevue Road is 55 miles per hour (mph).

Cardella Road. Cardella Road is an east-west two-lane road that extends easterly from rural Merced County to SR 59. Another segment of Cardella Road exists in the BRMDP as a Divided Arterial from Fahrens Creek across M Street east to G street. Ultimately, Cardella Road is to extend as a four-lane roadway from SR 59 to Lake Road, with the missing pieces installed as development proceeds. Completing Cardella Road is constrained by the need to bridge Fahrens Creek, which meanders through the BRMDP area.

Yosemite Avenue. Yosemite Avenue is an east-west Major Arterial / Divided Arterial that traverses Merced in the area roughly a mile north of Olive Avenue. In the study area of the project, Yosemite Avenue is a four-lane facility with a 45 mph speed limit.

G Street. G Street is a north-south Arterial. G Street extends north from the downtown area as a four-lane roadway to the Yosemite Avenue intersection. Beyond that intersection, the configuration of the road varies as portions of G Street have been widened to its ultimate six-lane section but a single through travel lane remains in other areas, including the segment from Mercy Avenue – Community College Drive. The posted speed limit on G Street is 45 mph south of Yosemite Avenue and 55 mph to the north.

M Street. M Street is a north-south Arterial that extends from downtown Merced to Bellevue Road. In the area of Yosemite Avenue, M Street is a divided four-lane roadway with on-street parking and Class 2 bike lanes. The roadway narrows to a two-lane facility from Cardella Road to Bellevue Road. The speed limit is 40 mph south of Yosemite Avenue and 45 mph to the north.

R Street. R Street is a north-south four-lane Arterial that extends north from downtown Merced to a point just beyond the Yosemite Avenue intersection. Ultimately, R Street will continue north across Bellevue Road to Nevada Street - Lake Road. South of Bellevue Road, R Street is separated from the BRMDP area by Fahrens Creek.

Barclay Way. Barclay Way is a Collector Street that extends north and south from Bellevue Road at a location midway between M Street and G Street. The southern leg continues to an intersection on M Street, while the northern leg extends to the El Capitan High School southwestern access.

Nevada Street - Old Lake Road. Nevada Street and Old Lake Road are rural east-west roadways that generally follow the northern BRMDP area boundary from SR 59 westerly to Gold Road. Today the route is discontinuous but the General Plan Circulation Element indicates that these roadways will be upgraded to a four-lane Arterial.

Farmland Avenue. Farmland Avenue is an east-west Collector located midway between Bellevue Road and Old Lake Road. Today, Farmland Avenue extends west from G Street to El Capitan High School's northern entrance. In the future, the road is planned to extend west into the BRMDP area. Farmland Avenue extends easterly from G Street to Gold Road.

Study Area - Intersections

The quality of traffic flow is typically governed by the operation of major intersections. Based on a review of the original Bellevue Ranch California Environmental Quality Act (CEQA) environmental documents and its impact conclusions, as well as direction from City staff, 17 study intersections were analyzed for this TIA. The study intersections are previously listed in the *Study Area* section of this TIA, and the locations of the study intersections are shown in Figure 5.

The geometric configuration of study intersections and the traffic controls are described in the text which follows.

The **G Street / Farmland Avenue intersection** is controlled by an actuated traffic signal. G Street has been widened along the high school's frontage to its ultimate ½ section (i.e., 3 southbound lanes), but northbound G Street remains a single through lane with an auxiliary right turn lane at Farmland Avenue. Separate left turn lanes are provided on G Street, with the southbound turn lane being about 60 feet long, but the northbound turn lane stretches for 850 feet. Eastbound Farmland Avenue has two lanes along the school frontage and at the G Street intersection is configured as a three-lane approach with separate left turn, through and right turn lanes.

The **SR 59 / Bellevue Road intersection** is controlled by an all-way stop. The intersection has single travel lanes on each approach, and there are no crosswalks.

The **Bellevue Road / M Street intersection** is a "Tee" intersection controlled by a stop sign on the northbound M Street approach. No turn lanes are provided today on Bellevue Road at this intersection, but the M Street approach has a large median area that separates inbound and outbound lanes. There are no crosswalks at this intersection.

The **Bellevue Road / Barclay Way intersection** is controlled by a traffic signal. Each approach leg has a separate left turn lane, and the westbound and southbound approaches also have right turn lanes. Crosswalks exist on the north and east legs of the intersection.

The **G Street / Bellevue Road intersection** is controlled by a traffic signal. G Street has two through travel lanes in each direction, but the second northbound lane ends about 300 feet north of the intersection. Each approach has a separate left turn lane, but the westbound and southbound approaches have separate right turn lanes. Crosswalks exist on the north and west legs of the intersection.

The **M Street / Cardella intersection** is a broad four-legged intersection that is controlled by an all-way stop. The intersection is laid out in its ultimate configuration for a Divided Arterial Street. The northbound M Street approach has dual left turn lanes, a through lane and a separate right turn lane. The three-lane southbound approach has separate left turn, through and right turn lanes. Cardella Road has two through lanes in each direction, as well as separate left turn and right turn lanes. The westbound approach has dual left turn lanes. Crosswalks exist on all four legs of the intersection.

The **Cardella Road / G Street intersection** is controlled by a traffic signal. The intersection is a "Tee", but future construction will extend Cardella Road easterly. While portions of the intersection have been widened to their ultimate width, interim striping is consistent with the available through travel lanes. The eastbound Cardella Road approach is striped for a single left turn lane and a separate right turn lane. Southbound G Street has separate left, through and right

turn lanes, northbound G Street has a left turn lane and a through travel lane. There are no crosswalks at this location.

The **M Street / Lehigh Drive / Community College Drive intersection** is controlled by a traffic signal. M Street has two through lanes in each direction, as well as separate left turn lanes along a broad raised median. The Lehigh Drive and Community College Drive approaches are single lanes that operate under "split" phases.

The **SR 59 / Yosemite Avenue intersection** has a "Tee" configuration, controlled by a traffic signal. The intersection is configured with separate southbound and westbound left turn lanes, and the northbound SR 59 and westbound Yosemite Avenue approaches have separate right turn lanes. Crosswalks are striped across the north and east legs of the intersection.

The **Yosemite Avenue / R Street intersection** is controlled by a traffic signal. The intersection has separate left turn lanes and two through lanes on each approach. The north, south and west legs also have separate right turn lanes. Crosswalks are striped across each leg of the intersection.

The **Yosemite Avenue / M Street intersection** is controlled by a traffic signal. The M Street approaches have two through lanes and left turn lanes. The three-lane Yosemite Avenue approaches are configured as a left turn lane, combined left+through lane and through+right turn lane, and these approaches operate with "split" phases. Crosswalks exist on all four legs of the intersection.

The **Yosemite Avenue / G Street intersection** is controlled by a traffic signal. Each approach has two travel lanes and a left turn lane, and with the exception of the eastbound approach, all also have separate right turn lanes. Crosswalks are marked on each leg.

The **SR 59 / Santa Fe Drive / W. Olive Avenue intersection** is controlled by a traffic signal. Olive Avenue has two through travel lanes on each approach, and SR 59 has a single through lane in each direction. Each approach has separate left turn lanes and right turn lanes. Crosswalks are marked on each leg.

The **R Street / Olive Avenue intersection** is controlled by a traffic signal. The Olive Avenue approaches have three travel lanes plus separate left turn and right turn lanes. The R Street approaches have two through lanes and left turn lanes, and the southbound approach has a right turn lane. Crosswalks are marked on each leg.

The **M Street / Olive Avenue intersection** is controlled by a traffic signal. The Olive Avenue approach has three travel lanes and a left turn lane. The eastbound approach has a separate right turn lane. The M Street approaches have two through lanes and a left turn lane. Crosswalks are marked on each leg.

The **G Street / Olive Avenue intersection** is controlled by a traffic signal. Each approach has two through travel lanes and a right turn lane. Separate right turn lanes exist on the eastbound and northbound approaches. Crosswalks are marked on each leg.

Level of Service Analysis Procedures

Level of Service (LOS) analysis provides a basis for describing existing traffic conditions and for evaluating the significance of project traffic effects. Level of Service measures the quality of traffic flow and is represented by letter designations from A to F, with a grade of A referring to the best conditions, and F representing the worst conditions. The characteristics associated with the various LOS for intersections are presented in Table 1.

Intersection Level of Service Methodology. Intersection LOS was calculated for this TIA using the methodology contained in the *Highway Capacity Manual, 6th Edition* (Transportation Research Board 2016) (HCM) using Synchro 11 software (Trafficware 2023). HCM techniques identify the average length of delays and use that information to determine the operating LOS. An overall average delay and LOS is determined for intersections controlled by traffic signals or all-way stops. At locations controlled by side street stops, delays can be determined for each approach that must yield the right of way, and the "worst case" approach delay is employed for analysis.

Analysis of all-way stop controlled intersections is somewhat limited under the HCM and Synchro 11, as the analysis procedures allow a maximum of three approach lanes. As the M Street / Cardella intersection has five-lane approaches, the results presented herein should be recognized as a "conservative" estimate of current conditions.

Roadway Segment Level of Service Methodology. The Merced General Plan presents daily traffic volume LOS thresholds that can be employed on a planning level basis (GP Table 4.3), and these values are presented in Table 2. As shown, a two-lane collector street meets the City's minimum LOS D standard carrying up to 10,300 vehicles per day, while a two-lane arterial can carry up to 16,000 vehicles per day.

Table 1. Level of Service Definitions

Level of Service	Signalized Intersections	Unsignalized Intersections
A	Vehicle progression is exceptionally favorable or the cycle length is very short. Delay ≤ 10.0 seconds/vehicle	Little or no delay. Delay ≤ 10 seconds/vehicle
B	Vehicle progression is highly favorable or the cycle length is short. Delay > 10 seconds/vehicle and ≤ 20 seconds/vehicle	Short traffic delays. Delay > 10 seconds/vehicle and ≤ 15 seconds/vehicle
C	Vehicle progression is favorable or the cycle length is moderate. Individual cycle failures may begin to appear at this level. Delay > 20 seconds/vehicle and ≤ 35 seconds/vehicle	Average traffic delays. Delay > 15 seconds/vehicle and ≤ 25 seconds/vehicle
D	Vehicle progression is ineffective or the cycle length is long. Many vehicles stop and the individual cycle failures are noticeable. Delay > 35 seconds/vehicle and ≤ 55 seconds/vehicle	Long traffic delays. Delay > 25 seconds/vehicle and ≤ 35 seconds/vehicle
E	Vehicle progression is unfavorable and the cycle length is long. Individual cycle failures are frequent. Delay > 55 seconds/vehicle and ≤ 80 seconds/vehicle	Very long traffic delays, failure, extreme congestion. Delay > 35 seconds/vehicle and ≤ 50 seconds/vehicle
F	Vehicle progression is very poor and the cycle length is long. Most cycles fail to clear the vehicle queue. Delay > 80 seconds/vehicle	Intersection blocked by external causes. Delay > 50 seconds/vehicle

Source: Transportation Research Board 2016.

Table 2. Level of Service Thresholds for Roadway Segments

Roadway Type	Daily Roadway Segment Level of Service Thresholds				
	LOS A	LOS B	LOS C	LOS D	LOS E
4 Lane Freeway	25,900	42,600	57,800	68,400	76,000
6 Lane Freeway	40,000	65,800	89,200	105,600	117,400
2 Lane Highway	2,300	7,600	14,200	20,000	27,400
4 Lane Highway	20,500	33,200	48,000	62,200	70,600
2 Lane County Road			7,700	15,000	16,100
2 Lane County Road			18,000	32,200	34,000
2 Lane Arterial	-	-	11,600	16,000	16,800
4 Lane Arterial	-	4,100	26,800	33,700	35,400
6 Lane Arterial	-	6,600	41,800	50,700	53,200
2 Lane Collector	-	-	4,800	10,300	13,200
4 Lane Collector	-	-	11,300	22,200	26,400

Source: City of Merced 2012.

Standards of Significance. The methods employed to determine the significance of LOS are noted in the General Plan and in Merced's traffic study guidelines.

Implementing Action T-1.8.b of the *Merced Vision 2030 General Plan* (City of Merced 2012) establishes an acceptable LOS of D for intersections and roadways. Action T-1.8.b states:

> "1.8.b Use peak-hour Level of Service "D" ("Tolerable Delays") as the design standard for new streets and intersections in new growth areas.
>
> "The preferred LOS levels are typically "C" and "D," particularly for larger roads and major intersections. With LOS C the road provides stable operation but is still underutilized to some degree. LOS D represents a fine balance between the relatively large number of vehicles served and the generally acceptable level of

service provided. It is the intent of the City's standards and policies for new and most upgraded intersections and road segments to be designed and built so as not to drop below LOS D ("tolerable delay") during peak traffic periods."

Therefore, in this traffic impact analysis, LOS A through D are considered acceptable for signalized intersections, while LOS E and F are unacceptable.

At two-way stop-sign-controlled intersections (or one-way stop "Tee" intersections), LOS can be calculated for each approach where motorists yield the right of way, as well as for the intersection as a whole. Significance is based on the length of the average delay experienced by motorists on the worst-case approach, which is typically from the stop-sign-controlled approach to the intersection. It should be noted that overall intersection average LOS at un-signalized intersections is better, often much better, than LOS on the worst single movement.

Under City of Merced guidelines, however, a poor "worst case" LOS is not necessarily significant unless the intersection also carries traffic volumes which satisfy peak hour traffic signal warrant requirements. Traffic signal warrants are a series of several standards which provide guidelines for determining if a traffic signal is appropriate. Signal warrant analyses are typically conducted at intersections of uncontrolled major streets and stop sign-controlled minor streets. If one or more signal warrants are met, signalization of the intersection may be appropriate. However, a signal should not be installed if none of the warrants are met, since the installation of signals would increase delays on the previously-uncontrolled major street, and may increase the occurrence of particular types of accidents.

Consistent with CEQA, the City will use the traffic study to determine the project's effects on two broad CEQA checklist topics: (1) substantial increases in traffic; and (2) changes to LOS. Each of these broad categories have distinct thresholds of significance (described below) and are to be utilized in the TIA.

1. Topic: Substantial Increase in Traffic Levels

A. Arterial Level Road: The threshold of significance is a project ADT contribution equal or greater than 5% of the current ADT for an "arterial roadway" that is, or will be, operating at an unacceptable LOS "E" or "F".

B. Collector Level Road: The threshold of significance is an amount where the Project contributes more than 20% of the current ADT on roads carrying at least 3,000 ADT. Thus, a significant impact would occur if a Project adds 601 ADT to a collector road that currently has 3,000 ADT. [3,000 x (.20)]

2. Topic: Change in Level of Service (LOS) Rating

Merced Vision 2015 General Plan Policy T-1.8 states: Use A Minimum Peak Hour Level of Service (LOS) "D" As a Design Objective for All New Streets in New Growth Areas and for Most Existing City Streets Except Under Special Circumstances. *To implement*

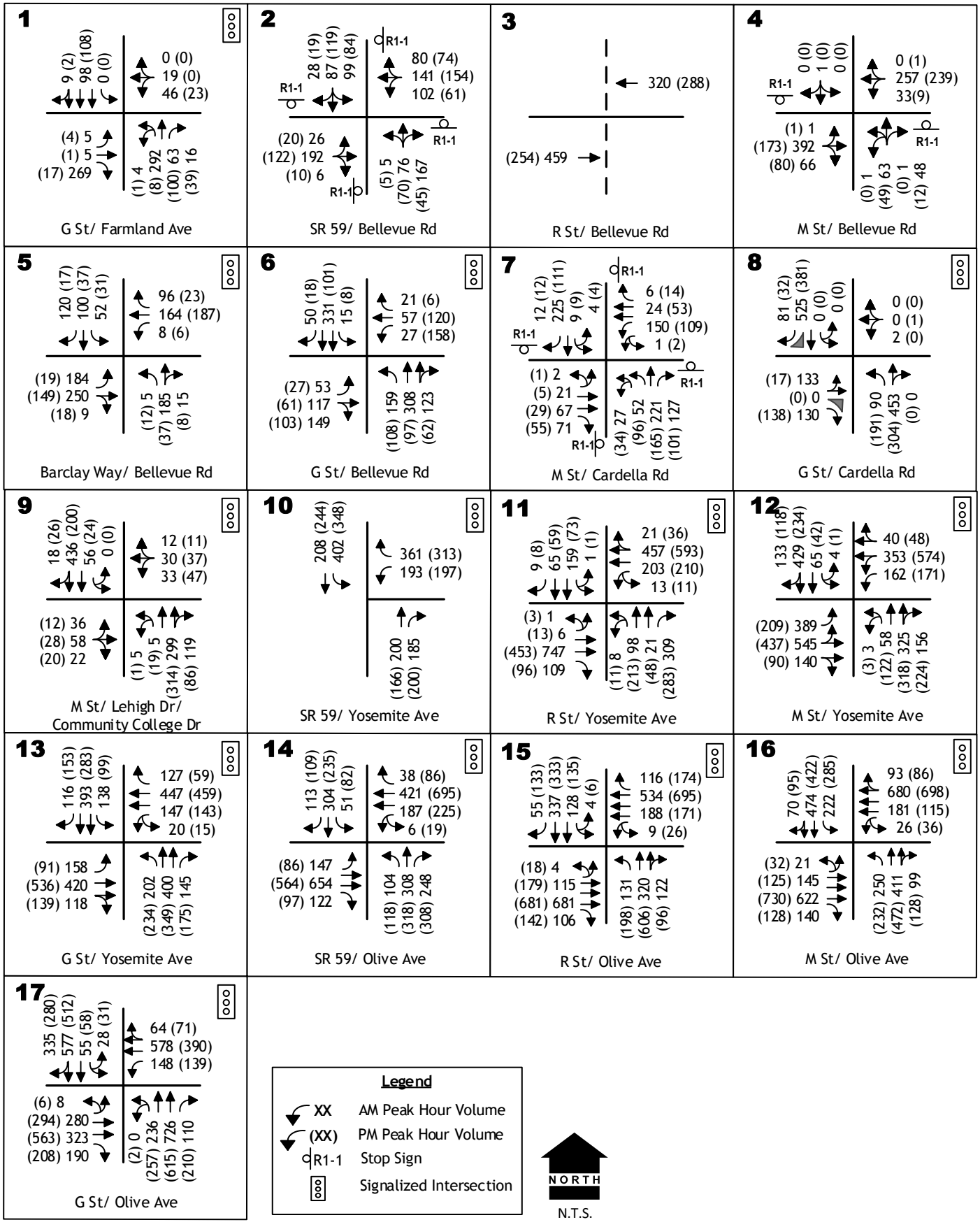
this Policy, the City focuses on four different street system categories, each described in greater detail below: (A) roadways; (B) signalized intersections; (C) un-signalized intersections; and (D) roads within established neighborhoods.

A. Roadways and Signalized Intersections: *Merced Vision 2015 General Plan*, Implementing Action T-1.8.b, establishes an acceptable LOS of "D" for intersection and roadway operations.

1.8.b Use peak-hour Level of Service "D" ("Tolerable Delays") as the design standard for new streets and intersections in new growth areas.
The preferred LOS levels are typically "C" and "D," particularly for larger roads and major intersections. With LOS C the road provides stable operation but is still underutilized to some degree. LOS D represents a fine balance between the relatively large number of vehicles served and the generally acceptable level of service provided. It is the intent of the City's standards and policies for new and most upgraded intersections and road segments to be designed and built so as not to drop below LOS D ("tolerable delay") during peak traffic periods.

Existing Traffic Conditions and Levels of Service

Traffic Volumes. Traffic count data were collected in August 2022 when local Merced schools were in operation. These counts reflect the recent changes to public school bell schedule mandated under state law. Traffic volumes were observed at intersections in 15-minute intervals over two hour periods (i.e., 7:00 to 9:00 am, and 4:00 to 6:00 pm) and the four consecutive intervals with the greatest traffic volumes were identified as the peak hour. The extent to which traffic volumes within the hour was concentrated into any particular 15-minute period was determined based on the *Peak Hour Factor (PHF)* at each intersection. The observed Year 2022 PHF was incorporated into the LOS analysis to address the specific peaking characteristics of traffic in this area. Existing peak hour traffic volumes are shown in Figure 6.



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Transportation Engineers

EXISTING TRAFFIC VOLUMES AND LANE CONFIGURATIONS

7043-05 RA 5/10/2023

figure 6

24-hour roadway segment traffic volumes were observed on two weekdays (i.e., Tuesday August 16, 2022 and Wednesday August 17, 2022). The results were averaged and reported as the average daily traffic on each road.

Intersection Levels of Service. Table 3 presents existing a.m. peak hour and p.m. peak hour LOS. As shown, with one exception, all intersections meet the City's minimum LOS D standard. The Olive Avenue / G Street intersection operates at LOS E during the a.m. peak hour.

TABLE 3
EXISTING PEAK HOUR INTERSECTION LEVELS OF SERVICE

	Intersection	Control	AM Peak Hour		PM Peak Hour	
			Average Delay	LOS	Average Delay	LOS
1	G Street / Farmland Ave	Signal	17	B	9	A
2	SR 59 / Bellevue Road	AWS	14	B	12	B
3	Bellevue Road / R Street	Future	- -	- -	- -	- -
4	M Street / Bellevue Road	NB Stop	20	C	13	B
5	Barclay Way / Bellevue Rd	Signal	27	C	14	B
6	G Street / Bellevue Road	Signal	22	C	19	B
7	M Street / Cardella Road[1]	AWS	13	B	11	B
8	G Street / Cardella Road	Signal	16	B	16	B
9	M Street / Lehigh Drive	Signal	21	C	20	B
10	SR 59 / Yosemite Avenue	Signal	18	B	14	B
11	R Street / Yosemite Avenue	Signal	36	D	22	C
12	M Street / Yosemite Ave	Signal	32	C	37	D
13	G Street / Yosemite Avenue	Signal	28	C	29	C
14	SR 59 / Olive Avenue	Signal	30	C	30	C
15	R Street / Olive Avenue	Signal	25	C	35	C
16	M Street / Olive Avenue	Signal	30	C	36	D
17	G Street / Olive Avenue	Signal	62	**E**	49	D

AWS is All-Way Stop. Delay is in seconds per vehicle. Highlighting shows LOS in excess of minimum LOS D. Conditions over the entire peak hour are shown; delays are longer during the peak minutes before the school day. [1] LOS calculated for maximum number of lanes allowed by HCM, 6th Edition

Traffic Signal Warrants. The volume of traffic occurring at un-signalized intersections was compared to peak hour traffic signal warrants using procedures described in the *California Manual on Uniform Traffic Control Devices* (California Department of Transportation 2021) (MUTCD). The unsignalized SR 59 / Bellevue Road intersection, and Bellevue Road / M Street intersection carry volumes that nearly satisfy warrants during the a.m. peak hour, but the M Street / Cardella Road intersections does not carry volumes that reach the level that satisfies peak hour traffic signal warrants during any time period.

It should be noted that merely satisfying the peak hour warrant is not sufficient evidence to determine whether signalization is the applicable action. If this initial screenline is passed, the remaining applicable MUTCD warrants need to be reviewed. In addition, Caltrans policies regarding traffic controls on state highways need to be followed. While adequate LOS may be achieved with a traffic signal, Caltrans policy requires evaluation of alternative traffic controls when it is necessary to stop traffic on the state highway. Those alternatives include a roundabout, in addition to a traffic signal. Current Caltrans policy requires that an Intersection Control Evaluation (ICE) be prepared when it is determined that traffic on the state highway needs to be stopped in order to consider the feasibility of all-way stop control, traffic signals or a roundabout intersection. A decision regarding applicable traffic control will be made by Caltrans with local input.

Roadway Segments. Table 4 identifies current daily traffic volumes on study area roadways in 2022 as well as the applicable LOS based on Merced General Plan thresholds. As indicated, all of the study area roadway segments carry volumes that result in LOS which satisfies the City's minimum LOS D standard.

TABLE 4. EXISTING ROADWAY SEGMENT VOLUMES AND LEVELS OF SERVICE

Street	From	To	Current Classification	Daily Traffic Volume	Level of Service
Farmland Avenue	El Capitan Entrance	G Street	2 lane Collector	3,344	C
	G Street	Golf Road	2 lane Collector	829	C
Bellevue Road	State Route 59	R Street	2 lane Arterial	6,591	C
	R Street	M Street	2 lane Arterial	6,743	C
	M Street	G Street	2 lane Arterial	5,799	C
	G Street	Golf Road	2 lane Arterial	4,670	C
State Route 59	Nevada Street	Bellevue Road	2 lane Highway	3,800	B
	Bellevue Road	Cardella Road	2 lane Highway	4,572	B
	Cardella Road	Belcher Road	2 lane Highway	4,572	B
	Belcher Road	Yosemite Avenue	2 lane Highway	12,705	C
G Street	Farmland Avenue	Bellevue Road	2 lane Arterial[1]	5,721	C
	Bellevue Road	Cardella Road	2 lane Arterial[1]	9,897	C
	Cardella Road	Yosemite Avenue	2 lane Arterial	13,129	D
Barclay Way	El Capitan HS	Bellevue Road	2 lane Collector	2,218	C
	Bellevue Road	M Street	2 lane Collector	1,406	C
Cardella Road	SR 59	R Street	2 lane Arterial	83	C
	R Street	M Street	4 lane Arterial	3,539	B
	M Street	G Street	4 lane Arterial	4,983	C
M Street	Bellevue Road	Cardella Road	2-lane Arterial	2,922	C
	Cardella Road	University Drive	4 lane Arterial	6,936	C
	University Drive	Yosemite Avenue	4 lane Arterial	10,045	C
San Jose Avenue	University Drive	Yosemite Avenue	2 lane Local	4,828	D
Yosemite Avenue	SR 59	R Street	4 lane Arterial	16,489	C
	R Street	M Street	4 lane Arterial	21,864	C
	M Street	G Street	4 lane Arterial	19,810	C
	G Street	Parsons	4 lane Arterial	19,513	C

Notes: **Bold and highlighted** values exceed General Plan level of service standard.

[1] Additional lanes are available; the minimum number of lanes in one direction used for LOS analysis.

Alternative Transportation Modes

The following describes existing and planned facilities for public transit riders, bicyclists and pedestrians in the area of the BRMDP.

Public Transit. The City of Merced is served by a local public bus system, inter-regional private bus companies, and private taxi-cabs, as well as rail and air passenger services. The public bus system, created in 1974, served the community as the Merced Transit System (MTS) / City Shuttle for more than two decades. Its primary goal over time remained to serve senior citizens, low-income people and the disabled, even as the system expanded. Originally created solely as a demand responsive Dial-A-Ride operation, the service extended as time passed to include a number of fixed routes within the City.

Today the area of the project is served by *The Bus. Route M1 – Merced West, M2 R Street Shuttle, M3 M Street Shuttle and M4 G Street Shuttle* and *UC Merced* all reach the Yosemite Avenue / M Street intersection or travel along Yosemite Avenue by the site. All connect the site with the downtown Transportation Center on 16th Street. (Merced Transit Authority 2023)

Bicycles. The City of Merced has an extensive network of bicycle facilities, including off-street trails and paths, as well as on-street bicycle lanes and routes. Many of these facilities also support pedestrian travel. According to Caltrans guidelines (California Department of Transportation 2022), bicycle facilities are generally divided into four categories:

- **Class I Bikeway (Bike Path).** A completely separate facility designated for the exclusive use of bicycles and pedestrians with vehicle and pedestrian cross-flow minimized.

- **Class II Bikeway (Bike Lane).** A striped lane designated for the use of bicycles on a street or highway. Vehicle parking and vehicle/pedestrian cross-flow are permitted at designated locations.

- **Class III Bikeway (Bike Route).** A route designated by signs or pavement markings for bicyclists within the vehicular travel lane (i.e., shared use) of a roadway.

- **Class IV Separated Bikeways.** Bicycle lanes that are fully protected from auto traffic through raised elements such as curbs, plastic bollards, landscaping, or parking.

The **City of Merced Active Transportation Plan and Safe-Routes to School Plan.** 2019 City of Merced Active Transportation and Safe Routes to Schools Plan identified existing and planned facilities. Today Class I shared paths exist:

- Along Fahrens Creek south of Cardella Road
- Linking El Capitan HS and the Bellevue Road / G Street intersection

Class II bike lanes follow:

- G Street south of Bellevue Road
- M Street from Bellevue Road to south end of M Street Circle
- M Street from Barclay Way to Yosemite Avenue
- Cardella Road from Fahrens Creek to G Street
- Mandeville Lane from M Street to Barclay Way
- Bancroft Drive from M Street to Barclay Way

Pedestrians. Sidewalks exist along many study area streets, including:

- M Street from Barclay Way to Yosemite Avenue
- West side of G Street from Farmland Avenue to Cardella Road and from Community College Drive to Yosemite Avenue
- East side of Barclay Way from El Capitan HS to M Street
- Other developed local streets in Bellevue Ranch

Recommended Improvements. As part of the Active Transportation and Safe Routes to Schools 2019 plan, the City of Merced reviewed bicycle and pedestrian facilities and produced a prioritized list of recommended bicycle and pedestrian improvements. Table 5 lists the identified future improvements near the BRMDP area.

TABLE 5
CITY OF MERCED
ACTIVE TRANSPORTATION AND SAFE ROUTES TO SCHOOLS PLAN IMPROVEMENTS

Location	Project Type	Status
Bicycle Prioritized Projects		
G Street: 13th Street to Mercy Avenue	Class IV	Not installed
G Street: Mercy Hospital Path south of Korbel Avenue	Class I	Not installed
Yosemite Ave: San Augustine to Gardner Ave	Class II Buffer	Not installed
East side of G Street: Bellevue Road to Mercy Ave	Class II	Not installed
Bancroft Drive: Cardella Road to Barclay Way	Class II	Not installed
East side of G Street: Bellevue Road to Farmland Ave	Class II	Not installed
Barclay Way: M Street to Bellevue Road	Class II	Not installed
Bellevue Road: G Street to Barclay Way	Class II	Not installed
Bellevue Road: Barclay Way to M Street	Class II	Not installed
Fahrens Creek: Heitz Court to Bellevue Road	Class I	Not installed
Fahrens Creek: Bellevue Road to Cardella Road	Class I	Not installed
Pedestrian Prioritized Projects		
G Street / Brookdale Drive Intersection	Mid-Block crossing with HAWK or FFRB	Not installed
Source: Appendix D City of Merced Active Transportation and Safe Routes to School Plan https://www.cityofmerced.org/home/showdocument?id=8556		

PROJECT CHARACTERISTICS

The BRMDP includes a mix of single family and multi-family residential uses, retail commercial uses, office uses, and schools. The following describes traffic-related characteristics of the previously-approved BRMDP and the proposed amended BRMDP.

Project Use / Access Characteristics

Approved Land Use Designations. Land uses included in the previously-approved BRMDP include:

- 4,873 single family dwelling units,
- 1,675 multiple family dwelling units,
- 618,000 building square feet of retail commercial land use,
- 254,390 building square feet of commercial office land use,
- 54,450 building square feet of self-storage land use,
- primary public school facilities with 750 student enrollment, and
- high school facilities with 1,800 student enrollment.

Proposed Land Uses. Land Uses included in the proposed BRMDP include:

- 3,805 single family dwelling units,
- 1,317 multiple family dwelling units,
- 500,400 building square feet of retail commercial land use,
- 254,390 building square feet of commercial office land use,
- primary public school facilities with 1,500 student enrollment, and
- high school facilities with 1,800 student enrollment.

The net change in the BRMDP area from previously-approved land uses to proposed land uses would be:

- a reduction of 1,068 single family dwelling units,
- a reduction of 358 multiple-family dwelling units,
- a reduction 117,600 building square feet of retail commercial land use,
- elimination of self-storage land use, and
- an increase in primary public school facilities with 750 student enrollment.

Trip Generation Rates. The number of vehicle trips that are expected to be generated by development of the BRMDP has been estimated using trip generation rates based on the nature and size of project land uses. Data compiled by the Institute of Transportation Engineers (ITE) and presented in the publication *Trip Generation, 11th Edition* (Institute of Transportation Engineers 2021) was reviewed as a source of trip generation rates for the uses within the proposed project. The trip generation rates used in this analysis are presented in Table 6.

Table 6. Trip Generation Rates

Land Use Designation	Description	ITE Code	Units	Trip Generation Rates		
				Daily	AM	PM
LDR, LMDR, VR	Single Family Residential	110	DU	9.43	0.70	0.94
HMDR	Multiple Family Residential	220	DU	6.74	0.40	0.51
NC, RCC	Retail	820	KSF	37.01	0.84	3.40
COMM / OFFICE	Commercial Office	710	KSF	10.84	1.52	1.44
SS	Self Storage	151	KSF	1.45	0.09	0.15
School	Public Schools	520	Students	2.27	0.74	0.16
School	High School	525	Students	1.94	0.52	0.14

Notes: ITE = Institute of Transportation Engineers. DU = dwelling units. KSF = 1,000 building square feet.

Trip Generation Forecasts. Table 7 identifies the results of applying the identified trip generation rates to land uses included in the Approved BRMDP and the Proposed BRMDP, respectively. The Approved BRMDP would generate:

- 89,146 trips per day,
- 6,483 trips in the a.m. peak hour, and
- 8,282 trips in the p.m. peak hour.

The Proposed BRMDP would generate:

- 72,933 trips per day,
- 6,044 trips in the a.m. peak hour, and
- 6,808 trips in the p.m. peak hour.

As a percentage of the trips generated by the Approved BRMDP, the Proposed BRMDP would generate:

- 82 percent per day,
- 93 percent in the a.m. peak hour, and
- 82 percent in the p.m. peak hour.

Table 7. Bellevue Ranch Master Development Plan Trip Generation Forecasts

Designation	Description	ITE Code	Quantity	Trip Generation Forecasts		
				Daily	AM	PM
		Approved BRMDP				
LDR, LMDR, VR	Single Family Residential	110	4,873	45,952	3,411	4,581
HMDR	Multiple Family Residential	220	1,675	11,290	670	854
NC, RCC	Retail	820	618	23,872	519	2,101
COMM / OFFICE	Commercial Office	710	254.39	2,758	387	366
SS	Self Storage	151	54.45	79	5	8
School	Primary Public Schools	520	750	1,703	555	120
School	High School	525	1,800	3,492	936	252
			Total	***89,146***	***6,483***	***8,282***
		Proposed BRMDP				
LDR, LMDR, VR	Single Family Residential	110	3,805	35,881	2,664	3,577
HMDR	Multiple Family Residential	220	1,317	8,877	527	672
NC /RCC	Retail	820	500.4	18,520	420	1,701
COMM / OFFICE	Commercial Office	710	254.39	2,758	387	366
School	Primary Public Schools	520	1,500	3,405	1,110	240
School	High School	525	1,800	3,492	936	252
			Total	***72,933***	***6,044***	***6,808***

Notes: ITE = Institute of Transportation Engineers.

Trip Distribution and Assignment. The geographic distribution and assignment of future vehicle trips to specific roadways was conducted using the Merced County Association of Governments (MCAG) Year 2035 regional travel demand forecasting model. This approach results in the traffic analysis directly addressing and integrating:

- the geographic distribution of residential and non-residential land uses,
- the extent of intra-site travel within the BRMDP area between on-site residential and non-residential land uses,
- the availability of roadway facilities and the relative utility of alternative travel routes, and
- the extent and geographic distribution of travel between the BRMDP area and surrounding citywide and regional land uses.

The MCAG travel demand model was applied separately to both the Approved BRMDP and the Proposed BRMDP.

LONG TERM YEAR 2035 CUMULATIVE CONDITIONS

Overview

The Cumulative Year 2035 analysis presented herein is intended to evaluate the relative cumulative impact of the project assuming implementation of long-term circulation system improvements and continuing development in the Merced area. As noted earlier in this TIA, the MCAG regional travel demand forecasting model is the tool employed for this analysis.

Land Use. The land use input data in the MCAG travel demand model for the BRMDP area were revised to reflect two alternative scenarios:

- Approved BRMDP land uses
- Proposed BRMDP land uses

Circulation System Improvements. The City of Merced General Plan Circulation Element and General Plan EIR suggest that appreciable improvements will be needed to accommodate the future traffic volumes accompanying build out of the General Plan. SR 59 is projected to be a six-lane facility from W. 16th Street to Yosemite Avenue (refer to GP Table 4.4) and a four-lane facility north of Yosemite Avenue. Bellevue Road is to be a six-lane arterial east of SR 59, and Cardella Road is planned to be a four-lane arterial that is completed from SR 59 easterly to Lake Road. R Street and M Street will be extended northerly across Bellevue Road. Regionally, the General Plan envisions the completion of the Atwater Merced Expressway (AME), and Campus Parkway.

The General Plan identifies the level of improvements planned at new intersections. Figure 7 and Figure 8 show Circulation Element Figures 4.28 and 4.29, which identify expanded lane geometry at the intersection of a major arterial / divided arterial, and the intersection of two major arterials, respectively.

Anticipated funding constrains the level of future improvements assumed in this analysis. The MCAG travel demand model was adjusted to include Tier I improvements noted in the 2018 Regional Transportation Plan.

Approach to Developing Traffic Volume Forecasts – Arterial Streets. An incremental approach was applied for this TIA to forecast future traffic volumes. The approach addresses the relative difference between baseline travel model estimates and actual traffic counts. Because the study area includes some streets that carry little traffic today, but are forecast to experience large future volumes, the approach follows the following steps:

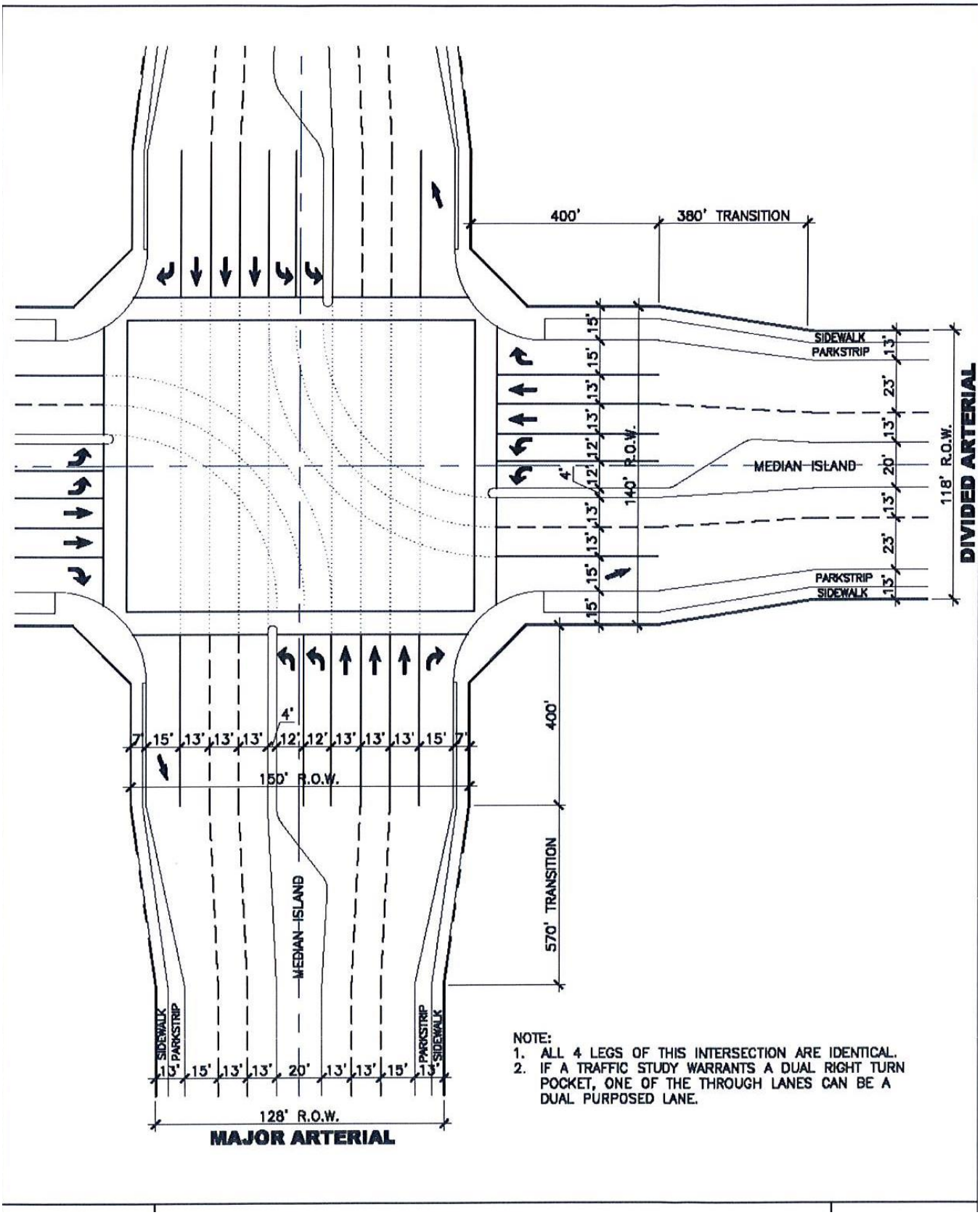
Refine the MCAG travel models to reflect future improvements as noted above.

- Modify the model to replace assumed land uses within the BRMDP area with the Approved and Proposed land use plans.

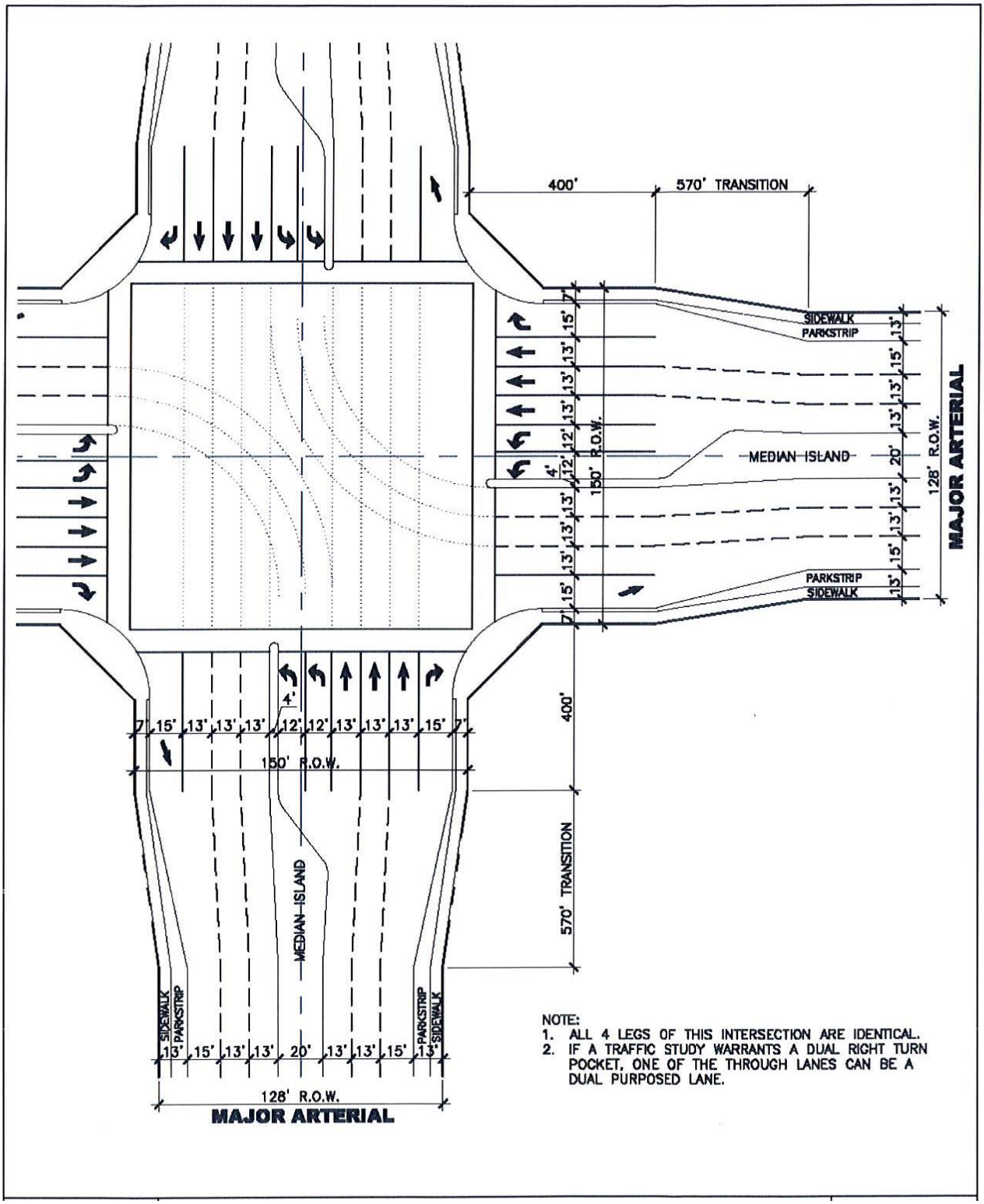
- Compare baseline model forecasts with future forecasts to identify the incremental change in daily approach volume at each intersection and on each roadway segment.

- Add the baseline-to-future increment to the existing approach or segment volumes counted in 2022 to create "adjusted future" volumes separately under both Approved and Proposed scenarios.

- Apply baseline-to-future growth factors to the turning movements at each intersection and adjust the results to balance inbound and outbound traffic using the methods contained in the National Cooperative Highway Research Program (NCHRP) Report 255, *Highway Traffic Data for Urbanized Area Project Planning and Design* (Transportation Research Board 1982) (Furness Factoring).



CIRCULATION ELEMENT EXHIBIT
EXPANDED INTERSECTION OF A MAJOR ARTERIAL
AND DIVIDED ARTERIAL



CIRCULATION ELEMENT EXHIBIT
EXPANDED INTERSECTION OF TWO MAJOR ARTERIALS

Daily Traffic Volumes / Levels of Service

Traffic Volumes. Table 8 identifies projected Year 2035 daily traffic volumes on study roadway segments and the resulting LOS under 2035 No Project conditions and 2035 Plus Project conditions. The table also shows the daily volumes presented in the General Plan EIR for buildout conditions. The No Project condition assumes development of the currently Approved BRMDP and General Plan circulation system. The Plus Project assumes development of the Proposed BRMDP land uses and General Plan circulation system.

Roadway Segment Levels of Service – No Project. Table 8 shows 2035 roadway segment traffic volumes and LOS if the proposed amendment to the BRMDP does not proceed, and the plan area develops as currently approved. Under 2035 No Project conditions, all study roadway segments would operate at LOS D or better conditions. Based on City General Plan policies, LOS D or better is considered acceptable. No improvements are recommended along study roadway segments.

Roadway Segment Levels of Service – Plus Project. Table 8 shows 2035 roadway segment traffic volumes and LOS with development of the proposed amendment to the BRMDP. As previously described in the *Trip Generation Forecasts* section of this TIA, development of the BRMDP as Proposed would generate 82 percent of the trips that would be generated with development of the Approved BRMDP. As a result, 2035 Plus Project volumes are lower than 2035 No Project volumes on a majority of study roadway segments. Under 2035 Plus Project conditions, all study roadway segments would operate at LOS D or better conditions. Based on City General Plan policies, LOS D or better is considered acceptable. No improvements are recommended along study roadway segments.

TABLE 8. YEAR 2035 ROADWAY SEGMENT VOLUMES AND LEVELS OF SERVICE

Street	From	To	General Plan Classification	2035 No Project		2035 Plus Project		General Plan EIR (Buildout)	
				Daily Traffic Volume	Level of Service	Daily Traffic Volume	Level of Service	Daily Traffic Volume	Level of Service
Old Lake Road	State Route 59	R Street	4 lane Arterial	10,437	C	8,216	C	20,840	C
	R Street	M Street	4 lane Arterial	6,037	C	4,926	C	17,890	C
	M Street	G Street	4 lane Arterial	2,273	B	0	A	17,040	C
	G Street	Golf Road	2 lane County Rd	1,022	C	970	C	8,830	D
Farmland Avenue	M Street	El Capitan HS	2 lane Collector	1,776	C	1,830	C	Not Avail.	- -
	El Capitan Entrance	G Street	2 lane Collector	2,541	C	4,165	C	Not Avail.	- -
	G Street	Golf Road	2 lane Collector	5,546	D	5,477	D	Not Avail.	- -
Bellevue Road	State Route 59	R Street	6 lane Arterial	39,159	C	37,993	C	58,400	**F**
	R Street	M Street	6 lane Arterial	31,168	C	30,568	C	55,310	**F**
	M Street	Barclay Way	6 lane Arterial	28,705	C	29,127	C	57,470	**F**
	Barclay Way	G Street	6 lane Arterial	34,425	C	35,077	C	57,470	**F**
	G Street	Golf Road	6 lane Arterial	28,479	C	27,090	C	52,950	**E**
State Route 59	Nevada Street	Bellevue Road	6 lane Arterial	15,018	C	14,124	C	40,790	C
	Bellevue Road	Cardella Road	4 lane Arterial	22,994	C	22,568	C	33,690	D
	Cardella Road	Belcher Road	4 lane Arterial	26,295	C	23,898	C	30,030	D
	Belcher Road	Yosemite Avenue	4 lane Arterial	28,691	D	26,218	C	33,030	D
	Yosemite Avenue	Olive Avenue	6 lane Arterial	35,873	C	31,081	C	48,030	D
R Street	Old Lake Road	Bellevue Road	6 lane Arterial	16,677	C	11,984	C	34,740	C

TABLE 8. YEAR 2035 ROADWAY SEGMENT VOLUMES AND LEVELS OF SERVICE (CONTINUED)

Street	From	To	General Plan Classification	2035 No Project		2035 Plus Project		General Plan EIR (Buildout)	
				Daily Traffic Volume	Level of Service	Daily Traffic Volume	Level of Service	Daily Traffic Volume	Level of Service
G Street	Old Lake Road	Farmland Avenue	6 lane Arterial	11,267	C	3,997	B	36,750	C
	Farmland Avenue	Bellevue Road	6 lane Arterial	16,115	C	10,151	C	36,750	C
	Bellevue Road	Cardella Road	4 lane Arterial	22,480	C	19,656	C	30,380	D
Barclay Way	Farmland Avenue	Bellevue Road	2 lane Collector	6,822	D	4,000	C	Not Avail.	- -
	Bellevue Road	M Street	2 lane Collector	4,024	C	3,144	C	Not Avail.	- -
Cardella Road	SR 59	R Street	4 lane Arterial	24,607	C	23,713	C	31,840	D
	R Street	M Street	6-lane Arterial	27,773	C	26,769	C	35,340	C
	M Street	G Street	4 lane Arterial	25,322	C	24,111	C	33,520	D
M Street	Old Lake Road	Bellevue Road	2 lane Arterial	14,744	D	15,104	D	11,910	D
	Bellevue Road	Cardella Road	2 lane Arterial	12,687	D	11,920	D	12,920	D
	Cardella Road	University Drive	4 lane Arterial	23,785	C	21,086	C	35,710	**F**
	University Drive	Yosemite Avenue	4 lane Arterial	25,053	C	22,119	C	35,710	**F**
San Jose Avenue	University Drive	Yosemite Avenue	2 lane Local	5,000	D	5,000	D	5,000	D
Yosemite Avenue	SR 59	R Street	4 lane Arterial	16,133	C	14,155	C	26,130	C
	R Street	M Street	4 lane Arterial	26,084	C	26,347	C	38,430	**F**
	M Street	G Street	4 lane Arterial	20,794	C	19,443	C	38,770	**F**
	G Street	Parsons	4 lane Arterial	31,249	D	31,094	D	38,990	**F**

Notes: **Bold and highlighted** values exceed General Plan level of service standard.

Peak Hour Intersection Volumes and Levels of Service

Traffic Volumes. Year 2035 a.m. and p.m. peak hour traffic volumes are presented in Figure 9 and Figure 10. Figure 9 presents 2035 No Project volumes, which assume the BRMDP area is developed with the Approved BRMDP land uses and the General Plan circulation system. Figure 10 presents 2035 Plus Project volumes, which assume the BRMDP area is developed with the Proposed BRMDP land uses.

Intersection Geometry. The geometry assumed for study area intersections under Year 2035 condition is also illustrated in Figure 9 and Figure 10. Improvements consistent with the Bellevue Ranch Master Development Agreement are assumed. In the case of intersections on SR 59, improvements planned by Caltrans and the City have been assumed. Elsewhere, intersection geometry is consistent with the City General Plan.

Intersection Level of Service – 2035 No Project. Table 9 displays the a.m. and p.m. peak hour LOS at each study intersection under future Cumulative 2035 conditions. Table 9 shows LOS for the No Project condition (with Approved BRMDP land uses), and LOS for the Plus Project condition (with Proposed BRMDP land uses).

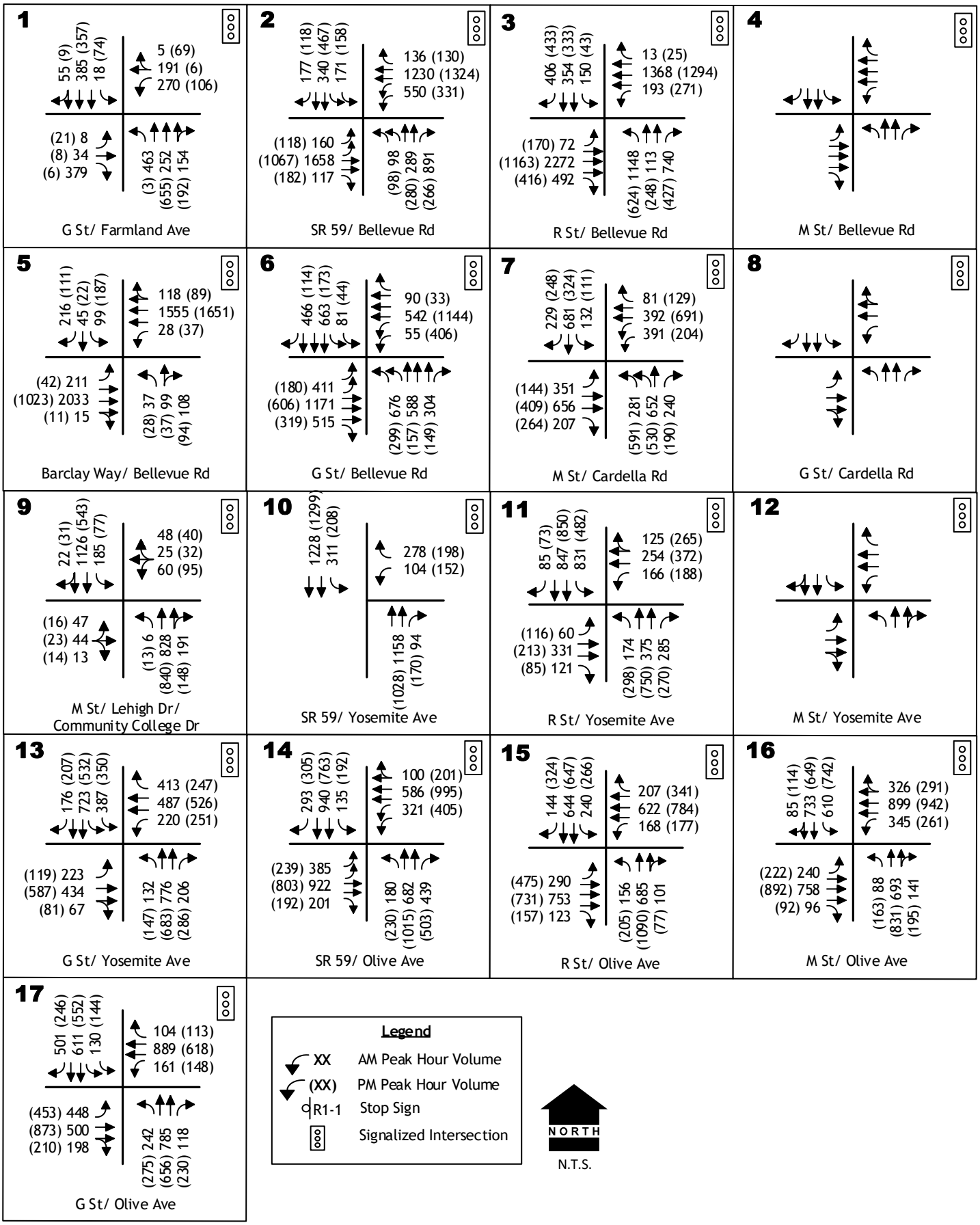
Under 2035 No Project conditions, the following two of the 17 study intersections would operate at acceptable LOS D or better during both the a.m. peak hour and p.m. peak hour:

7. M Street / Cardella Road, and
10. SR 59 / Yosemite Avenue.

The following 15 of the 17 study intersections would operate at LOS that exceeds the minimum LOS D standard.

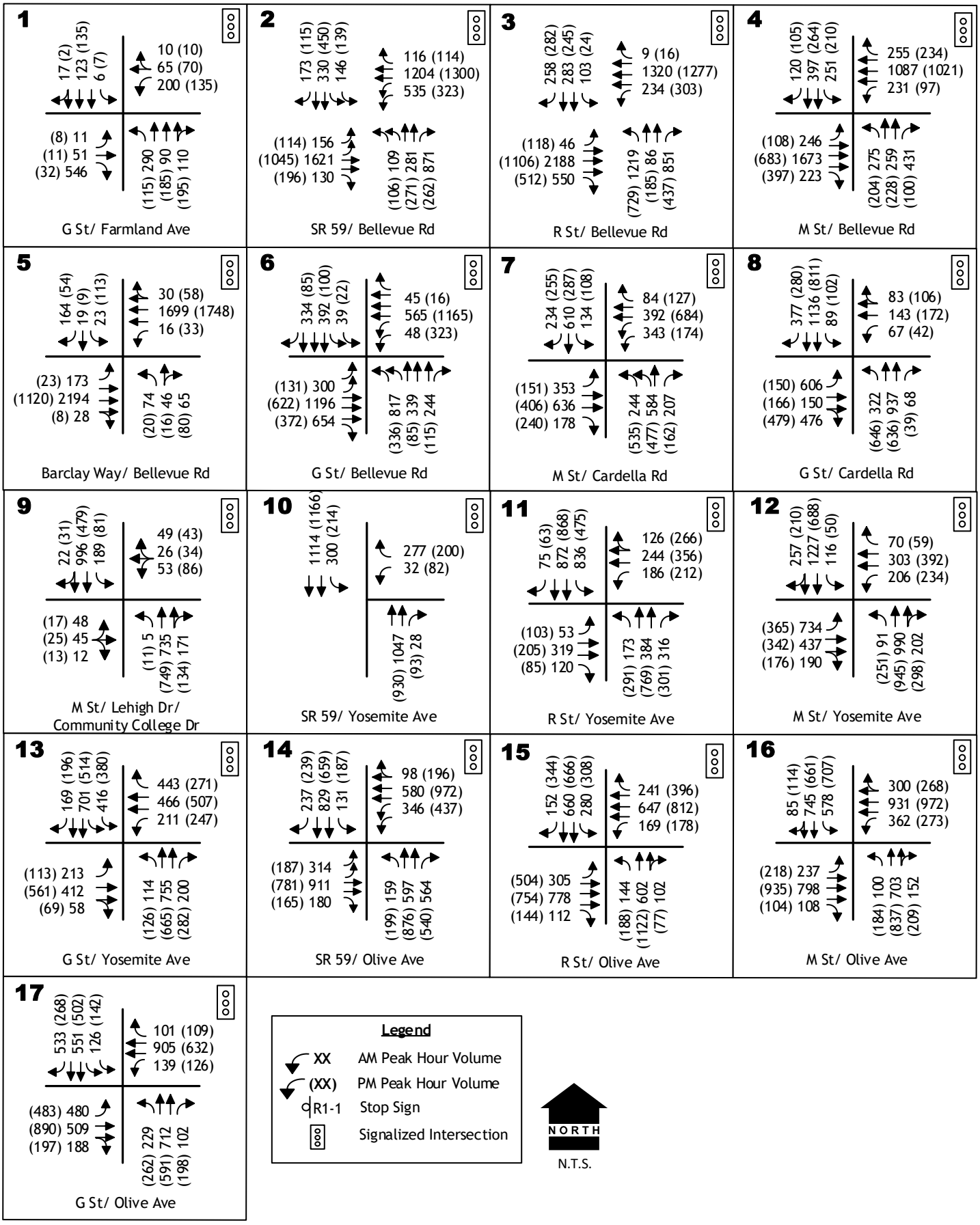
Intersection 1 – G Street / Farmland Avenue. Under Cumulative No Project conditions, this intersection would operate at LOS F with 95 seconds of delay in the a.m. peak hour, and LOS B with 13 seconds of delay in the p.m. peak hour. LOS F is inconsistent with the General Plan policies and is considered unacceptable. The following improvements are recommended to improve LOS at this intersection:

- Install permitted plus overlap phasing on the eastbound-to-southbound right-turn movement.
- Prohibit northbound-to-southbound U-turns.
- Add a second westbound-to-southbound left-turn lane.
- Optimize the traffic signal timing at this intersection to long-term future cumulative traffic volumes.



CUMULATIVE PLUS APPROVED PROJECT TRAFFIC VOLUMES AND LANE CONFIGURATIONS

KD Anderson & Associates, Inc.
Transportation Engineers



CUMULATIVE PLUS PROPOSED PROJECT TRAFFIC VOLUMES AND LANE CONFIGURATIONS

KD Anderson & Associates, Inc.
Transportation Engineers

7043-05 RA 5/10/2023

figure 10

TABLE 9
2035 PEAK HOUR INTERSECTION LEVELS OF SERVICE

	Intersection	With Current Plan					With Proposed Plan				
			AM Peak Hour		PM Peak Hour			AM Peak Hour		PM Peak Hour	
		Control	Delay	LOS	Delay	LOS	Control	Delay	LOS	Delay	LOS
1	G Street / Farmland Ave	Signal	95	**F**	13	B	Signal	193	**F**	12	B
2	SR 59 / Bellevue Road	Signal	196	**F**	43	D	Signal	185	**F**	41	D
3	Bellevue Road / R Street	Signal	301	**F**	128	**F**	Signal	299	**F**	142	**F**
4	M Street / Bellevue Road	Signal	113	**F**	56	**E**	Signal	90	**F**	26	C
5	Barclay Way / Bellevue Rd	Signal	56	**E**	30	C	Signal	43	D	18	B
6	G Street / Bellevue Road	Signal	90	**F**	23	C	Signal	74	**E**	21	C
7	M Street / Cardella Road[1]	Signal	53	D	49	D	Signal	46	D	43	D
8	G Street / Cardella Road	Signal	181	**F**	106	**F**	Signal	173	**F**	102	**F**
9	M Street / Lehigh Drive	Signal	100	**F**	24	C	Signal	92	**F**	23	C
10	SR 59 / Yosemite Avenue	Signal	39	D	12	B	Signal	17	B	10	B
11	R Street / Yosemite Avenue	Signal	84	**F**	70	**E**	Signal	87	**F**	71	**E**
12	M Street / Yosemite Ave	Signal	142	**F**	70	**E**	Signal	111	**F**	58	**E**
13	G Street / Yosemite Avenue	Signal	65	**E**	37	D	Signal	65	**E**	36	D
14	SR 59 / Olive Avenue	Signal	64	**E**	62	**E**	Signal	57	**E**	53	D
15	R Street / Olive Avenue	Signal	88	**F**	201	**F**	Signal	92	**F**	250	**F**
16	M Street / Olive Avenue	Signal	216	**F**	160	**F**	Signal	218	**F**	154	**F**
17	G Street / Olive Avenue	Signal	131	**F**	56	**E**	Signal	146	**F**	56	**E**

Notes: Highlighting shows LOS in excess of minimum LOS D. Conditions over the entire peak hour; delays are longer during the peak minutes before the school day.

TABLE 10
2035 PEAK HOUR INTERSECTION LEVELS OF SERVICE - WITH RECOMMENDED IMPROVEMENTS

	Intersection	With Current Plan					With Proposed Plan				
		Control	AM Peak Hour		PM Peak Hour		Control	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS		Delay	LOS	Delay	LOS
1	G Street / Farmland Ave	Signal	81	**F**	13	B					
2	SR 59 / Bellevue Road	Signal	76	**E**	30	C					
3	Bellevue Road / R Street	Signal	178	**F**	52	D	Signal	173	**F**	53	D
4	M Street / Bellevue Road	Signal	86	**F**	29	C					
5	Barclay Way / Bellevue Rd	Signal	51	D	30	C					
6	G Street / Bellevue Road	Signal	51	D	23	C					
7	M Street / Cardella Road										
8	G Street / Cardella Road	Signal	95	**F**	74	**E**					
9	M Street / Lehigh Drive	Signal	53	D	21	C					
10	SR 59 / Yosemite Avenue										
11	R Street / Yosemite Avenue	Signal	36	D	44	D					
12	M Street / Yosemite Ave	Signal	142	**F**	70	**E**					
13	G Street / Yosemite Avenue	Signal	57	**E**	37	D					
14	SR 59 / Olive Avenue	Signal	63	**E**	61	**E**					
15	R Street / Olive Avenue	Signal	196	**F**	196	**F**	Signal	92	**F**	243	**F**
16	M Street / Olive Avenue	Signal	216	**F**	160	**F**					
17	G Street / Olive Avenue	Signal	85	**F**	53	D	Signal	85	**F**	50	D

Notes: Highlighting shows LOS in excess of minimum LOS D. Conditions over the entire peak hour; delays are longer during the peak minutes before the school day. Blank indicates acceptable LOS and no improvement recommended, or project does not add more than five seconds of delay.

As shown in Table 10, the improvement listed above would result in this intersection operating at LOS F with 81 seconds of delay in the a.m. peak hour and LOS B with 13 seconds of delay in the p.m. peak hour. Even with implementation of the above improvements, this intersection would continue to operate at unacceptable LOS F in the a.m. peak hour. Additional improvements are not recommended at this time.

Because of existing land use development and the availability of right-of-way, it is unclear if adding a second northbound to-westbound left-turn lane is feasible. If future study determines this second left-turn lane is feasible, it is recommended.

Intersection 2 – SR 59 / Bellevue Road. Under Cumulative No Project conditions, this intersection would operate at LOS F with 196 seconds of delay in the a.m. peak hour, and LOS D with 43 seconds of delay in the p.m. peak hour. LOS F is inconsistent with the General Plan policies and is considered unacceptable. The following improvements are recommended to improve LOS at this intersection:

- Add a third westbound through lane and a third eastbound through lane in the immediate vicinity of the intersection. The lengths of the third approach and departure lanes should be determined when land use development adjacent to the intersection is proposed.

- Install permitted plus overlap phasing on the northbound-to-eastbound right-turn movement.

- Prohibit westbound-to-eastbound U-turns.

As shown in Table 10, the improvement listed above would result in this intersection operating at LOS E with 76 seconds of delay in the a.m. peak hour and LOS C with 30 seconds of delay in the p.m. peak hour. Even with implementation of the above improvements, this intersection would continue to operate at unacceptable LOS E in the a.m. peak hour. Additional improvements are not recommended at this time.

Intersection 3 – Bellevue Road / R Street. Under Cumulative No Project conditions, this intersection would operate at LOS F with 301 seconds of delay in the a.m. peak hour, and LOS F with 128 seconds of delay in the p.m. peak hour. LOS F is inconsistent with the General Plan policies and is considered unacceptable. The following improvements are recommended to improve LOS at this intersection:

- Add a second northbound-to-westbound left-turn lane.

- Install permitted plus overlap phasing on the eastbound-to-southbound right-turn movement.

- Prohibit northbound-to-southbound U-turns.

- Install permitted plus overlap phasing on the northbound-to-eastbound right-turn movement.

- Prohibit westbound-to-eastbound U-turns.

- Install permitted plus overlap phasing on the southbound-to-westbound right-turn movement.

- Prohibit eastbound-to-westbound U-turns.

- Optimize the traffic signal timing at this intersection to long-term future cumulative traffic volumes.

As shown in Table 10, the improvement listed above would result in this intersection operating at LOS F with 178 seconds of delay in the a.m. peak hour and LOS D with 52 seconds of delay in the p.m. peak hour. Even with implementation of the above improvements, this intersection would continue to operate at unacceptable LOS F in the a.m. peak hour. Additional improvements are not recommended at this time.

Intersection 4 – M Street / Bellevue Road. Under Cumulative No Project conditions, this intersection would operate at LOS F with 113 seconds of delay in the a.m. peak hour, and LOS E with 56 seconds of delay in the p.m. peak hour. LOS F and LOS E are inconsistent with the General Plan policies and are considered unacceptable. The following improvements are recommended to improve LOS at this intersection:

- Add a second southbound-to-eastbound left-turn lane.

- Install permitted plus overlap phasing on the eastbound-to-southbound right-turn movement.

- Prohibit northbound-to-southbound U-turns.

- Install permitted plus overlap phasing on the westbound-to-northbound right-turn movement.

- Prohibit southbound-to-northbound U-turns.

- Install permitted plus overlap phasing on the northbound-to-eastbound right-turn movement.

- Prohibit westbound-to-eastbound U-turns.

- Install permitted plus overlap phasing on the southbound-to-westbound right-turn movement.

- Prohibit eastbound-to-westbound U-turns.

- Optimize the traffic signal timing at this intersection to long-term future cumulative traffic volumes.

As shown in Table 10, the improvement listed above would result in this intersection operating at LOS F with 86 seconds of delay in the a.m. peak hour and LOS C with 29 seconds of delay in the p.m. peak hour. Even with implementation of the above improvements, this intersection would continue to operate at unacceptable LOS F in the a.m. peak hour. Additional improvements are not recommended at this time.

Intersection 5 – Barclay Way / Bellevue Road. Under Cumulative No Project conditions, this intersection would operate at LOS E with 56 seconds of delay in the a.m. peak hour, and LOS C with 30 seconds of delay in the p.m. peak hour. LOS E is inconsistent with the General Plan policies and is considered unacceptable. The following improvements are recommended to improve LOS at this intersection:

- Install permitted plus overlap phasing on the southbound-to-westbound right-turn movement.

- Prohibit eastbound-to-westbound U-turns.

As shown in Table 10, the improvement listed above would result in this intersection operating at LOS D with 51 seconds of delay in the a.m. peak hour and LOS C with 30 seconds of delay in the p.m. peak hour. Per General Plan policies, LOS D and LOS C are considered acceptable.

Intersection 6 – G Street / Bellevue Road. Under Cumulative No Project conditions, this intersection would operate at LOS F with 90 seconds of delay in the a.m. peak hour, and LOS C with 23 seconds of delay in the p.m. peak hour. LOS F is inconsistent with the General Plan policies and is considered unacceptable. The following improvements are recommended to improve LOS at this intersection:

- Install permitted plus overlap phasing on the southbound-to-westbound right-turn movement.

- Prohibit eastbound-to-westbound U-turns.

- Optimize the traffic signal timing at this intersection to long-term future cumulative traffic volumes.

As shown in Table 10, the improvement listed above would result in this intersection operating at LOS D with 51 seconds of delay in the a.m. peak hour and LOS C with 23 seconds of delay in the p.m. peak hour. Per General Plan policies, LOS D and LOS C are considered acceptable.

Intersection 8 – G Street / Cardella Road. Under Cumulative No Project conditions, this intersection would operate at LOS F with 181 seconds of delay in the a.m. peak hour, and LOS F with 106 seconds of delay in the p.m. peak hour. LOS F is inconsistent with the General Plan policies and is considered unacceptable. The following improvements are recommended to improve LOS at this intersection:

- Install permitted plus overlap phasing on the eastbound-to-southbound right-turn movement.

- Prohibit northbound-to-southbound U-turns.

- Install permitted plus overlap phasing on the southbound-to-westbound right-turn movement.

- Prohibit eastbound-to-westbound U-turns.

- Widen the eastbound approach to include:
  - two exclusive left-turn lanes,
  - two exclusive through lanes, and
  - an exclusive right-turn lane.

- Widen the westbound approach to include:
  - an exclusive left-turn lane,
  - two exclusive through lanes, and
  - an exclusive right-turn lane.

- Optimize the traffic signal timing at this intersection to long-term future cumulative traffic volumes.

As shown in Table 10, the improvement listed above would result in this intersection operating at LOS F with 95 seconds of delay in the a.m. peak hour and LOS E with 74 seconds of delay in the p.m. peak hour. Even with implementation of the above improvements, this intersection would continue to operate at unacceptable LOS F in the a.m. peak hour and LOS E in the p.m. peak hour.

Due to the availability of right-of-way, it is unclear if it is feasible to add a third northbound through lane and a third southbound through lane in the immediate vicinity of the intersection. If future study determines these third through lanes are feasible, they are recommended. The lengths of the third approach and departure lanes should be determined when land use development adjacent to the intersection on the east side of G Street is proposed.

Intersection 9 – M Street / Lehigh Drive. Under Cumulative No Project conditions, this intersection would operate at LOS F with 100 seconds of delay in the a.m. peak hour, and LOS C with 24 seconds of delay in the p.m. peak hour. LOS F is inconsistent with the General Plan policies and is considered unacceptable. The following improvements are recommended to improve LOS at this intersection:

- Widen the northbound approach to include:
  - an exclusive left-turn lane,
  - two exclusive through lanes, and
  - an exclusive right-turn lane.

- Add a second southbound-to-eastbound left-turn lane. Currently, two eastbound departure lanes are present at the intersection. However, the configuration and striping of the departure lanes might need to be modified with the addition of the second southbound-to-eastbound left-turn lane.

- Optimize the traffic signal timing at this intersection to long-term future cumulative traffic volumes.

As shown in Table 10, the improvement listed above would result in this intersection operating at LOS D with 53 seconds of delay in the a.m. peak hour and LOS C with 21 seconds of delay in the p.m. peak hour. Per General Plan policies, LOS D and LOS C are considered acceptable.

Intersection 11 – R Street / Yosemite Avenue. Under Cumulative No Project conditions, this intersection would operate at LOS F with 84 seconds of delay in the a.m. peak hour, and LOS E with 70 seconds of delay in the p.m. peak hour. LOS F and LOS E are inconsistent with the General Plan policies and are considered unacceptable. The following improvements are recommended to improve LOS at this intersection:

- Install permitted plus overlap phasing on the eastbound-to-southbound right-turn movement.

- Prohibit northbound-to-southbound U-turns.

- Add a second southbound-to-eastbound left-turn lane.

- Add a second northbound-to-westbound left-turn lane.

As shown in Table 10, the improvement listed above would result in this intersection operating at LOS D with 36 seconds of delay in the a.m. peak hour and LOS D with 44 seconds of delay in the p.m. peak hour. Per General Plan policies, LOS D is considered acceptable.

Intersection 12 – M Street / Yosemite Avenue. Under Cumulative No Project conditions, this intersection would operate at LOS F with 142 seconds of delay in the a.m. peak hour, and LOS E with 70 seconds of delay in the p.m. peak hour. LOS F and LOS E are inconsistent with the General Plan policies and are considered unacceptable. Due to the presence of existing land use development and utility infrastructure, widening of this intersection is considered infeasible.

Intersection 13 – G Street / Yosemite Avenue. Under Cumulative No Project conditions, this intersection would operate at LOS E with 65 seconds of delay in the a.m. peak hour, and LOS D with 37 seconds of delay in the p.m. peak hour. LOS E is inconsistent with the General Plan

policies and is considered unacceptable. The following improvements are recommended to improve LOS at this intersection:

- Install permitted plus overlap phasing on the westbound-to-northbound right-turn movement.
- Prohibit southbound-to-northbound U-turns.
- Optimize the traffic signal timing at this intersection to long-term future cumulative traffic volumes.

As shown in Table 10, the improvement listed above would result in this intersection operating at LOS E with 57 seconds of delay in the a.m. peak hour and LOS D with 37 seconds of delay in the p.m. peak hour. Even with implementation of the above improvements, this intersection would continue to operate at unacceptable LOS E in the a.m. peak hour. Additional improvements are not recommended at this time.

Intersection 14 – SR 59 / Olive Avenue. Under Cumulative No Project conditions, this intersection would operate at LOS E with 64 seconds of delay in the a.m. peak hour, and LOS E with 62 seconds of delay in the p.m. peak hour. LOS E is inconsistent with the General Plan policies and is considered unacceptable. The following improvements are recommended to improve LOS at this intersection:

- Install permitted plus overlap phasing on the eastbound-to-southbound right-turn movement.
- Prohibit northbound-to-southbound U-turns.
- Install permitted plus overlap phasing on the northbound-to-eastbound right-turn movement.
- Prohibit westbound-to-eastbound U-turns.
- Optimize the traffic signal timing at this intersection to long-term future cumulative traffic volumes.

As shown in Table 10, the improvement listed above would result in this intersection operating at LOS E with 63 seconds of delay in the a.m. peak hour and LOS E with 61 seconds of delay in the p.m. peak hour. Even with implementation of the above improvements, this intersection would continue to operate at unacceptable LOS E in both the a.m. peak hour and p.m. peak hour. Additional improvements are not recommended at this time.

Intersection 15 – R Street / Olive Avenue. Under Cumulative No Project conditions, this intersection would operate at LOS F with 88 seconds of delay in the a.m. peak hour, and LOS F with 201 seconds of delay in the p.m. peak hour. LOS F is inconsistent with the General Plan

policies and is considered unacceptable. The following improvements are recommended to improve LOS at this intersection:

- Install permitted plus overlap phasing on the westbound-to-northbound right-turn movement.

- Prohibit southbound-to-northbound U-turns.

As shown in Table 10, the improvement listed above would result in this intersection operating at LOS F with 196 seconds of delay in the a.m. peak hour and LOS F with 196 seconds of delay in the p.m. peak hour. Even with implementation of the above improvements, this intersection would continue to operate at unacceptable LOS F in both the a.m. peak hour and p.m. peak hour. Because of the presence of existing land use development adjacent to this intersection, additional improvements are not recommended.

Intersection 16 – M Street / Olive Avenue. Under Cumulative No Project conditions, this intersection would operate at LOS F with 216 seconds of delay in the a.m. peak hour, and LOS F with 160 seconds of delay in the p.m. peak hour. LOS F is inconsistent with the General Plan policies and is considered unacceptable. The following improvements are recommended to improve LOS at this intersection:

- Install permitted plus overlap phasing on the eastbound-to-southbound right-turn movement.

- Prohibit northbound-to-southbound U-turns.

As shown in Table 10, the improvement listed above would result in this intersection operating at LOS F with 216 seconds of delay in the a.m. peak hour and LOS F with 160 seconds of delay in the p.m. peak hour. Even with implementation of the above improvements, this intersection would continue to operate at unacceptable LOS F in both the a.m. peak hour and p.m. peak hour. Because of the presence of existing land use development adjacent to this intersection, additional improvements are not recommended.

Intersection 17 – G Street / Olive Avenue. Under Cumulative No Project conditions, this intersection would operate at LOS F with 131 seconds of delay in the a.m. peak hour, and LOS E with 56 seconds of delay in the p.m. peak hour. LOS F and LOS E are inconsistent with the General Plan policies and are considered unacceptable. The following improvements are recommended to improve LOS at this intersection:

- Install permitted plus overlap phasing on the southbound-to-westbound right-turn movement.

- Prohibit eastbound-to-westbound U-turns.

- Optimize the traffic signal timing at this intersection to long-term future cumulative traffic volumes.

As shown in Table 10, the improvement listed above would result in this intersection operating at LOS F with 85 seconds of delay in the a.m. peak hour and LOS D with 53 seconds of delay in the p.m. peak hour. Even with implementation of the above improvements, this intersection would continue to operate at unacceptable LOS F in the a.m. peak hour. Because of the presence of existing land use development adjacent to this intersection, additional improvements are not recommended.

Intersection Levels of Service – Plus Project Impacts. The effects of implementing Proposed amendments to the BRMDP would be significant if the change from No Project conditions to Proposed Project conditions causes an intersection's operation to change from LOS D to LOS E or F, or if it appreciably lengthens the delay at an intersection that is already forecast to exceed LOS D. For this TIA, an increase in delay of more than five seconds is considered to be an appreciable increase.

As shown in Table 9, traffic peak hour conditions at intersections with implementation of the Proposed BRMDP are for the most part similar to those projected with the Approved BRMDP. At 14 of the 17 study intersections:

- the intersection would operate at LOS D or better during both the a.m. peak hour and p.m. peak hour; or

- delay at the intersection with the Proposed BRMDP would not be more than five seconds greater than delay with the Approved BRMDP.

The 14 study intersections that would operate at LOS D or better, or would not experience an increase in delay greater than five seconds are:

1	G Street / Farmland Avenue
2	SR 59 / Bellevue Road
4	M Street / Bellevue Road
5	Barclay Way / Bellevue Road
6	G Street / Bellevue Road
7	M Street / Cardella Road
8	G Street / Cardella Road
9	M Street / Lehigh Drive
10	SR 59 / Yosemite Avenue
11	R Street / Yosemite Avenue
12	M Street / Yosemite Avenue
13	G Street / Yosemite Avenue
14	SR 59 / Olive Avenue
16	M Street / Olive Avenue

At the following three study intersections, traffic operations under 2035 Plus Project conditions would be unacceptable at LOS F during both the a.m. peak hour and the p.m. peak hour, and delay with the Proposed BRMDP would be more than five seconds greater than delay with the Approved BRMDP.

Intersection 3 – Bellevue Road / R Street. Under Cumulative Plus Project conditions, this intersection would operate at LOS F with 299 seconds of delay in the a.m. peak hour, and LOS F with 142 seconds of delay in the p.m. peak hour. LOS F is inconsistent with the General Plan policies and is considered unacceptable. The following improvements are recommended to improve LOS at this intersection:

- Add a second northbound-to-westbound left-turn lane.
- Install permitted plus overlap phasing on the eastbound-to-southbound right-turn movement.
- Prohibit northbound-to-southbound U-turns.
- Install permitted plus overlap phasing on the northbound-to-eastbound right-turn movement.
- Prohibit westbound-to-eastbound U-turns.
- Install permitted plus overlap phasing on the southbound-to-westbound right-turn movement.
- Prohibit eastbound-to-westbound U-turns.
- Optimize the traffic signal timing at this intersection to long-term future cumulative traffic volumes.

As shown in Table 10, the improvement listed above would result in this intersection operating at LOS F with 173 seconds of delay in the a.m. peak hour and LOS D with 53 seconds of delay in the p.m. peak hour. The above improvements are the same as those recommended under Cumulative No Project conditions. Even with implementation of the above improvements, this intersection would continue to operate at unacceptable LOS F in the a.m. peak hour. Additional improvements are not recommended at this time.

Intersection 15 – R Street / Olive Avenue. Under Cumulative Plus Project conditions, this intersection would operate at LOS F with 92 seconds of delay in the a.m. peak hour, and LOS F with 250 seconds of delay in the p.m. peak hour. LOS F is inconsistent with the General Plan policies and is considered unacceptable. The following improvements are recommended to improve LOS at this intersection:

- Install permitted plus overlap phasing on the westbound-to-northbound right-turn movement.
- Prohibit southbound-to-northbound U-turns.

As shown in Table 10, the improvement listed above would result in this intersection operating at LOS F with 92 seconds of delay in the a.m. peak hour and LOS F with 243 seconds of delay in the p.m. peak hour. The above improvements are the same as those recommended under Cumulative No Project conditions. Even with implementation of the above improvements, this intersection would continue to operate at unacceptable LOS F in both the a.m. peak hour and the p.m. peak hour. Because of the presence of existing land use development adjacent to this intersection, additional improvements are not recommended.

Intersection 17 – G Street / Olive Avenue. Under Cumulative Plus Project conditions, this intersection would operate at LOS F with 146 seconds of delay in the a.m. peak hour, and LOS E with 56 seconds of delay in the p.m. peak hour. LOS F and LOS E are inconsistent with the General Plan policies and are considered unacceptable. The following improvements are recommended to improve LOS at this intersection:

- Install permitted plus overlap phasing on the southbound-to-westbound right-turn movement.

- Prohibit eastbound-to-westbound U-turns.

- Optimize the traffic signal timing at this intersection to long-term future cumulative traffic volumes.

As shown in Table 10, the improvement listed above would result in this intersection operating at LOS F with 85 seconds of delay in the a.m. peak hour and LOS D with 50 seconds of delay in the p.m. peak hour. The above improvements are the same as those recommended under Cumulative No Project conditions. Even with implementation of the above improvements, this intersection would continue to operate at unacceptable LOS F in the a.m. peak hour. Because of the presence of existing land use development adjacent to this intersection, additional improvements are not recommended.

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APPENDICES

(Presented in Separate Electronic File)