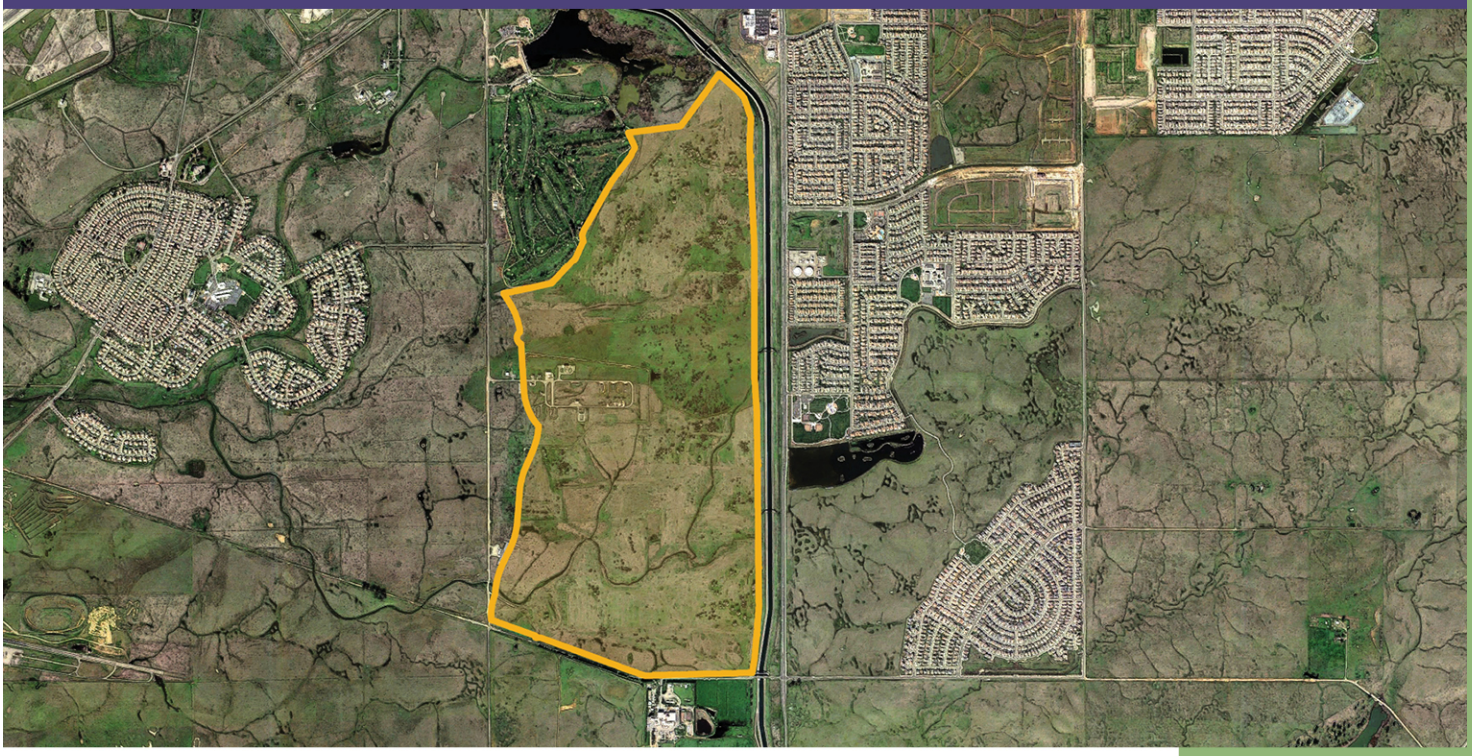
Appendix AQ-2

Mather South Community Master Plan Air Quality Master Plan

ASCENT ENVIRONMENTAL

AIR QUALITY MITIGATION PLAN

Mather South Community Master Plan



JANUARY 2019

SACRAMENTO COUNTY

PREPARED FOR:
Sacramento County

1. Introduction

The Mather South Community Master Plan (MSCMP or project) is a proposed development area (referred to as "project area") located in the Cordova community of unincorporated Sacramento County and encompasses 848 acres. The project site is located approximately 10 miles from downtown Sacramento via Highway 50 and is generally situated within the central portion of Sacramento County. The project is subject to the California Environmental Quality Act (CEQA), which requires the preparation of an environmental impact report (EIR). Development of the project would result in emissions of criteria air pollutants and ozone precursors during both the construction and operational phases. Construction-related impacts would be short-term and associated with the use of heavy-duty equipment. Construction-related emissions are evaluated in the Air Quality Section of the Draft Environmental Impact Report (DEIR). Operational emissions would be associated with vehicle trip generation, area sources (e.g., landscaping equipment, consumer products, architectural coatings), and energy use (e.g., natural gas for area heating/cooling and appliances). This Air Quality Mitigation Plan (AQMP) addresses the operational impacts by proposing mitigation measures to be applied to the project. These measures are necessary for the project to meet the requirements of CEQA and to meet regional air quality goals.

The MSCMP is subject to CEQA review and, as a commenting agency, the Sacramento Metropolitan Air Quality Management District (SMAQMD) assesses whether this project has significant air pollutant impacts. If impacts are significant, then in accordance with SMAQMD guidance, an AQMP is required by SMAQMD to address these significant impacts. This AQMP has been prepared to supplement the CEQA analysis and serves as mitigation, as referenced in the DEIR, for emissions of long-term criteria air pollutants and ozone precursors. The AQMP specifies the measures that will be applied to address the potentially significant impact of regional ozone precursor emissions of oxides of nitrogen (NO_X) and reactive organic gases (ROG).

2. Purpose of the Air Quality Mitigation Plan

CEQA requires that EIRs identify and evaluate any significant environmental impacts of a proposed project. A project is determined to have potentially significant air quality impacts under CEQA if construction and/or operational emissions would exceed SMAQMD's established mass emission thresholds for ROG and NO_X. SMAQMD has established construction thresholds of 85 pounds per day (lb/day) for ROG and NO_X, and operational thresholds of 65 lb/day for ROG and NO_X. Operational emissions are evaluated for the full build-out year of the project. Projects that exceed daily operational thresholds of 65 lb/day for ROG or NO_X are considered operationally significant and required to prepare an AQMP (SMAQMD 2017).

The analysis of significant effects shall quantify project-generated emissions of ozone precursors and then describe feasible measures that could minimize any significant adverse impacts. To assist in the evaluation of air quality impacts, SMAQMD developed its Recommended Guidance for Land Use Emission Reductions Version 4.0 (AQMP Guidance) dated November 30, 2017 (SMAQMD 2017). The AQMP Guidance outlines methods for estimating project-related operational emissions, establishing an emissions reduction target for the project, and quantifying emission reductions associated with SMAQMD-approved reduction measures.

An emissions reduction target of 15 percent is required of projects that have been included in the most current State Implementation Plan (SIP), and a reduction target of 35 percent is required of projects that have not been included in the current SIP. The project area was included in the current SIP; thus, the project would be required to achieve (at a minimum) a 15 percent reduction in operational ozone precursor emissions. Measures included in this AQMP are incorporated by reference into the DEIR prepared for the project.

This AQMP includes a description of the MSCMP and the methodology used to establish both an unmitigated and a mitigated emissions scenario. These scenarios are based on project-specific data, traffic study, and available mitigation measures. The emissions scenarios are then compared to emission reduction targets and include an explanation of how the 15 percent reduction target for ROG and NO_X is achieved.

3. Project Description

3.1. Project Location

The MSCMP is a proposed development located in the Cordova community of unincorporated Sacramento County. The MSCMP establishes a separate development plan for the site within the Mather Field Specific Plan (Specific Plan) and is an amendment to the Specific Plan. The applicant proposes an 848-acre master plan community with 3,522 residential dwelling units, a 28-acre Environmental Education Campus, a 22-acre Research and Development Campus, 21 acres of commercial-retail with up to 225,000 square feet (sq. ft.) of retail space, 44 acres of parkland, and 210 acres of open space areas. The project also includes new amendments to the General Plan Transportation Plan, Land Use Diagram, and Bicycle Master Plan; a Specific Plan amendment; adoption of the MSCMP; a zoning ordinance amendment; adoption of a development agreement; and an amendment of the Mather Field Public Facilities Financing Plan.

The project site is located on an easterly portion of the former Mather Air Force Base and is generally bounded by the Mather Golf Course and Mather Regional Park to the north, the Folsom South Canal to the east, Kiefer Boulevard to the south, and the Mather Preserve and Zinfandel Drive to the west. Regional access to and from the area is provided by U.S. Highway 50, along with numerous existing local roads. Refer to Exhibits 3-1 for project location and vicinity.

3.2. Project Summary

The approval of the project would result in the development of the private, mixed-use development consisting of residential, an Environmental Education Campus, a Research and Development Campus, commercial and retail, two elementary schools, roadways, and park uses. Table 3-1 provides a summary of the proposed land uses and Exhibit 3-2 shows the schematic plan of the project.

Table 3-1: Mather South Community Master Plan Approximate Acreage and Yield by Land Use

PROPOSED LAND USE	RESIDENTIAL UNITS	COMMERCIAL SQ. FT.	SUBTOTAL ACRES	TOTAL ACRES
OPEN SPACE				**210.5**
NATURAL PRESERVE & CREEK/DRAINAGE			141.7	
WATER QUALITY/DETENTION BASIN			50.4	
UTILITY/TRAIL CORRIDORS			13.5	
LANDSCAPE BUFFERS			4.9	
PARKS & RECREATION				**44**
NEIGHBORHOOD			21.6	
COMMUNITY			22.5	
ENVIRONMENTAL EDUCATION CAMPUS				**27.9**
COMMERCIAL-OFFICE		275,000	22.9	
RESIDENTIAL RD-20 (20 du/ac)	200		5	

PROPOSED LAND USE	RESIDENTIAL UNITS	COMMERCIAL SQ. FT.	SUBTOTAL ACRES	TOTAL ACRES
RESEARCH AND DEVELOPMENT CAMPUS				**21.4**
COMMERCIAL-OFFICE		325,000	21.4	
COMMERCIAL				**26.9**
RETAIL		185,000	21.1	
COMMUNITY CENTER		15,000	5.8	
PUBLIC FACILITIES				**90.4**
SCHOOL			22.2	
UTILITIES			5.3	
ROADWAYS			63	
RESIDENTIAL				**428.7**
RD-5 (5 du/ac)	849		154.7	
RD-6 (6 du/ac)	476		71.4	
RD-7 (7 du/ac)	628		84.9	
RD-8 (8 du/ac)	338		42.3	
RD-10 (10 du/ac)	450		44.9	
RD-20 (20 du/ac)	581		29.1	
TOTALS	**3,522**	**800,000**	**848.3**	**848.3**

3.3. PROPOSED LAND USES

3.3.1. Residential

The Master Plan proposes the development of approximately 848-acres with approximately 427 acres (or 50 percent of the site) allocated to the production of 3,521 residential dwelling units. Table 3-1 summarizes the land use allocation in the MSCMP. The photo to the right depicts what multi-family residential units could look like at the project site.

Multifamily residential units

The MSCMP includes the development of single-family and multifamily residential units with allowable densities ranging from three to 20 dwelling units per acre (du/ac). The mix of lot size and densities would provide a variety of housing types:

- Single-family attached and detached with a density of 5-10 du/ac; and
- Multifamily apartments, townhouses, and condominiums with a density of 20 du/ac.

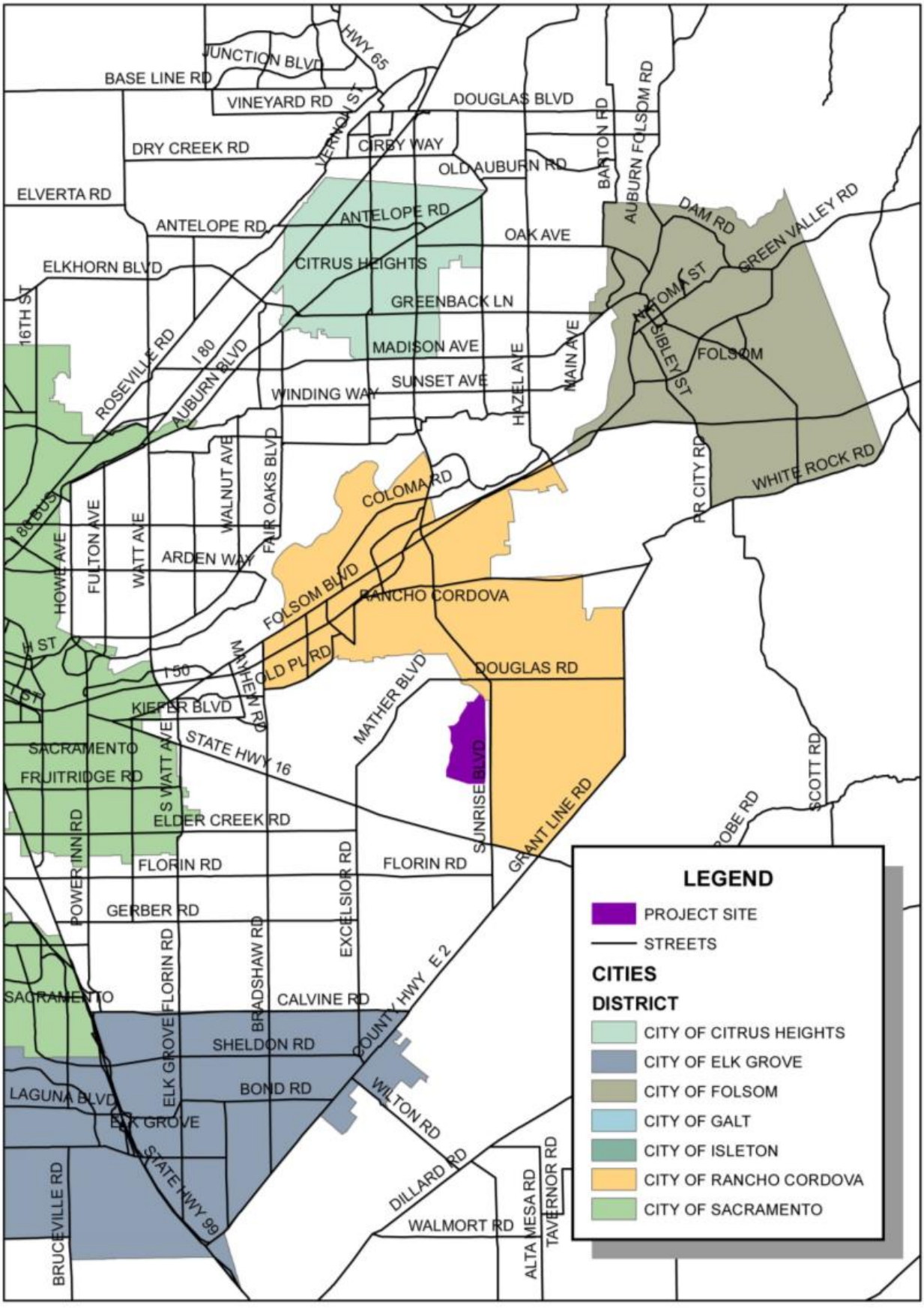
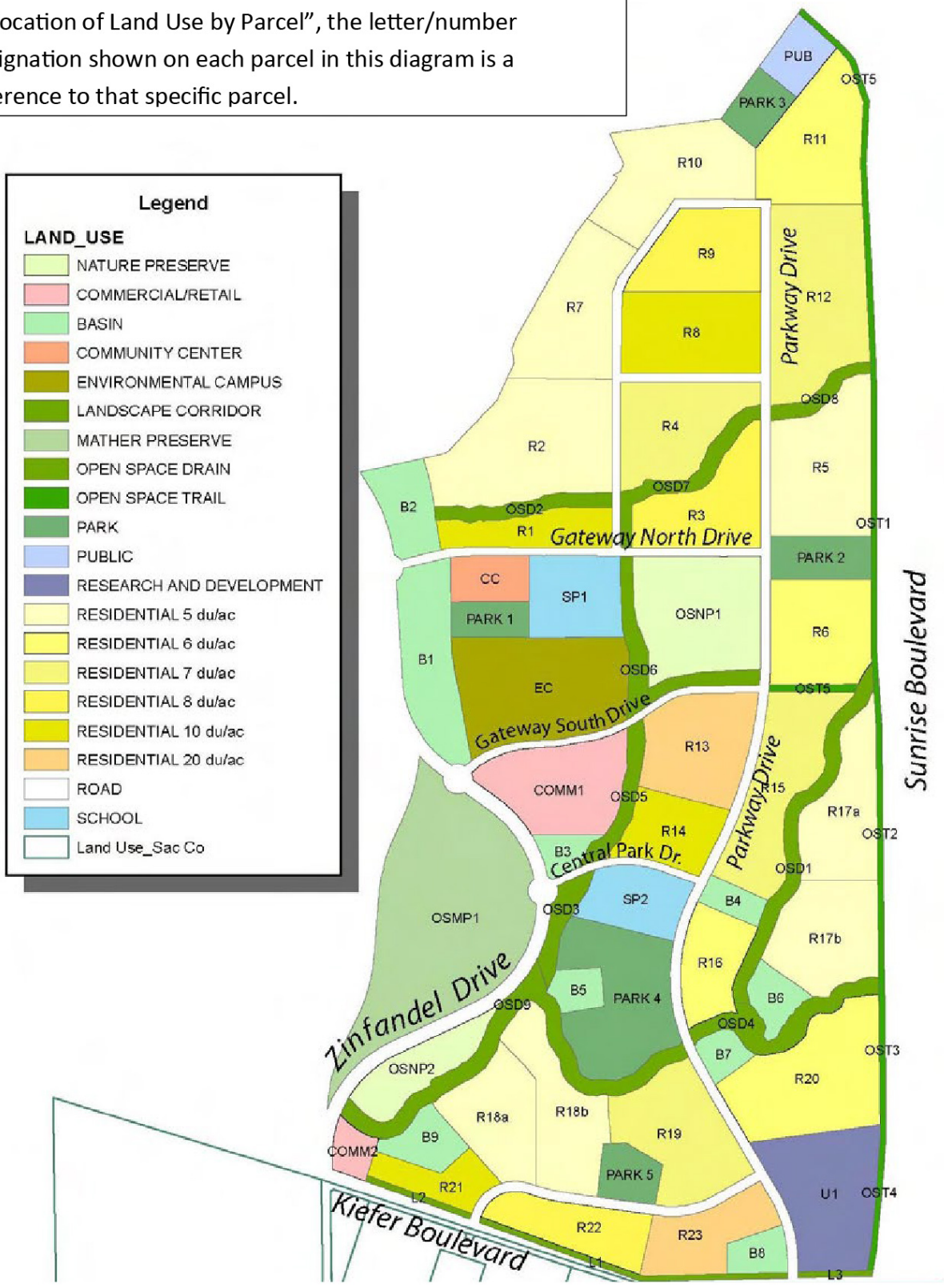


Exhibit 3-1: Regional Location Map

NOTE: Throughout this Master Plan, and in Appendix B "Allocation of Land Use by Parcel", the letter/number designation shown on each parcel in this diagram is a reference to that specific parcel.



Source: Mather South Community Master Plan 2018

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Exhibit 3-2: Mather South Land Use Plan

Typical open space on-site

3.3.2. Commercial

The MSCMP includes two commercial sites. There would be a 21-acre mixed-use village center on South Gateway Drive with neighborhood retail, a large anchor, office and service commercial, a plaza, multi-family residences, with adjacent open space drainage and a trail network. There would also be a three-acre commercial development on Zinfandel Drive consisting of small commercial with a gas station and restaurant, as well as connections to the on-site trail system.

3.3.3. Environmental Education Campus

The MSCMP would include an Environmental Education Campus on 28 acres that would consist of office space, indoor and outdoor classrooms, laboratories, support facilities, food services, and up to 200 multi-family residential units. The photo below depicts a rendering of the Environmental Education Campus, although the facility has not been fully designed at the time of writing this AQMP.

3.3.4. Research and Development Campus

The MSCMP would include a Research and Development Campus on 21 acres that would consist of office space, light assembly, and research and development space.

3.3.5. Community Center

The MSCMP would include a community center on 5 acres adjacent to one of the elementary schools and a park. This community center would provide private recreation opportunities for residential of the MSCMP.

3.3.6. Schools

The MCSMP includes two elementary schools with a net acreage of 22.2 that would be connected to bicycle and pedestrian trails.

3.3.7. Parks and Open Space

The MCSMP would include approximately 255 acres of parks and open space uses consisting of natural preserve (142 acres) park facilities (44 acres), open space trails (13.5 acres) and detention areas (50.4 acres). The photo to the left depicts open space typical of the project area.

Environmental Education Campus rendering

3.3.8. Project Access/Circulation

As shown in Exhibit 3-1, roadway access to the MSCMP area would be available from Douglas Road, Zinfandel Drive, Sunrise Boulevard, and Kiefer Boulevard. Zinfandel Drive is a planned six-lane roadway extending from U.S. Highway 50 to the intersection with Douglas Road.

4. Methods

All emissions estimates and analysis presented in this AQMP were conducted based on SMAQMD Recommended Guidance for Land Use Emission Reductions Version 4.0 for Operational Emissions [(AQMP Guidance) November 30, 2017] and discussions with SMAQMD staff. Emissions modeling was conducted using the California Emissions Estimator Model (CalEEMod) Version 2016.3.2 (CAPCOA 2016), in accordance with Sacramento County and SMAQMD guidance. Emissions estimates included in this AQMP include long-term operational emissions of criteria air pollutants and ozone precursors (i.e., ROG, NO_X, respirable particulate matter [PM_{10}]) associated with mobile sources (i.e., trip generation) and stationary sources (e.g., area wide and energy consumption).

Project details such as proposed land uses and densities, build-out phasing, project-generated trips, and project components are based on information included in the traffic study conducted for the project, *Transportation Impact Report Mather South Specific Plan Amendment* (DKS 2018), and data provided by the applicant and by Sacramento County. Data used in this analysis are included in Appendix B.

To estimate mobile source emissions, CalEEMod was used in combination with project-specific traffic data included in the traffic study conducted for the project (DKS 2018). The traffic study includes a description of existing conditions and traffic-related impacts associated with the proposed project. The project-specific traffic study was used to obtain trip data associated with the project. Specifically, the traffic study included estimates of daily vehicle miles traveled (VMT) and trip generation associated with the existing conditions and existing plus project conditions.

In accordance with SMAQMD guidance for the evaluation of projects where a traffic study has been prepared, CalEEMod is used to estimate the project's emissions with and without the incorporation of emission reduction measures. The estimation of emissions that does not account for emission reduction measures and uses CalEEMod defaults is referred to as the unmitigated emissions scenario. The estimate that does account for incorporation of emission reduction measures and project-specific traffic data is referred to as the mitigated emissions scenario. The total daily mass emissions that the project shall reduce to meet the 15 percent reduction target for the AQMP is then calculated based on the maximum mobile sector emissions of ROG and NO_X separately as established by the unmitigated emission scenario. The two scenarios are described in further detail below.

4.1. Unmitigated Emissions Scenario

To establish the unmitigated emissions scenario, the proposed land uses and their sizes were entered into CalEEMod for the buildout year 2032. Proposed land use and unit numbers were based on the project description. For a complete description of all land uses input into the CalEEMod runs, refer to Table 3-1 above. The 2019 Title 24 Building Energy Efficiency Standards were also included because the project would be operational after January 1, 2020, when the new standards take effect. The 2019 Title 24 standards would result in energy consumption reductions of 53 percent for single-family housing and low-rise apartments (with the requirement of solar photovoltaics) and 30 percent for nonresidential buildings and mid-rise apartments (CEC 2018).

Once representative land uses were chosen, CalEEMod was run for both the winter and summer seasons using default values and trip rates for Sacramento County to determine if emissions exceed SMAQMD-adopted operational thresholds. CalEEMod does not account for regional reductions in VMT due to other surrounding development or changes in the roadway network, and therefore, default trip rates assigned by CalEEMod to the proposed land uses would represent the maximum trip generation, and associated emissions. The unmitigated emissions from these runs were used to establish the AQMP reduction target

for the project. In accordance with SMAQMD recommendations, the emission reduction targets were based on the mobile sector only, not total combined project emissions. Although SMAQMD-adopted operational thresholds are based on maximum daily emissions, guidance from SMAQMD suggest the use of annual emissions of ROG and NO_X for determining the AQMP reduction target.

4.2. Mitigated Emissions Scenario

To establish the mitigated emissions scenario, the unmitigated emissions scenario (as described above) was adjusted to more accurately reflect project-specific parameters. Project-specific VMT and total trips were obtained from the traffic study conducted for the project. The unmitigated emissions scenario was altered to reflect actual project annual VMT and trip generation for the year 2032. Using the information provided in the traffic study and SMAQMD-approved reduction measures, all measures that were accounted for in the traffic study were then described for the project. Additional on-site mitigation measures were recommended and included as necessary to meet the 15 percent reduction target.

5. Emission Reduction Target

This section shows the calculations conducted to establish the project's emission target of 15 percent. Calculation methods were based on discussions with SMAQMD staff and the AQMP Guidance. Reduction targets were based on the unmitigated emission scenario as described above in Section 4. Detailed calculations are provided below.

5.1. Unmitigated Emissions Scenario and Reduction Target

The project would develop approximately 848 acres of various land use types, as summarized in Table 3-1 and shown in Exhibit 3-2. Based on the proposed land use types and sizes (Table 3-1), emissions of criteria air pollutants and ozone precursors were quantified using defaults in CalEEMod. Based on the proposed land uses and CalEEMod defaults for trip generation rates and average trip distance, the annual VMT was 145,637,622 and the daily VMT was 399,007. The default average daily trips were 44,166. Daily VMT was calculated by dividing the annual VMT by 365 days per year. Table 5-1 summarizes the unmitigated emissions in tons per year (tons/year).

Table 5-1: Summary of Annual Operational Emissions of Ozone Precursors at Full Buildout for the Unmitigated Scenario (2032)

SOURCE TYPE	TONS/YEAR		
	ROG	NO_X	PM_{10}
Area Source[1]	29.4	0.4	0.2
Energy[2]	0.3	2.4	0.2
Mobile Source	8.2	39.8	54.3
Total Annual Emissions	37.9	42.7	54.7

Notes: NO_X = oxides of nitrogen; ROG = reactive organic gases; PM_{10} = respirable particulate matter; tons/year = tons per year.
Totals may not sum exactly because of rounding.
[1] Area-source emissions include emissions from landscaping, application of architectural coatings, and consumer products, and are estimated based on default model settings.
[2] Energy emissions include emissions associated with natural gas consumption for indoor heating/cooling and appliance use.
See Appendix AQ-GHG-1 for detailed input parameters and modeling results.
Source: Modeling conducted by Ascent Environmental in 2019.

To determine the mass reduction in emissions a project needs to achieve to meet the 15 percent reduction target, the first step is to determine the total mass emissions of ozone precursors emitted by the project's mobile sector. As shown in Table 5-3 below, the unmitigated scenario would result in total ROG of 8.2 tons/year and total NO_X of 39.8 tons/year from the mobile sector. To achieve the 15 percent reduction target, ROG would need to be reduced by a minimum of 1.2 tons/year and NO_X by a minimum of 6.0 tons/year. Table 5-3 below displays the reduction target in tons/year for each ozone precursor.

Table 5-3 Criteria Air Pollutant Reduction Targets

	ROG TONS/YEAR	NO_X TONS/YEAR[1]
Mobile Source Emissions	8.2	39.8
15 Percent Reduction Target[2]	**1.2**	**6.0**

Notes: NO_X = oxides of nitrogen; ROG = reactive organic gases; tons/year = tons per year.
[1] Emissions taken from the unmitigated CalEEMod run using CalEEMod default trip rates.
[2] A 15 percent mitigation target is required by this project per SMAQMD guidance as it was included in the currently adopted SIP. The reduction target of 15 percent is calculated based on the total ROG and NO_X emissions from the mobile sector.
Source: Data compiled by Ascent Environmental in 2019.

6. Traffic Study and Project Design Features

The following section discusses the specific project components used to conduct the mitigated emissions scenario using CalEEMod, project-specific traffic information, and project design features included within the Specific Plan. A description of the project design feature is provided, how the project would incorporate the specific design feature, and how the emissions modeling was adjusted to reflect each design component. Each design feature is described separately below.

6.1. Traffic Study

A traffic study was completed for the MSCMP. The traffic study considered several design features incorporated into the project that would result in daily VMT and trip generation that is lower than the estimate provided by CalEEMod. The project trip generation and VMT was estimated using the Sacramento Area Council of Governments' (SACOG) SACSIM travel model, a region-specific transportation model. SACSIM is a complete travel demand model that SACOG uses for planning in the Sacramento region. The demand for personal travel within the region was modeled by DaySim, an activity-based demand model. DaySim incorporates a variety of model features, including:

- The ability to model each person in the Sacramento region separately through the use of a population synthesizer that creates a synthetic population representing each person and household in the region;
- The ability to model the complete daily activity pattern for each individual, including the number and sequencing of activities defined by seven purposes;
- A series of logit destination, mode, and time-of-day choice models at the tour and trip levels to simulate the choices for each individual;
- Estimation of the start and end times of all activities and trips to the half-hour level of resolution; and
- Parcel-level spatial resolution for home and activity locations.

Other components of SACSIM are used to model, at an aggregate level, the remaining components of regional travel - including travel into, out of, and through the region (external travel); truck travel; and travel to and from Sacramento International Airport. All travel into, out of, and within the project area is

estimated by the model. The model predicts the number of trips, trip purposes, origins and destinations of trips, time of day of the trips, travel mode (e.g., walk, bike, transit, automobile), and travel path. Project-specific factors that were considered in the regional model include:

- Demographics of the households (e.g., income levels, household size, number of workers, auto ownership) – assumed to be similar to the Cordova community, as obtained from the American Community Survey.
- Characteristics of the schools (i.e., number of students, typical number of employees).
- Characteristics of the commercial center (i.e., number of employees by type) – assumed to be retail oriented.
- Roadway network – connections to existing roadway system, number of lanes, free-flow travel speeds.
- Pedestrian network.
- Bicycle network, on-street and off-street.
- Development patterns (i.e., grid connectivity).

The SACSIM regional travel model was used to estimate project-specific VMT and trip generation. The SACSIM model also accounts for the bus and light rail transit system, all existing and proposed bicycle facilities, and sidewalks on streets both in and around the project area. The trip generation for the project is based directly on household travel information collected in the Sacramento region and reflects the location, mode choice, and demographics associated with the area. The VMT estimate also considers the redistribution of regional trips associated with new land uses included in the project, such as residences, schools, and parks. The estimated change in daily VMT over the unmitigated scenario (i.e., without traffic study) is the result of many factors, including:

- Travel characteristics associated with the project land use:
    - Personal trip generation;
    - Mode choice (motor vehicle, transit, walk, bike); and
    - Trip origins and destinations (trip length).
    - Redistribution of regional trips associated with new land use (e.g., residences, commercial, schools, parks)
- Network effects:
    - Availability of new roadways associated with the project; and
    - Change in roadway travel speeds associated with changes in traffic volumes.
    - Based on the above traffic modeling inputs, Table 6-1 below summarizes project-specific VMT and trip generation in comparison to CalEEMod default project VMT and trip generation.

Table 6-1 Project Vehicle Miles Traveled and Trip Generation Comparison

TRAFFIC SCENARIO	DAILY VMT	ANNUAL VMT
VEHICLE MILES TRAVELED		
CalEEMod-Generated Project VMT	399,407	145,637,622
SACSIM-Generated Project VMT	192,618	70,305,557
Percent Change in VMT	-52	

TRAFFIC SCENARIO	DAILY VMT	ANNUAL VMT
TRIP GENERATION		
CalEEMod-Generated Project Daily Trips[1]	44,166	
SACSIM-Generated Project Daily Trips	29,134	
Percent Change in Trips	-34	

Notes: SACSIM = travel forecasting model system used by the Sacramento Area Council of Governments; CalEEMod = California Emissions Estimator Model; VMT = vehicle miles traveled.
[1] Average daily trips calculated by multiplying weekday trips generated by five, adding Saturday and Sunday trips, and dividing by seven days per week.
Source: Data compiled by Ascent Environmental in 2019.

6.2. PROJECT DESIGN FEATURES INCLUDED IN TRAFFIC STUDY

6.2.1. LUT-1 Increase Density

Design Feature Description: The project would be designed in a way that increases density without increasing the amount of land utilized. Communities that feature higher densities, which normally include a mixed-use component and access or proximity to alternative modes of transportation result in a reduction in VMT.

Project Applicability: The project would include residential, retail, office, and mixed-use land uses. The number of dwelling units per acre ranges from 5 to 20 throughout the project area. The traffic study accounts for the density of residential development and the connections between land uses within the project area, and thus the resultant effect on trip generation rates and trip lengths. The total VMT associated with operation of the MSCMP at full buildout accounts for the increase in density and the fact that residents, employees, and students would not need to travel long distances to access various services. Thus, no further VMT reductions can be applied to the project than those already accounted for in the traffic study.

6.2.2. LUT-3 Increase Diversity

Design Feature Description: The project would be designed with a variety of land use types in close proximity, which results in decreased VMT because trips between land use types are shorter and may be accommodated by non-auto modes of transport. The project would minimize the need for external trips by including services and facilities such as restaurants, banking, and offices.

Project Applicability: The project would include mixed-use development that would encourage walking, bicycling, and transit through the planned trail network. The traffic study accounts for the proximity of residential units to parks, schools, and other uses and the resultant effect on trip generation and average trip lengths. As such, the total VMT associated with operation of the MSCMP at full buildout accounts for the diversity of land uses within the project area. Thus, no further VMT reductions can be applied to the project than those already accounted for in the traffic study.

6.2.3. LUT-4 Improve Destination Accessibility

Design Feature Description: The project would be in an area with high accessibility to destinations, such as employment centers, shopping, and entertainment. Destination accessibility is measured in terms of the number of jobs or other attractions reachable within a given travel time, which tends to be highest at regional centers and lowest at peripheral locations. The location of the project also increases the potential for pedestrians to walk and bike to these destinations and; therefore, reduces VMT.

Project Applicability: The project would be located approximately 17.7 miles from what SMAQMD considers the regional center (the intersection of 10th and K Streets in Sacramento). The traffic study accounts for the proximity to the regional center and the resultant effect on both trip generation rates and average trip lengths. As described above, the traffic study uses the SACSIM model which considers region-specific travel patterns. Further, the SACSIM model is based on similar development in the Cordova community area and uses travel behavior to inform trip generation rates and lengths. As such, the total VMT associated with operation of the MSCMP at full buildout accounts for the fact that residents, employees, and students would not need to travel long distances to access various services. Thus, no further VMT reductions can be applied to the project than those already accounted for in the traffic study.

6.2.4. LUT-5 Increase Transit Accessibility

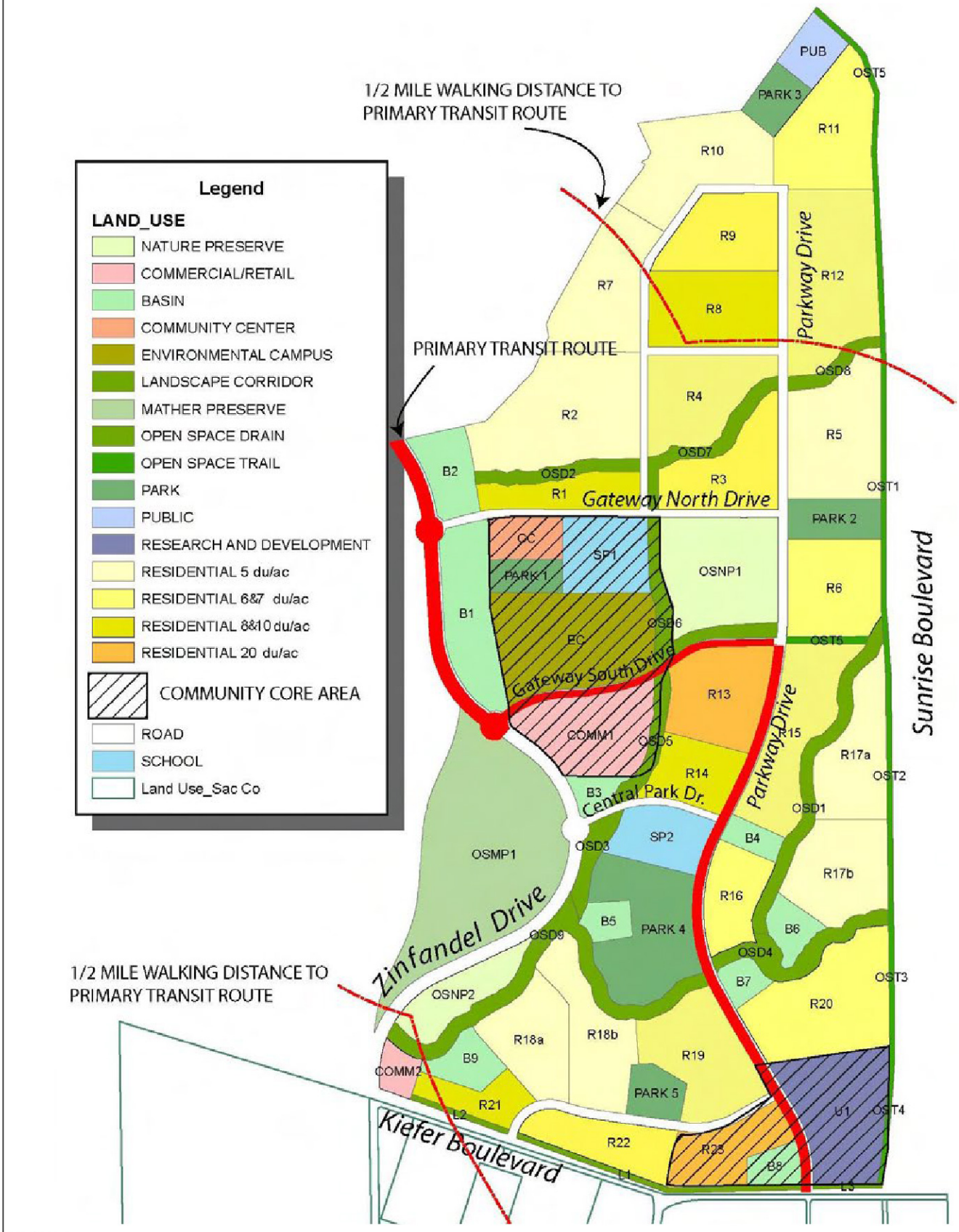
Design Feature Description: Locating a project with high density near transit would facilitate the use of transit by people traveling to or from the project site. The use of transit results in a mode shift and; therefore, reduced VMT.

Project Applicability: The Sacramento County General Plan Circulation Map and the Sacramento Regional Transit (RT) Transit Action Plan (Sacramento Regional Transit District 2014) identify Jackson Road and Sunrise Boulevard as Bus Rapid Transit/Hi-Bus routes. Further, the MSCMP can accommodate public transit if RT extends transit service for the Zinfandel corridor in the future. Exhibit 6-1 shows a conceptual primary transit route that would link the Environmental Education Campus, schools, community center, parks, residential, and the Research and Development Campus. The dashed red line of the exhibit indicates that approximately 90 percent of the development area would be within a one-half mile of the route. The traffic study accounts for these transit routes and proximity to existing facilities and the resultant effect on both trip generation rates and average trip lengths. As such, the total VMT associated with operation of the MSCMP project at full buildout accounts for an assumed mode shift by those served by the project.

6.2.5. LUT-9 Improve Walkability Design, SDT-1 Improve Pedestrian Network, SDT-5 Incorporate Bike Lane Street Design, SDT-6 Provide Bike Parking in Non-Residential Projects, SDT-7 Provide Bike Parking in Multi-Unit Residential Projects, and SDT-9 Dedicate Land for Bike Trails (on-site)

These measures are discussed together because improving walkability design involves improving multiple street components such as the construction of sidewalks, traffic calming measures to slow vehicular traffic, and the implementation of crosswalks. All components were accounted for together in the traffic analysis prepared for the MSCMP.

Design Feature Description: The project would include improved design elements to enhance walkability and connectivity. Improved street network characteristics within a neighborhood include street accessibility, measured in terms of number of intersections per square mile. Projects must have a minimum of 36 intersections per square mile to qualify for this measure.



Source: Mather South Community Master Plan 2018

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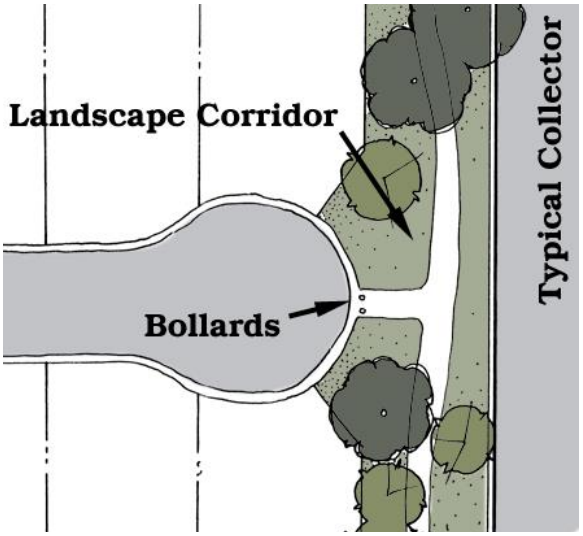
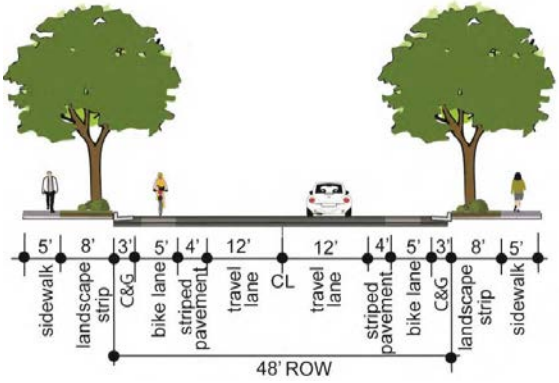
Exhibit 6-1 Walking Distance to Primary Transit Route

Project Applicability: The project would include the following features for each of the measures:

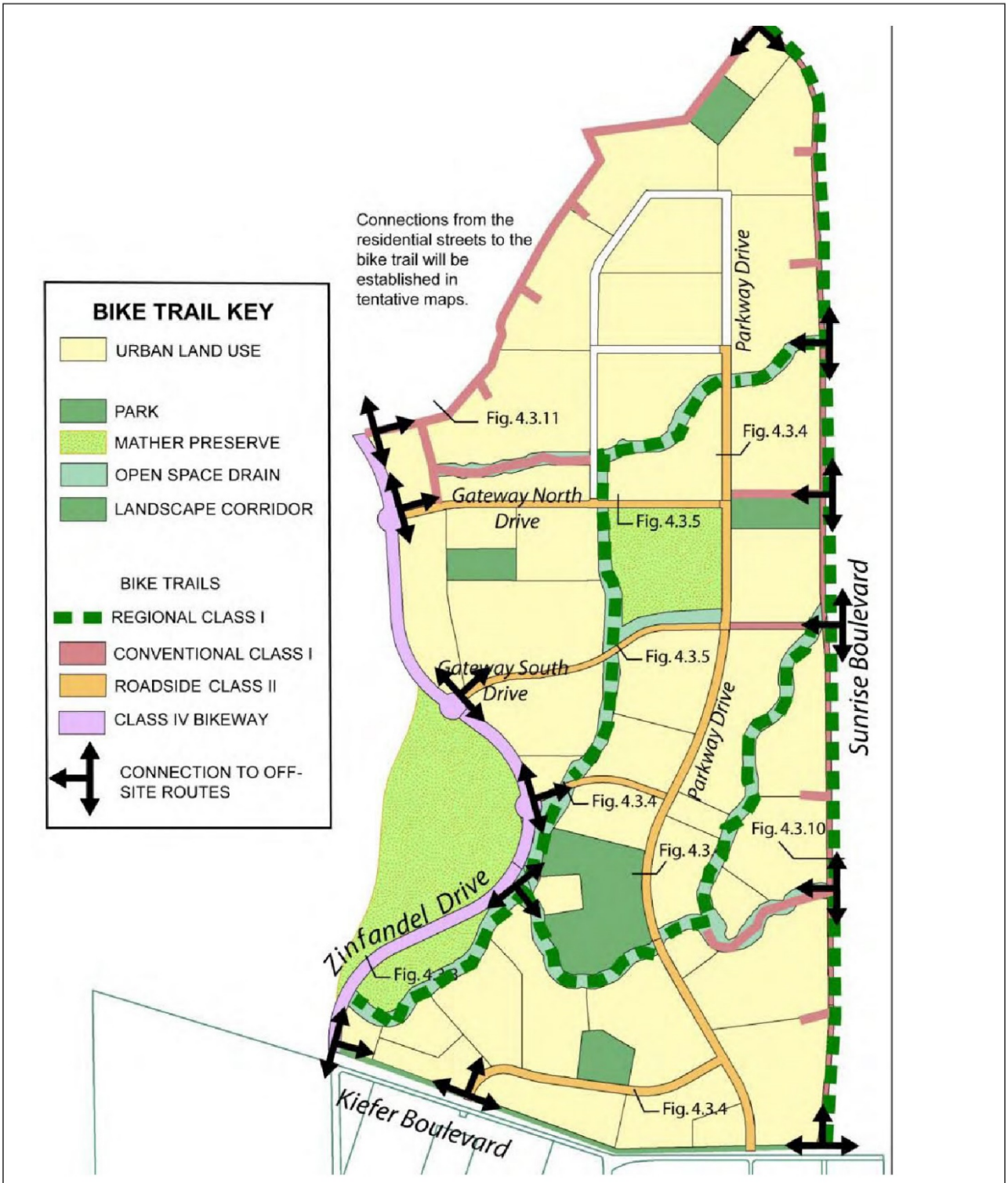
- **SDT-5:** The project would incorporate approximately 9 miles of Class II bike lanes on internal streets that would be designated with a white, painted strip located within the right-of-way. Street signs would indicate the location of bicycles lanes and major destination points. The bicycle network is shown in Exhibit 6-2 below.
- **SDT-7:** Policy 4.2-31 of the Mather South Transportation Plan states that "Secure, lighted, signed and sufficient bicycle parking shall be provided at all destinations accessible to the public." This includes multi-family residential buildings would provide bicycle parking spaces or storage for a capacity of no less than 5 percent of the automobile parking space capacity provided for the project. Further, bicycle parking areas would include a solid rack or parking closet suitable for chaining or locking each individual bicycle, and would be lighted, visible from an adjacent street or business front door, and signed.
- **SDT-9:** The project would include both off-street and on-street trails. In the collector street system, on-street bicycles would use a separated bike lane while NEVs use the travel lane, as shown in the figure to the right. Further, the project would provide approximately 11 miles of Class I bicycle trails.
- **LUT-9 and SDT-1:** The project would minimize barriers to pedestrian access through the implementation of local paseos and major pedestrian trails throughout the local street system. The project would include continuous sidewalks along perimeters of all blocks and large-footprint buildings. All sidewalks would be between 5 and 7 feet wide within residential subdivisions, 7 feet wide in front of schools, and 7 to 16 feet wide in front of the commercial center. The target connectivity index for Mather South neighborhoods is 140 intersections per square mile.



Paseos connect pedestrian access points



Lane widths on typical project road with shared NEV and bike lane



Source: Mather South Community Master Plan 2018

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Exhibit 6-2 Bicycle and Pedestrian Connections

6.2.6. TST-1 Provide BRT System, TST-3 Expand Transit Network, and TST-4 Increase Transit Frequency

Measure Description: The project would provide a Bus Rapid Transit (BRT) system with design features for high quality and cost-effective transit service. The project would expand the local transit network by adding or modifying existing transit service to enhance service near the project site, resulting in increased transit use and therefore, decreased VMT. The project would also reduce transit-passenger travel time through more reduced headways and increased speed and reliability. This makes transit service more attractive and may result in a mode shift from auto to transit, which reduces VMT.

Project Applicability: The Sacramento County General Plan Circulation Map the Sacramento RT Transit Action Plan identify Jackson Road and Sunrise Boulevard as BRT/Hi-Bus routes. The project could accommodate public transit if RT extends transit service to the Zinfandel corridor in the future. Bus or shuttle service along Zinfandel Drive could connect to RT bus stops or Sacramento Light Rail system at the Mather/Mills, Zinfandel, Cordova Town Center, or Sunrise light rail stations. Exhibit 6-1 above illustrates a conceptual primary transit route that would link the commercial center, Environmental Education Campus, Research and Development Campus, schools, community center, parks, and residences. The implementation of this route would result in nearly 90 percent of the development area to be within a one-half mile walk of this route. The traffic study accounts for the expansion of the transit network, and thus, the increase in transit frequency as there is not currently transit that serves the project area. This results in a decrease in overall project VMT.

6.3. Reductions Achieved by Traffic Study

Based on the measures included in the traffic study and the adjusted VMT and trip generation estimate for the project, the ROG and NO_X emission reductions are shown below in Table 6-3.

Table 6-3 Emission Reduction Achieved by Traffic Study

	ROG TONS/YEAR	NO_X TONS/YEAR[1]
15 Percent Reduction Target[1]	1.2	6.0
Reductions from Traffic Study	3.4	16.8
Reductions Still Needed	**0**	**0**

Notes: NO_X = oxides of nitrogen; ROG = reactive organic gases; tons/year = tons per year.
Totals may not sum exactly due to rounding.
[1] A 15 percent mitigation target is required by this project per SMAQMD guidance as it was included in the currently adopted SIP. The reduction target of 15 percent is calculated based on the total ROG and NO_X emissions from the mobile sector.
Source: Modeling conducted by Ascent Environmental in 2019.

6.4. Additional Measures Included in EIR

Based on the emission reduction associated with the traffic study alone, the project would meet the reduction target of 15 percent for both ROG and NO_X. However, as described in Chapter 4, "Air Quality" of the Draft EIR, the project's emissions would not be reduced to the thresholds of significance adopted by SMAQMD. Thus, additional measures are included as mitigation measures to further reduce emissions. These additional reduction measures were identified, and their effectiveness quantified with additional model runs in CalEEMod. This section provides detailed calculations of all additional reduction measures.

6.4.1. Project Setting for Applying Air Quality Emissions Reductions

The Project Setting feature in CalEEMod was used for this AQMP and set to "Low Density Suburban." The Project Setting feature is required to be used to help predict the efficacy of the traffic-related mitigation

measures. The AQMP Guidance states that "Low Density Suburban" matches the California Air Pollution Control Officers Association (CAPCOA) land use setting "Suburban" (CAPCOA 2010). This setting was chosen based on the definition in CAPCOA's *Quantification of Greenhouse Gas Mitigation Measures* for "Suburban," which is characterized by "dispersed, low-density, single-use, automobile dependent land use patterns, usually outside of the central city." This matches the characteristics of the development proposed in the MSCMP.

6.4.2. SDT-2 Provide Traffic Calming Measures

Measure Description: The project provides traffic calming measures to encourage people to walk or bike instead of using a vehicle. Project design includes pedestrian/bicycle safety and traffic calming measures in excess of jurisdiction requirements. Roadways are designed to reduce motor vehicle speeds and encourage pedestrian and bicycle trips with traffic calming features.

Project Applicability: The project would use various traffic calming techniques such as signs and markings; narrowing devices, such as bulb-outs or center island medians; horizontal deflection devices, such as chicanes and traffic circles; and/or various vertical deflection devices. It was assumed that 75 percent of project intersections and 75 percent of project streets would include traffic calming features.

ROG and NO_X Reduction: Implementation of this measure would reduce ROG by 0.09 tons/year and NO_X by 0.45 tons/year.

Enforcement: Incorporation into the project design and required as a provision of this AQMP by Mitigation Measure AQ-2 in the Draft EIR.

6.4.3. SDT-3 Implement NEV Network

Measure Description: The project would create a local "light" vehicle network, such as neighborhood electric vehicle (NEV) networks. This would involve the implementation of the necessary infrastructure, including NEV parking, charging facilities, striping, signage, and educational tools.

Project Applicability: The project would accommodate NEV operation through an on-street NEV and off-street golf cart path, per Policy 4.4-9, and signage indicating that MSCMP is a community where NEVs are common would be placed along streets entering the plan area, and a combination of NEV/bike lane signs would be located on collector streets, per Policy 4.4-11. Further, electric vehicle charging stations would be provided at the commercial center, community center, Research and Development Campus, and the Environmental Education Campus, in accordance with Policy 4.4-10 of the Mather South Transportation Plan. NEV routes are indicated in Exhibit 6-3 below.

ROG and NO_X Reduction: Implementation of this measure would reduce ROG by 0.18 tons/year and NO_X by 0.9 tons/year.

Enforcement: Incorporation into the project design and required as a provision of this AQMP by Mitigation Measure AQ-2 in the Draft EIR.

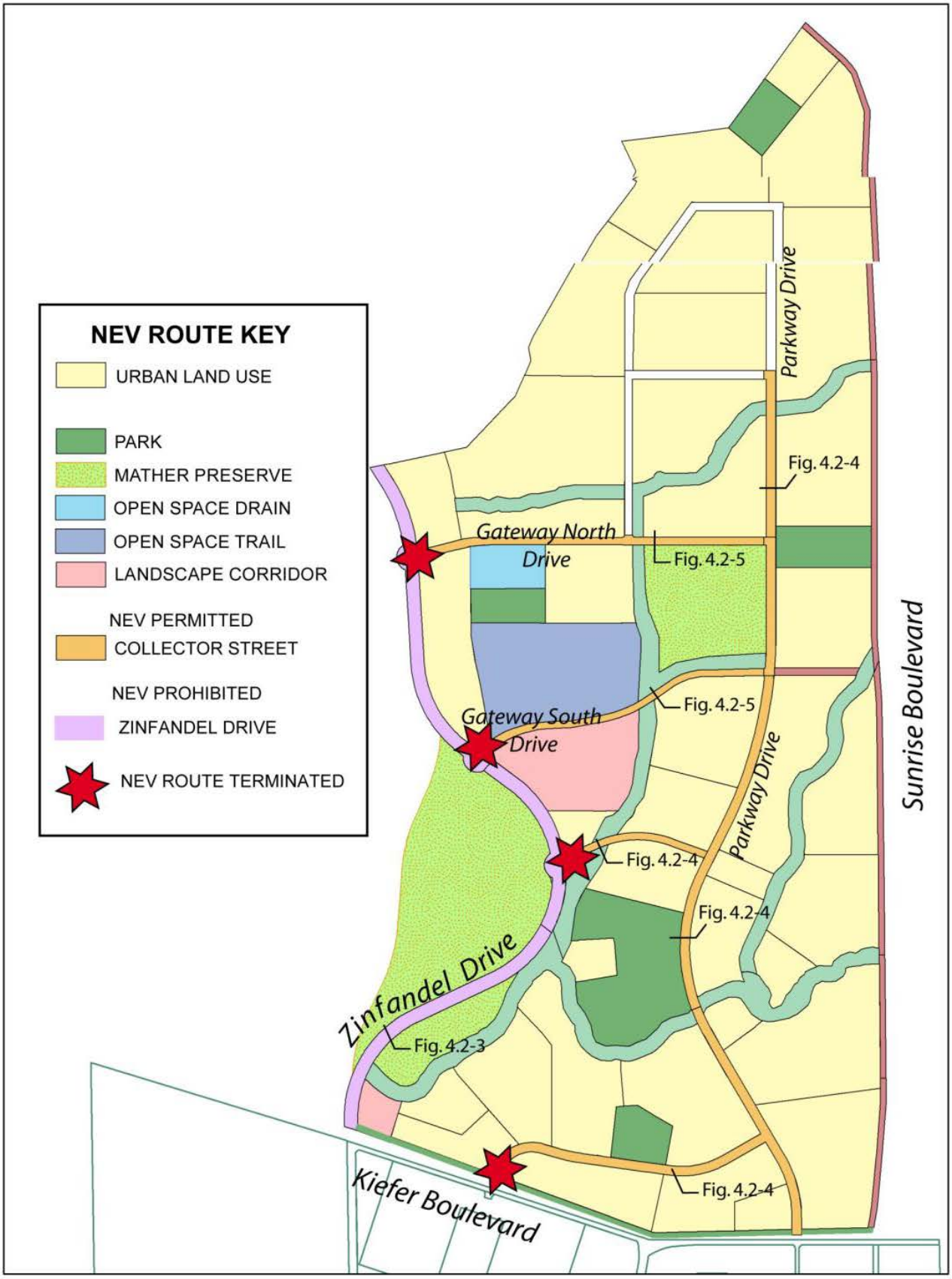

Exhibit 6-3 NEV Route

7. Mitigated Emissions Scenario and Reduction Target Achievement

To generate the mitigated emissions scenario for the project, the unmitigated emissions scenario was altered to reflect project-specific traffic parameters described in the traffic study and all on-site feasible mitigation measures identified in Section 6 above (DKS 2018).

Based on the traffic study, the project's daily VMT in comparison to the existing conditions would be 196,618 and the annual VMT would be 70,305,557. Daily VMT was calculated by dividing the annual VMT by 365 days per year. This represents a 52 percent reduction over the annual VMT calculated by CalEEMod for the unmitigated emissions scenario. The project's daily trip generation would be 29,134, based on the traffic study. This represents a 34 percent decrease from average daily trip generation calculated by CalEEMod for the unmitigated emissions scenario. With the additional measures not included in the traffic study (i.e., SDT-2 and SDT-3), annual VMT would be further reduced to 63,277,768. Emissions estimated based on the project-specific traffic study (i.e., VMT and trip generation) and additional measures are summarized below in Table 7-1.

Table 7-1: Summary of Mitigated Annual Operational Emissions of Ozone Precursors at Full Buildout (2032)

SOURCE TYPE	TONS/YEAR		
	ROG	NO_X	PM_{10}
Area Source[1]	29.4	0.4	0.2
Energy[2]	0.3	2.4	0.2
Mobile Source	4.5	21.7	22.4
Total Annual Emissions	**34.2**	**24.5**	**22.8**

Notes: NO_X = oxides of nitrogen; ROG = reactive organic gases; PM_{10} = respirable particulate matter; tons/year = tons per year.
Totals may not sum exactly because of rounding.
[1] Area-source emissions include emissions from landscaping, application of architectural coatings, and consumer products, and are estimated based on default model settings.
[2] Energy emissions include emissions associated with natural gas consumption for indoor heating/cooling and appliance use.
See Appendix AQ-GHG-1 for detailed input parameters and modeling results.
Source: Modeling conducted by Ascent Environmental in 2019.

Table 7-2 Mitigation Measure Reduction Summary

MEASURE IDENTIFICATION	MEASURE TITLE	ROG REDUCTION (TONS/YEAR)	NO_X REDUCTION (TONS/YEAR)
SDT-2	Provide Traffic Calming Measures	0.09	0.45
SDT-3	Implement NEV Network	0.18	0.9
Traffic Study Design Features	Traffic Study VMT	3.4	16.8
Total		**3.7**	**18.2**
Target		**1.2**	**6.0**

Notes: NO_X = oxides of nitrogen; ROG = reactive organic gases; PM_{10} = respirable particulate matter; tons/year = tons per year.
Totals may not sum exactly because of rounding.
Source: Data compiled by Ascent Environmental in 2019.

8. Conclusion

The application of the above mitigation measures, as well as Mitigation Measure AQ-2 of the Draft EIR, to the proposed project will meet the 15 percent emissions reduction target established by SMAQMD. Considering the mix of proposed land uses, incorporated bicycle and pedestrian facilities, transit connections, NEV network, and traffic calming measures, the MSCMP would result in greater than a 15 percent reduction in long-term operational emissions of ozone precursors over unmitigated emissions.

None of the measures included in the project design would need ongoing monitoring beyond the completion date of the project. By meeting the 15 percent reduction target, as documented in this AQMP, the requirements of this AQMP have been met. A breakdown of on-site mitigation measures compared to the reduction target is shown below in Table 8-1.

Table 8-1 Reduction Target Summary

	ROG (TONS/YEAR)	NO_X (TONS/YEAR)	PM_{10} TONS/YEAR
15 Percent Reduction Target[1]	1.2	6.0	NA
Total Mitigation Achieved[2]	3.7	18.2	32

Notes: NO_X = oxides of nitrogen; ROG = reactive organic gases; PM_{10} = respirable particulate matter; tons/year = tons per year; NA = not applicable.
[1] A 15 percent mitigation target is required by this project per SMAQMD guidance as it was included in the currently adopted SIP.
[2] Emissions reported from the mitigated CalEEMod run using project-specific trips rates.
Source: Data compiled by Ascent Environmental in 2019.

9. References

California Air Pollution Control Officers Association. 2016 (September). California Emissions Estimator Model Version 2016.3.2.

_____. 2010 (August). *Quantifying Greenhouse Gas Mitigation Measures*. Available: http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf. Accessed June 1, 2017.

California Energy Commission. 2018 (March). 2019 Building Energy Efficiency Standards Frequently Asked Questions. Available: http://www.energy.ca.gov/title24/2019standards/documents/2018_Title_24_2019_Building_Standards_FAQ.pdf. Accessed July 17, 2018.

CAPCOA. *See* California Air Pollution Control Officers Association.

CEC. *See* California Energy Commission.

DKS. *See* DKS Associates.

DKS Associates. 2018 (February). Transportation Impact Report Mather South Specific Plan Amendment. Prepared by DKS Associates.

Sacramento Metropolitan Air Quality Management District (SMAQMD). 2017 (November 30). Recommended Guidance for Land Use Emission Reduction Version 4.0 for Operational Emissions.

Sacramento Regional Transit District. 2014. *Short Range Transit Plan.* Sacramento, CA.

SMAQMD. *See* Sacramento Metropolitan Air Quality Management District.

CAPCOA 2010
CEC 2018
DKS 2018
SMAQMD 2017