Appendix AQ-1

Air Quality Mitigation Plan and Greenhouse Gas Reduction Plan

SACRAMENTO METROPOLITAN
AIR QUALITY
MANAGEMENT DISTRICT

August 30, 2022

Todd Smith
Planning Director
Sacramento County Department of Planning and Environmental Review
827 7th Street, Room 225
Sacramento, CA 95814

Subject: Verification of Technical Adequacy for the August 24, 2022 Jackson Township Air Quality Mitigation Plan and August 25, 2022 Jackson Township Greenhouse Gas Reduction Plan (PLNP2011-00095) (SAC201101396)

Dear Todd Smith:

The Sacramento Metropolitan Air Quality Management District (Sac Metro Air District) has reviewed the August 24, 2022 Air Quality Mitigation Plan (AQMP, Attachment 1)[1] and the August 25, 2022 Greenhouse Gas Reduction Plan (GHGRP, Attachment 2)[2] for the Jackson Township Specific Plan and verifies their technical adequacy for purposes of the California Environmental Quality Act (CEQA). This verification supersedes the verifications of the June 2019 AQMP and January 2021 GHGRP.

Please ensure the emission reduction features described in these plans are implemented via mitigation measures, conditions of approval, finance plans, or other enforceable mechanism.

Please let me know if you have questions. I can be reached at 279-207-1127 or rdubose@airquality.org.

Sincerely,

RDuBose

Rachel DuBose
Air Quality Planner / Analyst
CEQA and Land Use

cc: Paul Philley, CEQA and Land Use Program Supervisor, Sac Metro Air District

Enclosures: Attachment 1 AQMP, Attachment 2 GHGRP. (Appendices excluded.)

[1] Revision 3 – Updated Air Quality Mitigation Plan for the Proposed Jackson Township Specific Plan Kleinfelder Project No. 20221505.001A
[2] Revision 4 – Updated Greenhouse Gas Reduction Plan for the Proposed Jackson Township Specific Plan Kleinfelder Project No. 20221505.001A

Attachment 1

REVISION 3 - UPDATED AIR QUALITY MITIGATION PLAN FOR THE PROPOSED JACKSON TOWNSHIP SPECIFIC PLAN KLEINFELDER PROJECT NO. 20221505.001A

AUGUST 24, 2022

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A Report Prepared for:

Mr. Angelo Tsakopoulos
Tsakopoulos Investments
7423 Fair Oaks Blvd., Suite 10
Sacramento, CA 95608

REVISION 3 - UPDATED AIR QUALITY MITIGATION PLAN FOR THE PROPOSED JACKSON TOWNSHIP SPECIFIC PLAN

Prepared by:

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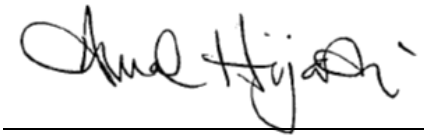

Amal Hijazi
Air Quality Project Manager

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August 24, 2022
Kleinfelder Project No.: 20221505.001A

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REVISION 3 - UPDATED AIR QUALITY MITIGATION PLAN FOR THE PROPOSED JACKSON TOWNSHIP SPECIFIC PLAN

1 EXECUTIVE SUMMARY

1.1 INTRODUCTION AND METHODOLOGY

Tsakopoulos Investments (the Applicant) is proposing the Jackson Township Specific Plan (Jackson Township) encompassing approximately 1,391 acres of land located in southeastern Sacramento County, east of Excelsior Road, north of Jackson Highway, and west of Eagles Nest Road. The proposed project is located approximately 10 miles southeast of the Sacramento central business district. The Jackson Township project is a mixed-use development that includes a mix of different housing types and commercial and retail land uses. The Proposed Project (formerly referred to as the California Environmental Quality Act, CEQA, Alternative 2) is evaluated in this report.

The Sacramento Metropolitan Air Quality Management District (SMAQMD) recommends that projects that emit more than 65 pounds per day (lb/day) of nitrogen oxides (NO_x) or reactive organic gases (ROG) and that are outside of the State Implementation Plan (SIP) reduce emissions by 35 percent from business as usual (BAU). The reductions are achieved through a series of mitigation measures and documented in an Air Quality Mitigation Plan (AQMP).

In August 2015, an AQMP and a Greenhouse Gas Reduction Plan (GHGRP) were prepared for the Jackson Township Specific Plan. The 2015 AQMP/GHGRP was based on then-current emission models and Guidance and was for the Jackson Township project-alone alternatives. Since that time, there have been new models, data, and Guidance published, and the Sacramento County Planning Division (PER) wishes to also evaluate the CEQA cumulative project scenarios. Project-alone scenarios, referred to herein as Project-Related vehicle miles traveled (VMT), assume that Jackson Township is the only project developed in the area. Cumulative scenarios (Cumulative VMT) are based on the assumption that there will be other projects developed in the area, and thus the VMT associated with Jackson Township is less because drivers can make combined trips (e.g., stopping by a supermarket on the way home from work). The proposed land uses for the Jackson Township Project-Related scenario are the same as for the Cumulative scenario; only the VMT is different.

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In February 2019, an update to the August 2015 AQMP/GHGRP based on the then current (as of January 2019) models, data, and Guidance was submitted to PER and the SMAQMD. In March 2019, the SMAQMD requested that the Applicant submit a revision to the February 2019 AQMP/GHGRP to refine some of the mitigation calculations, and Revision 1 was submitted April 16, 2019. In May 2019, SMAQMD requested additional changes to clarify some of the mitigation measures, and Revision 2 to the AQMP/GHGRP was submitted.

Since May 2019 there have been a number of additional changes to the traffic and emission models and significance thresholds, and updated Guidance has been published by the California Air Pollution Control Officers Association (CAPCOA) and SMAQMD. Thus, in April through June 2022, this revised AQMP was prepared. The AQMP and GHGRP were separated into two separate documents, and this revised AQMP is termed Revision 3.

This Revision 3 to the AQMP addresses the following:

- Updated SMAQMD Guidance for AQMP and GHGRPs (Version 4.3)[1].
- Updated CAPCOA mitigation measures (CAPCOA 2022 Handbook)[2].
- New California Emissions Estimator Model (CalEEMod) version (Version 2020.4.0).
- Only the Proposed Project (Alternative 2) now requires evaluation.
- Updated 2022 Traffic Study completed by PER with more current Project-Related and Cumulative VMT than examined in 2019.
- Change in Operational Year to 2040 (from 2035) and start of construction to 2025 (from 2020).
- Additional transportation related VMT reductions that were not analyzed as part of the updated Traffic Study.
- Additional non-transportation mitigation commitments made in the previous AQMPs and GHGRPs and in Revision 4 to the GHGRP.

Kleinfelder, Inc. (Kleinfelder) prepared this AQMP and GHGRP consistent with SMAQMD Guidance and PER direction. PER staff reviewed the calculations, methodology, and document.

[1] *SMAQMD, 2021. Recommended Guidance for Land Use Emission Reductions Version 4.3 (Operational Emissions.* Available at https://www.airquality.org/residents/ceqa-land-use-planning/mitigation. Accessed April 2022.

[2] CAPCOA, 2021. *Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity*. Available at https://www.airquality.org/residents/climate-change/ghg-handbook-caleemod. Accessed April, 2022.

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To estimate emissions of NO_x, ROG, and particulate matter (PM), Kleinfelder used the current (as of April 2022) version of CalEEMod (Version 2020.4.0). The CalEEMod model uses details regarding specific land uses (e.g., strip mall) and various additional parameters (e.g., vehicle trip frequency and length associated with a land use and emission factors for vehicles) to calculate peak daily (pounds per day, lb/day) and annual emissions (tons per year, tpy). AQMP Guidance Version 4.3 focuses on NO_x and ROG emissions from annual transportation (annual mobile-only) and PM emissions from all sectors.

Kleinfelder ran the CalEEMod with detailed land uses for Alternative 2, including parking lot areas, as provided by the Applicant. The detailed land uses entered into CalEEMod are shown in Appendix A and discussed in Section 2. One of the key inputs in CalEEMod is the amount of traffic (VMT) associated with a project. The CalEEMod model contains default VMT values calculated from local district provided information and/or California statewide averages based on typical projects, (the default parameters are termed business as usual, BAU).

For Jackson Township, in early 2022, PER had a comprehensive Traffic Study completed that calculated the amount of traffic associated with the Jackson Township and other Jackson Highway projects and included induced VMT that is the result of additional vehicle travel associated with improved roads in the proposed Jackson Township area, but the VMT is not caused by the project itself. The Traffic Study analyzed effects of Jackson Township and the other projects on a regional Project-Related and on a regional Cumulative basis, starting with the existing conditions and then adding Jackson Township and the other projects. The Traffic Study also accounted for most of the large number of design features incorporated into Jackson Township that greatly reduces the amount of VMT. These measures include, but are not limited to, the location, density/mix of land uses, internal proximity, multi-modal efficiency, and transit supportive measures. Accordingly, in order to estimate emissions for the Jackson Township project as designed and planned, Kleinfelder used the Jackson Township incremental VMT calculated by the PER Traffic Study in the CalEEMod runs. Kleinfelder adjusted the default annual VMT calculated by CalEEMod such that the annual VMT matched the Traffic Study. This results in emissions estimates for the Jackson Township project considering most of the design features that reduce VMT. The incremental VMT associated with the project is shown in Appendix B and the emission calculations methodology and results are discussed in Section 3.

Kleinfelder calculated annual, summer peak daily, and winter peak daily operational emissions. The results are shown in Section 3 and the CalEEMod output reports are in Appendix C. BAU annual, summer peak daily, and winter peak daily operational emissions were also calculated and are shown in

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Appendix D. The BAU emissions are discussed in Sections 3, 4, and 5. Construction emissions were calculated and discussed in Section 6 with the CalEEMod reports shown in Appendix E.

The BAU scenario uses the same land use detail as the planned and designed project but uses typical VMT instead of the greatly reduced VMT associated with the project. Table 1-1 shows the default CalEEMod VMT compared to the VMT associated with Alternative 2. The Project-Related VMT is 43 percent less than BAU and the Cumulative VMT is 61 percent less than BAU. (Dividing the difference between the default VMT and project VMT by the default VMT value calculates the percent reduction.)

Table 1-1: CalEEMod Default VMT Compared to Project VMT

Scenario	CalEEMod BAU Annual VMT (miles/yr)	Traffic Study VMT (miles/yr)	Percent Reduction of Traffic Study VMT Compared to BAU
Alternative 2 Project-Related VMT	211,550,554	120,083,520	- 43.2%
Alternative 2 Cumulative VMT	211,550,554	81,557,862	- 61.4%

Note that the Traffic Study and CalEEMod modeled adjusted VMT shown in the CalEEMod runs do not match exactly, as discussed in Section 3. The above Project-Related and Cumulative VMT values are the values from the Traffic Study.

1.2 OPERATIONAL ROG AND NO_X MOBILE EMISSIONS

For the AQMP, the annual ROG and NO_x mobile-only emissions for the Jackson Township project as designed and planned were compared to the annual mobile-only emissions that would occur under the BAU scenario. Table 1-2 shows the BAU mobile-only emissions and the Alternative 2 emissions under the Project-Related and Cumulative VMT scenarios in terms of annual tons per year. The table shows that the percent reductions for ROG for both the Project-Related and Cumulative VMT are more than the SMAQMD 35 percent reduction target even if only accounting for the mitigation accounted for in the Traffic Study.

Table 1-2: Comparison of BAU and Jackson Township Alternative 2 ROG and NO_x Annual Mobile-Only Emissions for BAU, Project-Related and Cumulative VMT Prior to Additional Mitigation

VMT Scenario	Mobile-Only ROG	Mobile-Only NO_x
BAU Alternative 2 Annual Mobile-Only Emissions	32.6 tpy	34.9 tpy
Project-Related VMT Alternative 2 Annual Mobile-Only Emissions	20.3 tpy	21.1 tpy
Project-Related Mobile Percent Reduction from BAU	**- 37.7 %**	**- 39.5 %**
Cumulative VMT Alternative 2 Annual Mobile-Only Emissions	15.3 tpy	15.3 tpy
Cumulative Mobile Percent Reduction from BAU	**- 53.1 %**	**- 56.2 %**

Table 1-3 compares the Alternative 2 Project-Related VMT scenario and emissions to the Cumulative VMT scenario. The Cumulative VMT scenario mobile-only emissions are from about 25 to 28 percent less than the Project-Related VMT scenario mobile-only emissions.

Table 1-3: Comparison of Cumulative VMT to Project-Related VMT Mobile-Only Annual Emissions for Alternative 2 Prior to Additional Mitigation (VMT from Traffic Study)

VMT Scenario	VMT (miles/yr)	ROG Emissions (tpy)	NO_x Emissions (tpy)
Project-Related VMT Scenario for Alternative 2	120,083,520	20.3	21.1
Cumulative VMT Scenario for Alternative 2	81,557,862	15.3	15.3
Difference between Project-Related and Cumulative Scenarios	- 38,525,658	- 5.0	- 5.8
Percent Reduction Cumulative from Project-Related	**- 32.1%**	**- 24.6%**	**- 27.5%**

The reduction in vehicle travel and emissions of ROG and NO_x are accomplished through a large number of Jackson Township project design features proposed by the Applicant. The features that reduce emissions include, but are not limited to, those listed immediately below. Where applicable, the related current (as of April 2022) CAPCOA[3] greenhouse gas mitigation measures (T-xx), the SMAQMD[4] land use

[3] CAPCOA, 2021. Op cit.

[4] SMAQMD, 2021, Op cit.

emission reduction measures (LUT-xx), and the Sacramento County Revised Final Draft Community Wide Climate Action Plan (CAP)[5] measures (GHG-xx) are noted. However, the CAPCOA, SMAQMD, and Sacramento County emission reduction percentages for the noted measures were not used, rather the Traffic Study VMT was used to calculate emissions. Note that the Traffic Study is SMAQMD pre-requisite measure TS – Traffic Study. The figures and exhibits in Appendix H further illustrate some of the measures noted below.

LOCATION (T-1, T-2, GHG-22):

- Project is located in a suburban center within approximately 10 miles of the Sacramento downtown central business district and less than 5 miles from other existing high-density commercial/job center areas (LUT-2 and LUT-3).
- Project is located adjacent to other planned developments such that single-use trips are minimized, i.e., there are more pass-by and diverted trips (LUT-3 and LUT-4).

DENSITY/MIX (T-1, T-2, T-3, T-4, GHG-22):

- Project provides a compact mix of land uses in close proximity to each other with a highly connected street and trail network (LUT-3).
- Project design is for high and medium density housing for over half of the total project dwelling units (LUT-1).
- Housing density is better than 9.5 dwelling units per acre (LUT-1).
- Project includes below market rate housing (LUT-6).
- Approximately 15 percent of the total commercial square footage is dedicated to a mixed-use facility that combines residences and commercial/retail uses (LUT-3).

INTERNAL PROXIMITY (T-31-A, GHG-15, GHG-22):

- Most residential units are within 1,320 feet (one-quarter mile) of a neighborhood park, open space, school, and/or bicycle/pedestrian trail (LUT-3).
- Most residential units are less than one-half mile from shopping and services (LUT-4).

[5] Sacramento County, 2022. *Revised Final Draft Community Wide Climate Action Plan, February 2022.* Available at https://planning.saccounty.net/PlansandProjectsIn-Progress/Pages/CAP.aspx. Accessed April 2022.

- Project design includes locating at least four schools within the project boundaries such that most students can walk to a local school (LUT-3 and LUT-4).
- Project design includes at least eight parks within the project boundaries such that residents can walk/bike to enjoy the parks (LUT -3 and LUT-4).

MULTI-MODAL EFFICIENCY (T-10, T-17, T-18, T-29, T-25, T-26, T-32, T-37, T-47, GHG-14, GHG-17):

- Project design is based on a network of streets in a grid pattern (LUT-8).
- Project design includes access to high frequency bus service that connects to the Watt/Manlove light rail station (LUT-5).
- Bus routes are signalized in order to avoid traffic delays (T-27).
- Project design promotes a multi-modal system that makes public transit, walking, and bicycling viable and attractive travel choices for residents and employees. Features include:
    - Adequate bike parking at non-residential locations, including the transit center and park and ride locations (T-34, T-47).
    - Showers/lockers and other end of trip facilities at non-residential buildings (T-10).
    - Long-term bike parking facilities (T-34, T-47).
- Project includes an extensive pedestrian path and trail system that is convenient and accessible from homes, school, parks, employment, and shopping (LUT-8).
- Pedestrian and bike paths minimize any barriers to pedestrian/bicycle use (e.g., fences, berms and other impediments are eliminated where possible) (LUT-8, T-18, T-20).

TRANSIT SUPPORTIVE (T-3, T-5, T-6, T-9, T-25, T-27, T-28, T-32, T-38; GHG-14, GHG-22):

- Project includes an on-site transit center and park and ride facilities along the designated transit route of Jackson Highway (LUT-5, T-3).
- Project subsidizes bus rapid transit lanes on Jackson Highway (T-27).
- Project funding and design will result in bus headways of 15 minutes or better (T-26).
- Project includes joining a Transportation Management Association (TMA) funded through assessments. Although the project will include a TMA, no VMT reduction from the TMA has been calculated or included in the Traffic Study.
- Project includes assessments for regional transportation improvements (T-27).

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1.3 ADDITIONAL QUANTIFIED EMISSION REDUCTIONS NOT INCLUDED IN THE TRAFFIC STUDY

Even though the measures listed above that are included in the Traffic Study more than achieve the AQMP emission reduction targets, there are additional transportation related mitigation measures that are incorporated into the project design and operation and for which emission reductions have been quantified. These measures are discussed in Section 4.2 and include the following (where applicable the CAPCOA mitigation measure has been cited, T-xx):

- For Residents:
  - Mandatory Community-Wide TMA participation that was not included in the Traffic Study (M-3[6]).
  - Electric bike share and scooter share (T-22-B, T-22-C).
  - Additional sidewalks within the Project (T-18).
- For Employees:
  - Mandatory Community-Wide TMA participation that was not included in the Traffic Study (M-3).
  - Carpooling/rideshare (T-8).

Furthermore, the Applicant has committed to the following quantified non-transportation related measures that will reduce ROG and NO_x emissions:

- Installation of a total of 805 non-residential electric vehicle (EV) charging stations at parking lots within the Project serving 1,610 parking spaces.
- Pre-wiring an additional 57 percent of multi-family housing for EV chargers. The Project is required by Sacramento County GHG reduction measures to pre-wire all of single-family housing and 20 percent of multi-family housing. The 57 percent of multi-family housing pre-wiring is in addition to that required, so there will be a total of 77 percent of multi-family housing pre-wired. The magnitude of emission reductions associated with this non-transportation related mitigation is discussed in Section 4.3.

[6] Measure M-3 is a Miscellaneous measure that is a mandatory TMA program for residents and employees that is paid annually as an assessment on both residential and non-residential properties. It is most analogous to T-6, which is normally a project/site-scale measure and allows up to 26% reduction; however, for Jackson Township it is applied community-wide, includes carpooling and rideshare, and totals 12.3% reduction. See Section 4.2.

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Note that the 2022 version of California Green Building Code (CCR Title 24), effective January 1, 2023, also requires EV chargers for non-residential and multi-family housing. Should Title 24 mandate more EV chargers than committed to herein, the number of EV chargers will be increased to meet the Title 24 requirements.

All of the Jackson Township mitigation measures will be documented and made compulsory through the approved Final Environmental Impact Report (FEIR) under CEQA and the financing plan. Appendix H provides land use and other exhibits supporting the planned mitigation measures.

In addition, with full build out of Jackson Township, the existing Sacramento Raceway will cease operations. Thus, the existing emissions at the Raceway will be eliminated as discussed in Section 4.4.

Table 1-4a summarizes the quantified emission reduction measures and resulting percent reduction from BAU for Alternative 2 mobile-only annual emissions of ROG and NO_x for the Project-Related VMT scenario and Table 1-4b summarizes the reduction for the Cumulative VMT scenario.

Table 1-4A: Quantified Mobile-Only Emission Reductions
Compared to BAU for Alternative 2 Project-Related VMT Scenario

Index	VMT Scenario	Mobile-Only ROG	Mobile-Only NO_x
1	BAU Alternative 2 Annual Mobile-Only Emissions (from Table 3-3)	32.6 tpy	34.9 tpy
2	Project-Related VMT Alternative 2 Annual Mobile-Only Emissions based on the Traffic Study (from Table 3-3)	20.3 tpy	21.1 tpy
3	Emission Reduction for Project-Related VMT (Row 2 minus Row 1)	- 12.3 tpy	- 13.8 tpy
4	**Project-Related Mobile Percent Reduction from BAU based Only on the Traffic Study (Row 3 / Row 1)**	**- 37.7 %**	**- 39.5 %**
5	Additional Emission Reductions from Transportation-Related Measures for Project-Related VMT Alternative 2 (from Table 4-5)	- 1.6 tpy	- 1.7 tpy
6	Emission Reductions from Committed Non-Transportation Related Mitigation for Project-Related VMT Alternative 2 (from Table 4-7)	- 0.5 tpy	- 2.9 tpy
7	Elimination of Sacramento Raceway (Section 4.4)	- 0.9 tpy	- 2.6 tpy
8	Total Emission Reductions for the Project-Related VMT Scenario (Rows 3 + 5 + 6 + 7)	- 15.3 tpy	- 21.0 tpy
9	**Total Percent Reduction for Project-Related VMT Scenario (Row 8 / Row 1)**	**- 46.9 %**	**- 60.2 %**

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Table 1-4B: Quantified Mobile-Only Emission Reductions Compared to BAU for Alternative 2 Cumulative VMT Scenario

Index	VMT Scenario	Mobile-Only ROG	Mobile-Only NO_x
1	BAU Alternative 2 Annual Mobile-Only Emissions (from Table 3-3)	32.6 tpy	34.9 tpy
2	Cumulative VMT Alternative 2 Annual Mobile-Only Emissions based on the Traffic Study (from Table 3-3)	15.3 tpy	15.3 tpy
3	Emission Reduction for Cumulative VMT (Row 2 minus Row 1)	- 17.3 tpy	- 19.6 tpy
4	**Cumulative Mobile Percent Reduction from BAU based Only on the Traffic Study (Row 3 / Row 1)**	**- 53.1 %**	**- 56.2 %**
5	Additional Emission Reductions from Transportation-Related Measures for Cumulative VMT Alternative 2 (from Table 4-5)	- 1.2 tpy	- 1.3 tpy
6	Emission Reductions from Committed Non-Transportation Related Mitigation for Cumulative VMT Alternative 2 (from Table 4-7)	- 0.4 tpy	- 2.3 tpy
7	Elimination of Sacramento Raceway (Section 4.4)	- 0.9 tpy	- 2.6 tpy
8	Total Emission Reductions for the Cumulative VMT Scenario (Rows 3 + 5 + 6 + 7)	- 19.8 tpy	- 25.8 tpy
9	**Total Percent Reduction for Cumulative VMT Scenario (Row 8 / Row 1)**	**- 60.7 %**	**- 73.9 %**

Note that the NO_x and ROG emissions shown in Tables 1-4A and 1-4B are mobile-only emissions and reductions. Because natural gas infrastructure will be eliminated from the Jackson Township, there are other NO_x and ROG emissions from residential hot water heaters and commercial boilers that will also be eliminated. Those emission reductions are not shown in the Tables, so the total reduction from all sources is greater than shown.

1.4 OPERATIONAL PM EMISSIONS

Because there are no sources of operational PM emissions that are not also sources of NO_x, ROG, and GHG, the design features that greatly reduce NO_x and ROG will also greatly reduce potential PM emissions as discussed in Section 6. PM emissions under the Project-Related and Cumulative VMT scenarios compared to BAU are shown in Table 1-5 in units of tons per year (tpy).

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Table 1-5: Comparison of BAU and Jackson Township PM Annual Emissions for Alternative 2 BAU, Project-Related VMT and Cumulative VMT Scenarios

VMT Scenario	Fugitive PM_{10} (tpy)	Exhaust PM_{10} (tpy)	Total PM_{10} (tpy)	Fugitive $PM_{2.5}$ (tpy)	Exhaust $PM_{2.5}$ (tpy)	Total $PM_{2.5}$ (tpy)
BAU Original Project Annual Emissions	78.2	1.1	79.4	20.9	1.1	22.0
Project-Related VMT Annual Emissions	44.6	1.0	45.6	11.9	1.0	12.9
Percent Reduction for Project-Related VMT from BAU	**- 43.0%**	**- 9.1%**	**- 42.6%**	**- 43.1%**	**- 9.1%**	**- 41.4%**
Cumulative VMT Annual Emissions	30.2	1.0	31.1	8.1	1.0	9.0
Percent Reduction for Cumulative VMT from BAU	**- 61.4%**	**- 9.1%**	**- 60.8%**	**- 61.2%**	**- 9.1%**	**- 59.1%**

Note that the total PM may not exactly equal the sum of fugitive plus exhaust emissions due to round off differences.

There are no thresholds for PM reductions, but the design features built into the proposed project result in a reduction of total PM emissions ranging from 41 to 61 percent. The significant reduction in emissions of NO_x, ROG, and PM emissions for the planned and designed project compared to BAU is the result of the large number of design features incorporated into the project that greatly reduce the VMT. These design features are discussed in Section 4 and include locating the project close to the Sacramento central business district, incorporating a high density of mixed-use buildings, designing the project in a gridded street pattern with schools and parks located within the development, and incorporating multi-modal transportation systems. The multi-modal transportation systems include extensive bike and pedestrian paths, on-site transit center and park and ride facilities, bus rapid transit subsidies, and assessments for regional transportation improvements, among other features as detailed in Section 4.

1.5 CONSTRUCTION EMISSIONS

Although not part of the AQMP, SMAQMD recommends that construction emissions of ROG, NO_x, and PM emissions be quantified with CalEEMod if possible. To estimate construction emissions, CalEEMod was first run with default parameters and then the default parameters were adjusted as necessary to meet planned project constraints. The methodology is discussed in Section 6 and the results are shown in Table 1-6. The values shown in the table are the maximum annual and daily emissions during the 15-year construction period. The values come from construction CalEEMod runs shown in Appendix E. The emissions are compared to the current (as of April 2022) SMAQMD significance thresholds and all of the emissions are less than thresholds.

Table 1-6: Maximum Construction Emissions for Alternative 2

Alternative	ROG (lb/day)	NO_x (lb/day)	Total PM_{10} (lb/day)	Total PM_{10} (tpy)	Total $PM_{2.5}$ (lb/day)	Total $PM_{2.5}$ (tpy)
Alternative 2 Emissions	57.3 (Summer)	68.5 (Winter)	45.4 (Winter)	5.7 (2027)	12.9 (Winter)	1.6 (2027)
SMAQMD Significance Thresholds	None	85	80	14.6	82	15
Exceed Threshold?	**N/A**	**No**	**No**	**No**	**No**	**No**

1.6 SUMMARY

In summary, incorporation of the planned and designed VMT reduction features of the Jackson Township greatly mitigates potential emissions of NO_x, ROG, and PM. The emission reductions are much greater than the SMAQMD 35 percent reduction target for NO_x and ROG. Table 1-7 summarizes the various reduction targets and how Alternative 2 meets those targets.

Table 1-7: Summary of Jackson Township Emissions Compared to Reduction Requirements and Thresholds

Scenario	Meets SMAQMD ROG 35% Reduction?	Meets SMAQMD NO_x 35% Reduction?	Below SMAQMD Construction Significance Criteria?	Achieves Meaningful PM Emission Reductions?
Alternative 2 Project-Related VMT Emissions Based on Traffic Study	Yes	Yes	Yes	Yes
Alternative 2 Project-Related VMT when Additional Quantified Mitigation is Credited	Yes	Yes	Yes	Yes
Alternative 2 Cumulative VMT Emissions Based on Traffic Study	Yes	Yes	Yes	Yes
Alternative 2 Cumulative VMT when Additional Quantified Mitigation is Credited	Yes	Yes	Yes	Yes

In addition to all of the design features that reduce VMT and the additional mitigation, there are more emission reductions associated with other design and mitigation measures that have not been quantified but will also occur. For example, the following features, among others, will occur but the benefits of those features have not been quantified. It is recognized that some of the following measures only indirectly reduce ROG and NO_x, as they are primarily GHG reduction measures.

- An over-statement of VMT because the VMT per resident and per employee values do not account for the mutually beneficial interaction of the Jackson Township Specific Plan with other

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existing and/or approved land uses that result in reduced VMT. For example, Jackson Township schools and retail will serve not only Jackson Township residences but existing residences in the area, thus reducing the distance traveled by existing persons.

- An over-statement of employee VMT because the VMT per employee does not account for the current shift to work-from-home and remote working/learning that is occurring.
- Low flow bathroom fixtures, kitchen fixtures, showers, and toilets in all residential units and commercial buildings.
- Reduced square footage of residential turf due to the increased housing density.
- Water efficient irrigation systems and water efficient landscaping for the non-residential areas.
- Some of the existing homes located within the Jackson Township Specific Plan will be replaced with more modern and energy efficient homes.

And most significantly, all of the mobile-source emission estimates are over-stated and the benefit of EV charging stations under-stated because they do not account for the much larger electric vehicle penetration and other changes in transportation that will have to occur if California is to reach the 2050 GHG reduction goals. For example, the new (April 1, 2022) Federal passenger car and light duty truck fleet wide average fuel economy standard of approximately 49 miles per gallon (mpg) for new vehicles by calendar year 2026 has not been accounted for. Thus, prior to full development of Jackson Township in 2040 there will be greater ROG and NOx emission reductions and much lower total emissions than stated herein.

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2 PROPOSED JACKSON TOWNSHIP SPECIFIC PLAN

The proposed Jackson Township Specific Plan consists of approximately 1,391 acres located in southeastern Sacramento County. This AQMP focuses only on CEQA Alternative 2. Table 2-1 presents the summary land uses proposed by the Applicant by major category. The proposed land uses are shown in Appendix H.

Table 2-1: Alternative 2 Summary Land Use

Land Use Index	Residential Designations	Acres	Ave. Density	Dwelling Units
1	LD-Low Density Residential	382.6	6.0	2,295
2	MD-Medium Density Residential	124.5	10.0	1,245
3	HD-High Density Residential	82.0	25.0	2,050
	Subtotal	**589.1**		**5,590**
	Commercial + Office Zones		**Approx. Bldg. Square Footage**	
4	GC-General Commercial	59.7	650,100	
5	CC-Community Commercial	16.2	176,400	
6	MU-Mixed Use	19.7	429,000	100
7	O-Office	35.2	766,600	
	Subtotal	**130.8**	**2,022,100**	**100**
	Public/Quasi Public Zones			
8	PQP-Tank Site	1.0		
9	PQP-High School/Middle School	70.0		
10	PQP-Elementary School	30.0		
	Subtotal	**101.0**		
	Park + Open Space Zones			
11	CP-Community Park	40.6		
12	P-Neighborhood Park	38.2		
13	OS-Wetland Preserve	259.8		
14	OS-Greenbelt/Drainage Corridor	55.6		
15	OS-Landscape Corridor	14.5		
	Subtotal	**408.7**		
16	AG-Agriculture	74.7		
17	RW-Primary Roadways	86.7		
	TOTAL	**1,391**		**5,690**

The summary land uses are as planned as of December 1, 2014. The Land Use Index in Table 2-1 is used to reference the subcategory land uses in the following detailed land use descriptions. The land use data in Table 2-1 does not provide all of the detail necessary to estimate operational emissions. Appendix A provides the additional detail developed by Kleinfelder and the Applicant and is summarized in Table 2-2. The detail in Table 2-2 is based on the anticipated and typical land uses for a development like the Jackson Township. Detailed land use for the schools was derived from information provided by the Elk Grove Unified School District for average building sizes and parking lots. The gasoline pump numbers are based on the CalEEMod User Guide Appendix D that uses 7.1 pumps per 1,000 square feet (sf). The detailed land use information is used for the emission calculations discussed in Section 3.

As shown in Table 2-2 and Appendix A, one of the detailed land use categories inputs to the CalEEMod model is parking lot area. The parking lot area was planned by the Applicant through experience with other typical projects, usually as a fraction of the total acreage for the land use category.

Table 2-2: Detail Land Use for Emission Calculations for Alternative 2

Index	Residential Designations	Acres	Detailed Land Use for Emission Estimates
1	LD-Low Density Residential	382.6	Single Family Housing, 2,295 dwelling units
2	MD-Medium Density Residential	124.5	Single Family Housing, 1,245 dwelling units
3	HD-High Density Residential	82.0	Mid-Rise Apartments, 2,050 dwelling units
	Subtotal	**589.1**	
	Commercial + Office Zones		**Approx. Bldg. Square Footage**
4	GC-General Commercial	59.7	-195,000 sf Discount Club, 468,300 sf parking lot. -162,500 sf Home Improvement Store, 390,300 sf parking lot. -65,000 sf Grocery Store, 156,800 sf parking lot. -32,500 sf Pharmacy with Drive-Thru, 78,000 sf parking lot. -32,500 sf Hardware Store, 78,000 sf parking lot. -39,000 sf Restaurants with Drive-Thru, 93,700 sf parking lot. -113,800 sf Strip Mall (Miscellaneous in-line Retail), 273,100 sf parking lot. -3,300 sf Convenience Store, 7,800 sf parking lot. -6,500 sf Gasoline Service Stations (2 Stations), 15,700 sf parking lot. 24 pumps per station.
5	CC-Community Commercial	16.2	-3,000 sf Gasoline Service Station, 7, 400 sf parking lot. 24 pumps at the station. -173,400 sf Strip Mall, 416,000 sf parking lot
6	MU-Mixed Use	19.7	-178,600 sf Mid-rise Apartments, 100 Dwelling Units in Apartments. -250,400 sf Retail (Strip Mall style). -343,200 sf parking lot for both Apartments and Retail combined.
7	O-Office	35.2	-766,600 sf General Office Building, 613,300 sf surface parking lot
	Subtotal	**130.8**	**2,022,100 sf**

Table 2-2 (cont.): Detail Land Use for Emission Calculations for Alternative 2

Index	Public/Quasi Public Zones	Acres	Detailed Land Use for Emission Estimates
8	PQP-Tank Site	1.0	1 acre allotted for possible water storage tank 90 feet diameter by 24 feet high.
9	PQP-High School/Middle School	70.0	250,000 sf building; 609,800 sf parking lot
10	PQP-Elementary School	30.0	225,000 sf buildings (3 schools); 136,800 sf parking lot
	Subtotal	**101.0**	
	Park + Open Space Zones		
11	CP-Community Park	40.6	Community Park and Neighborhood Park acreage used for Operational emissions. Remaining land uses do not cause operational emissions.
12	P-Neighborhood Park	38.2	
13	OS-Wetland Preserve	259.8	
14	OS-Greenbelt/Drainage Corridor	55.6	
15	OS-Landscape Corridor	14.5	
	Subtotal	**408.7**	
16	AG-Agriculture	74.7	
17	RW-Primary Roadways	86.7	
	TOTAL	**1,391**	

The data in Table 2-2 and Appendix A were entered into CalEEMod to calculate the emissions. The CalEEMod reports show where the data were used, but there is one land use subcategory that requires additional explanation: the possible water storage tank. Although a water use study has not been completed for the Project, it is possible that an approximately 1-million-gallon water storage tank may need to be located within the Project. This tank would be located at the PQP-Tank Site (Land use category 8) on a 1-acre parcel. The tank would be approximately 90 feet in diameter and 24 feet high. To account for painting the tank, the surface area of the tank was calculated (13,148 square feet for the sides and top). CalEEMod assumes that all coatings have a volatile organic compound (VOC) content of 150 grams per liter (g/l). However, rust preventative coatings are allowed to contain up 400 g/l per SMAQMD Rule 440. Also, it is possible that the tank would need two coats of paint. Accordingly, Kleinfelder entered the tank into CalEEMod as a "User Defined" industrial land use with a 1-acre lot size and 70,123 square feet (13,148 square feet x 2 coatings x 400 g/l divided by 150 g/l).

3 OPERATIONAL EMISSION ESTIMATING METHODOLOGY AND RESULTS

3.1 OPERATIONAL ROG, NO_X, AND PM EMISSIONS ESTIMATING METHODOLOGY

Kleinfelder calculated operational emission estimates for Alternative 2 with the CalEEMod emissions model, Version 2020.4.0. CalEEMod calculates emissions of criteria pollutants and GHG based on detailed land use metrics (e.g., acreage, dwelling units, square feet, number of fueling pumps) and vehicle emissions associated with each land use. The detailed land uses shown in Appendix A were used to estimate emissions. CalEEMod Version 2020.4.0 is based on EMFAC 2017 and 2019 Title 24 Energy Standards that were promulgated in March 2018 and became effective January 1, 2020.

Except for the CO_2 intensity for electrical generation, the mobile source emissions category, the number of fireplaces and hearths, and the additional mitigation calculations as explained below, CalEEMod default input factors were used to calculate emissions. CalEEMod was run for a full build-out year of 2040 and start of construction 2025.

For electrical generation greenhouse gas (CO_2, CH_4, N_2O) intensity, zero was entered. This is because the Sacramento Municipal Utility District (SMUD) has committed to 100 percent renewable energy by 2030.

CalEEMod includes emissions from mobile sources, and uses typical trip frequencies, trip types, trip lengths (depending on the specific land use subcategory), and standard California emission factors (EMFAC 2017 in the CalEEMod 2020.4.0 version) to calculate mobile source emissions. However, as discussed in Section 4, Alternative 2 incorporates a number of features that significantly reduce the VMT of the mobile sources. Accordingly, to estimate emissions for Alternative 2, Kleinfelder adjusted the trip frequency in CalEEMod such that the annual VMT matched the annual VMT forecast by the Traffic Study prepared for PER for the Project-Related VMT and Cumulative VMT scenarios. The vehicle travel mileage forecast by the Traffic Study is shown in Appendix B and includes changes in traffic patterns as the result of the Project. Trip lengths were not changed in CalEEMod because the CAPCOA 2022 Handbook for mitigation measures states that none of the included measures (which are the measures used to reduce VMT) reduce trip lengths[7].

[7] *CAPCOA, 2021, op cit., Page 67.*

The Traffic Study VMT data provided by PER forecasts peak daily VMT that will occur in calendar year 2040 as the result of the Project, both as a stand-alone project (project-related) and cumulative with other projects in the area. The Traffic Study data included the induced VMT potentially caused by road improvements in the area, but not caused by the Jackson Township project itself. The VMT used in CalEEMod is the incremental increase in VMT forecast by the Traffic Study. The peak daily VMT forecast for calendar year 2040 is as follows (see Appendix B):

- Alternative 2 Project-Related VMT: 375,261 miles per day.
- Alternative 2 Cumulative VMT: 254,868 miles per day.

Kleinfelder converted the peak daily VMT to annual VMT by multiplying the peak daily calendar year 2040 VMT by 320 days per year. The 320 value is approximately 52 weeks per year, 6 days per week. The assumption is that the peak daily VMT occurs on each of 5 days and about one-half of the peak daily VMT occurs on Saturday and Sunday. Accordingly, the calendar year 2040 annual incremental VMT is as shown in Appendix C and repeated here:

- Alternative 2 Project-Related VMT: 120,083,520 miles per year.
- Alternative 2 Cumulative VMT: 81,557,862 miles per year.

As discussed in Section 4, the default CalEEMod parameters yields emission estimates and VMT based on BAU. Appendix D shows the annual VMT for BAU, which is 211,550,554 miles per year. If one compares the business-as-usual VMT to the VMT forecast by the Traffic Study, the Traffic Study VMT for Alternative 2 is about 43 (Project-Related VMT) to 61 (Cumulative VMT) percent less than BAU (see Table 1-1).

The CalEEMod BAU default trip frequency is based on each individual land use and the Institute of Traffic Engineers Trip Generation handbook. There are separate frequencies for weekdays, Saturday, and Sunday. The CalEEMod default trip type and trip length are from information provided by the air district or California statewide averages. The CalEEMod model calculates the mileage per trip type by considering whether the trip was a primary trip, diverted trip, or pass-by trip. An example pass-by trip is a person stopping to shop on their way home from work. A diverted trip example is a person going home from work but traveling a short additional distance to shop. CalEEMod assumes that a pass-by trip is 0.1 miles, and a diverted trip will be 25 percent of the primary trip length.

In order to match the Alternative 2 VMT in CalEEMod to the VMT forecast by the Traffic Study, Kleinfelder adjusted the default trip frequencies as described below. The default CalEEMod pass-by and

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diverted trip frequencies were not changed, and the emission factors were not changed. Tables 3-1 and 3-2 show the default trip frequencies and the adjusted trip frequencies for Alternative 2. For most of the land uses, the trip frequencies were reduced by about 50 to 60 percent. However, trip frequencies for land uses not likely to be greatly affected by design and mitigation in the Proposed Project were not changed. The un-changed land use trip frequencies were for the discount club, fast food restaurants, gasoline stations, hardware/paint store, home improvement store, hospital, and pharmacy. Note that the trip frequencies are in terms of the land use metric (which varies among different land uses) in CalEEMod and the frequency numbers in Tables 3-1 and 3-2 cannot be compared across land uses.

Table 3-1: BAU and Adjusted Trip Frequencies for Alternative 2

Project-Related VMT

	Business-As-Usual			Adjusted for Alternative 2		
Land Use	**Weekday**	**Sat**	**Sun**	**Weekday**	**Sat**	**Sun**
Apartments Mid-Rise	5.44	4.91	4.09	2.5	2.4	2.0
City Park	0.78	1.96	2.19	0.4	0.8	0.9
Convenience Market	762.28	1084.17	901.17	350.0	410.0	400.0
Discount Club	41.8	53.75	33.67	41.8	53.75	33.67
Elementary School	19.52	0	0	8.0	0	0
Fast Food Restaurants with drive-thru	470.95	616.12	472.58	470.95	616.12	472.58
Gasoline Stations	172.01	182.17	166.88	172.01	182.17	166.88
General Office Building	9.74	2.21	0.7	4.0	2.0	0.3
Hardware/Paint Store	9.14	9.14	9.14	9.14	9.14	9.14
High School	14.07	3.98	1.71	6.0	2.0	0.8
Home Improvement Store	30.74	56.72	55.8	30.74	56.72	55.8
Parking Lot	0	0	0	0	0	0
Pharmacy	109.16	114.89	45.57	109.16	114.89	45.57
Single Family Housing	9.44	9.54	8.55	4.9	5.0	4.1
Strip Mall	44.32	42.04	20.43	20.0	15.0	10.0
Supermarket	106.78	177.62	166.47	45.0	75.0	70.0

Table 3-2: BAU and Adjusted Trip Frequencies for Alternative 2

Cumulative VMT

	Business-As-Usual			Adjusted for Alternative 2		
Land Use	**Weekday**	**Sat**	**Sun**	**Weekday**	**Sat**	**Sun**
Apartments Mid-Rise	5.44	4.91	4.09	1.6	1.5	0.8
City Park	0.78	1.96	2.19	0.2	0.6	0.7
Convenience Market	762.28	1084.17	901.17	180.0	240.0	220.0
Discount Club	41.8	53.75	33.67	41.8	53.75	33.67
Elementary School	19.52	0	0	5.1	0	0
Fast Food Restaurants with drive-thru	470.95	616.12	472.58	470.95	616.12	472.58
Gasoline Stations	172.01	182.17	166.88	172.01	182.17	166.88
General Office Building	9.74	2.21	0.7	2.3	0.7	0.2
Hardware/Paint Store	9.14	9.14	9.14	9.14	9.14	9.14
High School	14.07	3.98	1.71	3.9	1.0	0.5
Home Improvement Store	30.74	56.72	55.8	30.74	56.72	55.8
Parking Lot	0	0	0	0	0	0
Pharmacy	109.16	114.89	45.57	109.16	114.89	45.57
Single Family Housing	9.44	9.54	8.55	2.1	2.2	1.9
Strip Mall	44.32	42.04	20.43	15.0	10.0	7.0
Supermarket	106.78	177.62	166.47	30.0	25.0	20.0

The CalEEMod trip frequency reductions from BAU made to match the VMT calculated by the Traffic Study resulted in the following annual VMT used in CalEEMod:

- Alternative 2 Project-related VMT: 120,642,549 miles per year.
- Alternative 2 Cumulative VMT: 81,606,212 miles per year.

Note that the modeled adjusted CalEEMod annual VMT is slightly greater (less than 0.5 percent) than the Traffic Study VMT. It was not reasonably feasible to adjust the CalEEMod trip lengths to exactly

match the Traffic Study VMT, and thus the slight over-estimate in VMT was used for the emission calculations.

3.2 OPERATIONAL ROG AND NO_X EMISSION RESULTS

The detailed land use subcategories of Appendix A and the traffic data of Appendix B were used to estimate annual ROG and NO_x emissions with the CalEEMod emissions model. The CalEEMod reports are shown in Appendices C and D and the results for total and mobile-only annual NO_x and ROG emissions are summarized in Table 3-3 (in terms of tons per year, tpy). Although this AQMP focuses on annual emissions, maximum daily total (mobile plus non-mobile) ROG and NO_x emissions for the Project-Related and Cumulative VMT scenarios are shown in Table 3-4 as a point of information, not as part of the AQMP.

Table 3-3: Total and Mobile-Only Annual BAU and Jackson Township Emissions of ROG and NO_x

VMT Scenario	Annual Total ROG	Annual Total NO_x	Annual Mobile-Only ROG	Annual Mobile-Only NO_x
BAU Alternative 2 Annual Mobile-Only Emissions	84.8 tpy	41.9 tpy	32.6 tpy	34.9 tpy
Project-Related VMT Alternative 2 Annual Mobile-Only Emissions	72.6 tpy	28.1 tpy	20.3 tpy	21.1 tpy
Cumulative VMT Alternative 2 Annual Mobile-Only Emissions	67.5 tpy	22.3 tpy	15.3 tpy	15.3 tpy

Table 3-4: Maximum Total Daily Emissions of ROG and NO_x Under BAU Project-Related, and Cumulative VMT Scenarios

VMT Scenario	Maximum Total Daily Summer ROG (lb/day)	Maximum Total Daily Winter ROG (lb/day)	Maximum Total Daily Summer NO_x (lb/day)	Maximum Total Daily Winter NO_x (lb/day)
BAU Alternative 2 Daily Total Emissions	559.4	482.5	242.3	274.0
Project-Related VMT Alternative 2 Daily Total Emissions	462.9	411.2	164.4	183.7
Cumulative VMT Alternative 2 Daily Total Emissions	424.7	382.7	132.8	147.1

3.3 OPERATIONAL PM EMISSION RESULTS

Appendices C and D contain the CalEEMod reports that show the total operational PM emissions. The results are summarized in Table 3-5.

Table 3-5: Total Operational PM Annual Emissions

VMT Scenario	Fugitive PM_{10} (tpy)	Exhaust PM_{10} (tpy)	Total PM_{10} (tpy)	Fugitive $PM_{2.5}$ (tpy)	Exhaust $PM_{2.5}$ (tpy)	Total $PM_{2.5}$ (tpy)
BAU Original Project Annual Emissions	78.2	1.1	79.4	20.9	1.1	22.0
Project-Related VMT Annual Emissions	44.6	1.0	45.6	11.9	1.0	12.9
Cumulative VMT Annual Emissions	30.2	1.0	31.1	8.1	1.0	9.0

Note that the total may not exactly equal the sum of fugitive plus exhaust emissions due to round off differences.

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4 AIR QUALITY MITIGATION PLAN

This Section describes the calculations for the total ROG and NOx emission reductions that will be achieved by the proposed Jackson Township Specific Plan. There are four categories of emission reductions discussed below:

- Transportation-related reductions based on the Traffic Study.
- Additional emission reductions related to transportation that were not included in the Traffic Study.
- Reductions from changes in land use (elimination of the Sacramento Raceway).
- Non-quantified emission reductions.

4.1 OPERATIONAL ROG AND NO_X EMISSIONS BASED ON THE TRAFFIC STUDY

SMAQMD Guidance recommends that a project that emits more than 65 lb/day of NO_x or ROG reduce emissions by least 35 percent from BAU if the project is not part of the SIP (which is the case for the Jackson Township Specific Plan). Version 4.3 of the Guidance specifies that the percent reduction is applied to annual mobile-only emissions.

To evaluate the Jackson Township Specific Plan, the annual mobile-only emissions as planned (based on the Traffic Study) were compared to emissions that would occur with a typical development with the same detailed land uses as proposed. Emissions that would occur with a typical development instead of the mitigation measures designed into the planned project are termed BAU emissions. To calculate the BAU emissions, the detailed land uses were entered into CalEEMod, and the emissions model run with the CalEEMod default vehicle trip frequency and mileage that that are typical of projects in Sacramento County. The BAU emissions reports are shown in Appendix D. Emissions calculated by CalEEMod for BAU were then compared to emissions from the project as proposed based on the Traffic Study. The results for mobile-only annual emissions are shown in Table 4-1 for the BAU, Project-Related VMT, and Cumulative VMT Traffic Study scenarios.

Table 4-1: Comparison of BAU and Jackson Township ROG and NO_x Annual Mobile-Only Emissions Based on the Traffic Study for Alternative 2

VMT Scenario	ROG	NO_x
BAU Alternative 2 Annual Mobile-Only Emissions	32.6 tpy	34.9 tpy
Project-Related VMT Alternative 2 Annual Mobile-Only Emissions based on the Traffic Study	20.3 tpy	21.1 tpy
Project-Related Mobile Percent Reduction from BAU	**- 37.7 %**	**- 39.5 %**
Cumulative VMT Alternative 2 Annual Mobile-Only Emissions based on the Traffic Study	15.3 tpy	15.3 tpy
Cumulative Mobile Percent Reduction from BAU	**- 53.1 %**	**- 56.2 %**

As shown in Table 4-1, under the Project-Related VMT scenario Alternative 2 achieves approximately 38 to 40 percent reduction of ROG and NO_x from business-as-usual mobile-only annual emissions. Under the Cumulative VMT scenario, Alternative 2 achieves about a 53 to 56 percent reduction in ROG and NO_x. Percent reduction was calculated per SMAQMD Guidance as follows:

Percent Reduction = [(BAU emissions – Mitigated Emissions) / BAU Emissions] x 100

The difference between BAU emissions and the proposed project emissions is related to the difference in vehicle travel. The VMT projected in the Traffic Study under the Project-Related scenario for Alternative 2 as proposed is about 43 percent less than the VMT calculated by CalEEMod for BAU; and under the Cumulative VMT scenario the VMT projected for Alternative 2 as proposed is about 61 percent less than the VMT calculated by CalEEMod for BAU. The reduction in vehicle travel and emissions of NO_x and ROG are accomplished through a large number of Jackson Township project design features proposed by the Applicant. The features that reduce emissions include, but are not limited to, those listed immediately below. Where applicable, the related CAPCOA[8] greenhouse gas mitigation measures (T-xx), the SMAQMD[9] land use emission reduction measures (LUT-xx), and the Sacramento County Revised Final Draft Community Wide Climate Action Plan (CAP)[10] measures (GHG-xx) are noted. However, the CAPCOA, SMAQMD, and Sacramento County emission reduction percentages for the noted measures were not used, rather the Traffic Study VMT was used to calculate emissions. Note that

[8] CAPCOA, 2021. Op cit.

[9] SMAQMD, 2021, Op cit.

[10] Sacramento County, 2022. *Revised Final Draft Community Wide Climate Action Plan, February 2022.* Available at https://planning.saccounty.net/PlansandProjectsIn-Progress/Pages/CAP.aspx. Accessed April 2022.

the Traffic Study is SMAQMD pre-requisite measure TS – Traffic Study. Appendix H includes a land use diagram and exhibits supporting the VMT reduction measures incorporated into the Traffic Study. The FEIR contains additional supporting exhibits.

LOCATION (T-1, T-2, GHG-22):

- Project is located in a suburban center within approximately 10 miles of the Sacramento downtown central business district and less than 5 miles from other existing high-density commercial/job center areas (LUT-2 and LUT-3).
- Project is located adjacent to other planned developments such that single-use trips are minimized, i.e., there are more pass-by and diverted trips (LUT-3 and LUT-4).

DENSITY/MIX (T-1, T-2, T-3, T-4, GHG-22):

- Project provides a compact mix of land uses in close proximity to each other with a highly connected street and trail network (LUT-3).
- Project design is for high and medium density housing for over half of the total project dwelling units (LUT-1).
- Housing density is better than 9.5 dwelling units per acre (LUT-1).
- Project includes below market rate housing (LUT-6).
- Approximately 15 percent of the total commercial square footage is dedicated to a mixed-use facility that combines residences and commercial/retail uses (LUT-3).

INTERNAL PROXIMITY (T-31-A, GHG-15, GHG-22):

- Most residential units are within 1,320 feet (one-quarter mile) of a neighborhood park, open space, school, and/or bicycle/pedestrian trail (LUT-3).
- Most residential units are less than one-half mile from shopping and services (LUT-4).
- Project design includes locating at least four schools within the project boundaries such that most students can walk to a local school (LUT-3 and LUT-4).
- Project design includes at least eight parks within the project boundaries such that residents can walk/bike to enjoy the parks (LUT -3 and LUT-4).

MULTI- MODAL EFFICIENCY (T-10, T-17, T-18, T-29, T-25, T-26, T-32, T-37, T-47, GHG-14, GHG-17):

- Project design is based on a network of streets in a grid pattern (LUT-8).
- Project design includes access to high frequency bus service that connects to the Watt/Manlove light rail station (LUT-5).
- Bus routes are signalized in order to avoid traffic delays (T-27).
- Project design promotes a multi-modal system that makes public transit, walking, and bicycling viable and attractive travel choices for residents and employees. Features include:
    - Adequate bike parking at non-residential locations, including the transit center and park and ride locations (T-34, T-47).
    - Showers/lockers and other end of trip facilities at non-residential buildings (T-10).
    - Long-term bike parking facilities (T-34, T-47).
- Project includes an extensive pedestrian path and trail system that is convenient and accessible from homes, school, parks, employment, and shopping (LUT-8).
- Pedestrian and bike paths minimize any barriers to pedestrian/bicycle use, (e.g., fences, berms and other impediments are eliminated where possible) (LUT-8, T-18, T-20).

TRANSIT SUPPORTIVE (T-3, T-5, T-6, T-9, T-25, T-27, T-28, T-32, T-38; GHG-14, GHG-22):

- Project includes an on-site transit center and park and ride facilities along the designated transit route of Jackson Highway (LUT-5, T-3).
- Project subsidizes bus rapid transit lanes on Jackson Highway (T-27).
- Project funding and design will result in bus headways of 15 minutes or better (T-26).
- Project includes joining a TMA funded through assessments. Although the project will include a TMA, no VMT reduction from the TMA has been calculated or included in the Traffic Study.
- Project includes assessments for regional transportation improvements (T-27).

4.2 ADDITIONAL QUANTIFIED TRANSPORTATION MITIGATION

In addition to all of the mitigation measures incorporated into the Traffic Study, there are additional transportation mitigation measures that are part of the proposed Jackson Township Alternative 2 project. The benefit of these additional measures was documented in a memorandum prepared by Kimley-Horn dated August 4, 2022 (the K-H Memo) and shown in Appendix F.

The additional measures quantified in the K-H Memo and the percentage reduction in VMT are shown in Table 4-2. The measures are separated by those that benefit residential-related transportation (VMT per capita) and those that benefit employee-related transportation (VMT per employee). Where applicable, the CAPCOA mitigation measure (T-xx) is also noted in the Table. The K-H Memo in Appendix F describes each mitigation measure in detail.

CAPCOA Measure T-6, Mandatory Trip Reduction Program, is normally applied as a Project/Site-scale measure and thus is not combinable with the Plan/Community-scale measures T-18 and T-22. However, in the case of the Jackson Township, measure M-3 has been created that is allowed at the Plan/Community scale level and consists of a community-wide mandatory trip reduction program that will be required of all residents and employers within Jackson Township. Under this program, both residential and non-residential property will be subject to an annual County Service Area (CSA) fee that will be used for the TMA services and programs. Rideshare and carpool programs will be part of the M-3 measure. As measure M-3 is considered a Plan/ Community measure it can be combined with T-18 and T-22.

CAPCOA establishes emission reduction caps on measures for which CAPCOA establishes a percent reduction (i.e., the T-xx measures) calculation. The cap for measures T-5 through T-13 is 45 percent and the cap for measures T-18 through 22-C is 10 percent. As shown in Table 4-2, the caps are not exceeded.

Table 4-2: Additional Transportation Mitigation Included in the Alternative 2 Project

Measure	VMT per Capita % Reduction	VMT per Employee % Reduction
Mandatory Community-Wide TMA Participation (M-3)	- 2.08 %	- 12.3 %
Electric Bike share (T-22-B)	- 0.05 %	NA
Electric Scooter Share (T-22-C)	- 0.06 %	NA
Adding Sidewalks (T-18)	- 1.0 %	NA
Total Percent Reduction*	**- 3.0 %**	**- 12.3 %**
Total Percent Reduction for Combined Measures T-8 through 22-C	- 1.1 %	NA

* Reported total reduction may not sum to table entries due to roundoff differences.

The percentage benefit on total VMT (and thus emissions) of the measures shown in Table 4-2 is not simply the sum of residential (VMT per capita) and employee (VMT per employee) percentages because

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some of the measures that reduce residential VMT also reduce employee VMT. Thus, in order to calculate the benefit of these measures on total VMT forecast by the Traffic Study, the VMT reduction (in terms of VMT, not percentage) was calculated for residents and employees separately and then added together. The calculations are shown in Tables 4-3 and 4-4. The percent VMT reduction shown in Tables 4-3 and 4-4 translates directly into a similar percent reduction in ROG and NO_x emissions as shown in Table 4-5.

Table 4-3: Calculation of VMT Benefit from Additional Transportation Mitigation for Alternative 2 Project-Related VMT

Index	Measure	Residents	Employees
1	Daily VMT per capita/employee (from K-H Memo Table 1)	17.46	16.48
2	Number of Residents/Employees (from K-H Memo Page 3)	15,893	7,130
3	Residential and Employee VMT (Row 1 x Row 2)	277,492	117,502
4	Annual VMT (Row 3 x 320 days/year)	88,797,440	37,600,768
5	Total VMT Analyzed: Residential + Employee (Note that some of the VMT is double counted in Resident and Employee)	126,398,208	
6	Percent of VMT Analyzed for Residents versus Employees (Row 4 / Row 5)	70.3 %	29.7 %
7	Total Forecast Project-Related VMT from Traffic Study (Shown in Table 1-1)	120,083,520	
8	Residential and Employee VMT in Traffic Study (Row 6 x Row 7)	84,418,715	35,664,805
9	Percent Resident and Employee VMT Reduction (K-H Memo Table 2 and also shown in Table 4-2)	- 3.0 %	- 12.3 %
10	VMT Reduction (Row 8 x Row 9)	- 2,532,561	- 4,386,771
11	Total VMT Reduction (Sum of Row 10 Resident and Employee)	- 6,919,332	
12	Percent Total VMT Reduction for Project-Related VMT (Row 11 / Row 7)	**- 5.8 %**	

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Table 4-4: Calculation of VMT Benefit from Additional Transportation Mitigation for Alternative 2 Cumulative VMT

Index	Measure	Residents	Employees
1	Daily VMT per capita/employee (from K-H Memo Table 1)	13.97	13.31
2	Number of Residents/Employees (from K-H Memo Page 3)	15,893	7,130
3	Residential and Employee VMT (Row 1 x Row 2)	222,025	94,900
4	Annual VMT (Row 3 x 320 days/year)	71,048,000	30,368,000
5	Total VMT Analyzed: Residential + Employee (Note that some of the VMT is double counted in Resident and Employee)	101,416,000	
6	Percent of VMT Analyzed for Residents versus Employees (Row 4 / Row 5)	70.1 %	29.9 %
7	Total Forecast Cumulative VMT from Traffic Study (Shown in Table 1-1)	81,557,862	
8	Residential and Employee VMT in Traffic Study (Row 6 x Row 7)	57,172,061	24,385,801
9	Percent Resident and Employee VMT Reduction (K-H Memo Table 2 and also shown in Table 4-3)	- 3.0 %	- 12.3 %
10	VMT Reduction (Row 8 x Row 9)	- 1,715,162	- 2,999,454
11	Total VMT Reduction (Sum of Row 10 Resident and Employee)	- 4,714,616	
12	**Percent Total VMT Reduction for Cumulative VMT (Row 11 / Row 7)**	**- 5.8 %**	

Table 4-5: Comparison of BAU and Jackson Township ROG and NO_x Annual Mobile-Only Emissions for Alternative 2 When Additional Transportation Mitigation is Included

Index	VMT Scenario	ROG	NO_x
1	BAU Alternative 2 Annual Mobile-Only Emissions	32.6 tpy	34.9 tpy
2	Project-Related VMT Alternative 2 Annual Mobile-Only Emissions	20.3 tpy	21.1 tpy
3	Percentage Reduction in Emissions due to Additional Transportation Mitigation (From Table 4-3)	- 8.1%	- 8.2%
4	Emission Reduction from Additional Transportation Mitigation (Row 2 x Row 3)	- 1.6 tpy	- 1.7 tpy
5	Net Emissions (Row 2 less Row 4)	18.7 tpy	19.4 tpy
6	**Project-Related Mobile Percent Reduction from BAU ((Row 5 – Row 1) / Row 1))**	**- 42.6 %**	**- 44.4 %**
7	Cumulative VMT Alternative 2 Annual Mobile-Only Emissions	15.3 tpy	15.3 tpy
8	Percentage Reduction in Emissions due to Additional Transportation Mitigation (From Table 4-4)	- 5.8 %	- 5.8 %
9	Emission Reduction from Additional Transportation Mitigation (Row 7 x Row 8)	- 0.9 tpy	- 0.9 tpy
10	Net Emissions (Row 7 less Row 9)	14.4 tpy	14.4 tpy
11	**Cumulative Mobile Percent Reduction from BAU ((Row 10 – Row 1) / Row 1))**	**- 55.8 %**	**- 58.7 %**

4.3 ADDITIONAL QUANTIFIED NON-TRANSPORTATION RELATED EMISSION REDUCTIONS

The previous AQMP and GHGRP Revision 2 prepared in May 2019 included the following non-transportation mitigation measures for which emission reductions were quantified:

- High efficacy public outdoor lighting (GHGRP).
- Energy efficient appliances (GHGRP).
- Energy efficient boilers (AQMP and GHGRP).
- Residential electric hot water heaters (AQMP and GHGRP).
- Non-residential electric vehicle charging stations (AQMP and GHGRP).
- Residential electric vehicle charging stations (AQMP and GHGRP).

However, since May 2019, SMAQMD and Sacramento County adopted Best Management Practices (BMPs) to reduce GHG emissions. BMP1 eliminated natural gas infrastructure for new projects and BMP2 requires all projects to meet CalGreen Tier 2 standards except EV-capable spaces shall be EV-ready. The newly adopted BMPs were the impetus for Revision 3 to the GHGRP (prepared in January 2021). Furthermore, after May 2019 SMUD committed to 100 percent renewable energy by 2030.

Although the BMPs are not optional, credit for ROG and NO_x emission reductions that would occur under the BMPs are creditable because applicants can choose not to implement the BMPs and achieve emission reductions equivalent to the BMPs through other measures. However, because SMUD committed to 100 percent renewable energy, additional ROG and NOx emission reductions from electricity generation cannot be taken. This eliminates credits taken in the previous AQMP from high efficacy public outdoor lighting and electric appliances. There will be non-mobile emission reductions from elimination of natural gas infrastructure, which would eliminate emissions from natural gas-fueled appliances, boilers, and residential hot water heaters. Credit for these reductions is not shown herein and would result in greater total NO_x and ROG reductions.

Credit is shown for non-residential and residential EV charging stations. Revision 3 to the GHGRP committed to installing a total of 690 non-residential EV charging stations and to pre-wiring a total of 77 percent of multi-family housing for EV charging. (BMP2 requires only 20 percent of multi-family housing be pre-wired). As part of Revision 4 to the GHGRP, the Applicant has committed to installing another 115 non-residential EV charging stations for a total of 805 stations serving 1,610 parking spaces. ROG and NO_x emission reductions resulting from this additional mitigation are calculated as described below and shown in Appendix G.

4.3.1 Non-residential Electric Vehicle Charging Stations

A total of 805 non-residential EV charging stations will be installed at Jackson Township parking spaces at commercial, retail, office, and school parking lots. Each electric vehicle charging station has two connections, so, as incorporated in Appendix G, a total of 1,610 parking spaces will be served by the 805 EV charging stations.

For the emission reduction calculation, it was assumed that each EV connection would be used an average of 4 hours per day at a charging rate of 6 kWh per hour. The 4-hour per day value is based on the average observed actual session length (one vehicle in a session) of 4 hours and 19 minutes for the period April 21, 2009 through June 23, 2022 at EV charging stations located at the Applicant's current properties. The 4 hours per EV charging station is a conservatively low value because it is likely that the

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stations will be used by more than one vehicle per day (so total charging at the station will be multiples of 4 hours). Nevertheless, it was assumed that charging would occur at the stations only 4 hours per day. The VMT from the amount of electrical energy charged would offset an equivalent VMT of gasoline-fueled driving. EMFAC 2021 includes electric efficiency of EVs (see Appendix G) and was used in the emission calculations. Only light duty autos and light and medium duty trucks were included in the calculations assuming that only those vehicle types would use the non-residential charging stations in the Jackson Township parking lots. The non-residential EV charging stations offset about 43.3 million miles of gasoline-fueled travel. EMFAC 2021 was used to determine emission factors (grams per mile) for calendar year 2040 from those same gasoline-fueled vehicle types (see Appendix G).

4.3.2 Residential Electric Vehicle Charging Stations.

All residential low density and medium density single-family dwelling units (3,540 dwelling units for Alternative 2) and 20 percent of high density multi-family dwelling units (20 percent of 2,150 dwelling units) must be pre-wired for EV charging per BMP2. However, the Applicant has committed to pre-wiring an additional 57 percent of multi-family dwelling units (for a total of 77%) and credit can be taken for the entire 77% of multi-family and all of the single-family housing pre-wiring . As noted below, by 2040, most of the homeowners will take advantage of the pre-wiring and install charging stations for EVs. The following discussion and Appendix G show the calculations for the emission reductions that would result from the pre-wiring.

It is difficult to predict actual EV use 18 years into the future (calendar year 2040), because consumers choose their vehicle types based on a myriad of factors, some of which are legislatively and regulatorily driven, some are market driven, and some are individual choice. The major regulatory driver is the commitment that by calendar year 2035, one hundred percent of all new light duty vehicles (light duty autos and light duty trucks) sold in California must be zero emission vehicles (ZEV); either EV, plug-in hybrid EV (PHEV), or fuel cell electric vehicles (FCEV). In April 2022 CARB published a proposed Advanced Clean Cars II (ACC II) regulation that will require ZEVs for at least 35 percent of new light duty vehicle sales in 2026 and increasing by about 8 percentage points per year until 2035 where 100 percent of light duty vehicle sales must be ZEV[11]. The proposed regulations allow manufacturers to meet their ZEV requirement with up to 20 percent PHEVs. There is no cap on FCEVs, but CARB forecasts FCEV to be a small percentage of the ZEV fleet, with only 0.2% of ZEVs being FCEVs in 2021[12]. Accordingly, it was

[11] CARB, 2021. Advanced Clean Cars II Regulations Initial Statement of Reasons, April 12, 2022. Page 9, ES-Figure 1.

[12] Ibid. Page 19, Figure 2.

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assumed that in 2040, 100 percent of new light duty vehicle sales would be EV or PHEV. For purposes of ACC II, CARB defines light duty vehicles as automobiles and light duty trucks with a gross vehicle weight rating of 8,500 pounds or less[13], which is equivalent to the LDA, LDT1, and LDT2 vehicle categories in EMFAC 2021 (categories based on EMFAC 2007).

To estimate the number of homes that would actually have an EV and charge it at home, the EMFAC 2021 forecast vehicle type and model year population distribution for Sacramento County in 2040 was used along with the percent ZEV requirements from the proposed ACC II. EMFAC 2021 does not account for ACC II because it includes only regulations that are in place when the model was developed. Table 4-6 shows the EMFAC 2021 forecast of the number of light duty vehicles in 2040. To estimate the number of EVs, a percent EV assumption by model year was made as follows:

- Model years 1966 to 2012: zero percent EV is assumed. EMFAC does show some EV for those model years, but the quantity is in the 0.01 percent range, thus zero was assumed.
- Model years 2013 to 2020: EMFAC percent EV is used, which is based on actual California sales data.
- Model years 2021 to 2025: 12 percent EV sales are assumed, which is the same assumption EMFAC 2021 uses for all model years after 2020.
- Model years 2026 to 2034: the percent EVs is based on the ACC II ZEV requirements, which is 35 percent in 2026 increasing by 8 percent each year.
- Model years 2035 to 2040: 100 percent EV is assumed based on the ACC II ZEV requirements.

ACC II allows up to 20 percent PHEV to provide manufacturers flexibility, but notes that the PHEV share of the market has declined in recent years[14], PHEVs will likely be more expensive than EVs and that manufacturers are not planning to use the 20 percent PHEV allowance[15]. Furthermore, ACC II requires PHEVs to have 4 to 5 times greater EV-only mileage range than current EVs[16]. ACC II also requires more convenient EV charging capability than current PHEV models[17]. All of these features encourage PHEV drivers to charge their vehicle batteries rather than relying on the auxiliary engine. So, it was assumed that if a person purchased a PHEV, they would, in fact, use their home charger (especially as it will already be pre-wired).

[13] Ibid., Page 65, Footnote 328.
[14] Ibid., Page 56.
[15] Ibid., Page 59.
[16] Ibid., Page 59, Table III-4.
[17] Ibid., Pages 50 - 53.

Table 4-6: Light Duty Vehicle Counts by Model Year in Sacramento County

Forecast by EMFAC for Calendar Year 2040

Model Year	Number of Light Duty Vehicles	% EV Sales	Number of EVs	Model Year	Number of Light Duty Vehicles	% EV Sales	Number of EVs
1996	1,478	0%	0	2019	12,157	6.7%	816
1997	1,876	0%	0	2020	11,129	8.6%	958
1998	2,037	0%	0	2021	15,486	12%	1,858
1999	2,099	0%	0	2022	20,646	12%	2,478
2000	2,462	0%	0	2023	23,417	12%	2,810
2001	2,454	0%	0	2024	26,413	12%	3,170
2002	2,452	0%	0	2025	29,841	12%	3,581
2003	2,429	0%	0	2026	33,073	35%	11,576
2004	2,442	0%	0	2027	36,546	43%	15,715
2005	2,744	0%	0	2028	39,495	51%	20,142
2006	2,776	0%	0	2029	42,605	59%	25,137
2007	2,864	0%	0	2030	45,191	68%	30,730
2008	2,343	0%	0	2031	47,921	76%	36,420
2009	1,656	0%	0	2032	49,690	82%	40,746
2010	1,999	0%	0	2033	51,756	88%	45,546
2011	2,392	0%	0	2034	53,102	94%	49,916
2012	3,350	0%	0	2035	54,362	100%	54,362
2013	4,897	1.7%	82	2036	54,942	100%	54,942
2014	5,511	2.0%	112	2037	54,447	100%	54,447
2015	7,729	1.6%	126	2038	52,923	100%	52,923
2016	9,052	1.9%	171	2039	49,671	100%	49,671
2017	10,888	3.7%	400	2040	39,774	100%	39,774
2018	12,282	5.3%	648			**Total**	**599,255**

Table 4-6 shows an estimated number of 599,255 EVs in 2040 in Sacramento County out of a total 934,801 light duty vehicles forecast by EMFAC, or 64.1 percent EV. It was assumed that each of single-family and multi-family home will have a light duty vehicle, and therefore, that 64.1 percent of the homes will have an EV or PHEV and will use a home charger by 2040.

The above analysis assumes that the model year distribution in 2040 does not change from that forecast by EMFAC 2021. It is possible that Sacramento County drivers will more rapidly embrace ZEV technology and replace their conventional-fueled cars more frequently than required by the ACC II regulations. But it is also possible that after 2035 drivers hold on to their conventional fueled vehicles longer because they do not want ZEVs. Considering that by 2035 consumers will have no choice but to purchase a ZEV, that all Jackson Township single-family and 77 percent of multi-family homes will be pre-wired for EV

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charging, and that by 2040 EV charging will likely become simply a matter of plugging in a 110-volt or 220-volt cord;[18] it is reasonable to assume that residents of Jackson Township will embrace ZEVs at a higher frequency than required and the percentage of ZEVs will be greater than the 64.1 percent calculated.

The 64.1 percent value is also an underestimate because there are electrically powered medium duty trucks that will also be owned and charged at home by Jackson Township residents, but the above ACC II calculations only accounted for light duty autos and light duty trucks. But to be conservative, it was assumed that if a resident owned an electric medium duty truck, they would not purchase an EV light duty auto or light duty truck.

In light of the above, it is reasonable that residents of Jackson Township will embrace ZEVs at a much higher frequency than required and the percentage of ZEVs will be greater than the 64.1 percent calculated. Accordingly, a reasonably conservative assumption of 75 percent residential ZEVs was made

Appendix G-1 shows the calculations for the emission reductions that would result from the pre-wiring and the 75 percent actual EV assumption. To calculate the emission reduction, an average light duty VMT per Jackson Township household was first calculated from the Project-Related VMT and from the Cumulative VMT scenarios and the EMFAC forecasted VMT for Sacramento County that 77.1 percent of total VMT is produced in 2040 by light duty autos and trucks. Then 75 percent of the light duty vehicle VMT associated with the pre-wired households for which credit can be taken was calculated (i.e., 75 percent of all single-family housing plus 75 percent of 77 percent of the 2,150 multi-family dwelling units times the average light duty VMT per household) to represent the amount of electric VMT that would offset conventionally fueled VMT. The amount of emission reductions was calculated using EMFAC 2021 emission factors for only gasoline and diesel-fueled light duty automobiles and light and medium duty trucks.

Table 4-7 summarizes the magnitude of the emission reductions achieved through the 805 non-residential EV charging stations and the single-family and multi-family pre-wiring.

[18] Ibid.

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Table 4-7: Emission Reductions from Non-Residential and Residential EV Charging Stations

	ROG	NO_x
805 Non-residential EV Charging Stations (Applies to both Project-Related and Cumulative VMT Scenarios)	- 0.20 tpy	- 1.17 tpy
77% Pre-wiring for EV Chargers for Project-Related VMT	- 0.29 tpy	- 1.71 tpy
Total for Project-Related or Cumulative VMT	**- 0.49 tpy**	**- 2.88 tpy**
77% Pre-wiring for EV Chargers for Cumulative VMT	- 0.20 tpy	- 1.16 tpy
Total for Cumulative VMT	**- 0.40 tpy**	**- 2.33 tpy**

Note that the 2022 version of California Green Building Code (CCR Title 24), effective January 1, 2023, also requires EV chargers for non-residential and multi-family housing. Should Title 24 mandate more EV chargers than committed to herein, the number of EV chargers will be increased to meet the Title 24 requirements. If this occurs, the emission reductions will be greater than shown in Table 4-7.

4.4 EMISSION REDUCTIONS ASSOCIATED WITH THE SACRAMENTO RACEWAY

The Jackson Township Specific Plan includes land owned and operated by the Sacramento Raceway. If Jackson Township is completely developed, the Sacramento Raceway will cease operations and emissions associated with the Raceway will be eliminated. In April 2021, a study was conducted to assess the potential health effects of Raceway operations[19]. This study estimated the ROG and NO_x emissions from the Raceway, including spectators, race vehicle transport, and racing vehicle emissions. The study found annual ROG emissions of 1,888 pounds per year (lb/yr) or 0.94 tpy and annual NO_x emissions of 5,236 lb/yr or 2.62 tpy associated with Raceway operations.

4.5 ADDITIONAL NON-QUANTIFIED MITIGATION

The project includes a number of additional features that also reduce potential emissions, but the benefit of those measures is not incorporated into the emission estimates and calculated reductions. Among the additional measures proposed by the Applicant are the following. It is recognized that some of the following measures only indirectly reduce ROG and NO_x, as they are primarily GHG reduction measures.

[19] Kleinfelder, 2021. *Air Quality Health Effects Assessment of the Sacramento Raceway, April 19, 2021.*

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- An over-statement of VMT because the VMT per resident and per employee values do not account for the mutually beneficial interaction of the Jackson Township Specific Plan with other existing and/or approved land uses that result in reduced VMT. For example, Jackson Township schools and retail will serve not only Jackson Township residences but existing residences in the area, thus reducing the distance traveled by existing persons.
- An over-statement of employee VMT because the VMT per employee does not account for the current shift to work-from-home and remote working/learning that is occurring.
- Low flow bathroom fixtures, kitchen fixtures, showers, and toilets in all residential units and commercial buildings.
- Reduced square footage of residential turf due to the increased housing density.
- Water efficient irrigation systems and water efficient landscaping for the non-residential areas.
- Some of the existing homes located within the Jackson Township Specific Plan will be replaced with more modern and energy efficient homes.

And most significantly, all of the mobile-source emission estimates are over-stated and the benefit of EV charging stations under-stated because they do not account for the much larger electric vehicle penetration and other changes in transportation that will have to occur if California is to reach the 2050 GHG reduction goals. For example, the new (April 1, 2022) Federal passenger car and light duty truck fleet wide average fuel economy standard of approximately 49 miles per gallon (mpg) for new vehicles by calendar year 2026 has not been accounted for. Thus, prior to full development of Jackson Township in 2040 there will be greater ROG and NO_x emission reductions and much lower total emissions than stated herein.

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5 PARTICULATE MATTER REDUCTIONS

The mitigation measures that reduce NO_x and ROG emissions also greatly reduce operational particulate matter (PM) emissions because for the Jackson Township Specific Plan, NO_x, ROG, and PM emissions are all associated with the same sources.

Operational annual PM emissions associated with BAU were estimated with the CalEEMod emissions model and compared to PM emissions for Alternative 2 for the Project-Related and Cumulative VMT scenarios. The CalEEMod reports are shown in Appendix C for the proposed project and Appendix D for BAU. The results are shown in Table 5-1 for fugitive and exhaust PM_{10} and $PM_{2.5}$. PM_{10} is particulate matter with a mean aerodynamic diameter of 10 microns or less and $PM_{2.5}$ is particulate matter with a mean aerodynamic diameter of 2.5 microns or less. Fugitive PM emissions are primarily due to re-suspension of road dust by vehicle traffic. Exhaust PM emissions are associated with combustion of fossil fuels in both mobile and non-mobile equipment.

Table 5-1: Comparison of BAU and Jackson Township PM Annual Emissions for Alternative 2

VMT Scenario	Fugitive PM_{10} (tpy)	Exhaust PM_{10} (tpy)	Total PM_{10} (tpy)	Fugitive $PM_{2.5}$ (tpy)	Exhaust $PM_{2.5}$ (tpy)	Total $PM_{2.5}$ (tpy)
BAU Original Project Annual Emissions	78.2	1.1	79.4	20.9	1.1	22.0
Project-Related VMT Annual Emissions	44.6	1.0	45.6	11.9	1.0	12.9
Percent Reduction for Project-Related VMT from BAU	**- 43.0%**	**- 9.1%**	**- 42.6%**	**- 43.1%**	**- 9.1%**	**- 41.4%**
Cumulative VMT Annual Emissions	30.2	1.0	31.1	8.1	1.0	9.0
Percent Reduction for Cumulative VMT from BAU	**- 61.4%**	**- 9.1%**	**- 60.8%**	**- 61.2%**	**- 9.1%**	**- 59.1%**

Note that the total PM may not exactly equal the sum of fugitive plus exhaust emissions due to round off differences.

There are no thresholds for PM reductions, but the mitigation built into the proposed project results in a reduction of total PM emissions ranging from 41 to 61 percent from BAU. The reduction is due to reduced vehicle travel that result from the mitigation measures designed into the Project. The VMT projected in the Traffic Study for Alternative 2 as proposed is about 43 to 61 percent less than the VMT calculated by CalEEMod for BAU. The reduction in vehicle travel and emissions of PM are the same measures that result in large reductions of NO_x and ROG emissions. The features that reduce emissions

include, but are not limited to, those listed immediately below. Where applicable, the related CAPCOA[20] greenhouse gas mitigation measures (T-xx), the SMAQMD[21] land use emission reduction measures (LUT-xx), and the Sacramento County Revised Final Draft Community Wide Climate Action Plan (CAP)[22] measures (GHG-xx) are noted. However, the CAPCOA, SMAQMD, and Sacramento County emission reduction percentages for the noted measures were not used, rather the Traffic Study VMT was used to calculate emissions.

LOCATION (T-1, T-2, GHG-22):

- Project is located in a suburban center within approximately 10 miles of the Sacramento downtown central business district and less than 5 miles from other existing high-density commercial/job center areas (LUT-2 and LUT-3).
- Project is located adjacent to other planned developments such that single-use trips are minimized, i.e., there are more pass-by and diverted trips (LUT-3 and LUT-4).

DENSITY/MIX (T-1, T-2, T-3, T-4, GHG-22):

- Project provides a compact mix of land uses in close proximity to each other with a highly connected street and trail network (LUT-3).
- Project design is for high and medium density housing for over half of the total project dwelling units (LUT-1).
- Housing density is better than 9.5 dwelling units per acre (LUT-1).
- Project includes below market rate housing (LUT-6).
- Approximately 15 percent of the total commercial square footage is dedicated to a mixed-use facility that combines residences and commercial/retail uses (LUT-3).

INTERNAL PROXIMITY (T-31-A, GHG-15, GHG-22):

- Most residential units are within 1,320 feet (one-quarter mile) of a neighborhood park, open space, school, and/or bicycle/pedestrian trail (LUT-3).
- Most residential units are less than one-half mile from shopping and services (LUT-4).

[20] CAPCOA, 2021. Op cit.

[21] SMAQMD, 2021, Op cit.

[22] Sacramento County, 2022. Op. cit.

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- Project design includes locating at least four schools within the project boundaries such that most students can walk to a local school (LUT-3 and LUT-4).
- Project design includes at least eight parks within the project boundaries such that residents can walk/bike to enjoy the parks (LUT -3 and LUT-4).

MULTI- MODAL EFFICIENCY (T-10, T-17, T-18, T-29, T-25, T-26, T-32, T-37, T-47, GHG-14, GHG-17):

- Project design is based on a network of streets in a grid pattern (LUT-8).
- Project design includes access to high frequency bus service that connects to the Watt/Manlove light rail station (LUT-5).
- Bus routes are signalized in order to avoid traffic delays (T-27).
- Project design promotes a multi-modal system that makes public transit, walking, and bicycling viable and attractive travel choices for residents and employees. Features include:
    - Adequate bike parking at non-residential locations, including the transit center and park and ride locations (T-34, T-47).
    - Showers/lockers and other end of trip facilities at non-residential buildings (T-10).
    - Long-term bike parking facilities (T-34, T-47).
- Project includes an extensive pedestrian path and trail system that is convenient and accessible from homes, school, parks, employment, and shopping (LUT-8).
- Pedestrian and bike paths minimize any barriers to pedestrian/bicycle use (e.g., fences, berms and other impediments are eliminated where possible) (LUT-8, T-18, T-20).

TRANSIT SUPPORTIVE (T-3, T-5, T-6, T-9, T-25, T-27, T-28, T-32, T-38; GHG-14, GHG-22):

- Project includes an on-site transit center and park and ride facilities along the designated transit route of Jackson Highway (LUT-5, T-3).
- Project subsidizes bus rapid transit lanes on Jackson Highway (T-27).
- Project funding and design will result in bus headways of 15 minutes or better (T-26).
- Project includes joining a Transportation Management Association (TMA) funded through assessments. Although the project will include a TMA, no VMT reduction from the TMA has been calculated or included in the Traffic Study.
- Project includes assessments for regional transportation improvements (T-27).

Elimination of the Sacramento Raceway will also reduce PM_{10} emissions by 3745 lb/yr (1.9 tpy) and $PM_{2.5}$ emissions by 977 lb/yr (0.5 tpy).

6 CONSTRUCTION EMISSIONS

Although not part of an AQMP, the SMAQMD requests that construction emissions of ROG, NO_x, and PM be estimated where possible. To estimate construction emissions CalEEMod was run for Alternative 2 with default parameters. The default parameters were then adjusted as needed to match project constraints.

For the CalEEMod emission model, construction was assumed to start on January 1, 2025 and be complete by December 31, 2039. When CalEEMod was run with default parameters, the model estimated total construction duration of 18,765 days. That is obviously an over-estimate. The planned construction duration is 3900 days (260 days per year times 15 years), or 21 percent of the default. Accordingly, the individual CalEEMod default construction phase durations were adjusted by a factor of approximately 0.21 and such that the total construction duration (not including architectural coating) equaled 3900 days. Architectural coating was assumed to occur during the entire construction period. The resulting adjusted construction durations are shown in Table 6-1.

Table 6-1: Default and Adjusted Construction Duration for Alternative 2

Construction Phase	Default Duration (days)	Adjusted Duration (days)	Rationale for Adjustment
Demolition	900	0	There is essentially no demolition required at the proposed location
Site Preparation	540	125	Applied factor of 0.23 to reflect the ratio of planned versus default total construction duration
Site Grading	1,395	322	
Building Construction	13,950	3,224	
Paving	990	229	
Architectural Coating	990	3,224	Assumed architectural coating could occur over approximately the same duration as building construction

The CalEEMod default construction worker and vendor trip frequencies were also adjusted to match the proposed project as shown in Table 6-2. The trip lengths were not adjusted.

Table 6-2: Default and Adjusted Worker and Vendor Construction Trips for Alternative 2

Construction Phase	Default Trips per Day		Adjusted Trips per Day		Rationale for Adjustment
	Worker	Vendor	Worker	Vendor	
Demolition	15	0	0	0	There is essentially no demolition required at the proposed location
Site Preparation	18	0	18	0	No change
Site Grading	20	0	20	0	No change
Building Construction	6,636	2,167	4,193	1,018	Trip frequencies are a function of the number of dwelling units and square feet of building. CalEEMod trip frequency functions and planned dwelling units/square footage were used to calculate project-specific trip frequencies
Paving	15	0	15	0	No change
Architectural Coating	1,327	0	839	0	Per CalEEMod, assumed architectural coating trips are 20% of Building Construction

Finally, the acreage of site preparation and grading were changed from the default to reflect the project-specific acreage of land that would be prepared and graded. It was assumed that all of the project area would be prepared and graded except for the parks, open space, and agricultural area: 907.6 acres prepared and graded for Alternative 2. In the absence of a detailed construction plan, the remainder of the construction parameters in CalEEMod were left at their default settings.

Table 6-3 lists the CalEEMod default numbers of equipment and hours of usage for each construction phase. The data in Table 6-3 were provided to a design engineer/construction manager for reasonableness evaluation. He concluded that the default parameters were conservative over-estimates of the duration and/or numbers and usage of construction equipment. Specifically, he concluded the following[23]:

- There is essentially no Demolition, consistent with Table 6-2.
- Multiple teams will likely be working on Site Preparation simultaneously, and thus on average the modeled 7 pieces of equipment operating a total of 8 hours per day, are sufficient to complete the site preparation in the modeled 0.5 years shown in Table 6-2.
- The modeled equipment list for Grading is typical and sufficient to complete grading in the modeled time period (1.2 years). More equipment could possibly be used to shorten the time

[23] *Personal Communication to Kleinfelder, Mr. Steve AuClair, PE, April 13, 2019.*

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period to less than 1.2 years; but given the limited amount of grading equipment in the Sacramento area, the modeled duration, equipment numbers and usage are reasonable.

- The default equipment usage rates for Building Construction equipment are an over-estimate. For example, a crane would not normally be used continuously for 7 hours per day; it would be used to load materials for a brief period and then left idle for the rest of the day. Thus, the emissions for Building Construction are likely over-stated.
- The amount of Paving equipment and use duration shown in Table 6-2 is a large over-estimate.
- Architectural Coating is an on-going activity during Building Construction as there are coating applications other than the finish coats on building surfaces; thus, assuming a duration equivalent to the Building Construction duration is reasonable.

Table 6-3: CalEEMod Default Construction Equipment and Hours of Usage

Construction Phase	Equipment List	Number of Pieces of Equipment	Usage Hours Per Day	Total Construction Days (Years)*
Demolition				
There is essentially no demolition needed				
Site Preparation				
	Rubber Tired Dozers	3	8	125 (0.5 yrs)
	Tractors/Loaders/Backhoes	4	8	125 (0.5 yrs)
Grading				
	Excavators	2	8	322 (1.2 yrs)
	Graders	1	8	322 (1.2 yrs)
	Rubber Tired Dozers	1	8	322 (1.2 yrs)
	Scrapers	2	8	322 (1.2 yrs)
	Tractors/Loaders/Backhoes	2	8	322 (1.2 yrs)
Building Construction				
	Cranes	1	7	3,224 (12.4 yrs)
	Forklifts	3	8	3,224 (12.4 yrs)
	Generator Sets	1	8	3,224 (12.4 yrs)
	Tractors/Loaders/Backhoes	3	7	3,224 (12.4 yrs)
	Welders	1	8	3,224 (12.4 yrs)
Paving				
	Pavers	2	8	229 (0.9 yrs)
	Paving Equipment	2	8	229 (0.9 yrs)
	Rollers	2	8	229 (0.9 yrs)
Architectural Coating				
	Compressors	1	6	3,224 (12.4 yrs)

* From Table 6-1 and assuming 260 construction days per year.

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Table 6-4 below presents the construction emissions compared to the current (as of April 2022) SMAQMD significance thresholds[24]. The Alternative 2 values in Table 6-4, along with their corresponding season or year of the maxima, were taken from the CalEEMod reports in Appendix E and depict the maximum annual and maximum daily emissions during the construction period. All of the emissions are less than the significance thresholds, except for daily NO_x that has no threshold.

Table 6-4: Maximum Daily Construction Emissions Compared to Significance Thresholds

	ROG (lb/day)	NO_x (lb/day)	Total PM_{10} (lb/day)	Total PM_{10} (tpy)	Total $PM_{2.5}$ (lb/day)	Total $PM_{2.5}$ (tpy)
Alternative 2 Emissions	57.3 (Summer)	68.5 (Winter)	45.4 (Winter)	5.7 (2027)	12.9 (Winter)	1.6 (2027)
SMAQMD Significance Thresholds	None	85	80	14.6	82	15
Exceed Threshold?	**N/A**	**No**	**No**	**No**	**No**	**No**

[24] *http://www.airquality.org/LandUseTransportation/Documents/CH2ThresholdsTable4-2020.pdf*

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Attachment 2

REVISION 4 - UPDATED GREENHOUSE GAS REDUCTION PLAN FOR THE PROPOSED JACKSON TOWNSHIP SPECIFIC PLAN KLEINFELDER PROJECT NO. 20221505.001A

AUGUST 25, 2022

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A Report Prepared for:

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REVISION 4 - UPDATED GREENHOUSE GAS REDUCTION PLAN FOR THE PROPOSED JACKSON TOWNSHIP SPECIFIC PLAN

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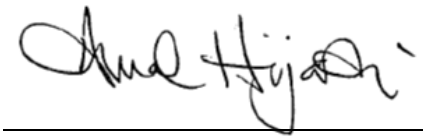

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August 25, 2022
Kleinfelder Project No: 20221505.001A

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REVISION 4 - UPDATED GREENHOUSE GAS REDUCTION PLAN FOR THE PROPOSED JACKSON TOWNSHIP SPECIFIC PLAN

1 EXECUTIVE SUMMARY

1.1 INTRODUCTION

Tsakopoulos Investments (the Applicant) is proposing the Jackson Township Specific Plan (Jackson Township) encompassing approximately 1,391 acres of land located in southeastern Sacramento County, east of Excelsior Road, north of Jackson Highway, and west of Eagles Nest Road. The proposed project is located approximately ten miles southeast of the Sacramento central business district. The Jackson Township project is a mixed-use development that includes a mix of different housing types and commercial and retail land uses. The Proposed Project (formerly referred to as the California Environmental Quality Act, CEQA, Alternative 2) is evaluated in this report.

In August 2015, an Air Quality Mitigation Plan (AQMP) and a Greenhouse Gas Reduction Plan (GHGRP) were prepared for the Jackson Township Specific Plan. The 2015 AQMP/GHGRP was based on then-current emission models and Guidance and was for the Jackson Township project-alone scenarios. Since that time, there have been new models, data, and Guidance published, and the Sacramento County Planning Division (PER) wishes to also evaluate the CEQA cumulative scenarios. Project-alone scenarios, referred to herein as Project-Related vehicle miles traveled (VMT), assume that Jackson Township is the only project developed in the area. Cumulative scenarios (Cumulative VMT) are based on the assumption that there will be other projects developed in the area, and thus the VMT associated with Jackson Township is less because drivers can make combined trips (e.g., stopping by a supermarket on the way home from work). The proposed land uses for the Jackson Township Project-Related scenario are the same as for the Cumulative scenario; only the VMT is different.

In February 2019 an update to the August 2015 AQMP/GHGRP that was based on the then current (as of January 2019) models, data, and Guidance was submitted to PER and the Sacramento Metropolitan Air Quality Management District (SMAQMD). In March 2019, the SMAQMD requested that the Applicant submit a revision to the February 2019 AQMP/GHGRP to refine some of the mitigation calculations, and Revision 1 was submitted April 16, 2019. In May 2019, SMAQMD requested some additional changes to further clarify some of the mitigation measures, and Revision 2 to the AQMP/GHGRP was submitted. Then on November 25, 2020, Revision 3 to the GHGRP (alone, not the AQMP) was prepared and

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submitted in response to comments made on the Draft Environmental Impact Report and newly adopted GHG thresholds and standards. In January 2021, GHGRP Revision 3a was prepared to address the GHG significance thresholds published by the SMAQMD[1] and adopted by the County of Sacramento on December 16, 2020. Revision 3a incorporated comments made by the SMAQMD and PER on the Revision 3 GHGRP.

The December 2020 SMAQMD GHG thresholds (which are still in effect as of April 2022) require that the Jackson Township Specific Plan Alternative 2 meet both Tier 1 and Tier 2 Best Management Practices (BMPs). Those BMPs are addressed below in Section 1.2. The third BMP was promulgated considering implementation of Senate Bill 743 (SB 743) requirements by the local jurisdiction, the County in this case. SB 743 states that transportation impacts under CEQA may no longer be measured with automobile delay and level of service (LOS) after July 1, 2020. SB 743 is designed to encourage reduction of GHG emissions from transportation, and since the third BMP published by SMAQMD is aimed at meeting SB 743, the thresholds established by the third BMP for the project will be referred to as the SB 743 'target level.'

Since January 2021 there have been a number of additional changes to the traffic and emission models, and updated Guidance has been published by the California Air Pollution Control Officers Association (CAPCOA) and SMAQMD. Thus, in April through June 2022, revised AQMP and GHGRP documents were prepared. The plans were separated into two individual documents, and this revised GHGRP is termed Revision 4.

This Revision 4 to the GHGRP addresses the following:

- Updated SMAQMD Guidance for AQMP and GHGRPs (Version 4.3)[2].
- Updated CAPCOA mitigation measures (CAPCOA 2021 Handbook)[3].
- New California Emissions Estimator Model (CalEEMod) version (Version 2020.4.0).
- Only the Proposed Project (Alternative 2) now requires evaluation.

[1] Greenhouse Gas Thresholds for Sacramento County, *SMAQMD, June 2020.*

[2] *SMAQMD, 2021. Recommended Guidance for Land Use Emission Reductions Version 4.3 (Operational Emissions.* Available at https://www.airquality.org/residents/ceqa-land-use-planning/mitigation. Accessed April 2022.

[3] CAPCOA, 2021. *Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity*. Available at https://www.airquality.org/residents/climate-change/ghg-handbook-caleemod. Accessed April, 2022.

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- Updated 2022 Traffic Study completed by PER with more current Project-Related and Cumulative VMT than examined in 2019.
- Change in Operational Year to 2040 (from 2035) and start of construction to 2025 (from 2020).
- Additional transportation related VMT reductions that were not analyzed as part of the updated Traffic Study.
- Additional non-transportation mitigation commitments made in the previous GHGRPs.
- Additional mitigation beyond that included in previous GHGRPs.

Kleinfelder, Inc. (Kleinfelder) prepared this GHGRP consistent with SMAQMD Guidance and PER direction. PER staff reviewed the calculations, methodology, and document.

For the GHGRP, the SB 743 requirement that new development VMT per resident and per employee are less than 85 percent of regional values was used. The VMT per resident and per employee are the metrics that must be used to determine significance under CEQA. If the SB 743 metrics cannot be met, then additional offsetting GHG emission reductions must be implemented to achieve an equivalent reduction to the SB 743 target level. This GHGRP demonstrates that the Jackson Township Specific Plan GHG emissions are less than significant. In addition, the GHGRP provides an assessment of total (mobile plus non-mobile) GHG emissions as a point of information and shows that with the planned mitigation, net GHG emissions are less than zero (a net positive benefit for GHG emissions).

VMT per resident and per employee were calculated as part of the 2022 Traffic Study prepared for PER. Mobile GHG emissions were calculated with VMT data provided in the Traffic Study and emission factors (gram per mile, g/mile) obtained from the current (as of April 2022) EMFAC 2021 (Version 1.0.1) emissions model. Non-mobile and construction GHG emissions were calculated from the current (as of April 2022) version of CalEEMod (Version 2020.4.0). The CalEEMod model uses details regarding specific land uses (e.g., strip mall) and various additional parameters (e.g., vehicle trip frequency and length associated with a land use and emission factors for vehicles) to calculate annual GHG emissions (metric tons per year, MT/yr).

For Jackson Township, in early 2022, PER had a comprehensive Traffic Study completed that calculated the amount of traffic associated with both Jackson Township and other Jackson Highway projects and included induced VMT that is the result of additional vehicle travel that is the result of improved roads in the proposed Jackson Township area, but the VMT is not caused by the project itself. The Traffic Study analyzed effects of Jackson Township and the other projects on a regional Project-Related and a regional Cumulative basis, starting with the existing conditions and then adding Jackson Township and the other

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projects. The Traffic Study also accounted for most of the large number of design features incorporated into Jackson Township that greatly reduce the amount of VMT. These features include, but are not limited to, the location, density/mix of land uses, internal proximity, multi-modal efficiency, and transit supportive measures. Although the Traffic Study accounted for most of the VMT mitigations included in the Project, it did not account for all. The added benefit of these study-omitted measures is evaluated after the Traffic Study and are discussed in Section 2.2.

For non-mobile and construction GHG emissions, Kleinfelder ran CalEEMod with detailed land uses for Alternative 2, including parking lot areas, as provided by the Applicant. The detailed land uses entered into CalEEMod are discussed in Section 3. VMT was not used in the CalEEMod runs because mobile GHG emissions are calculated from the Traffic Study and EMFAC 2021 emission factors.

1.2 SB 743 TRANSPORTATION TARGET LEVEL

The SMAQMD GHG rules for large projects such as the Jackson Township Specific Plan require implementation of three BMPs:

- BMP 1 specifies that projects shall be designed and built without natural gas infrastructure.
- BMP 2 specifies that projects shall meet current CalGreen Voluntary Tier 2 standards, except that all electric vehicle (EV) capable (EV Capable) spaces shall instead be EV Ready. EV Capable means that the parking space will be installed with a raceway and electrical panel capable of supporting an EV charging station. EV Ready means that in addition to the raceway and panel, dedicated branch circuits, circuit breakers, and other electrical components will be installed to support future installation of charging stations but does not include installation of the charger itself. Current CalGreen Voluntary Tier 2 standards require 100 percent of single family and 20 percent of multi-family housing to be pre-wired to EV Ready.
- BMP 3 specifies that a project shall comply with the local jurisdiction's SB 743 requirements if they have been adopted. Sacramento County adopted SB 743 requirements on October 6, 2020. The Sacramento County program requires VMT per capita for a proposed project achieve a 15 percent reduction in regional VMT per resident and VMT per employee and that there shall be no net increase in retail VMT. The County program provides that if the VMT reduction standard cannot be met the County can find a significant and unavoidable impact and override such impact.

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The SMAQMD Guidance allows project proponents to demonstrate equivalent GHG emission reductions if the BMPs cannot be met, and if a Jackson Township entity requires natural gas access in the future, equivalent emission reductions will be needed to meet the BMP 3 requirement. The BMPs are not optional, but because applicants can use other measures to achieve emission reductions equivalent to the BMPs, all of the emission reductions are creditable.

On August 4, 2022, Kimley-Horn (K-H) prepared a memorandum for PER that evaluated Jackson Township Alternative 2 with respect to the SB 743 BMP 3 target level. The K-H memo also described the amount of VMT reduction that was not accounted for in the Traffic Study and that would occur from the additional mitigation planned for Jackson Township. The K-H memo is shown in Appendix A.

Table 1-1 shows the per capita VMT values for Jackson Township Alternative 2 when only the Traffic Study VMT is considered and when the additional transportation-related mitigation evaluated by K-H is included. Table 1-2 shows the additional transportation-related mitigation evaluated by K-H. Both Project-Related VMT and Cumulative VMT were evaluated. (The VMT mitigation shown in Table 1-2 is included in the results of Table 1-1.)

Table 1-1: Regional VMT Per Resident and Per Employee
When Additional Transportation Mitigation is Included

Land Use	VMT Per Resident	VMT Per Employee
Regional VMT No Project	20.20	16.04
Significance Target Level (15% below regional average)	*17.17*	*13.64*
Jackson Township Project-Related VMT based on Traffic Study	17.46	16.48
Additional Mitigation Reduction in VMT (Table 1-2, - 3.0% and -12.3%)	- 0.52	- 2.03
Jackson Township Project-Related VMT After Additional Transportation Mitigation	**16.94**	**14.45**
Below Significance Target Level?	Yes	No
Regional VMT Super Cumulative No Project	18.40	13.31
Significance Target Level (15% below regional average)	*15.64*	*11.31*
Jackson Township Cumulative VMT based on Traffic Study	13.97	12.68
Additional Mitigation Reduction in VMT (Table 1-2, - 3.0% and -12.3%)	- 0.42	- 1.56
Jackson Township Project-Related VMT After Additional Transportation Mitigation	**13.55**	**11.12**
Below Significance Target Level?	Yes	Yes

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Table 1-2: Additional Transportation Mitigation Included in the Alternative 2 Project

Measure	VMT per Resident % Reduction	VMT per Employee % Reduction
Mandatory Community-Wide TMA* Participation (M-3)	- 2.08 %	- 12.3%
Electric Bike Share (T-22-B)	- 0.05 %	NA
Electric Scooter Share (T-22-C)	- 0.06 %	NA
Adding Sidewalks (T-18)	- 1.0 %	NA
Total Percent Reduction**	**- 3.0 %**	**- 12.3 %**

* Transportation Management Association

** Reported total reduction may not sum to table entries due to roundoff differences.

With the additional transportation mitigation, the Jackson Township VMT per resident for both the Project-Related VMT and Cumulative VMT scenarios and VMT per employee for the Cumulative scenario are less than the significance target levels. However, the VMT per employee for the Project-Related scenario is greater than the significance target level, so additional mitigation of GHG will be implemented to meet that level as described in Section 2.3. The amount of required equivalent emission reductions is shown in Table 2-4 and amounts to 391 metric tons per year (MT/yr) GHG emissions[4]. Tables 1-4 and 5-6 shows that the proposed Jackson Township project includes more than 40,000 MT/yr of GHG emission reductions, thus, the SB 743 VMT per employee target level is easily met.

Note that the two VMT metrics (residential and employee) calculated by K-H are evaluated independently. Some of the same VMT is counted in both metrics, so if one adds the K-H memo residential VMT to the employee VMT, the total is greater than when the project VMT is evaluated as a whole single entity. For example, some of the Jackson Township residents work at businesses within Jackson Township, but that VMT is counted twice: once for the residential metric and once for the employee metric. There are other duplications in the VMT analysis between the two metrics, so they are evaluated separately. Furthermore, the VMT used in the two metrics do not account for mutually beneficial land uses that result in less VMT. The issues with the VMT are an inherent feature of the current VMT modeling and future modeling may be able to refine those limitations. This GHGRP is based on the only currently available VMT modeling and thus provides a conservative overestimate of the mitigation needed.

[4] Note that unless otherwise stated GHG emissions are in terms of carbon dioxide equivalent emissions (CO_2e).

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With respect to the no net increase in retail VMT requirement of BMP 3, PER distinguishes between local serving and regional serving retail. Local serving retail can be screened out of the VMT analysis and PER concluded that the Jackson Township meets the no net increase in retail VMT requirement.

1.3 CONSTRUCTION EMISSIONS

GHG emissions from construction activities are not generally considered a meaningful GHG impact because they are typically a one-time activity over a relatively short period of time compared to the operational life of a project, and because projects do not typically create "new" construction equipment or emissions (i.e., the construction equipment will be used somewhere else even if the proposed project is not constructed). However, as construction of the Jackson Township will occur over about a 15-year period, the associated GHG emissions are also assessed herein. The total construction emissions for the 15-year period estimated with the CalEEMod model were amortized over the life of the project assuming a 50-year lifetime[5] and added to the operational emissions, for a total of 65 years. Sixty-five years was used because there are operational emissions during the construction period. Section 4 discusses construction GHG emissions.

1.4 OPERATIONAL GHG EMISSIONS

Non-mobile operational GHG emissions were calculated from the CalEEMod emissions model for operational year 2040 and are discussed in Section 3.1. GHG emissions from mobile sources were calculated using EMFAC 2021 emission factors for calendar year 2040 (all model years, all vehicle types, and all fuel types) and the total Project VMT (for both the Project-Related and the Cumulative scenarios) as discussed in Section 3.2.

Table 1-3 shows the calculated mobile and non-mobile GHG emissions for Jackson Township when only the Traffic Study and no additional mitigation is considered. Table 1-3 shows GHG emissions calculated by CalEEMod for business as usual (BAU), which are the emissions that a typical project in Sacramento County would have when no mitigation is included. With only the Traffic Study mitigation, total emissions from the Jackson Township are from 41 to 66 percent less than BAU.

[5] *According to the NewBridge Specific Plan Greenhouse Gas Reduction Plan dated July 10, 2020, Footnote 15 on Page 23; 50 years is the most commonly used duration for building life-cycle analyses and is used by the European Union for building life spans for modern buildings.*

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Table 1-3: Total and Mobile-Only Annual BAU and Jackson Township GHG Emissions

VMT Scenario	Annual Non-Mobile GHG (MT/yr)	Annual Mobile GHG (MT/yr)	Total Operational GHG (MT/yr)
BAU Alternative 2 Annual Mobile-Only Emissions	12,890	63,703	76,593
Project-Related VMT Alternative 2 Annual Emissions	12,890	32,497	45,387
Percent Reduction from BAU for Project-Related VMT	**--**	**- 49.0 %**	**- 40.7 %**
Cumulative VMT Alternative 2 Annual Emissions	12,890	21,381	34,271
Percent Reduction from BAU for Cumulative VMT	**--**	**- 66.4 %**	**- 55.3 %**

The large reduction from BAU in vehicle travel and emissions of GHG are accomplished through a large number of Jackson Township project design features proposed by the Applicant. The features that reduce emissions include, but are not limited to, those listed immediately below. Where applicable, the related current (as of April 2022) CAPCOA[6] 2021 Handbook greenhouse gas mitigation measures (T-xx), the SMAQMD[7] land use emission reduction measures (LUT-xx), and the Sacramento County Revised Final Draft Community Wide Climate Action Plan (CAP)[8] measures (GHG-xx) are noted. However, the CAPCOA, SMAQMD, and Sacramento County emission reduction percentages for the noted measures were not used, rather the Traffic Study VMT was used to calculate emissions. Note that the Traffic Study is SMAQMD pre-requisite measure TS – Traffic Study. The figures and exhibits in Appendix L further illustrate some of the measures noted below.

LOCATION (T-1, T-2, GHG-22):

- Project is located in a suburban center within approximately ten miles of the Sacramento downtown central business district and less than five miles from other existing high-density commercial/job center areas (LUT-2 and LUT-3).
- Project is located adjacent to other planned developments such that single-use trips are minimized, i.e., there are more pass-by and diverted trips (LUT-3 and LUT-4).

[6] CAPCOA, 2021. Op cit.

[7] SMAQMD, 2021, Op cit.

[8] Sacramento County, 2022. *Revised Final Draft Community Wide Climate Action Plan, February 2022.* Available at https://planning.saccounty.net/PlansandProjectsIn-Progress/Pages/CAP.aspx. Accessed April 2022.

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DENSITY/MIX (T-1, T-2, T-3, T-4, GHG-22):

- Project provides a compact mix of land uses in close proximity to each other with a highly connected street and trail network (LUT-3).
- Project design is for high and medium density housing for over half of the total project dwelling units (LUT-1).
- Housing density is better than 9.5 dwelling units per acre (LUT-1).
- Project includes below market rate housing (LUT-6).
- Approximately 15 percent of the total commercial square footage is dedicated to a mixed-use facility that combines residences and commercial/retail uses (LUT-3).

INTERNAL PROXIMITY (T-31-A, GHG-15, GHG-22):

- Most residential units are within 1,320 feet (one-quarter mile) of a neighborhood park, open space, school, and/or bicycle/pedestrian trail (LUT-3).
- Most residential units are less than one-half mile from shopping and services (LUT-4).
- Project design includes locating at least four schools within the project boundaries such that most students can walk to a local school (LUT-3 and LUT-4).
- Project design includes at least eight parks within the project boundaries such that residents can walk/bike to enjoy the parks (LUT -3 and LUT-4).

MULTI- MODAL EFFICIENCY (T-10, T-17, T-18, T-29, T-25, T-26, T-32, T-37, T-47, GHG-14, GHG-17):

- Project design is based on a network of streets in a grid pattern (LUT-8).
- Project design includes access to high frequency bus service that connects to the Watt/Manlove light rail station (LUT-5).
- Bus routes are signalized in order to avoid traffic delays (T-27).
- Project design promotes a multi-modal system that makes public transit, walking, and bicycling viable and attractive travel choices for residents and employees. Features include:
    - Adequate bike parking at non-residential locations, including the transit center and park and ride locations (T-34, T-47).
    - Showers/lockers and other end of trip facilities at non-residential buildings (T-10).
    - Long-term bike parking facilities (T-34, T-47).

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- Project includes an extensive pedestrian path and trail system that is convenient and accessible from homes, school, parks, employment, and shopping (LUT-8).
- Pedestrian and bike paths minimize any barriers to pedestrian/bicycle use (e.g., fences, berms and other impediments are eliminated where possible) (LUT-8, T-18, T-20).

TRANSIT SUPPORTIVE (T-3, T-5, T-6, T-9, T-25, T-27, T-28, T-32, T-38; GHG-14, GHG-22):

- Project includes an on-site transit center and park and ride facilities along the designated transit route of Jackson Highway (LUT-5, T-3).
- Project subsidizes bus rapid transit lanes on Jackson Highway (T-27).
- Project funding and design will result in bus headways of 15 minutes or better (T-26).
- Project includes joining a Transportation Management Association (TMA) funded through assessments. Although the project will include a TMA, no VMT reduction from the TMA has been calculated or included in the Traffic Study.
- Project includes assessments for regional transportation improvements (T-27).

1.5 ADDITIONAL MITIGATION

Additional VMT mitigation analyzed by Kimley-Horn beyond that incorporated into the Traffic Study include the following features noted in Table 1-2. Where applicable, the CAPCOA 2021 Handbook mitigation measure number (T-xx) is noted:

- Mandatory Community-Wide Transportation Management Association Participation (M-3[9]),
- Electric Bike Share (T-22-B),
- Electric Scooter Share (T-22-C),
- Adding Sidewalks (T-18), and
- Carpooling/Rideshare (T-8).

Additional non-transportation mitigation or GHG reductions not directly related to reducing VMT are discussed in Section 5.2 and include the following:

[9] Measure M-3 is a Miscellaneous measure that is a mandatory TMA program for residents and employees that is paid annually as an assessment on both residential and non-residential properties. It is most analogous to T-6, which is normally a project/site-scale measure and allows up to 26% reduction; however, for Jackson Township it is applied community-wide, includes carpooling and rideshare, and totals 12.3% reduction. See Section 2.2.

- Elimination of all natural gas emissions because natural gas infrastructure is prohibited under BMP-2.
- Preservation of 1,368.9 acres of vegetated land.
- Elimination of cattle grazing that currently occurs on portions of the property.
- Planting of over 20,000 new trees as part of the Project.
- All electric landscaping equipment.
- All landfills capture landfill gas for energy recovery.
- Installation of 805 non-residential electric vehicle (EV) charging stations serving 1,610 parking spaces.
- Pre-wiring all single-family housing (3,540 units) and 77 percent of high-density multi-family housing (77 percent of 2,150 units) for EV chargers. (Note that the 2022 version of California Green Building Code (CCR Title 24), effective January 1, 2023, also requires EV chargers for non-residential and multi-family housing. Should Title 24 mandate more EV chargers than committed to herein, the number of EV chargers will be increased to meet Title 24 requirements.)
- Redevelopment of the Sacramento Raceway which will cease operations with the full build out of the Jackson Township.
- Electrification of construction equipment where feasible and improved fuel efficiency for equipment, thus reducing construction GHG emissions by more than 67 percent.

All of the Jackson Township mitigation measures will be documented and made compulsory through the approved Final Environmental Impact Report (FEIR) under CEQA and the financing plan. Appendix L provides land use and other exhibits supporting the planned mitigation measures.

Although there are a large number of mitigation measures to reduce GHG emissions, there are two activities associated with the Project that will increase emissions (described in Section 5.2):

- Elimination of about 180 existing trees that cannot be preserved, and
- Redevelopment of 1,316.3 acres of existing grassland.

To calculate total GHG emissions associated with the Project, all of the above features have been assessed, and the results are shown in Table 1-4.

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Table 1-4: Net Annual GHG Emissions for Alternative 2 GHG Emissions

Description	Project-Related VMT Scenario Annual GHG Emissions (MT/yr)	Cumulative VMT Scenario Annual GHG Emissions (MT/yr)
Annual Non-Mobile Operational Emissions from CalEEMod (Table 2-3)	12,890	12,890
Amortized Annual Construction Emissions (Section 4)	1,129	1,129
Annual Mobile Emissions from Traffic Study (Table 3-2)	32,497	21,381
Total Annual Operational Non-Mobile plus Construction plus Mobile Emissions	*46,516*	*35,400*
Penalty for Removal of Grassland (Section 5.3.1)	322	322
Penalty for Removal of Trees (Section 5.3.2)	7	7
Total Equivalent Project Emissions (including penalties)	**46,845**	**35,729**
Reduced VMT (Table 5-3)	- 1,885	- 1,240
Eliminate Natural Gas Emissions (Section 5.2.1)	- 7,431	- 7,431
Reduction from Jackson Township Vegetation Preserve (Section 5.2.2)	- 2,905	- 2,905
Reduction from Elimination of Cattle (Section 5.2.3)	- 168	- 168
Reduction from Jackson Township Trees (Section 5.2.4)	- 730	- 730
Reduction from Electric Landscaping Equipment (Section 5.2.5)	- 98	- 98
Reduction from Landfill Gas Energy Recovery (Section 5.2.6)	- 1,183	- 1,183
Reduction from 805 Non-residential EV Charging Stations (Section 5.2.7)	- 12,250	- 12,250
Reduction from Residential Housing EV Charging (Section 5.2.8)	- 17,898	- 12,156
Redevelop Sacramento Raceway (Section 5.2.9)	- 1,610	- 1,610
Reduction from Electrified Construction Equipment (Section 5.2.10)	- 756	- 756
Total GHG Reductions	*- 46,914*	*- 40,527*
Net GHG After Reductions	**- 69**	**- 4,798**

1.6 NON-QUANTIFIED MITIGATION

The preceding deals only with quantified GHG emission reductions. There are numerous other project design features that also result in reduced GHG emissions, but the benefit of those features has not been quantified. Some of those features are:

- An over-statement of VMT because the VMT per resident and per employee values do not account for the mutually beneficial interaction of the Jackson Township Specific Plan with other

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existing and/or approved land uses that result in reduced VMT. For example, Jackson Township schools and retail will serve not only Jackson Township residences but existing residences in the area, thus reducing the distance traveled by existing persons.

- An over-statement of employee VMT because the VMT per employee does not account for the current shift to work-from-home and remote working/learning that is occurring.
- Participation in the Sacramento County affordable housing program. Providing affordable (below market rate) housing allows residents to live closer to job or schools, reducing commute distances and emissions.
- Low flow bathroom fixtures, kitchen fixtures, showers, and toilets in all residential units and commercial buildings.
- Reduced square footage of residential turf due to the increased housing density.
- Water efficient irrigation systems and water efficient landscaping for the non-residential areas.
- Some of the existing homes located within the Jackson Township Specific Plan will be replaced with more modern and energy efficient homes and existing sources of natural gas combustion will be removed.
- Increased landfill gas capture efficiency to more than 90 percent. Many existing landfills in California capture well in excess of 90 percent, and by 2040 that should be standard for all landfills.
- More efficient water treatment digester gas capture and energy recovery.
- Additional electric construction equipment that will be developed and implemented by 2040.
- Increased fuel efficiency of non-electric construction equipment that will occur before 2040.
- There may be additional GHG reduction measures that could be implemented as the result of the Final Draft Sacramento County Climate Action Plan but have not been accounted for herein.

And most significantly, all of the mobile-source emission estimates are over-stated and the benefit of EV charging stations under-stated because they do not account for more electric vehicle penetration than assumed, and other changes in transportation that will have to occur if California is to reach the 2050 GHG reduction goals. For example, the new (April 1, 2022) Federal passenger car and light duty truck fleet wide average fuel economy standard of approximately 49 miles per gallon (mpg) for new vehicles by calendar year 2026 has not been accounted for. Thus, prior to full development of Jackson Township in 2040, there will be greater GHG emission reductions and even lower GHG emissions than stated herein.

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2 SB 743 SIGNIFICANCE TARGET LEVELS BASED ON THE TRAFFIC STUDY

In response to SB 743, SMAQMD and Sacramento County PER established VMT per resident and VMT per employee metrics of significance that replaced previously used emissions metrics. This and the following sections discuss how the proposed Jackson Township VMT more than meets the adopted metrics in response to SB 743. The significance metrics are that the Project VMT per resident and VMT per employee must both be 15 percent less than regional values.

2.1 VMT PER RESIDENT AND EMPLOYEE BASED ON THE TRAFFIC STUDY

The Traffic Study prepared for PER provided data that were used to calculate the regional and Project VMT per resident and per employee. The results of the Traffic Study-based calculations were summarized in the K-H Memo included in Appendix A and are shown in Table 2-1. The VMT data from the Traffic Study include induced VMT that is the result of improved roads but not part of the project itself.

Table 2-1: Regional VMT Per Resident and Per Employee Based on Traffic Study

Land Use	VMT Per Resident	VMT Per Employee
Regional VMT No Project	20.20	16.04
Significance Target Level (15% below regional average)	*17.17*	*13.64*
Jackson Township **Project-Related VMT based on Traffic Study**	**17.46**	**16.48**
Regional VMT Super Cumulative No Project	18.40	13.31
Significance Target Level (15% below regional average)	*15.64*	*11.31*
Jackson Township **Cumulative VMT based on Traffic Study**	**13.97**	**12.68**

Table 2-1 shows that the Project-Related scenario VMT per resident, the Project-Related scenario VMT per employee, and the Cumulative scenario VMT per employee exceed the significance target levels; but

the Cumulative scenario VMT per resident does not. However, the Traffic Study does not include all of the Project's mitigation as discussed below.

2.2 VMT PER RESIDENT AND EMPLOYEE WHEN ADDITIONAL TRANSPORTATION MITIGATION IS CREDITED

Kimley-Horn analyzed the Traffic Study prepared for PER and identified additional transportation related mitigation that is included in the Jackson Township design and operations but not accounted for in the Traffic Study. The results of the analysis are reported in the K-H Memo (Appendix A) and are repeated in Table 2-2. Table 2-2 also shows, where applicable, the CAPCOA 2021 Handbook mitigation measure number (T-xx). The K-H Memo in Appendix A describes each mitigation measure in detail.

Table 2-2: Additional Transportation Mitigation Included in the Alternative 2 Project

Measure	VMT per Resident % Reduction	VMT per Employee % Reduction
Mandatory Community-Wide TMA Participation (M-3)	- 2.08 %	- 12.3%
Electric Bike Share (T-22-B)	- 0.05 %	NA
Electric Scooter Share (T-22-C)	- 0.06 %	NA
Adding Sidewalks (T-18)	- 1.0 %	NA
Total Percent Reduction*	**- 3.0 %**	**- 12.3 %**
Total Percent Reduction for Combined Measures T-18 through 22-C	- 1.1 %	NA

* Reported total reduction may not sum to table entries due to roundoff differences.

CAPCOA Measure T-6, Mandatory Trip Reduction Program, is normally applied as a Project/Site-scale measure and thus is not combinable with the Plan/Community-scale measures T-18 and T-22. However, in the case of the Jackson Township measure M-3 has been created that is allowed at the Plan/Community-scale level and consists of a community-wide mandatory trip reduction program that will be required of all residents and employers within Jackson Township. Under this program, both residential and non-residential property will be subject to an annual assessment through a County Service Area (CSA) fee that will be used for the TMA services and programs. Rideshare and carpool programs will be part of the M-3 measure. As measure M-3 is considered a Plan/Community scale measure it can be combined with T-18 and T-22.

CAPCOA establishes emission reduction caps on measures for which CAPCOA establishes a percent reduction (i.e., the T-xx measures) calculation. The cap for measures T-18 through 22-C is 10 percent. As shown in Table 2-2, the cap is not exceeded.

The total percent reductions shown in Table 2-2 can be applied directly to the VMT per resident and per employee metrics and the results are shown in Table 2-3.

Table 2-3: Regional VMT Per Resident and Per Employee
When Additional Transportation Mitigation is Included

Land Use	VMT Per Resident	VMT Per Employee
Regional VMT No Project	20.20	16.04
Significance Target Level (15% below regional average)	*17.17*	*13.64*
Jackson Township Project-Related VMT based on Traffic Study	17.46	16.48
Additional Mitigation Reduction in VMT (- 3.0% and -12.3%)	- 0.52	- 2.03
Jackson Township Project-Related VMT After Additional Transportation Mitigation	**16.94**	**14.45**
Less than Significance Target Levels	**Yes**	No
Regional VMT Super Cumulative No Project	18.40	13.31
Significance Target Level (15% below regional average)	*15.64*	*11.31*
Jackson Township Cumulative VMT based on Traffic Study	13.97	12.68
Additional Mitigation Reduction in VMT (- 3.0% and -12.3%)	- 0.42	- 1.56
Jackson Township Cumulative VMT After Additional Transportation Mitigation	**13.55**	**11.12**
Less than Significance Target Levels	**Yes**	**Yes**

With the additional transportation mitigation, the Jackson Township VMT per resident for both the Project-Related VMT and Cumulative VMT scenarios and VMT per employee for the Cumulative VMT scenario are less than the significance target levels. However, the VMT per employee for the Project-Related VMT scenario is greater than the significance target level, so additional mitigation will be implemented as described in Section 2.3 to meet the target level.

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2.3 ADDITIONAL GHG MITIGATION NEEDED TO ACHIEVE THE VMT PER EMPLOYEE SIGNIFICANCE TARGET

The difference between the Project-Related 14.45 VMT per employee value and the significance target level of 13.64 can be converted into equivalent GHG emissions as shown in Table 2-4.

Table 2-4: Equivalent GHG Emissions for the Project-Related VMT per Employee

Index		VMT Per Employee
1	Project-Related VMT per Employee (from Table 2-3)	14.45
2	Significance Target Level VMT per Employee (from Table 2-3: 15% below regional average)	13.64
3	Difference in VMT per Employee	0.81
4	Number of Employees (Note 1)	7,130
5	Excess Daily VMT (miles/day) (Line 3 x Line 4)	5,775
6	Excess Annual VMT (miles/year) (Line 5 x 240, Note 2)	1,386,000
7	GHG Emission Factor (grams/mile) (from Appendix AJ-3, light, and medium duty vehicles)	282.1
8	Excess GHG Emissions (MT/yr) (Line 6 x Line 7 converted to MT)	391

Note 1: Reported by Kimley-Horn, personal communication April 15, 2022.
Note 2: 240 days per year was used because the metric is employee travel, and employees were assumed to work 5 days per week, 52 weeks per year, less 2 weeks of vacation, and 10 holidays.

The excess emissions of 391 MT/yr shown in Table 2-4 must be offset in accordance with County and SMAQMD requirements in order to meet SB 743. As shown in Section 3, the 391 MT/yr excess emissions will be much more than offset through the additional committed mitigation discussed in Section 5.

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3 PROPOSED JACKSON TOWNSHIP OPERATIONAL GHG EMISSIONS

VMT per resident and per employee metrics do not indicate the magnitude of GHG emissions; thus, this and following sections discuss GHG emissions for informational purposes and to show that the planned mitigation more than achieves the emission reductions needed to meet the Project-Related VMT per employee target level shown in Section 2.3.

GHG operational emissions are calculated using two different sources, one for non-mobile emissions (CalEEMod) and one for mobile emissions (EMFAC 2021). Sacramento County does not use CalEEMod for transportation related GHG emissions because it cannot adequately capture the trip redistribution of a project, as it does not consider regional travel dynamics. Accordingly, it is the County's practice to calculate emissions directly from the VMT data in the traffic study using the most recent California EMFAC model, which (as of April 2022) is EMFAC 2021. Therefore, transportation-related GHG emissions were calculated with EMFAC 2021 for both the Project-Related and the Cumulative VMT scenarios.

3.1 OPERATIONAL GHG NON-MOBILE EMISSIONS ESTIMATING METHODOLOGY

Kleinfelder calculated operational non-mobile emission estimates for Alternative 2 with the CalEEMod emissions model, Version 2020.4.0. CalEEMod calculates emissions for criteria pollutants and GHG based on detailed land use parameters (e.g., acreage, dwelling units, square feet, number of fueling pumps) and vehicle emissions associated with each land use. The detailed land uses shown in Appendix B were used to estimate emissions. CalEEMod Version 2020.4.0 is based on EMFAC 2017 and the 2019 Title 24 Energy Standards that were promulgated in March 2018 and became effective January 1, 2020.

Except for the CO_2 intensity for electrical generation, the mobile source emissions category, the number of fireplaces and hearths, and the additional mitigation calculations as explained below, CalEEMod default input factors were used to calculate emissions. CalEEMod was run for a full build-out year of 2040 and start of construction in 2025. Three CalEEMod scenarios were run: business as usual (BAU), Project-Related VMT, and Cumulative VMT.

For all three CalEEMod scenarios, electrical generation greenhouse gas intensity was entered as zero. This is because the Sacramento Municipal Utility District (SMUD) has committed to 100 percent renewable energy by 2030.

CalEEMod includes emissions from mobile sources, but these were not used, rather the Traffic Study VMT and EMFAC emissions were used.

Appendix D contains the CalEEMod runs for BAU, Project-Related and Cumulative VMT. Appendix D shows the annual VMT for BAU, which is 211,550,554 miles per year. If one compares the business-as-usual VMT to the VMT forecast by the Traffic Study (Appendix C), the Traffic Study VMT for Alternative 2 is about 43 (Project-Related VMT) to 61 (Cumulative VMT) percent less than BAU (the annual VMT shown in Appendix C are also reported in Section 3.2).

Table 3-1 shows the non-mobile GHG emissions estimated with CalEEMod when electrical energy generation GHGs are zero (taken from the reports in Appendix D). These emissions include GHG from natural gas combustion, digester gas emissions from wastewater treatment, landfill gas emissions from solid waste disposal, and GHG emissions from landscaping equipment. Because the non-mobile GHG emissions are only related to land uses, there is no difference between BAU, Project-Related VMT, and Cumulative VMT scenario GHG emissions.

Table 3-1: Non-Mobile Jackson Township GHG Emissions

VMT Scenario	Annual GHG
BAU Alternative 2 Annual Non-Mobile Emissions	12,890* MT/yr
Project-Related VMT Alternative 2 Annual Non-Mobile Emissions	12,890* MT/yr
Cumulative VMT Alternative 2 Annual Non-Mobile Emissions	12,890* MT/yr

* Non-mobile emissions equal total emissions minus mobile, e.g., for BAU 70,714 – 57,824 = 12,890 MT/yr shown in Appendix D-1.

3.2 OPERATIONAL MOBILE GHG EMISSIONS

The PER Traffic Study VMT data forecasts peak daily VMT (including induced VMT) that will occur in calendar year 2040 as the result of Project, both as a stand-alone project (project-related) and cumulative. The peak daily incremental VMT forecast for calendar year 2040 is as follows (see Appendix C):

- Alternative 2 Project-Related VMT: 375,261 miles per day.
- Alternative 2 Cumulative VMT: 254,868 miles per day.

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Kleinfelder converted the peak daily VMT to annual VMT by multiplying the peak daily calendar year 2040 VMT by 320 days per year. The 320 value is approximately 52 weeks per year, 6 days per week. The assumption is that the peak daily VMT occurs on each of 5 days and about one-half of the peak daily VMT occurs on Saturday and Sunday. Accordingly, the calendar year 2040 annual incremental VMT is:

- Alternative 2 Project-Related VMT: 120,083,520 miles per year.
- Alternative 2 Cumulative VMT: 81,557,862 miles per year.

The Traffic Study VMT and EMFAC 2021 emission factors shown in Appendix E were used to calculate GHG emissions for the Project-Related and Cumulative VMT scenarios presented in Appendix F. For these calculations EMFAC 2021 emission factors for calendar year 2040 were used for all models and vehicle types with emission factors stratified by speed bin. All fuel types were used, including the amount of EV penetration included in EMFAC 2021, to calculate GHG emissions. The results are shown in Table 3-2.

Table 3-2: Mobile-Only Jackson Township **GHG Emissions**

VMT Scenario	Annual GHG
BAU Alternative 2 Annual Mobile-Only Emissions	63,703 MT/yr
Project-Related VMT Alternative 2 Annual Mobile-Only Emissions	32,497 MT/yr
Cumulative VMT Alternative 2 Annual Mobile-Only Emissions	21,381 MT/yr

3.3 TOTAL ALTERNATIVE 2 OPERATIONAL GHG EMISSIONS

Total operational (mobile plus non-mobile) GHG emissions for Alternative 2 are shown in Table 3-3. The individual mobile and non-mobile emission values come from Tables 3-1 and 3-2 above.

Table 3-3: Total and Mobile-Only Annual BAU and Jackson Township **GHG Emissions**

VMT Scenario	Annual Non-Mobile GHG (MT/yr)	Annual Mobile GHG (MT/yr)	Total Operational GHG (MT/yr)
BAU Alternative 2 Annual Mobile-Only Emissions	12,890	63,703	76,593
Project-Related VMT Alternative 2 Annual Emissions	12,890	32,497	45,387
Percent Reduction from BAU for Project-Related VMT	--	**- 49.0 %**	**- 40.7 %**
Cumulative VMT Alternative 2 Annual Emissions	12,890	21,381	34,271
Percent Reduction from BAU for Cumulative VMT	--	**- 66.4 %**	**- 55.3 %**

Table 3-3 shows the very large reduction in GHG emissions from BAU that are accomplished through only those mitigation measures included in the Traffic Study. The reduction in vehicle travel and emissions of GHG are accomplished through a large number of Jackson Township project design features proposed by the Applicant. The features that reduce emissions include, but are not limited to, those listed immediately below. Where applicable, the related current (as of April 2022) CAPCOA[10] 2021 Handbook greenhouse gas mitigation measures (T-xx), the SMAQMD[11] land use emission reduction measures
(LUT-xx), and the Sacramento County Revised Final Draft Community Wide Climate Action Plan (CAP)[12] measures (GHG-xx) are noted. However, the CAPCOA, SMAQMD, and Sacramento County emission reduction percentages for the noted measures were not used, rather the Traffic Study VMT was used to calculate emissions. Note that the Traffic Study is SMAQMD pre-requisite measure TS – Traffic Study. The figures and exhibits in Appendix L further illustrate some of the measures noted below.

LOCATION (T-1, T-2, GHG-22):

- Project is located in a suburban center within approximately ten miles of the Sacramento downtown central business district and less than five miles from other existing high-density commercial/job center areas (LUT-2 and LUT-3).
- Project is located adjacent to other planned developments such that single-use trips are minimized, i.e., there are more pass-by and diverted trips (LUT-3 and LUT-4).

DENSITY/MIX (T-1, T-2, T-3, T-4, GHG-22):

- Project provides a compact mix of land uses in close proximity to each other with a highly connected street and trail network (LUT-3).
- Project design is for high and medium density housing for over half of the total project dwelling units (LUT-1).
- Housing density is better than 9.5 dwelling units per acre (LUT-1).
- Project includes below market rate housing (LUT-6).

[10] CAPCOA, 2021. Op cit.

[11] SMAQMD, 2021, Op cit.

[12] Sacramento County, 2022. *Revised Final Draft Community Wide Climate Action Plan, February 2022.* Available at https://planning.saccounty.net/PlansandProjectsIn-Progress/Pages/CAP.aspx. Accessed April 2022.

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- Approximately 15 percent of the total commercial square footage is dedicated to a mixed-use facility that combines residences and commercial/retail uses (LUT-3).

INTERNAL PROXIMITY (T-31-A, GHG-15, GHG-22):

- Most residential units are within 1,320 feet (one-quarter mile) of a neighborhood park, open space, school, and/or bicycle/pedestrian trail (LUT-3).
- Most residential units are less than one-half mile from shopping and services (LUT-4).
- Project design includes locating at least four schools within the project boundaries such that most students can walk to a local school (LUT-3 and LUT-4).
- Project design includes at least eight parks within the project boundaries such that residents can walk/bike to enjoy the parks (LUT -3 and LUT-4).

MULTI- MODAL EFFICIENCY (T-10, T-17, T-18, T-29, T-25, T-26, T-32, T-37, T-47, GHG-14, GHG-17):

- Project design is based on a network of streets in a grid pattern (LUT-8).
- Project design includes access to high frequency bus service that connects to the Watt/Manlove light rail station (LUT-5).
- Bus routes are signalized in order to avoid traffic delays (T-27).
- Project design promotes a multi-modal system that makes public transit, walking, and bicycling viable and attractive travel choices for residents and employees. Features include:
    - Adequate bike parking at non-residential locations, including the transit center and park and ride locations (T-34, T-47).
    - Showers/lockers and other end of trip facilities at non-residential buildings (T-10).
    - Long-term bike parking facilities (T-34, T-47).
- Project includes an extensive pedestrian path and trail system that is convenient and accessible from homes, school, parks, employment, and shopping (LUT-8).
- Pedestrian and bike paths minimize any barriers to pedestrian/bicycle use (e.g., fences, berms and other impediments are eliminated where possible) (LUT-8, T-18, T-20).

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TRANSIT SUPPORTIVE (T-3, T-5, T-6, T-9, T-25, T-27, T-28, T-32, T-38; GHG-14, GHG-22):

- Project includes an on-site transit center and park and ride facilities along the designated transit route of Jackson Highway (LUT-5, T-3).
- Project subsidizes bus rapid transit lanes on Jackson Highway (T-27).
- Project funding and design will result in bus headways of 15 minutes or better (T-26).
- Project includes joining a TMA funded through assessments. Although the project will include a TMA, no VMT reduction from the TMA has been calculated or included in the Traffic Study.
- Project includes assessments for regional transportation improvements (T-27).

As discussed in Section 5, there are additional mitigation measures beyond those in the Traffic Study that need to be accounted for.

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4 CONSTRUCTION GHG EMISSIONS

GHG emissions from construction activities are not generally considered a meaningful GHG impact because they are typically a one-time activity over a relatively short period of time compared to the operational life of a project, and because projects do not typically create "new" construction equipment or emissions (i.e., the construction equipment will be used somewhere else even if the proposed project is not constructed). However, construction of the Jackson Township will occur over an approximately 15-year period, thus construction emissions were added to the operational emissions.

Appendix G shows the CalEEMod emission estimates for construction of the Jackson Township Alternative 2. For the CalEEMod emission model, construction was assumed to start on January 1, 2025 and be complete by December 31, 2039. When CalEEMod was run with default parameters, the model estimated total construction duration of 18,765 days. That is obviously an over-estimate. The planned construction duration is 3900 days (260 days per year times 15 years), or 21 percent of the default. Accordingly, the individual CalEEMod default construction phase durations were adjusted by a factor of approximately 0.21 and such that the total construction duration (not including architectural coating) equaled 3900 days. Architectural coating was assumed to occur during the entire construction period. The resulting adjusted construction durations are shown in Table 4-1.

Table 4-1: Default and Adjusted Construction Duration for Alternative 2

Construction Phase	Default Duration (days)	Adjusted Duration (days)	Rationale for Adjustment
Demolition	900	0	There is essentially no demolition required at the proposed location
Site Preparation	540	125	Applied factor of 0.23 to reflect the ratio of planned versus default total construction duration
Site Grading	1,395	322	
Building Construction	13,950	3,224	
Paving	990	229	
Architectural Coating	990	3,224	Assumed architectural coating could occur over approximately the same duration as building construction

The CalEEMod default construction worker and vendor trip frequencies were also adjusted to match the proposed project as shown in Table 4-2. The trip lengths were not adjusted.

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Table 4-2: Default and Adjusted Worker and Vendor Construction Trips for Alternative 2

Construction Phase	Default Trips per Day		Adjusted Trips per Day		Rationale for Adjustment
	Worker	Vendor	Worker	Vendor	
Demolition	15	0	0	0	There is essentially no demolition required at the proposed location
Site Preparation	18	0	18	0	No change
Site Grading	20	0	20	0	No change
Building Construction	6,636	2,167	4,193	1,018	Trip frequencies are a function of the number of dwelling units and square feet of building. CalEEMod trip frequency functions and planned dwelling units/square footage were used to calculate project-specific trip frequencies
Paving	15	0	15	0	No change
Architectural Coating	1,327	0	839	0	Per CalEEMod, assumed architectural coating trips are 20% of Building Construction

Finally, the acreage of site preparation and grading were changed from the default to reflect the project-specific acreage of land that would be prepared and graded. It was assumed that all of the project area would be prepared and graded except for the parks, open space, and agricultural area; so, 907.6 acres are prepared and graded for Alternative 2. In the absence of a detailed construction plan, the remainder of the construction parameters in CalEEMod were left at their default settings.

Table 4-3 lists the CalEEMod default numbers of equipment and hours of usage for each construction phase. The data in Table 4-3 were provided to a design engineer/construction manager for reasonableness evaluation. He concluded that the default parameters were conservative over-estimates of the duration and/or numbers and usage of construction equipment. Specifically, he concluded the following[13]:

- There is essentially no Demolition, consistent with Table 4-2.
- Multiple teams will likely be working on Site Preparation simultaneously, and thus on average the modeled seven pieces of equipment operating a total of eight hours per day, are sufficient to complete the site preparation in the modeled 0.5 years shown in Table 4-2.
- The modeled equipment list for Grading is typical and sufficient to complete grading in the modeled time period (1.2 years). More equipment could possibly be used to shorten the time

[13] *Personal Communication to Kleinfelder, Mr. Steve AuClair, PE, April 13, 2019.*

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period to less than 1.2 years; but given the limited amount of grading equipment in the Sacramento area, the modeled duration, equipment numbers and usage are reasonable.

- The default equipment usage rates for Building Construction equipment are an over-estimate. For example, a crane would not normally be used continuously for seven hours per day; it would be used to load materials for a short period and then left idle for the rest of the day. Thus, the emissions for Building Construction are likely over-stated.
- The amount of Paving equipment and use duration shown in Table 4-2 is a large over-estimate.
- Architectural Coating is an on-going activity during Building Construction as there are coating applications other than the finish coats on building surfaces; thus, assuming a duration equivalent to the Building Construction duration is reasonable.

Table 4-3: CalEEMod Default Construction Equipment and Hours of Usage

Construction Phase	Equipment List	Number of Pieces of Equipment	Usage Hours Per Day	Total Construction Days (Years)*
Demolition				
There is essentially no demolition needed				
Site Preparation				
	Rubber Tired Dozers	3	8	125 (0.5 yrs)
	Tractors/Loaders/Backhoes	4	8	125 (0.5 yrs)
Grading				
	Excavators	2	8	322 (1.2 yrs)
	Graders	1	8	322 (1.2 yrs)
	Rubber Tired Dozers	1	8	322 (1.2 yrs)
	Scrapers	2	8	322 (1.2 yrs)
	Tractors/Loaders/Backhoes	2	8	322 (1.2 yrs)
Building Construction				
	Cranes	1	7	3,224 (12.4 yrs)
	Forklifts	3	8	3,224 (12.4 yrs)
	Generator Sets	1	8	3,224 (12.4 yrs)
	Tractors/Loaders/Backhoes	3	7	3,224 (12.4 yrs)
	Welders	1	8	3,224 (12.4 yrs)
Paving				
	Pavers	2	8	229 (0.9 yrs)
	Paving Equipment	2	8	229 (0.9 yrs)
	Rollers	2	8	229 (0.9 yrs)
Architectural Coating				
	Compressors	1	6	3,224 (12.4 yrs)

* From Table 4-1 and assuming 260 construction days per year.

The CalEEMod reports for construction are shown in Appendix G and summarized in Table 4-4.

Table 4-4: Construction GHG Emissions for the Jackson Township Alternative 2

Construction Year	GHG Emissions (MT/yr)	Construction Year	GHG Emissions (MT/yr)
2025	596	2033	5,699
2026	2,334	2034	5,638
2027	6,251	2035	5,607
2028	6,015	2036	5,628
2029	6,017	2037	5,607
2030	5,956	2038	5,607
2031	5,867	2039	693
2032	5,812	**Total 2025 to 2039**	**73,417**

*Note that the individual years may not sum exactly due to roundoff differences.

The construction emissions were amortized over 65 years, which includes the anticipated 50-year life of Jackson Township facilities plus the 15-year construction period. Sixty-five years was used because there are operational emissions during the construction period as most of the residential and some of the commercial buildings will be completed before the end of the 15-year construction period). So, the annual GHG emissions are 1,129 metric tons per year (MT/yr).

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5 PROPOSED JACKSON TOWNSHIP ADDITIONAL MITIGATION AND GHG EMISSION REDUCTIONS

Mitigation measures that reduce GHG emissions beyond those accounted for in the Traffic Study include transportation-related and non-transportation related measures.

5.1 ADDITIONAL QUANTIFIED TRANSPORTATION-RELATED GHG EMISSION REDUCTIONS

In addition to all of the mitigation measures incorporated into the Traffic Study, the additional transportation mitigation measures that are part of the Proposed Project that were analyzed by Kimley-Horn (Appendix A) also reduce GHG emissions.

The additional measures quantified in the K-H Memo and the percentage reduction in VMT are shown in Table 2-2. The measures are separated by those that benefit residential-related transportation (VMT per resident) and those that benefit employee-related transportation (VMT per Employee).

The percentage benefit on total VMT (and thus total emissions) of the measures shown in Table 2-2 is not simply the sum of residential (VMT per resident) and employee (VMT per employee) percentages because some of the measures that reduce residential VMT also reduce employee VMT. Thus, in order to calculate the benefit of these measures on total VMT forecast by the Traffic Study, the VMT reduction (in terms of VMT, not percentage) was calculated for residents and employees separately and then added together. The calculations are shown in Tables 5-1 and 5-2. The percent VMT reduction shown in the last row of Tables 5-1 and 5-2 translate directly into a similar percent reduction in GHG emissions as shown in Table 5-3.

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Table 5-1: Calculation of VMT Benefit from Additional Transportation Mitigation for Alternative 2 Project-Related VMT

Index	Measure	Residents	Employees
1	Daily VMT per resident/employee prior to additional mitigation (from K-H Memo Table 1)	17.46	16.48
2	Number of Residents/Employees (Note 1)	15,893	7,130
3	Residential and Employee VMT prior to additional mitigation (Row 1 x Row 2)	277,492	117,502
4	Annual VMT prior to additional mitigation (Row 3 x 320 days/year)	88,797,440	37,600,768
5	Total VMT Analyzed: Residential + Employee (Note that some of the VMT is double counted in Resident and Employee)	126,398,208	
6	Percent of VMT Analyzed for Residents versus Employees (Row 4 / Row 5)	70.3 %	29.7 %
7	Total Forecast Project-Related VMT from Traffic Study (Shown in Table 1-1)	120,083,520	
8	Residential and Employee VMT in Traffic Study (Row 6 x Row 7)	84,418,715	35,664,805
9	Percent Resident and Employee VMT Reduction (K-H Memo Table 2 and also shown in Table 2-2)	- 3.0 %	- 12.3 %
10	VMT Reduction (Row 8 x Row 9)	- 2,532,561	- 4,386,771
11	Total VMT Reduction (Sum of Row 10 Resident and Employee)	- 6,919,332	
12	**Percent Total VMT Reduction from Project-Related VMT** (Row 11 / Row 7)	**- 5.8 %**	

Note 1: Reported by Kimley-Horn, personal communication April 15, 2022.

Table 5-2: Calculation of VMT Benefit from Additional Transportation Mitigation for Alternative 2 Cumulative VMT

Index	Measure	Residents	Employees
1	Daily VMT per resident/employee prior to additional mitigation (from K-H Memo Table 1)	13.97	13.31
2	Number of Residents/Employees (from K-H Memo Page 5)	15,893	7,130
3	Residential and Employee VMT prior to additional mitigation (Row 1 x Row 2)	222,025	94,900
4	Annual VMT prior to additional mitigation (Row 3 x 320 days/year)	71,048,000	30,368,000
5	Total VMT Analyzed: Residential + Employee (Note that some of the VMT is double counted in Resident and Employee)	101,416,000	

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Table 5-2 (cont.): Calculation of VMT Benefit from Additional Transportation Mitigation for Alternative 2 Cumulative VMT

Index	Measure	Residents	Employees
6	Percent of VMT Analyzed for Residents versus Employees (Row 4 / Row 5)	70.1 %	29.9 %
7	Total Forecast Cumulative VMT from Traffic Study (Shown in Table 1-1)	81,557,862	
8	Residential and Employee VMT in Traffic Study (Row 6 x Row 7)	57,172,061	24,385,801
9	Percent Resident and Employee VMT Reduction (K-H Memo Table 2 and also shown in Table 2-2)	- 3.0 %	- 12.3 %
10	VMT Reduction (Row 8 x Row 9)	- 1,715,162	- 2,999,454
11	Total VMT Reduction (Sum of Row 10 Resident and Employee)	- 4,714,616	
12	**Percent Total VMT Reduction from Cumulative VMT (Row 11 / Row 7)**	**- 5.8 %**	

Table 5-3: GHG Reductions from Additional Transportation-Related Mitigation

VMT Scenario	GHG
Project-Related VMT GHG Emissions from Traffic Study (from Table 3-3)	32,497 MT/yr
Project-Related VMT Reduction from Additional Transportation-Related Mitigation	- 5.8 %
Project-Related GHG Emissions Reduction from Additional Transportation Mitigation	- 1,885 MT/yr
Project-Related GHG Emissions after Additional Transportation-Related Mitigation	30,612 MT/yr
Cumulative VMT GHG Emissions from Traffic Study (from Table 3-3)	21,381 MT/yr
Cumulative VMT Reduction from Additional Transportation-Related Mitigation	- 5.8 %
Cumulative GHG Emissions Reduction from Additional Transportation Mitigation	- 1,240 MT/yr
Project-Related GHG Emissions after Additional Transportation-Related Mitigation	20,141 MT/yr

5.2 ADDITIONAL NON-TRANSPORTATION MITIGATION

There are a number of non-transportation mitigation measures designed into the Jackson Township Project that reduce GHG emissions and can be credited. These measures, such as elimination of GHG from natural gas combustion, and their benefit are described in the following subsections.

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5.2.1 Elimination of GHG from Electrical Energy Generation and Natural Gas Combustion

The previous GHGRP prepared in May 2019 included the following non-transportation mitigation measures for which emission reductions were quantified:

- High efficacy public outdoor lighting (GHGRP),
- Energy efficient appliances (GHGRP),
- Energy efficient boilers (AQMP and GHGRP),
- Residential electric hot water heaters (AQMP and GHGRP),
- Non-residential electric vehicle charging stations (AQMP and GHGRP), and
- Residential electric vehicle charging stations (AQMP and GHGRP).

However, since May 2019, SMAQMD and Sacramento County adopted BMPs to reduce GHG emissions. BMP 1 eliminated natural gas infrastructure for new projects, and BMP 2 requires all projects to meet CalGreen Tier 2 standards except EV-capable spaces shall be EV-ready. The newly adopted BMPs were the impetus for Revision 3a to the GHGRP (prepared in January 2021). Furthermore, after May 2019 SMUD committed to 100 percent renewable energy by 2030.

The CalEEMod emission estimates shown in Appendix D already accounted for the fact that SMUD committed to 100 percent renewables because zero GHG intensity was entered into the model and thus there is no additional credit for high efficacy public lighting and energy efficient appliances. However, although BMP-1 eliminates natural gas infrastructure , the CalEEMod model still contains GHG emissions from combustion of natural gas. The amount of GHG emissions from natural gas combustion was 7,527 MT/yr for both the Project-Related and the Cumulative VMT scenarios as shown in Appendix D-2 and D-3. All of these emissions are eliminated and thus there is no additional credit for energy efficient boilers or residential electric hot water heaters.

Emission reductions associated with the EV charging stations are discussed in Sections 5.2.7 and 5.2.8.

5.2.2 Vegetative Preserve

Jackson Township has committed to preserving a total of 1,131.2 acres of vegetative land. In addition, there will be another 88.8 acres of landscaped area associated with the buildings and another 148.9 acres of land vegetated in the parks and the greenbelt and landscape corridors. Table 5-4 shows the source and acreage of vegetated land associated with Jackson Township. Although there will be landscaping associated with residential housing, to be conservative, no credit is taken for that private

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landscaping. There is also no credit taken for agricultural land because that portion of Jackson Township will remain unchanged. The landscaped area associated with the buildings is the difference between the square footage of buildings plus parking lots (as shown in Appendix B) and the lot size.

Table 5-4: Alternative 2 Vegetated Area

Description	AGT Lands Only (acres)	Non-participant Jackson Township Lands (acres)	Total for Jackson Township (acres)
Vegetative Preserves			
On-site Acreage Preserved (Appendix B, Item 13)	191.3	68.5	259.8
Werre (offsite) Acreage Preserved	129.0	--	129.0
Additional Preserve Acreage to be Purchased by SSCA with Fees Paid from Development	372.1	370.3	742.4
Subtotal Acres Preserved	**692.4**	**438.8**	**1,131.2**
Community and Neighborhood Parks (Appendix B, Items 11 and 12)	--	--	78.8
Greenbelt Corridor (Appendix B, Item 14)	--	--	55.6
Landscape Corridor (Appendix B, Item 15)	--	--	14.5
Subtotal Parks and Corridors	--	--	**148.9**
Commercial and Office Landscaping (Appendix B, Items 4 – 7)[14]	--	--	16.8
School Landscaping (Appendix B, Items 9 and 10)[15]	--	--	72.0
Subtotal Landscaping Associated with Buildings	--	--	**88.8**
Total Vegetated Area			**1,368.9**

The amount of GHG reduced per acre of vegetation is per the CAPCOA 2021 Handbook mitigation measure N-1. This measure calculates the amount of sequestration as a function of vegetative sequestration plus sequestration that occurs when soil is converted to crop land, grazing land, or forest land. None of those soil conversions will occur at Jackson Township; thus, only the vegetative sequestration factor is considered. The amount of vegetative sequestration in measure N-1 is the area (hectares, ha) multiplied by carbon accumulation (MT C per ha per yr) multiplied by the molecular

[14] Landscape area = 130.8 acres – (2,022,100 total sf building + 1,561,700 sf General Commercial parking + 423,400 sf Community Commercial parking + 343,200 sf Mixed Use parking + 613,300 sf Office parking) = 16.8 acres.

[15] Landscape area = 100 acres – (250,000 sf high school + 609,800 sf parking + 225,000 sf elementary schools + 136,800 sf parking) = 72.0 acres.

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weight of
CO_2 to C (44/12).

Table N-1.1 from the CAPCOA 2021 Handbook lists 0.33 MT C/ha-yr sequestration for grassland, 1.87 MT C/ha-yr for broadleaf forest, and 2.10 MT C/yr for shrubland. The Jackson vegetative preserve will be a mix of grassland, broadleaf trees, and shrubland. Thus, an average carbon sequestration value of 1.43 MT C/ha-yr was used. Therefore, the amount of CO_2 sequestered by 1,368.9 acres is:

1,368.9 acres x 0.4047 ha/acre x 1.43 MT C/ha-yr x 44/12 = 2,905 MT CO_2/yr.

Note that the CAPCOA 2010 Handbook listed a CO_2 sequestration value of 4.31 MT CO_2 per acre, which for 1,368.9 acres would be 5,900 MT/yr. The amount of sequestration calculated by the 2021 Handbook appears to be low but will nevertheless be used herein.

5.2.3 Elimination of Existing Cattle Grazing

There are approximately 125 head of cattle that graze on the Jackson Township property from November through May and 85 head from June to October, for an average of approximately 105 per year. When Jackson Township is developed, those cattle will be removed. The Intergovernmental Panel on Climate Change (IPCC) publishes emission factors for various GHG-producing activities. The IPCC 2019 Refinement[16] of emission factors provided emission factors for cattle in Chapters 10 and 11.

There are three sources of GHG associated with cattle: methane (CH_4) belched from cattle due to enteric fermentation, CH_4 from manure, and nitrous oxide (N_2O) from manure. Chapter 10 of the Refinement presented a CH_4 emission factor from enteric fermentation of 64 kilograms (kg) per head per year (head-yr). Chapter 10 and 11 also discuss GHG emissions from manure, but on an individual cow basis, the amount of GHG from manure is less than about 2 percent of the GHG from enteric fermentation. Thus, the 64 kg CH_4 per year emission factor was used. The global warming potential (GWP) of CH_4 is 25, so the emission factor in terms of carbon dioxide equivalent (CO_2e) is 25 x 64 kg/head-year = 1.6 MT CO_2e/head-yr, and the total reduction for 105 head is 168 MT/yr.

[16] *2019 Refinement of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.*

5.2.4 CO_2 Sequestration from Planting Trees

Jackson Township is required to plant a minimum number of trees per the Design Standards and County ordinances. The number of additional trees was estimated as follows:

- One tree is required per each single-family lot. There will be 3,540 lots for low density (LD) and medium density (MD) single family housing, equating to 3,540 trees.
- It was assumed that on average each single-family homeowner would plant at least one tree in their back yard, so that amounts to an additional 3,540 trees.
- For multi-family housing, (82 acres), the stormwater model for the development assumed a minimum of 10 trees per acre, or 820 trees.
- For commercial land uses (total of 130.8 acres), the stormwater model assumed a minimum of 10 trees per acre, or 1,308 trees.
- For the community and school sites (101.0 acres), the stormwater model assumed a minimum of 10 trees per acre, or 1,010 trees.
- The preliminary park design plans indicate approximately 7 trees per acre for the interior of the parks (78.8 acres), or a minimum of 552 trees.
- The Design Standards require a minimum of one tree per 30 linear feet per side or median of street within Jackson Township. There are three major categories of streets for calculating the minimum number of trees (the street lengths are shown in Appendix H):
    - Grenville: 5,956 feet in length, minimum of 3 trees per 30 feet, or 596 trees, accounting for trees in the median plus each side of Greenville.
    - Excelsior, Jackson, and Keifer: total of 19,615 linear feet, with a minimum of 2 trees per 30 feet (one in the median and on one side), or 1,308 trees.
    - Other interior two-lane streets: total of 35,335 linear feet, with a minimum of 2 trees per 30 feet (one on each side), or 2,356 trees.
- There are three main drainage corridors/greenbelts with the following planned trees:
    - Central Drainage (Elder Creek), 6,500 linear feet with a minimum of 1 tree per 7 linear feet (accounting for trees on both sides), or 929 trees.
    - Western Drainage (Morrison Creek), 1,850 linear feet with a minimum of 1 tree per 7 linear feet, or 264 trees.

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- Greenbelts total 8,500 linear feet with a minimum of 1 tree per 15 linear feet (a minimum of 1 tree every 30 feet on both sides of the greenbelt), or 567 trees.

The above totals to a minimum of 16,790 trees. An approximately 20 percent increase to the minimum number of trees was added to account for the fact that there will be more trees actually planted than the minimum required (e.g., some people will plant several trees in their back yard rather than just one, parking lots may use trees instead of canopies to achieve the 50 percent shade requirement, the stormwater model assumes the smallest number of trees in order to ensure adequate drainage capacity, etc.). Thus, a total of 20,000 trees was assumed.

The CAPCOA 2021 Handbook measure N-2 discussed the amount of CO_2 that can be sequestered by trees. The method in measure N-2 is quite complex, involving parameters for tree species, tree trunk diameter, amount of sun the tree receives, where the tree is planted with respect to buildings, tree mortality, among other variables. Measure N-2 suggests using an "iTree" web-based tool to calculate CO_2 sequestration per tree. However, that tool (available at https://planting.itreetools.org/) requires several parameters that are not yet known for the Jackson Township project (e.g., the number of each species of tree and the amount of sun each tree is exposed to).

The CAPCOA 2010 Handbook provided a CO_2 sequestration rate of an average 0.0312 MT/yr per tree for evergreen trees and 0.0418 MT/yr per tree for deciduous, or an average of 0.0365 MT/yr per tree, assuming 50 percent evergreen[17]. To evaluate the 0.0365 MT/yr per tree value for consistency with the CAPCOA 2021 Handbook, the "iTree" tool sequestration rates for Japanese Maple, Mayten, and three types of Cedar trees with a 10-inch diameter trunk were compared to the 2010 Handbook average value. (Even though the "iTree" tool lists about 200 species for Sacramento County, only a few of the species recommended by the County in its suggested landscape tree list are included in the "iTree" tool). The "iTree" tool Japanese Maple sequestration rate ranged from 0.0246 to 0.0308 MT/yr per tree (depending on if the tree were planted in shade or full sun), the Mayten from 0.0752 to 0.1857 MT/yr per tree, and the three Cedars from 0.0668 to 0.2073 MT/yr per tree. It appears that the 2010 Handbook average value is less than the value for typical Sacramento tree species listed in the "iTree" tool; therefore, the 2010 Handbook average value of 0.0365 MT/yr per tree was used as a conservatively low value and for 20,000 trees, CO_2 sequestration will be at least 730 MT/yr.

[17] The stormwater plan was based on 50 percent of the trees being evergreen and 50 percent deciduous.

5.2.5 Reduction from Electric Landscaping Equipment

CalEEMod assumes that most landscaping equipment will be fossil-fuel powered. However, by 2040 it can be reasonably expected that all landscaping equipment will be electrically powered due to availability of electrically powered equipment of various horsepower ratings, including, as discussed below, construction equipment. Thus, the CalEEMod landscaping GHG emissions shown in Appendix D are eliminated. CalEEMod calculated 98 MT/yr from landscaping equipment.

5.2.6 Reduction from Landfill Gas Energy Recovery

CalEEMod estimates the amount of CO_2 and CH_4 emissions generated from landfill gas that is not captured and not used for energy recovery (e.g., generating electricity). CalEEMod assumes that 94 percent of landfills recover the landfill gas. However, it can be reasonably assumed that by 2040 all landfills will recover landfill gas. To calculate the emission reduction that would be achieved if 100 percent of landfills recover the gas, CalEEMod was run with 100 percent of landfills recovering landfill gas and compared to the 94-percent assumption. The 100 percent of landfills capturing landfill gas for energy recovery CalEEMod report is shown in Appendix I. GHG emissions from solid waste with 94 percent of landfills recovering (Appendix D) were 5,158 MT/yr. GHG emissions from solid waste with 100 percent of landfills recovering energy (Appendix I) were 4,770 MT/yr.

The CalEEMod emission GHG emission estimates for landfills recovering energy are over estimated because CalEEMod assumes that only 75 percent of landfill gas is captured (the rest of the CO_2 and CH_4 is emitted to the atmosphere). Landfill gas recovery systems can capture a much higher percentage, at least 60 to 90 percent according to USEPA[18]. This is especially the case for California, which has had landfill gas capture system requirements in place for decades. So, the CalEEMod GHG emissions were reduced by the ratio of 0.75 to 0.90, equals 3,975 MT/yr. The difference between BAU 5,158 MT/yr and 3,975 MT/yr can be credited, or 1,183 MT/yr.

5.2.7 Reduction from 805 Non-Residential EV Charging Stations

The January 2021 Revision 3a of the GHGRP committed to installing a total of 690 non-residential EV charging stations at Jackson Township parking spaces at commercial, retail, office, and school parking lots. Each electric vehicle charging station has 2 connections; so, a total of 1,380 parking spaces would be served by the 690 EV charging stations. In order to achieve net zero GHG emissions, the Applicant is

[18] See for example, https://www.epa.gov/lmop/benefits-landfill-gas-energy-projects.

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now committing to install an additional 115 non-residential EV charging stations, for a total of 805 stations serving 1,610 parking spaces.

For the emission reduction calculation shown in Appendix J-1, it was assumed that each EV connection would be used an average of 4 hours per day at a charging rate of 6 kWh per hour. The 4-hour per day value is based on the average observed actual session length (one vehicle in a session) of 4 hours and 19 minutes for the period April 21, 2009 through June 23, 2022 at EV charging stations located at the Applicant's current properties. The 4 hours per EV charging station is a conservatively low value because it is likely that the stations will be used by more than one vehicle per day (so total charging at the station will be multiples of 4 hours). Nevertheless, it was assumed that charging would occur at the stations only 4 hours per day.

The VMT from the amount of electrical energy charged would offset an equivalent VMT of gasoline-fueled driving. The EMFAC 2021 electric efficiency of EVs (see Appendix J-2) value of 32.5 kilowatt hours per 100 miles was used in the emission calculations. Only light duty autos and light and medium duty trucks were included in the calculations on the assumption that only those vehicle types would use the non-residential charging stations in the Jackson Township parking lots. The non-residential EV charging stations offset approximately 43.3 million miles of gasoline-fueled travel. EMFAC 2021 (version 1.0.1) was used to determine emission factors (grams per mile) for calendar year 2040 from those same gasoline-fueled vehicle types (see Appendix J-3). The emission reduction associated with non-residential charging stations shown in Appendix J-1 is 11,527 MT/yr.

5.2.8 Reduction from Residential Pre-Wiring for EV Chargers

All single-family housing and 20 percent of multi-family housing must be pre-wired for EV chargers (not actual chargers, just the pre-wiring) per BMP 2. However, Jackson Township has committed to pre-wiring an additional 57 percent of multi-family housing, for a total of 77 percent. By 2040, most of the homeowners will take advantage of the pre-wiring and install charging stations for EVs.

It is difficult to predict actual EV use 18 years into the future (calendar year 2040), because consumers choose their vehicle types based on a myriad of factors, some of which are legislatively and regulatorily driven, some are market driven, and some are individual choice. The major regulatory driver is the commitment that by calendar year 2035, one hundred percent of all new light duty vehicles (light duty autos and light duty trucks) sold in California must be zero emission vehicles (ZEV); either EV, plug-in hybrid EV (PHEV), or fuel cell electric vehicles (FCEV). In April 2022 CARB published a proposed Advanced Clean Cars II (ACC II) regulation that will require ZEVs for at least 35 percent of new light duty vehicle

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sales in 2026 and increasing by about 8 percentage points per year until 2035 where 100 percent of light duty vehicle sales must be ZEV[19]. The proposed regulations allow manufacturers to meet their ZEV requirement with up to 20 percent PHEVs. There is no cap on FCEVs, but CARB forecasts FCEVs to be a small percentage of the ZEV fleet, with only 0.2% of ZEVs being FCEVs in 2021[20]. Accordingly, it was assumed that in 2040, 100 percent of new light duty vehicle sales would be EV or PHEV. For purposes of ACC II, CARB defines light duty vehicles as automobiles and light duty trucks with a gross vehicle weight rating of 8,500 pounds or less[21], which is equivalent to the LDA, LDT1, and LDT2 vehicle categories in EMFAC 2021 (categories based on EMFAC 2007).

For an initial estimate of the number of homes that would actually have an EV and charge it at home, the EMFAC 2021 forecast vehicle type and model year population distribution for Sacramento County in 2040 was used along with the percent ZEV requirements from the proposed ACC II. EMFAC 2021 does not account for ACC II because it includes only regulations that are in place when the model was developed. Table 5-5 shows the EMFAC 2021 forecast of the number of light duty vehicles in 2040. To estimate the number of EVs, a percent EV assumption by model year was made as follows:

- Model years 1966 to 2012: zero percent EV is assumed. EMFAC does show some EV for those model years, but the quantity is in the 0.01 percent range, thus zero was assumed.
- Model years 2013 to 2020: EMFAC percent EV is used, which is based on actual California sales data.
- Model years 2021 to 2025: 12 percent EV sales are assumed, which is the same assumption EMFAC 2021 uses for all model years after 2020[22].
- Model years 2026 to 2034: the percent EVs is based on the ACC II ZEV requirements, which is 35 percent in 2026 increasing by 8 percent each year.
- Model years 2035 to 2040: 100 percent EV is assumed based on the ACC II ZEV requirements.

ACC II allows up to 20 percent PHEV to provide manufacturers flexibility, but notes that the PHEV share of the market has declined in recent years[23], PHEVs will likely be more expensive than EVs and that

[19] CARB, 2021. Advanced Clean Cars II Regulations Initial Statement of Reasons, April 12, 2022. Page 9, ES-Figure 1.

[20] Ibid., Page 19, Figure 2.

[21] Ibid., Page 65, Footnote 328.

[22] CARB 2021a, EMFAC 2021 Volume III Technical Document, April 2021. Page 11.

[23] CARB 2021. Op cit., Page 56.

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manufacturers are not planning to use the 20 percent PHEV allowance[24]. Furthermore, ACC II requires PHEVs to have 4 to 5 times greater EV-only mileage range than current EVs[25]. ACC II also requires more convenient EV charging capability than current PHEV models[26]. All of these features encourage PHEV drivers to charge their vehicle batteries rather than relying on the auxiliary engine. So, it was assumed that if a person purchased a PHEV, they would, in fact, use their home charger (especially as it will already be pre-wired).

Table 5-5: Light Duty Vehicle Counts by Model Year in Sacramento County

Forecast by EMFAC for Calendar Year 2040

Model Year	Number of Light Duty Vehicles	% EV Sales	Number of EVs	Model Year	Number of Light Duty Vehicles	% EV Sales	Number of EVs
1996	1,478	0%	0	2019	12,157	6.7%	816
1997	1,876	0%	0	2020	11,129	8.6%	958
1998	2,037	0%	0	2021	15,486	12%	1,858
1999	2,099	0%	0	2022	20,646	12%	2,478
2000	2,462	0%	0	2023	23,417	12%	2,810
2001	2,454	0%	0	2024	26,413	12%	3,170
2002	2,452	0%	0	2025	29,841	12%	3,581
2003	2,429	0%	0	2026	33,073	35%	11,576
2004	2,442	0%	0	2027	36,546	43%	15,715
2005	2,744	0%	0	2028	39,495	51%	20,142
2006	2,776	0%	0	2029	42,605	59%	25,137
2007	2,864	0%	0	2030	45,191	68%	30,730
2008	2,343	0%	0	2031	47,921	76%	36,420
2009	1,656	0%	0	2032	49,690	82%	40,746
2010	1,999	0%	0	2033	51,756	88%	45,546
2011	2,392	0%	0	2034	53,102	94%	49,916
2012	3,350	0%	0	2035	54,362	100%	54,362
2013	4,897	1.7%	82	2036	54,942	100%	54,942
2014	5,511	2.0%	112	2037	54,447	100%	54,447
2015	7,729	1.6%	126	2038	52,923	100%	52,923
2016	9,052	1.9%	171	2039	49,671	100%	49,671
2017	10,888	3.7%	400	2040	39,774	100%	39,774
2018	12,282	5.3%	648			**Total**	**599,255**

[24] Ibid., Page 59.

[25] Ibid., Page 59, Table III-4.

[26] Ibid., Pages 50 - 53.

Table 5-5 shows an estimated number of 599,255 EVs in 2040 in Sacramento County out of a total 934,801 light duty vehicles forecast by EMFAC, or 64.1 percent EV. It was assumed that each of single-family and multi-family homes will have a light duty vehicle. Thus, at least 64.1 percent of the homes will have an EV or PHEV and will use a home charger by 2040. The 64.1 percent value is an underestimate because there are electrically powered medium duty trucks that will also be owned and charged at home by Jackson Township residents, but the above ACC II calculations only accounted for light duty autos and light duty trucks.

However, the above analysis assumes that the model year distribution in 2040 does not change from that forecast by EMFAC 2021. It is likely that by 2040 the number of Jackson Township residents owning an EV will be much greater than the 64.1% value estimated by EMFAC 2021 for a number of reasons:

- After 2035, drivers will not have a choice but to purchase an EV if they want a new vehicle.
- Jackson Township residents will already have a pre-wired home so that installing a charger is simple and relatively inexpensive.
- By 2040, EV charging will likely simply become a matter of plugging in a 110-volt or 220-volt cord provided with the vehicle.[27]
- Jackson Township homes will be equipped with solar power, eliminating the cost of charging during the day; and by 2040 home battery storage will be prevalent allowing for "solar" charging even at night.
- Because California is a dominant market, vehicle manufacturers are likely to offer many more EV models and options than currently available and will not want to maintain dual manufacturing lines (internal combustion engines and EVs). Furthermore, other states will also likely adopt comparable requirements for EVs as required by the California ACC II. Therefore, there will be limited options for drivers to purchase non-EV vehicles.
- Vehicle repair shops are already switching to EV capabilities and by 2040 it will be even more difficult to find internal combustion engine repair and service opportunities.

In light of the above, it is reasonable that residents of Jackson Township will embrace ZEVs at a much higher frequency than required and the percentage of ZEVs will be greater than the 64.1 percent calculated. Accordingly, a reasonably conservative assumption of 75 percent residential ZEVs was made.

[27] Ibid.

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Appendix J-1 shows the calculations for the emission reductions that would result from the pre-wiring and the 75 percent actual EV assumption. To calculate the emission reduction, an average light duty VMT per Jackson Township household was first calculated from the Project-Related VMT and from the Cumulative VMT scenarios and the EMFAC forecasted VMT for Sacramento County that 77.1 percent of total VMT is produced in 2040 by light duty autos and trucks. Then 75 percent of the light duty vehicle VMT associated with the pre-wired households was calculated (i.e., 75 percent of the single-family housing units plus 75 percent of 77 percent of the 2,150 multi-family dwelling units times the average light duty VMT per household) to represent the amount of electric VMT that would offset conventionally fueled VMT. The amount of emission reductions was calculated using EMFAC 2021 emission factors for only gasoline and diesel-fueled light duty automobiles and light and medium duty trucks. The emission reductions associated with dwelling unit charging stations shown in Appendix J-1 are 17,898 MT/yr for the Project-Related VMT scenario and 12,156 MT/yr for the Cumulative VMT scenario.

Note that the 2022 version of California Green Building Code (CCR Title 24), effective January 1, 2023, also requires EV chargers for non-residential and multi-family housing. Should Title 24 mandate more EV chargers than committed to herein, the number of EV chargers will be increased to meet Title 24 requirements. If this occurs, the emission reductions will be greater than shown in Appendix J-1.

5.2.9 Emission Reductions Associated with the Sacramento Raceway

The Jackson Township Specific Plan includes land owned and operated by the Sacramento Raceway. If Jackson Township is completely developed, the Sacramento Raceway will cease operations. In April 2021 a study was conducted to assess the potential health effects of Raceway operations[28]. This study estimated the GHG emissions from the Raceway, including spectators, race vehicle transport, and racing vehicle emissions. The study estimated annual GHG emissions of 1,610 MT/yr.

5.2.10 Reduction for Electrified Construction Equipment

Electrification of construction equipment has not progressed as rapidly as passenger vehicles. However, both Caterpillar and Volvo are currently (in 2022) selling fully electric backhoes and dozers and are producing other heavier equipment with electric drive motors that, according to Caterpillar, result in 35 percent less fuel use[29].

[28] Kleinfelder, 2021. Letter to Mr. Angelo Tsakopoulos dated *April 19, 2021.*

[29] See for example, https://www.equipmentworld.com/equipment/article/14970340/caterpillars-d6-xe-electric-drive-dozer-explained. Accessed April 2022.

Appendix K shows the type and numbers of equipment, usage, horsepower, and load factor assumed by the CalEEMod model to estimate the construction emissions. The CalEEMod model does not account for any electrification of construction equipment. Thus, the CalEEMod assumptions were adjusted as shown in Appendix K to account for fully electric small dozers and backhoes and 35 percent better fuel economy from heavier equipment. Overall, construction emissions would be reduced by about 67 percent if currently available electrified construction equipment were used. The actual reduction by 2040 would likely be greater than 67 percent because by then there would be more electrified construction equipment available than there was in 2021. Thus, the emission reduction associated with electrified construction equipment is at least 756 MT/yr (0.67 x 1,129 MT/yr, refer to Section 4 herein).

5.3 POTENTIAL DISBENEFITS OF JACKSON TOWNSHIP

If Jackson Township is fully developed, the existing grassland and some of the existing trees on the site would have to be removed. The effect of this disbenefit is calculated as follows.

5.3.1 Redevelopment of Existing Grassland

The entire Jackson Township Specific Plan covers 1,391.0 acres of land. However, 74.7 of those acres are agricultural land that will remain agricultural. The remaining 1,316.3 acres of grassland could be removed and replaced with buildings, landscaping, roads, etc. as discussed above. The existing grassland sequesters CO_2. The existing grassland could be categorized as more like a desert grassland than a typical grassland (which, per IPCC definition includes pastures, woody vegetation, herbs, and brushes). Unfortunately, no CO_2 sequestration factors for desert grassland could be found, thus it was assumed that desert grassland sequestered one-half the amount of the traditional grassland value discussed in Section 5.2.2, i.e., one-half of 0.33 MT C/ha/yr. Thus, it was assumed that 1,316.3 acres of desert grassland sequestered 322 MT/yr of GHG:

$$1{,}316.3 \text{ acres} \times 0.4047 \text{ ha/acre} \times 0.33 \text{ MT C/ha-yr} \times 44/12 \times 0.5 = 322 \text{ MT } CO_2/\text{yr}$$

Note that as discussed above, cattle currently graze on the site. The cattle will be removed, but this is a benefit as discussed in Section 5.2.3.

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5.3.2 Removal of Trees

There are only a few trees on-site, as most of the property is desert grassland without shrubs or trees. A Google Earth view of the site was examined and an approximate count of trees shown in Google Earth calculated. Over the entire 1,391.0 acres, there appear to be about 280 trees; however, about 100 of those trees are on agricultural land that will not be affected by the Project. The amount of GHG sequestered by the 180 existing trees that could be removed if the Project is fully developed was calculated as 7 MT/yr using the average CO_2 sequestration value of 0.0365 MT/yr per tree discussed in Section 5.2.4 (180 trees x 0.0365 MT/yr per tree = 7 MT/yr).

5.4 SUMMARY OF THE BENEFIT OF ADDITIONAL MITIGATION

Table 5-6 summarizes the benefits and disbenefits of the measures and shows the net GHG emissions after accounting for all of the quantified mitigation. The corresponding Section of this GHGRP that discusses each line item in Table 5-6 is also noted.

Table 5-6: Net Annual GHG Emissions for Alternative 2 GHG Emissions

Description	Project-Related VMT Scenario Annual GHG Emissions (MT/yr)	Cumulative VMT Scenario Annual GHG Emissions (MT/yr)
Annual Non-Mobile Operational Emissions from CalEEMod (Table 2-3)	12,890	12,890
Amortized Annual Construction Emissions (Section 4)	1,129	1,129
Annual Mobile Emissions from Traffic Study (Table 3-2)	32,497	21,381
Total Annual Operational Non-Mobile plus Construction plus Mobile Emissions	*46,516*	*35,400*
Penalty for Removal of Grassland (Section 5.3.1)	322	322
Penalty for Removal of Trees (Section 5.3.2)	7	7
Total Equivalent Project Emissions (including penalties)	**46,845**	**35,729**
Reduced VMT (Table 5-3)	- 1,885	- 1,240
Eliminate Natural Gas Emissions (Section 5.2.1)	- 7,431	- 7,431
Reduction from Jackson Township Vegetation Preserve (Section 5.2.2)	- 2,905	- 2,905
Reduction from Elimination of Cattle (Section 5.2.3)	- 168	- 168
Reduction from Jackson Township Trees (Section 5.2.4)	- 730	- 730

Table 5-6 (cont): Net Annual GHG Emissions for Alternative 2 GHG Emissions

Reduction from Electric Landscaping Equipment (Section 5.2.5)	- 98	- 98
Reduction from Landfill Gas Energy Recovery (Section 5.2.6)	- 1,183	- 1,183
Reduction from 805 Non-residential EV Charging Stations (Section 5.2.7)	- 12,250	- 12,250
Reduction from Residential Housing EV Charging (Section 5.2.8)	- 17,898	- 12,156
Redevelop Sacramento Raceway (Section 5.2.9)	- 1,610	- 1,610
Reduction from Electrified Construction Equipment (Section 5.2.10)	- 756	- 756
Total GHG Reductions	*- 46,914*	*- 40,527*
Net GHG After Reductions	**- 69**	**- 4,798**

5.5 NON-QUANTIFIED MITIGATION

The preceding sections of the GHGRP deal only with quantified VMT and associated emission reductions. There are numerous other project design features that would also result in reduced GHG emissions, but the benefit of those features has not been quantified. Some of said features are:

- An over-statement of VMT because the VMT per resident and per employee values do not account for the mutually beneficial interaction of the Jackson Township Specific Plan with other existing and/or approved land uses that result in reduced VMT. For example, Jackson Township schools and retail will serve not only Jackson Township residences but existing residences in the area, thus reducing the distance traveled by existing persons.
- An over-statement of employee VMT because the VMT per employee does not account for the current shift to work-from-home and remote working/learning that is occurring.
- Participation in the Sacramento County affordable housing program. Providing affordable (below market rate) housing allows residents to live closer to job or schools, reducing commute distances and emissions.
- Low flow bathroom fixtures, kitchen fixtures, showers, and toilets in all residential units and commercial buildings.
- Reduced square footage of residential turf due to the increased housing density.
- Water efficient irrigation systems and water efficient landscaping for the non-residential areas.
- Some of the existing homes located within the Jackson Township Specific Plan will be replaced with more modern and energy efficient homes and existing sources of natural gas combustion will be removed.

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- Increased landfill gas capture efficiency to more than 90 percent. Many existing landfills in California capture well in excess of 90 percent and by 2040 that should be standard for all landfills.
- More efficient water treatment digester gas capture and energy recovery.
- Additional electric construction equipment that will be developed and implemented by 2040.
- Increased fuel efficiency of non-electric construction equipment that will occur before 2040.
- There may be additional GHG reduction measures that could be implemented as the result of the Final Draft Sacramento County Climate Action Plan but have not been accounted for herein.

And most significantly, all of the mobile-source emission estimates are over-stated and the benefit of EV charging stations under-stated because they do not account for more electric vehicle penetration than assumed and other changes in transportation that will have to occur if California is to reach the 2050 GHG reduction goals. For example, the new (April 1, 2022) Federal passenger car and light duty truck fleet wide average fuel economy standard of approximately 49 miles per gallon (mpg) for new vehicles by calendar year 2026 has not been accounted for. Thus, prior to full development of Jackson Township in 2040 there will be greater GHG emission reductions and even lower GHG emissions than stated herein.

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