Appendix C

Smart Growth Alternative VMT Forecast

FEHR PEERS

Memorandum

Date: October 2, 2023

To: Meghan Kelly, County of San Diego

From: Katy Cole and Andrew Scher, Fehr & Peers

Subject: County of San Diego Climate Action Plan SEIR VMT Assessment

SD21-0394

This memorandum provides of the results of the transportation/Vehicle Miles Traveled (VMT) modeling completed for the County of San Diego Climate Action Plan (CAP) Supplemental Environmental Impact Report (SEIR). This memorandum summarizes the project study scenarios, land use changes, travel demand model procedures, and vehicles miles traveled (VMT) calculations.

The SANDAG ABM 2+ model using land use data set ("DS") 39 for 2035 and 2050 was used to determine the VMT estimates for the CAP SEIR. As a cross-reference, the "County of San Diego Climate Action Plan Inventory Transportation Modeling Overview" Memorandum (Fehr & Peers, October 2023) documents that the DS 39 land use data set is appropriate to use as the basis for CAP SEIR model scenarios. It also documents that the SANDAG ABM 2+ is the appropriate tool for analyzing existing and future VMT at a regional scale for the unincorporated county.

Alternatives

The following CAP alternatives scenarios were modeled/analyzed:

- Project scenario – SANDAG Regional Plan EIR Alternative 2 land uses and transportation network.
- 2021 Regional Plan Sustainable Communities Strategy (SCS) Alternative – SANDAG 2021 Regional Plan land uses and transportation network.
- Fire Safe and VMT Efficient Alternative – Project scenario cumulative land use totals and transportation network. Moves half of unincorporated County household growth to unincorporated VMT efficient areas that are considered fire safe.
- Village Support Areas Alternative – Project scenario cumulative land use totals and transportation network. Moves all unincorporated County household growth to

designated unincorporated villages or unincorporated areas within a half-mile of those villages.

Project Scenario

The SANDAG Regional Plan EIR Alternative 2 (Data Set 39) model version, land uses, and VMT results are used to represent the proposed Project for the CAP SEIR. The land use assumptions contained in Data Set 39 are consistent with historical growth patterns in the unincorporated County and reflect expected growth consistent with the General Plan for the county. Additionally, the transportation network and policy inputs consist of "transportation projects with environmental clearance, that have full funding, are under construction, or are otherwise reasonably foreseeable based on current plans…" (SANDAG 2021 Regional Plan EIR, Chapter 6 Alternatives Analysis, Page 6-3).

Table 1 shows the housing totals and growth modeled within the county for the Project.

Table 1: DS 39 Unincorporated Land Use Totals by Model Year

Year	Total Households	Growth from Base Year
Base Year (2016)	180,543	-
2035	195,249	14,706
2050	199,250	18,707

Source: SANDAG, Fehr & Peers.

2021 Regional Plan/SCS Alternative

The adopted SANDAG 2021 Regional Plan assumes 9,902 new households in the unincorporated County between the base year and 2050 (with almost all of the growth occurring between the base year and 2035). Additionally, the 2021 Regional Plan/SCS version of the model includes the Road User Charge as a funding source for the Regional Plan. The Road User Charge directly affects auto operating costs; including the Road User Charge results in lower VMT forecasts than scenarios without the Road User Charge. On September 23, 2022 the SANDAG Board directed SANDAG staff to prepare an amendment to the 2021 Regional Plan without the Road User Charge. The amendment is expected to be brought to the SANDAG Board of Directors for consideration on October 27, 2023. In addition, the SANDAG Board voted on September 22, 2023 against including the Road User Charge in the 2025 Regional Plan.

Table 2 shows the number of households in the county by model year for the SCS alternative.

Table 2: SCS Alternative Unincorporated Land Use Totals by Model Year

Year	Total Households	Growth from Base Year
2016	180,543	-
2035	188,988	8,445
2050	190,445	9,902

Source: SANDAG, Fehr & Peers.

Fire Safe and VMT Efficient Alternative

This alternative reassigns housing growth from the Project scenario to VMT efficient areas that are considered fire safe. Specifically, half the housing growth in units in the unincorporated County would occur in areas designated as fire safe and VMT efficient. These areas are shown on **Figure 1** and represent areas that are both not designated "high" or "very high" fire and that have a VMT per resident of 15% below the SANDAG regional average.

The following changes were made to model land uses compared to the Project alternative:

- Half of all unincorporated County growth outside fire safe and VMT efficient master geographic reference areas (MGRAs) was moved to those MGRAs (MGRAs within VMT efficient TAZs and outside high and very high fire hazard areas). The other half of unincorporated County growth was not moved.
- No growth was moved from unincorporated MGRAs that are over 90% tribal, military, federal, or state land (not under County control) with growth greater than 10 households.
- All growth moved to VMT efficient MGRAs was distributed proportionally based on land area of the MGRAs (uniformly increasing the density of the MGRAs).

Table 3 shows the number of households moved to fire safe and VMT efficient areas by Community Plan Area (CPA).

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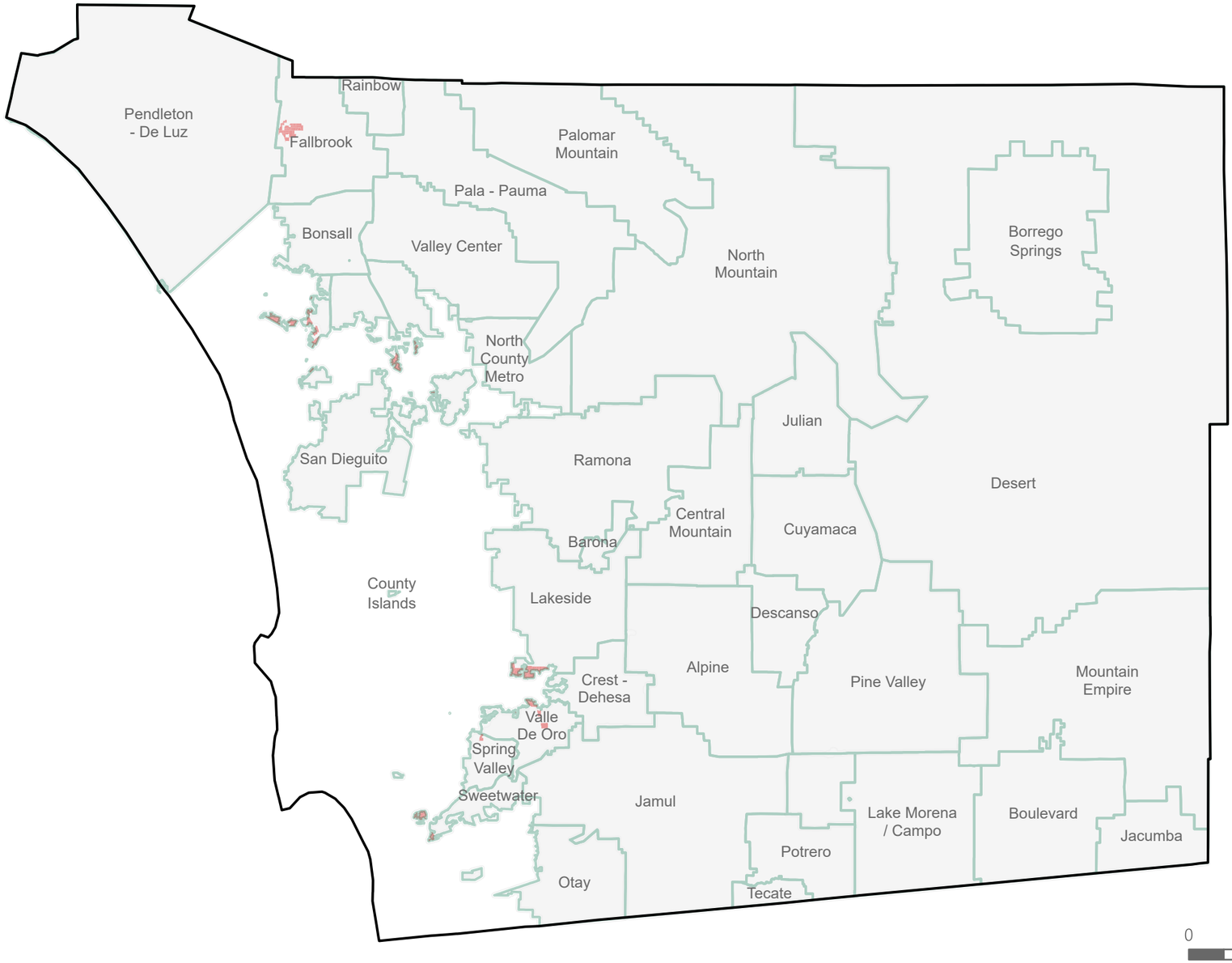

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Legend

- SANDAG Region
- Community Plan Area
- Fire Safe and VMT Efficient Areas

Figure 1: Fire Safe and VMT Efficient Areas

Table 3: Households moved from CPAs to VMT Efficient Areas that are Fire Safe

CPA	Number of Households Moved from a CPA to a VMT Efficient Area that is Fire Safe by Model Year	
	2035	2050
Spring Valley	387	534
Sweetwater	158	219
Otay	1,032	1,528
County Islands	0	0
Valle De Oro	151	224
Crest-Dehesa	13	14
Lakeside	493	602
Alpine	6	6
Barona	0	0
Ramona	160	161
Central Mountain	12	12
San Dieguito	629	896
Fallbrook	149	153
Bonsall	283	359
Pendleton-De Luz	12	12
Rainbow	13	13
Pala-Pauma	24	24
North Mountain	3	3
Valley Center	148	149
North County Metro	1,895	2,429
Julian	11	11
Desert	0	0
Mountain Empire	2	2
Jamul-Dulzura	81	81
Total	**5,662**	**7,432**

Source: SANDAG, Fehr & Peers.

Village Support Areas Alternative

This alternative assumes that all growth in housing in the unincorporated County will occur within designated villages or within a half-mile of those villages (collectively referred to as Village Support Areas). These areas are shown on **Figure 2**. The following changes were made to model land uses compared to the Project alternative:

- All unincorporated county growth was allocated to MGRAs which have centers in the Village Support Areas.
- No growth was moved to MGRAs in the Village Support Areas that are over 80% tribal, military, federal, or state land (not under County control).
- No growth was moved from unincorporated MGRAs that are over 90% tribal, military, federal, or state land (not under County control) with growth greater than 10 households.
- All growth was kept within the Community Plan Area where feasible. For example, growth outside the Village Support Areas in the Ramona CPA was moved to Village Support Areas within the Ramona CPA.
- Only the Barona, Desert, County Islands, and Pendleton – De Luz CPAs contained no Village Support Areas. Growth in these areas was manually assigned to the nearest Village Support Area.
- All growth moved to Village Support Area MGRAs within a given CPA was distributed proportionally based on land area of the MGRAs (uniformly increasing the density of the MGRAs).

Table 2 shows the number of households moved to Village Support Areas by CPA.

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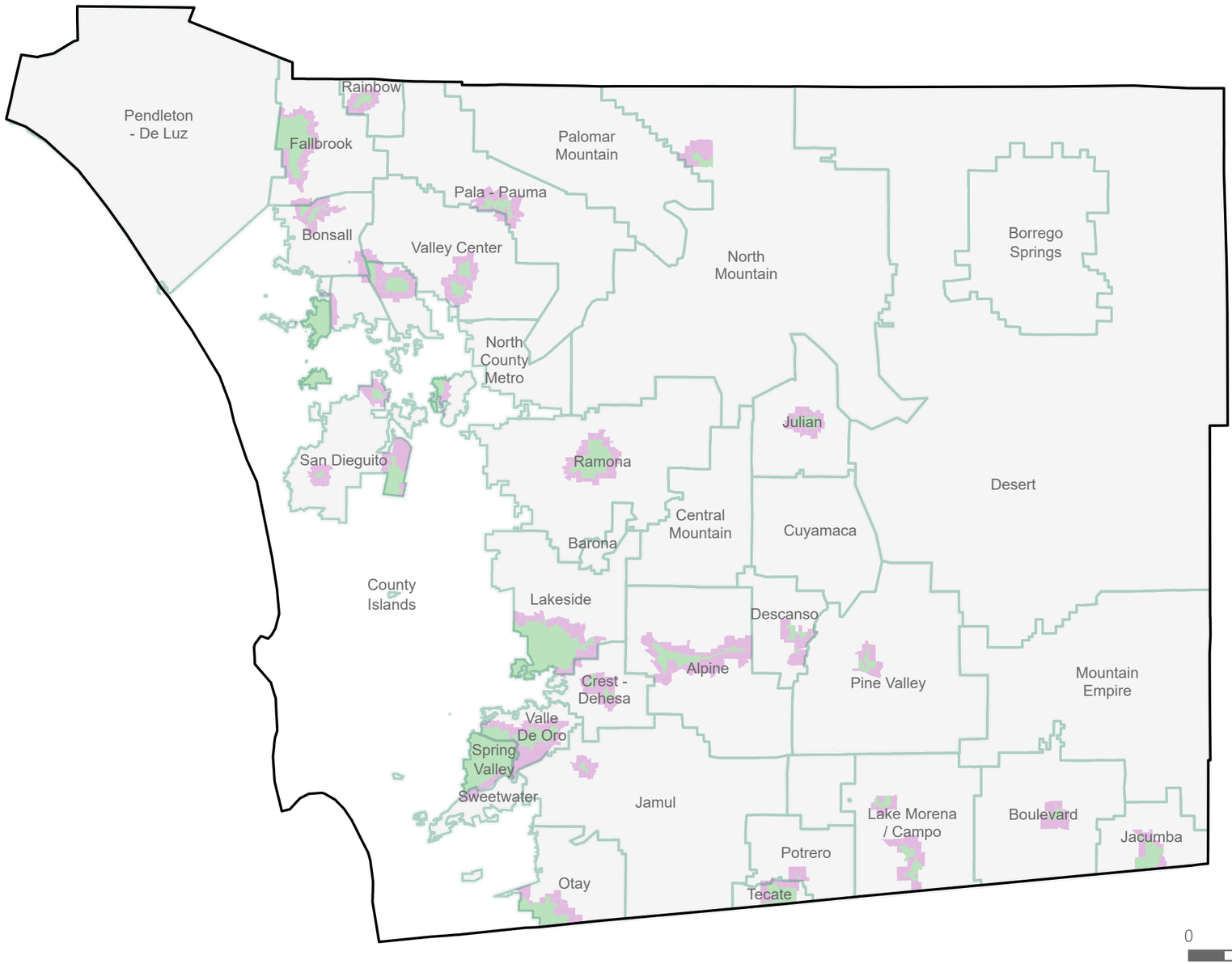

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Legend

- SANDAG Region
- Community Plan Area
- Village Support Areas
- County Village Areas

Figure 2: County Village Areas and Village Support Areas

Table 2: Households moved from CPAs to Village Support Areas

CPA	Number of Households Moved from a CPA to a Village Support Area	
	2035	2050
Spring Valley	0	0
Sweetwater	290	396
Otay	0	0
County Islands	142	161
Valle De Oro	122	232
Crest-Dehesa	17	18
Lakeside	51	69
Alpine	3	3
Barona	0	0
Ramona	115	118
Central Mountain	11	11
San Dieguito	257	434
Fallbrook	97	101
Bonsall	381	530
Pendleton-De Luz	18	18
Rainbow	8	8
Pala-Pauma	24	24
North Mountain	3	3
Valley Center	197	198
North County Metro	2,591	3,220
Julian	8	8
Desert	0	0
Mountain Empire	2	2
Jamul-Dulzura	149	150
Total	**4,486**	**5,704**

Source: SANDAG, Fehr & Peers.

Methodology for Determining Total VMT

Fehr & Peers utilized the model outputs for the CAP SEIR alternatives evaluate changes in VMT for the unincorporated County resulting from the alternatives. Total VMT and transportation metrics were evaluated for 2035 and 2050 conditions using the "CAP" method[1] as follows:

- Total VMT produced using the "CAP" method includes all internal VMT, ½ of internal to external VMT, and ½ of external to internal VMT. For example, all VMT originating from trips that start and end in the unincorporated area are included. One half of the VMT that originates in the unincorporated County but ends in one of the region's cities is included AND one half of the VMT that originates in one of the cities but ends in the unincorporated area is included.

Total VMT Generated (CAP)	All vehicle-trips are traced to the zone or zones of study. This includes internal to internal (II), 1/2 internal to external (IX), and 1/2 external to internal (XI) trips. May use final assignment origin-destination (OD) trip tables or production (P) and attraction (A) estimates multiplied by distance skims. When the model has multiple assignment periods, OD trip tables and congested skims from each period should be used.	

In addition, adjustments were made to account for military and tribal land, which is not within the County's jurisdiction. The *Military and Tribal VMT Adjustment for the San Diego County CAP Model Scenarios* (Fehr & Peers, February 2023) describes the process for the adjustment.

[1] "The "CAP" method for estimating total VMT is used throughout California and is the ICLEI (ICLEI-Local Governments for Sustainability) recommended methodology. In addition, it is documented in the SANDAG Regional Climate Action Planning Framework (ReCAP), December 2020, Appendix I, Pages 18-21.

Results

Table 4 shows base year CAP VMT as well as 2035 CAP VMT for the Project and three alternatives[2]. **Table 5** shows 2016 CAP VMT as well as 2050 CAP VMT for the Project and three alternatives.

Table 4: 2035 Total VMT

Alternative	Unincorporated County Total Weekday VMT[1]	Change from Project Alternative	Percent Change
Base Year (2016)	8,853,215	-	-
Project	9,635,081	0	0.0%
RTP SCS	8,892,653	-742,428	-7.71%
Fire Safe and VMT Efficient	9,583,847	-51,234	-0.53%
Village Support Areas	9,627,226	-7,855	-0.08%

Notes: [1] CAP VMT = II VMT + 1/2*IE VMT + 1/2*EI VMT
Source: SANDAG, Fehr & Peers.

Table 5: 2050 Total VMT

Alternative	Unincorporated County Total Weekday VMT[1]	Change from Project Alternative	Percent Change
2016	8,853,215	-	-
Project	10,216,009	0	0.0%
RTP SCS	9,247,568	-968,441	-9.48%
Fire Safe and VMT Efficient	10,174,451	-41,558	-0.41%
Village Support Areas	10,212,348	-3,661	-0.04%

Notes: [1] CAP VMT = II VMT + 1/2*IE VMT + 1/2*EI VMT
Source: SANDAG, Fehr & Peers.

The SCS Alternative results in the greatest reduction in VMT compared to the project. This is a result of a much smaller growth in households in the unincorporated County, inclusion of the Road User Charge, and significant investments and policy changes related to the transportation network (such as SANDAG's 5-Big Moves[3] which are part of the 2021 Regional Plan). These transportation network policies and network changes included in the SCS alternative result in

[2] VMT results for the Fire Safe and VMT Efficient alternative and Village Support Areas alternatives were calibrated to be consistent with results published for the County's CAP GHG Inventory sourced from model results provided directly from SANDAG. Each model run performed produces varied results since travel demand modeling is a simulation; therefore, the calibration was made to allow for direct comparison to the County's CAP GHG Inventory.

[3] SANDAG - 5 Big Moves

significant transportation mode shifts to transit, active transportation, and reduced driving in general.

The Fire Safe and VMT Efficient alternative results in a 0.53% reduction in unincorporated County VMT for 2035 and a 0.41% reduction in unincorporated County VMT for 2050. The Village Support Areas alternative results in a 0.08% reduction in total VMT in 2035 and a 0.04% reduction in total VMT in 2050. These changes appear very small; however, it is important to consider that in the base year (2016) the unincorporated County already generates approximately 8.8 million VMT. Only minor decreases in VMT associated with the existing population are expected due to the assumptions in the DS 39 version of the model, which is not the case under the SCS alternative since the policy assumptions result in large shifts in the existing population's travel choices. Therefore, Fehr & Peers expects the magnitude overall VMT reduction between the Project and these two alternatives to be small since the vast majority of unincorporated County VMT under future year alternatives can be attributed to existing land uses.

Another way to understand the VMT outcomes of moving land use within the County is to evaluate the VMT associated with the land use growth. For example, assuming the VMT associated with existing residents is held constant at the 2016 base year levels, the change in VMT from 2016 base year levels for the Project and each alternative would represent the VMT associated with new development beyond base year. This is shown in **Table 6** and **Table 7** for 2035 and 2050 respectively.

Focusing just on the growth in VMT since 2016, changes in VMT associated with the Fire Safe and VMT Efficient Areas alternative are more apparent. Growth in VMT is 6.6% lower than the Project for 2035 and 3.0% lower than the Project for 2050.

Table 6: 2035 Change in VMT compared to Project Growth in VMT

Alternative	Unincorporated County Weekday Total VMT[1]	Change in VMT from Base Year	Percent of Project Growth in VMT	Change in VMT Growth
Base Year (2016)	8,853,215	-	-	-
Project	9,635,081	781,866	100.0%	0.0%
RTP SCS	8,892,653	39,438	5.0%	-95.0%
Fire Safe and VMT Efficient	9,583,847	730,632	93.4%	-6.6%
Village Support Areas	9,627,226	774,011	99.0%	-1.0%

Notes: [1] CAP VMT = II VMT + 1/2*IE VMT + 1/2*EI VMT
Source: SANDAG, Fehr & Peers.

Table 6: 2050 Change in VMT compared to Project Growth in VMT

Alternative	Unincorporated County Total Weekday VMT[1]	Change in VMT from Base Year	Percent of Project Growth in VMT	Change in VMT Growth
Base Year (2016)	8,853,215	-	-	-
Project	10,216,009	1,362,794	100.0%	0.0%
RTP SCS	9,247,568	394,353	28.9%	-71.1%
Fire Safe and VMT Efficient	10,174,451	1,321,236	97.0%	-3.0%
Village Support Areas	10,212,348	1,359,133	99.7%	-0.3%

Notes: [1] CAP VMT = II VMT + 1/2*IE VMT + 1/2*EI VMT
Source: SANDAG, Fehr & Peers.

Growth in VMT for the Village Support Areas alternative is 1.0% lower than the Project for 2035 and 0.3% lower for 2050. While it may move households closer to retail, school, and other destinations, keeping the household growth in its respective CPA (or nearest CPA with a Village support area) likely has a limited effect on reducing commute distances.

For purposes of the analysis presented herein, households were moved to Village Support Areas within their original Community Plan Area in randomized process weighted to ensure approximately equal growth in density across a Village Support Area. Greater VMT benefits would likely occur if new households were concentrated in specific Village Support Areas, specifically in areas closer to incorporated areas. Growth in the Fire Safe and VMT Efficient alternative is concentrated closer to incorporated areas and the reduction in VMT compared to the project scenario is clear. A similar conclusion could be drawn if development was concentrated only in Village Support Areas overlapping VMT efficient areas that are fire safe.

Note that, while households were moved, socioeconomic data associated with those households was not changed. These household characteristics may vary from existing households in Fire Safe and VMT Efficient areas as well as Village Support Areas. While the change in location reduces trip lengths associated with the relocated households, it may not change the likelihood to use transit, to use alternative modes of transportation, or to commute a long distance to work using a personal vehicle.

Note that no employment changes associated with non-residential development were assumed in the modeling. The modeling reflects the highest VMT outcomes since it does not capture the typical benefits associated with mixed-use developments and neighborhood serving retail and focuses only on growth in housing units. Denser development for both the Fire Safe and VMT Efficient alternative as well as the Village Support Areas alternative would likely catalyze growth in employment and mixed-use development and would result in greater VMT benefits than shown.

Additional reductions in VMT could also occur if transportation network changes were made compared to the Project model scenario to encourage transit and active transportation.