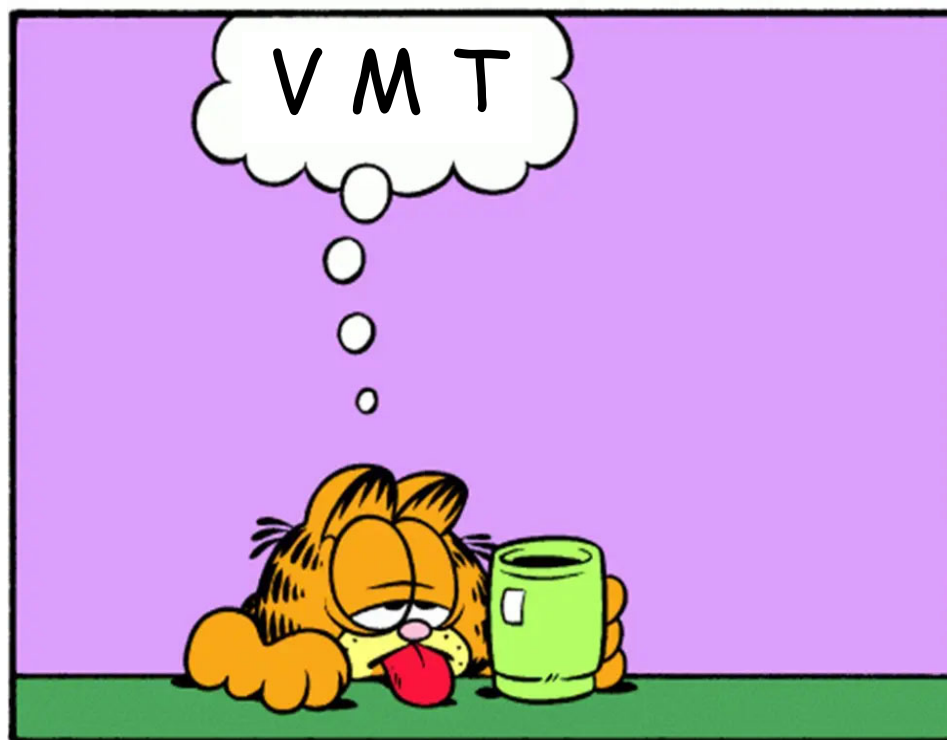




FEHR  PEERS

Presented by Katy Cole

ITE San Diego February Lunch Meeting: **ITE Task Force Modeling Sub-Committee and SANDAG Model VMT Metrics**



Current SANDAG Model

<i>Model</i>	<i>Associated Document</i>	<i>Growth Forecast</i>	<i>Status</i>
ABM 1	2015 Regional Plan	Series 13	RETIRED (no longer available for use)
ABM 2	2019 Federal Regional Transportation Plan	Series 14 – Data Set 17 (DS 17)	Past Model
ABM 2+	2021 Regional Plan	Series 14 – DS 38 (Note DS 41/42 will be used for Service Bureau requests)	Current Model
ABM 3 (New)	Future 2025 Regional Plan	TBD	Model in Development

ITE Modeling Sub-Committee History

- Started in February/March of 2020
- Meets Bi-Weekly (mostly)
- Purpose: Provide guidance on using the SANDAG model for VMT impact analysis related to SB 743

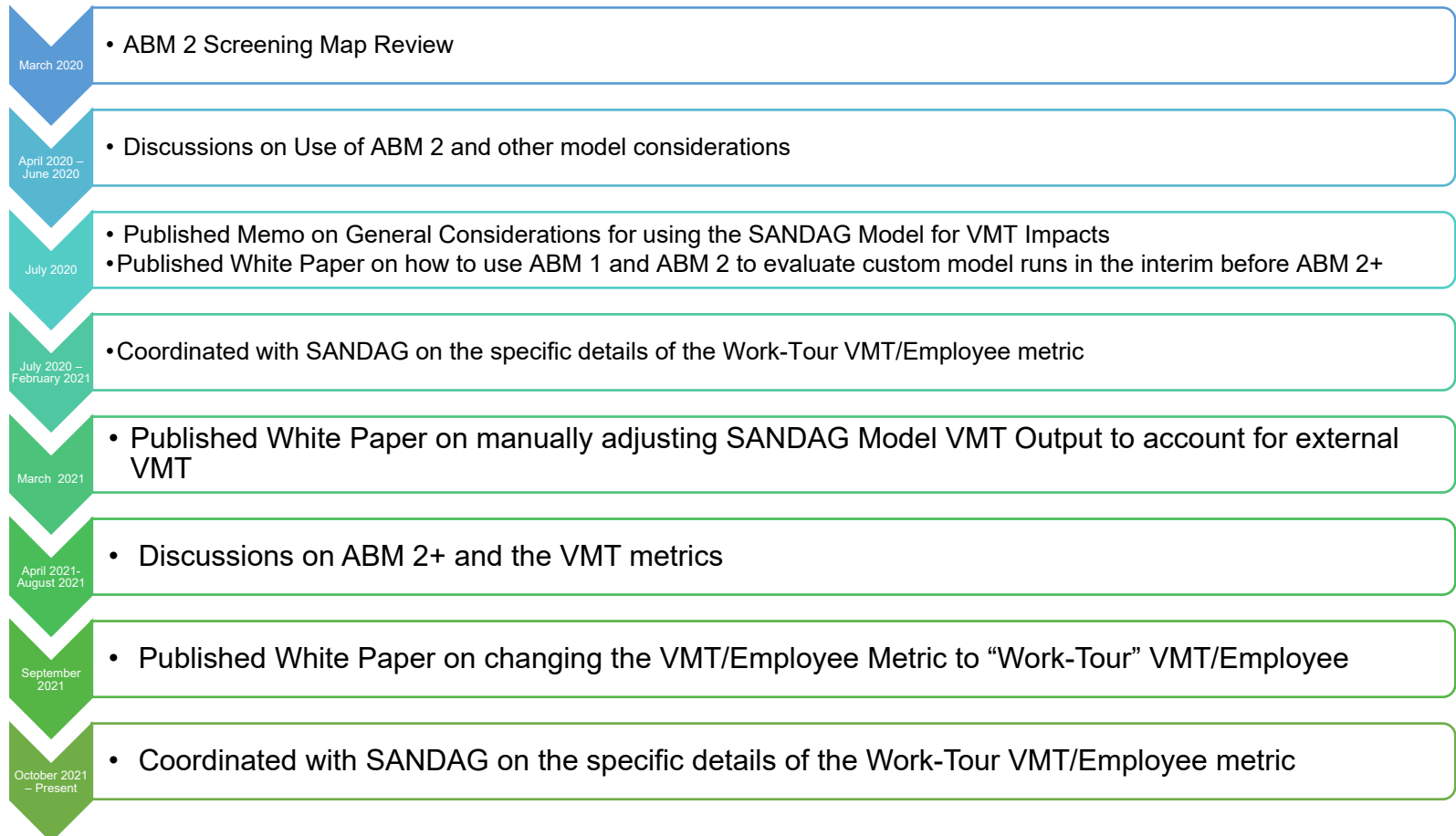
Sub-Committee Chair:

- Katy Cole, Fehr & Peers

Members:

- Amy Jackson, Kimley-Horn
- Ann French Gonsalves, City of San Diego
- Craig Williams, City of Escondido
- Damon Davis, County of San Diego
- Emanuel Alforja, City of San Diego
- Erik Ruehr, VRPA Technologies
- Jenifer Horodyski, City of Carlsbad
- Justin Rasas, LOS Engineering
- KC Yellapu, Linscott, Law & Greenspan
- Maureen Gardiner, City of San Diego
- Maurice Eaton, Caltrans
- Meghan Cedeno, City of San Diego
- Mike Calandra, SANDAG
- Pedro Valera, City of San Diego
- Phuong Nguyen, Chen Ryan
- Rick Curry, WSP
- Samir Hajjiri, City of San Diego
- Scott Barker, City of Chula Vista
- Sohrab Rashid, Fehr & Peers
- Walter Musial, Linscott, Law & Greenspan

Timeline of Issues Addressed by the Sub-Committee



Timeline of Issues Addressed by the Sub-Committee

July 2020

Published Memo on General Considerations for using the SANDAG Model for VMT Impacts

VRPA TECHNOLOGIES, INC.
TRANSPORTATION TECHNOLOGY AND SUSTAINABLE SOLUTIONS

MEMORANDUM

TO: Rick Curry, San Diego Association of Governments
Mike Calandra, San Diego Association of Governments

FROM: Erik Ruehr, VRPA Technologies
Chair, Transportation Capacity and Mobility Task Force
Institute of Transportation Engineers – San Diego Section

Katy Cole, Fehr and Peers
SANDAG Model Subcommittee Chair, Transportation Capacity and Mobility Task Force
Institute of Transportation Engineers – San Diego Section

DATE: July 17, 2020

RE: Use of SANDAG Regional Travel Model for VMT Analysis Related to SB 743

This memo was written by Erik Ruehr and Katy Cole of the Transportation Capacity and Mobility Task Force, a task force of the Institute of Transportation Engineers – San Diego Section. Its purpose is to provide background information regarding the use of the SANDAG regional travel model for VMT analysis related to SB 743.

Senate Bill 743 (SB 743) is state legislation passed in 2013 and was adopted into the California Environmental Quality Act (CEQA) in December 2018 with a required implementation date of July 1, 2020. Many lead agencies in California have already incorporated SB 743 and all lead agencies are expected to do so by July 1. SB 743 changes the performance measure for CEQA transportation impacts of land development projects from level of service and delay to vehicle miles traveled. This means that, for the purposes of CEQA, land development projects will no longer be evaluated based on whether they create traffic congestion but will instead be evaluated on how many vehicle miles traveled they generate.

The SB 743 legislation stated that the minimum geographic area for implementation of SB 743 would include transit priority areas (i.e. areas near major transit stations) but it could be extended to a larger geographic area including the entire state. The agency chosen by the legislature to determine the geographic area for implementation and to write other details regarding implementation is the Governor's Office of Planning and Research (OPR). OPR subsequently decided that SB 743 should apply to the entire state and the CEQA adoption language incorporating SB 743 includes this requirement. OPR also provided a number of recommendations for the implementation of SB 743 described in a Technical Advisory dated December 2018.

The information above describes state requirements for the implementation of SB 743. Under CEQA, lead agencies are allowed to determine the detailed methodologies for conducting CEQA technical studies and

- ❖ Identifies that unique project types may require using different modeling tools or metrics than those identified in the ITE Regional Guidelines.
- ❖ Identifies that model boundaries existing for all models and typically external VMT is not accounted for in the model, so alternative methods may be needed to account for external VMT.

Timeline of Issues Addressed by the Sub-Committee

July 2020

Published White Paper on how to use ABM 1 and ABM 2 to evaluate custom model runs in the interim before ABM 2+

ITE Transportation Capacity and Mobility Task Force - SB 743 Modeling Subcommittee

Use of ABM 1 and ABM 2 for SB 743 Related VMT Analysis in the Interim Until ABM 2+ is Completed
Final DRAFT - July 17, 2020

Drafted/Reviewed by: Maureen Gardiner, Phuong Nguyen, Katy Cole, Erik Ruehr

SANDAG Travel Demand Model Versions

For reference, below are the most recent SANDAG travel demand model versions and some relevant information about them. For complete information on SANDAG travel demand models, go to www.sandag.org.

Series 12 (retired from service)

- 2011 Regional Plan
- First Sustainable Communities Strategy (SCS)
- Used the Series 12 Growth Forecast, Base Year 2008
- Based on 2006 travel behavior survey
- Used the old 4-step travel demand model method (trip based)

ABM 1 (previous model version)

- [2015 Regional Plan \(RP\)](#)
- Second SCS
- Uses the Series 13 Growth Forecast, Base Year 2012
- Based on 2006 travel behavior survey
- Uses the new activity based model method (tour based)
- Able to be run with land use overrides.

ABM 2 (current model version)

- [2019 Federal Regional Transportation Plan \(RTP\)](#)
- Does not include a SCS
- Uses the network assumptions from the 2015 Regional Plan
- Uses a previous version of the Series 14 Growth Forecast, Base Year 2016
- Based on 2016 travel behavior survey
- Not able to be run with land use overrides.

ABM 2+ (under development)

- [2021 Regional Plan \(RP\) \(under development\)](#)
- Will include third SCS
- Will include the [5 Big Moves](#)
- Will use networks that are currently under development
- Will use an updated version of the Series 14 Growth Forecast, Base Year 2016
- Will be based on 2016 travel behavior survey, 2018 commute behavior survey
- Will include a SCS

- ❖ Describes the SANDAG models from the last decade.
- ❖ Provides a method for using ABM 1 and ABM 2 together to perform custom model runs. ABM 2 does not have the functionality to perform custom model runs.

Timeline of Issues Addressed by the Sub-Committee

March 2021

Published White Paper on manually adjusting SANDAG Model VMT Output to account for external VMT

ITE Transportation Capacity and Mobility Task Force - SB 743 Modeling Subcommittee

A Proposed Methodology for Adjustments to SANDAG Model-Produced VMT/Capita and VMT/Employee Due to VMT Generated Outside the San Diego Region

March 22, 2021 - Erik Ruehr (primary author, with input and assistance from the SB 743 Modeling Subcommittee)

BACKGROUND

In the San Diego region, VMT calculations for land development projects are typically conducted by comparing a project's VMT/capita or VMT/employee to community, city, or regional averages using data provided by the SANDAG regional travel demand model. State guidelines recommend that these calculations take into account VMT occurring outside the region. Although the SANDAG model does not currently include any adjustments for VMT occurring outside the region, the process of comparing project VMT data to the appropriate averages may indirectly account for the effects of external VMT so that additional adjustments may not be necessary. However, for analysis of some projects within the San Diego region, it may be advisable to adjust the results of the model to account for external VMT. This paper provides information to assist analysts in determining when adjustments may be needed as well as a proposed methodology to make the adjustments.

VMT/Capita and VMT/Employee data are used for a variety of applications in transportation planning and traffic engineering. The methodology described in this paper is intended for use in CEQA transportation analyses. It is not intended for use in calculating VMT-based fees.

DETERMINING THE NEED FOR ADJUSTMENTS

VMT analysis for most projects analyzed in the San Diego region would not require an adjustment to account for external VMT. The explanation provided below describes why external VMT is typically not a consideration in VMT analysis and identifies potential exceptions.

The SANDAG region is considered to be somewhat unique among the various regions in California in that there are natural or man-made barriers to travel between the SANDAG region and all of its neighboring regions. This assertion is based on judgment since it would be difficult to demonstrate the unique characteristics of different regions using available data. The various neighboring regions and the barriers to travel can be described as follows:

- ❖ Provides process for adjusting the SANDAG model output for a project to account for external VMT.
- ❖ Note that the process uses output from the California Statewide Travel Demand Model and assumptions about VMT produced in Mexico.
- ❖ The process does not adjust the VMT thresholds, therefore the resulting analysis is always conservative.

Timeline of Issues Addressed by the Sub-Committee

September 2021

Published White Paper on changing the VMT/Employee Metric to “Work-Tour” VMT/Employee

Refined VMT/Employee Metric for SB 743 Analysis
Final: 9/10/2021

ITE Transportation Capacity and Mobility Task Force - SB 743 Modeling Subcommittee

Refined VMT/Employee Metric for SB 743 Analysis

Final: 9/10/2021

Drafted by Katy Cole, reviewed by ITE Modeling Sub-Committee

This document describes the VMT/Employee metric, the current components of the metric, and refinements that will be made to the metric.

What is VMT/Employee?

VMT/Employee is used as a metric to evaluate VMT transportation impacts for employment projects. The metric is an “efficiency” metric that sums employee VMT and divides by the total number of employees. As with any VMT metric, the specific VMT that is included in the numerator of the calculation varies across agencies and travel models. This is due to variations in modeling procedures, model output, model type, and interpretation of what types of VMT should be included in the calculation.

The Office of Planning and Research (OPR) Technical Advisory on Evaluating Transportation Impacts in CEQA (December 2018) provides general guidance related to the VMT/employee metric and calculation methods. The following excerpts are from the OPR Technical Advisory related to calculating VMT/Employee:

Page 16:

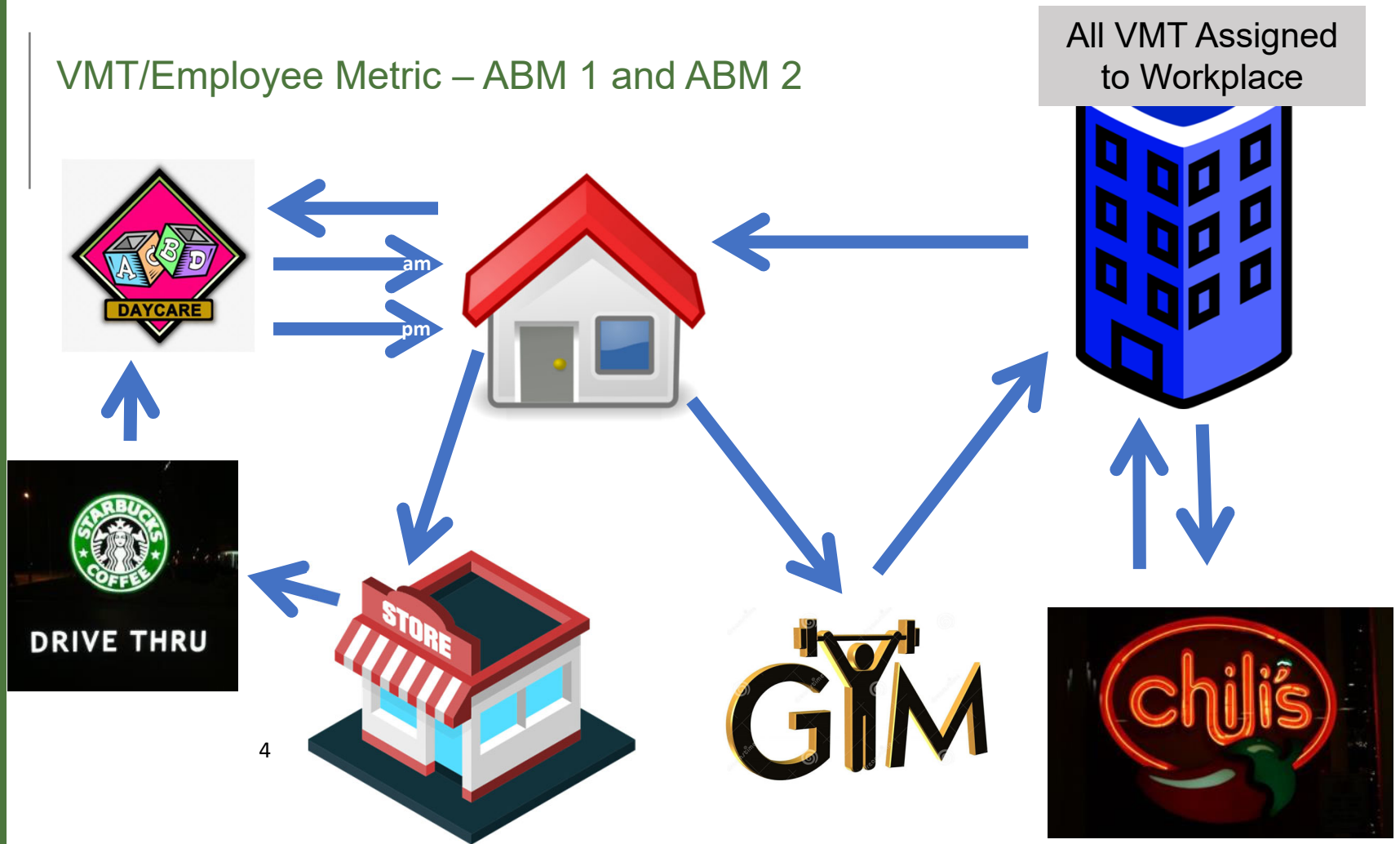
Recommended threshold for office projects: A proposed project exceeding a level of 15 percent below existing regional VMT per employee may indicate a significant transportation impact.

Office projects that would generate vehicle travel exceeding 15 percent below existing VMT per employee for the region may indicate a significant transportation impact. In cases where the region is substantially larger than the geography over which most workers would be expected to live, it might be appropriate to refer to a smaller geography, such as the county, that includes the area over which nearly all workers would be expected to live.

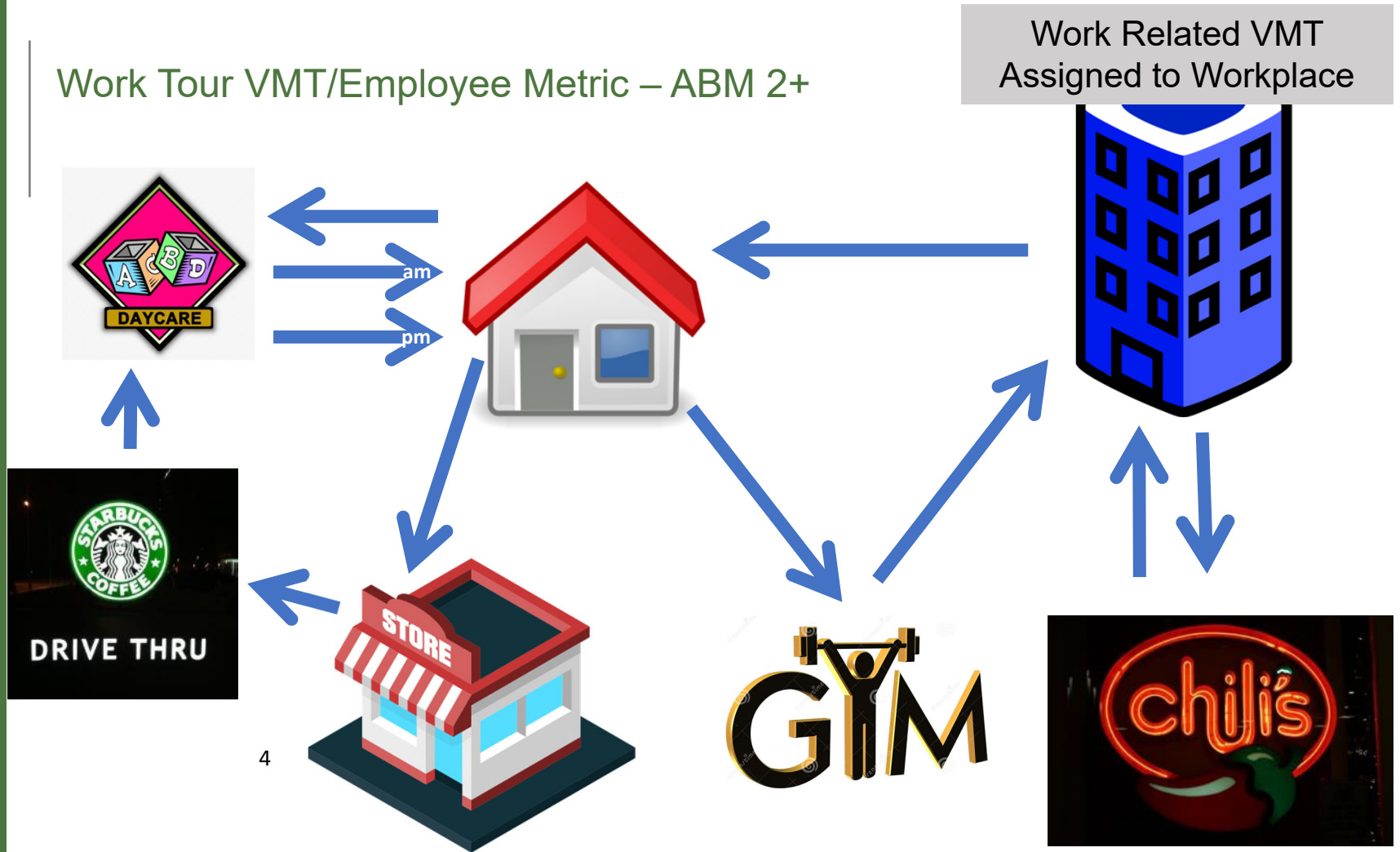
Office VMT screening maps can be developed using tour-based data, considering either total employee VMT or employee work tour VMT. Similarly, tour-based analysis of office project VMT could consider either total employee VMT or employee work tour VMT. Where tour-based information is unavailable for threshold determination, project assessment, or assessment of mitigation, home-based work trip VMT should be used throughout all steps of the analysis to maintain an “apples-to-apples” comparison.

- ❖ Describes options for calculating the VMT/employee metric.
- ❖ Describes the guidance provided in the OPR Technical Advisory for choosing the VMT to include in metrics.
- ❖ Recommends updating the VMT/employee metric to work tour VMT/employee.

VMT/Employee Metric – ABM 1 and ABM 2



Work Tour VMT/Employee Metric – ABM 2+



Purpose for Changing the Metric

Appendix 1. Considerations About Which VMT to Count

Consistent with the obligation to make a good faith effort to disclose the environmental consequences of a project, lead agencies have discretion to choose the most appropriate methodology to evaluate project impacts.³⁸ A lead agency can evaluate a project's effect on VMT in numerous ways. The purpose of this document is to provide technical considerations in determining which methodology may be most useful for various project types.

Background on Estimating Vehicle Miles Traveled

Before discussing specific methodological recommendations, this section provides a brief overview of modeling and counting VMT, including some key terminology.

Here is an illustrative example of some methods of estimating vehicle miles traveled. Consider the following hypothetical travel day (all by automobile):

1. Residence to Coffee Shop
2. Coffee Shop to Work
3. Work to Sandwich Shop
4. Sandwich Shop to Work
5. Work to Residence
6. Residence to Store
7. Store to Residence

Trip-based assessment of a project's effect on travel behavior counts VMT from individual trips to and from the project. It is the most basic, and traditionally the most common, method of counting VMT. A trip-based VMT assessment of the residence in the above example would consider segments 1, 5, 6 and 7. For residential projects, the sum of home-based trips is called *home-based* VMT.

A *tour-based* assessment counts the entire home-back-to-home tour that includes the project. A tour-based VMT assessment of the residence in the above example would consider segments 1, 2, 3, 4, and 5 in one tour, and 6 and 7 in a second tour. A tour-based assessment of the workplace would include segments 1, 2, 3, 4, and 5. Together, all tours comprise *household* VMT.

Both trip- and tour-based assessments can be used as measures of transportation efficiency, using denominators such as per capita, per employee, or per person-trip.

Trip- and Tour-based Assessment of VMT

As illustrated above, a tour-based assessment of VMT is a more complete characterization of a project's effect on VMT. In many cases, a project affects travel behavior beyond the first destination. The location and characteristics of the home and workplace will often be the main drivers of VMT. For example, a residential or office development located near high quality transit will likely lead to some commute trips utilizing transit, affecting mode choice on the rest of the tour.

Characteristics of an office project can also affect an employee's VMT beyond the work tour. For example, a workplace located at the urban periphery, far from transit, can require an employee to own a car, which in turn affects the entirety of an employee's travel behavior and VMT. For this reason, when estimating the effect of an office development on VMT, it may be appropriate to consider total employee VMT if data and tools, such as tour-based models, are available. This is consistent with CEQA's requirement to evaluate both direct and *indirect* effects of a project. (See CEQA Guidelines, § 15064, subd. (d)(2).)

Purpose for Changing the Metric

Scale	Subsector	Quantified Measures ^a	Subsector Maximum ^{b, c, d, e, f}
P/S	Land Use	4	65%
	Neighborhood Design	—	—
	Trip Reduction Programs	9	45% commute VMT
	Parking or Road Pricing/ Management	3	35%
	Transit	—	—
P/C	Land Use	1	30%
	Neighborhood Design	9	10%
	Trip Reduction Programs	1	2.3% commute VMT
	Parking or Road Pricing/ Management	1	30%
	Transit	5	15%

Preliminary Comparison of VMT/Employee Metrics

ABM 1 and ABM 2

- *VMT/Employee: All of a resident employee's VMT assigned to their workplace – even VMT not related in any way to work.*
- **ABM 2 VMT/Employee Regional Average: 27.2 VMT/Employee**

ABM 2+

- *Work Tour VMT/Employee: A resident employee's work related travel assigned to their workplace. Includes commute tours (for example home to daycare to work) and other work related travel (for example lunch). Includes all teleworkers.*
- **ABM 2+ Work Tour VMT/Employee Regional Average: 18.91 Work Tour VMT/Employee**

Other Considerations of the VMT/Employee Metric

❖ Teleworking

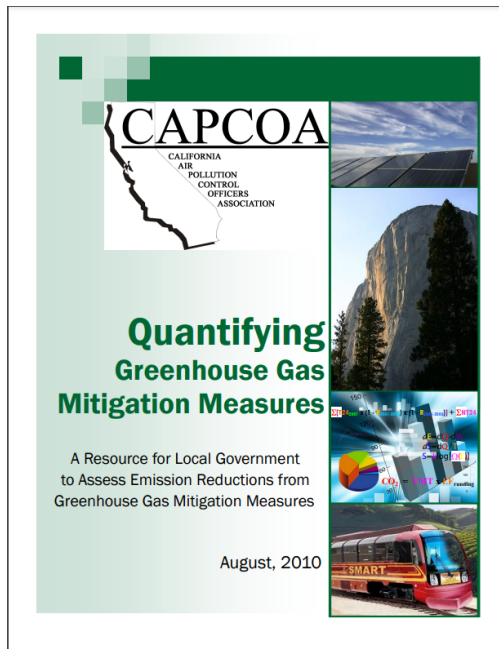
Table S.16: Telework Future Assumptions

Telework Future Assumptions			
Year	Telework Always or Primarily	Telework Occasionally	Telework Total
2016	7.1%	8%	15.1%
2020	9.2%	8.8%	18%
2025	9.7%	9.8%	19.5%
2035	10.9%	11.8%	22.7%
2050	12.7%	13.8%	26.5%

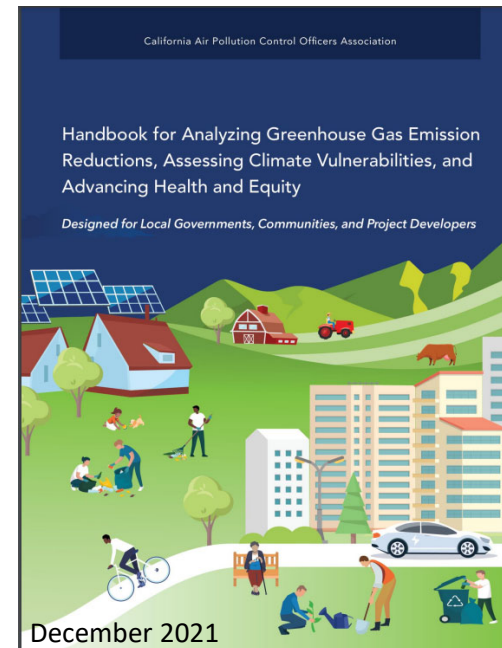
❖ External Trips

- Resident employee's external VMT
- Non-resident employee's VMT

Introducing the New CAPCOA



<http://www.aqmd.gov/docs/default-source/ceqa/handbook/capcoa-quantifying-greenhouse-gas-mitigation-measures.pdf>



<https://www.airquality.org/residents/climate-change/ghg-handbook-caleemod>

What modeling
related questions
would be helpful
for the sub-
committee to
tackle next?

