

# **DKS** MEMORANDUM

**DATE:** September 24, 2019  
**TO:** Rafael Martinez, Director of Transportation  
**FROM:** John P. Long, P.E., T.E.  
Cameron Shew, P.E., T.E.  
**SUBJECT:** TIM Fee Major Update  
Technical Memorandum 1A: VMT-Based EDU Rates

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## **Executive Summary**

The County's Traffic Impact Mitigation (TIM) Fee Program allocates the cost of roadway improvements by land use type based on "equivalent dwelling units" (EDU) – that is the demand placed on the transportation network relative to one single family dwelling unit. EDUs are currently calculated based on the number of new vehicle trips generated by that land use in the PM peak hour. The current methodology does not consider the average trip length for that land use type. Multiplying the vehicle trip generation by trip length results in vehicle-miles of travel (VMT), which is a more appropriate measure of the demand placed on the County's roadway system. Most counties and cities in the region have been using VMT-based EDU rates, and they are considered by many to be a "best practice" for traffic impact fee programs.

If adopted, VMT-based EDU rates for all for residential unit types would remain unchanged, and the rates for office and industrial uses would increase by only two percent. The EDU for typical "general commercial uses" would decrease to half the current EDU rate, while lodging uses would increase by 29 percent over current rates, due to their longer average trip lengths.

County staff and their consultant (DKS Associates) request direction on whether VMT-based EDU rates should be incorporated into the TIM Fee Program Major Update.

## **Background**

Like most development fee programs, the County's Traffic Impact Mitigation (TIM) Fee Program allocates the cost of roadway improvements by land use type based on the concept of "equivalent dwelling units" (EDU). An EDU equals the demand placed on the transportation network relative to one single family dwelling unit which is assigned an EDU of 1. Land uses which have greater overall traffic impacts than a typical single-family residential unit are assigned values greater than 1, while land uses with lower overall traffic impacts are assigned values less than 1.

Like many development fee programs, the County's TIM Fee Program bases its EDUs on the number of vehicle trips generated by each land use type. Vehicle trips are derived from studies compiled and vetted by the Institute of Transportation Engineers, which measure the vehicle trips entering and leaving a specific development. Since roadway needs are primarily based on traffic flows and conditions during the PM peak hour on an average weekday, the EDUs reflect the relative trip generation for the evening peak hour.

For non-residential uses, particularly commercial uses, trips entering and leaving a site may have already been on the roadway system and would already be passing by or near that site. Like many development fee programs, the County's TIM Fee Program accounts for the percentage of "pass by" trips, based on studies compiled and vetted by the Institute of

Transportation Engineers or other sources. EDUs thus reflect the average number of “new trips” generated by each land use type.

However, the County’s TIM Fee Program does not currently account for another important measure of the relative difference of traffic impacts by land use type – average trip lengths. The trips traveling to/from non-residential uses have shorter or longer average trip lengths than trips traveling to/from a typical residential unit. Multiplying the average number of “new” PM peak hour trips generated by a land use type by the average trip length for that land use type would yield the average vehicle-miles of travel (VMT) added to the County’s roadway system. This metric best measures the impact that each land use type would have on the County’s total roadway system.

VMT is recognized as the best measure of a development’s overall transportation impacts – not only on roadway improvement needs but also on air quality and greenhouse gas (GHG) emissions. By July 1, 2020, traffic impacts of new development under the California Environmental Quality Act (CEQA) must be based on VMT.

The use of VMT-based EDU rates is not new. DKS began using VMT-based rates in 1994 with major updates to the traffic impact fee programs for Placer County and the City of Roseville. Currently the following local jurisdictions and agencies use VMT-based EDU Rates:

**Counties**

- Sacramento County
- Placer County

**Cities**

- Sacramento
- West Sacramento
- Folsom
- Rancho Cordova
- Elk Grove
- Roseville
- Rocklin

**Agencies**

- South Placer County Transportation (SPRTA)
- Highway 65 JPA
- I-5 Subregional Corridor Mitigation Program

VMT-based EDUs is used by other jurisdictions around California and is now considered by many as a “best practice” for traffic impact fee programs.

The following analysis section shows how VMT-based EDUs would be calculated and compares potential rates with those in the current TIM Fee Program.

**Analysis**

Since some of the vehicles attracted to non-residential uses would have been on the roadway system regardless of the presence of the new traffic generator, the County’s EDUs are developed by multiplying the trip generation for a land use type “by the percent new” trips. Since the EDU rates in the County’s current TIM Fee Program are based on the “new” PM peak hour vehicle trips generated by each land use type, a VMT-based EDU rate would merely multiply the current EDU rates by the average trip length for each land use type. This

provides estimates of the “new” vehicle-miles of travel (VMT) generated during the PM peak hour for each general land use type.

The PM peak hour VMT per unit for a land use type is then divided by the VMT per single family unit. EDU factors are expressed per dwelling unit for residential development, per room for hotel/motel/B&B, and per 1,000 square feet for all other nonresidential development.

**Table 1** shows how VMT-based EDU rates could be calculated for the County’s TIM Fee Update. For the on-going TIM Fee Update, the EDU rates will be adjusted to reflect the latest PM peak hour vehicle trip generation rates from the Institute of Transportation Engineers. However, the trip generation rates used in the current TIM Fee Program were maintained so that the VMT-based EDU rates could be compared directly to the County’s current EDU rates. **Table 1** shows the effect of adding trip length to the County’s current EDU calculation. As shown in the column “VMT-Based Rate as a Percent of Current EDU Rate.” The EDU rates for all residential unit types would remain unchanged and the rates for office and industrial uses would increase by only two percent. The biggest change would be for commercial uses. The EDU for typical “general commercial uses” would decrease to half the current EDU rate, while lodging uses would increase by 29 percent over current rates due to their longer average trip lengths.

The analysis shows that VMT-based rates have two basic results. First they better reflect the overall traffic impacts of each land use type on the County’s roadway system and thus provide a better nexus for fee rates. Second they would decrease the TIM fee rates substantially for general commercial uses.

**Recommended Action:** DKS Associates and County Staff recommend the Board consider EDU rates that are based on vehicle-miles of travel (VMT).

**Table 1**

**Potential VMT-Based EDU Rates<sup>1</sup>**

**The Effect of Adding Trip Length to EDU Calculation in Current TIM Fee Program**

Land Use	Institute for Transportation Engineers (ITE) Category	Units	Trip Rate <sup>2</sup>	New Trip Ends	Trip Length (miles)	VMT per Unit <sup>3</sup>	VMT-Based EDU Rate <sup>4</sup>	EDU Rates in Current TIM Fee	Rate as Percent of Current EDU Rate
<b>Residential</b>									
SFD Not Restricted	210: Single Family Detached	Dwelling Units	1.00	100%	5.0	5.00	1.00	1.00	100%
SFD Age Restricted	251: Senior Adult - Detached	Dwelling Units	0.27	100%	5.0	1.35	0.27	0.27	100%
MFD Not Restricted	220: Apartment	Dwelling Units	0.62	100%	5.0	3.10	0.62	0.62	100%
MFD Age Restricted	252: Senior Adult - Attached	Dwelling Units	0.25	100%	5.0	1.25	0.25	0.25	100%
<b>Nonresidential</b>									
<b>Commercial</b>									
General Commercial	820: Shopping Center	1,000 Sq. Ft.	3.71	47%	2.5	4.36	0.87	1.74	50%
Hotel/Motel/B&B	320: Motel	Rooms	0.47	58%	6.4	1.74	0.35	0.27	129%
Church	560: Church	1,000 Sq. Ft.	0.55	64%	3.9	1.37	0.27	0.35	78%
<b>Office</b>									
General Office	710: General Office	1,000 Sq. Ft.	1.49	77%	5.1	5.85	1.17	1.15	102%
Medical	720: Medical-Dental Office	1,000 Sq. Ft.	3.57	60%	5.1	10.92	2.18	2.14	102%
Industrial	110: General Light Industrial	1,000 Sq. Ft.	0.97	79%	5.1	3.91	0.78	0.77	102%

<sup>1</sup> EDU Rates in TIM Fee Update will be adjusted to reflect latest ITE Trip Generation Rates. This table is intended to show effect of adding trip length to calculation of current EDU rates

<sup>2</sup> Evening peak hour trip rate

<sup>3</sup> New VMT per unit = Trip rate per unit x percent new trips x average trip length

<sup>4</sup> The equivalent dwelling unit (EDU) factor is the net new trip rate normalized so one single family unit is one EDU. Residential EDU factors are per dwelling unit. Nonresidential EDU factors are per 1,000 building square feet, except Hotel/Motel/B&B EDU factor is per room.

Source: Institute of Transportation Engineers, *Trip Generation 9th Edition*, 2012; San Diego Association of Governments, *Brief Guide of Vehicular Trip Generation Rates*, April 2002.