SERVICE UNIT CALCULATION – First Step

The basic service unit for roadway impact fees is the vehicle-mile of travel. This would be during peak afternoon traffic hours.

In order to determine the cost per service unit, the estimated growth in vehicle-miles of travel for each service area will need to be calculated for a 10-year period.

The growth in vehicle-miles will be calculated from 2023 to 2033 and will be based on estimated changes in residential as well as commercial units during the proposed period.

The growth rate used will be 7% to be consistent with the growth rate for the water and wastewater impact fees. The Land Use Assumption Map used for the Water and Wastewater Impact fees calculations will be used for the Roadway Impact Fee Service Areas.

All currently developed and developable land will be categorized as either residential or non-residential for the Roadway Impact Fee program. For residential land uses, the existing and projected number of dwelling units will be estimated for each service area.

The number of dwelling units in each service area will be multiplied by a transportation demand factor in order to compute the vehicle-miles of travel that will occur during the afternoon peak hour for the service area. This demand factor will be used to calculate the average amount of demand created by the residential land uses in each of the service areas.

There will be three (3) categories of non-residential – retail, service and basic.

Retail would be land use activities that provided for the retail sale of goods. These would be such things as grocery stores and restaurants

Service is activities that provide personal and professional services and would include government and professional offices as well as educational uses.

Basic would be activities that produce goods and services that would be exported out of the local economy. This would be such things as manufacturing, construction, transportation, wholesale, trade, warehousing and other industrial uses.

For non-residential units and using the Land Use Assumption Map, the estimated building square footages will be used for the service unit calculations. Typically when non-residential projects are proposed, the square footage of the proposed project is provided which can be used to assess the roadway impact fee for the proposed project. A transportation demand factor will be applied to non-residential units as well.

The proposed transportation demand factors will come from the ITE Trip Generation Manual, 11th Edition and the National Household Travel Survey performed by the Federal Highway Administration (FHWA).

The ITE Trip Generation Manual, 11th Edition provides the number of trips that are produced by the proposed land use for each dwelling unit, square foot of building, or other corresponding unit.

For retail projects, the rate is typically adjusted to account for the fact that a percentage of retail trips are made by people who would otherwise be traveling past the site any way, such as a trip between work and home.

For example, a stop at a nearby grocery store or home improvement store on the way home from work would not create a new trip as that person would still have been driving on that roadway to reach home. These types of trips are called pass-by trips, and since the demand would be calculated in the typical trip home, it would not be double counted as traffic for the grocery store.

The next component of the transportation demand factor accounts for the length of each trip. The average trip length for each category is based on the Capital Area Metropolitan Planning Organization (CAMPO) long-range transportation model and supplemented with the National Household Travel Survey conducted by the FHWA.

Transportation Demand Factor:

Variables:

$$TDF = T * (1 - P_b) * L_{max}$$

$$\text{where...} \ L_{max} = \min(L * OD \ \text{ or } 6)$$

TDF = Transportation Demand Factor,
T = Trip Rate (peak hour trips / unit),
P_b = Pass-By Discount (% of trips),
L_{max} = Maximum Trip Length (miles),
L = Average Trip Length (miles), and
OD = Origin-Destination Reduction (50%)

For the impact fee, the maximum trip length will vary between the service areas. In Service Area 1 the maximum trip length will be 2 miles. For Service Area 2 the maximum trip length will be 3 miles. For Service Area 3 the maximum trip length with be 4 miles.

The Origin-Destination Reduction (OD) is used to adjust the average trip length in the computation of the maximum trip length. This will prevent trips from being counted twice as both residential and non-residential. If this was not adjusted, then a trip from home to work with a stop at a store would result in this being counted as two trips. Only half of the trip would be counted as residential and the other half would be counted as non-residential.

SERVICE UNIT CALCULATION – Next Steps

1. Calculate the number of existing and future single-family units for each service area. (Using 7% growth rate)

2. Calculate the number of existing and future multifamily units for each service area. (Using 7 growth rate)

3. Calculate the square footage of existing and future non-residential development. This would be for retail, service, and basic.

4. Using the calculated demand factor, the total vehicle miles will be calculated for each service area. This would be for the estimated 10-year growth.

Variable	Residential Single Family	Residential Multifamily	Basic	Service	Retail
T	0.94	0.51	0.65	1.44	2.24
P_b	0%	0%	0%	0%	35%
L	8.59	8.59	12.89	6.76	6.35
L_{max}	4.30	4.30	6.00	3.38	3.18
TDF	4.04	2.19	3.90	4.87	4.62
	The max length is less than 6 miles for each of the service areas, so the lower trip length is used rather than 6 miles.				

Variables:

$$TDF = T * (1 - P_b) * L_{max}$$

$$\text{where...} \quad L_{max} = \min(L * OD \text{ or } 6)$$

TDF = Transportation Demand Factor,
T = Trip Rate (peak hour trips / unit),
P_b = Pass-By Discount (% of trips),
L_{max} = Maximum Trip Length (miles),
L = Average Trip Length (miles), and
OD = Origin-Destination Reduction (50%)