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FROM: Chris Cullinan, Principal
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RE: Explanation of Diverted Linked Trips

This memorandum discusses the inclusion of an additional diverted linked trip adjustment to the Streets Development Fee for commercial/shopping center land uses in the update of the County's Streets CIP and Development Fees. Please refer to the attached Figure 5.1 from the *Trip Generation Handbook*, 2nd edition, an ITE recommended practice, June 2004, Institute of Transportation Engineers (hereafter referred to as the "Handbook")

OVERVIEW

The County's Streets CIP and Development Fees utilize vehicle miles of travel (VMT) which are composed of two variables: trip generation rates and average trip length. A series of adjustments are made to both of these variables to account for the unique trip characteristics of different land uses. These adjustments improve the County's development fees compliance with the demand and proportionality requirements of the "rational nexus" test which serves as the Constitutional foundation of development fees and are echoed throughout the state enabling legislation for counties to assess development fees.

The adjustments discussed in this memorandum (including the diverted linked trips) are to just the trip generation rates and not to the average trip length.

ADJUSTMENTS TO TRIP GENERATION RATES

The County's current Streets Development Fees contain an adjustment to the trip generation rates to account for the primary trips "attracted" to the land use (i.e. the trips demanded by the land use). This is Adjustment #1 in the attached Figure 5.1. For residential, office, and industrial/flex land uses, the adjustment is 50%. In other words, of the 100% of trips associated with one of these land uses, 50% are attracted to these land uses with the other 50% leaving these land uses to travel to another land use. The impact of the 50% of trips leaving this land use is ascribed to the next land use in the series of trips. This adjustment is also referred to as an "origin-destination" adjustment where the "destination" trips are used for measuring the demand and the proportionality of the demand for additional infrastructure capacity.

ADJUSTMENTS TO TRIP GENERATION RATES FOR COMMERCIAL/SHOPPING CENTER LAND USES

Pass-by Trips

For commercial/shopping center land uses, the trip generation rate adjustment is less than 50% to account for the unique trip characteristics of these land uses. Handbook contains data on the unique trip characteristics of commercial/shopping center land uses.

The County's current Streets Development Fees for commercial/shopping centers contains an adjustment for pass-by trips (Adjustment #2 in the attached Figure 5.1). For example, when someone stops at a convenience store on their way home from work, the convenience store is not their primary destination. In other words, they stopped at the convenience store as they "passed by". Thus, to better meet the demand and proportionality requirements of the "rational nexus" test, the commercial/shopping center trip generation rates are adjusted to factor out these pass-by trips. It also important to note, the Handbook contains a significant amount of data on these sorts of trips which enables TischlerBise to produce a statistically robust analysis including a differentiation of pass-by adjustments based on size of commercial/shopping center land uses.

Diverted Linked Trips

The Handbook discusses a second characteristic of trips associated with commercial/shopping center land uses called diverted linked trips (Adjustment #3 in attached Figure 5.1). Diverted linked trips are trips that are attracted from the traffic volume on roads in the vicinity of commercial/shopping center land use but require a diversion from one road to another road to gain access to the land use. These trips add traffic to streets adjacent to the land use, but do not add trips to a community's transportation network. The Handbook lists data for these types of trips; however it is not as extensive as the data listed for pass-by trips.

RATIONALE FOR INCLUSION OF DIVERTED LINKED TRIPS IN THE COUNTY'S UPDATED STREETS CIP AND DEVELOPMENT FEES

The inclusion of diverted linked trips in transportation/streets impact fees is not uncommon. At TischlerBise, we continuously attempt to improve how we measure the impact of land uses on a community's network of infrastructure capacity. But these efforts at improvement must be carried out in a statistically sound manner that is consistent with the legal foundations and intent of development fees.

Data Concerns

The diverted linked trip data listed in the Handbook is not as extensive as that for pass-by trips. For example, there is sufficient pass-by trip data to differentiate percentages by size of development (see the column labeled "Comm. Pass-by Trips" in the table below). There is not sufficient diverted linked trip data to make a similar differentiation. However, there is sufficient diverted linked trip data to calculate a statistically sound overall adjustment factor for all sizes of commercial/shopping center land uses (see the column labeled "Comm. Diverted-Link Trips" in the table below). While the diverted linked trip data is not as robust as desired, it is sufficient for the purpose acknowledging this characteristic of commercial/shopping center land uses.

Trip Rate Adjustment Factors for Land Use Code 820 - Shopping Centers

Floor Area in thousands (KSF)	All Commercial Trips (a)	Comm. Pass-by Trips (b)*	Comm. Diverted-Link Trips (c)**	Primary Comm. Trips (d=(a-(b+c)))	Origin - Destination Adj. Factor (e)***	Commercial Trip Adj Factor (d x e)
10	100%	52%	24%	24%	50%	12%
25	100%	45%	24%	31%	50%	16%
50	100%	39%	24%	37%	50%	19%
100	100%	34%	24%	42%	50%	21%
200	100%	29%	24%	47%	50%	24%
400	100%	23%	24%	53%	50%	27%
800	100%	18%	24%	58%	50%	29%

* Based on data published by ITE in *Trip Generation Handbook* (2004), the best trendline correlation between pass-by trips and floor area is a logarithmic curve with the equation $(-7.6967 * \ln(KSF)) + 69.448$.

** Based on data published by ITE in *Trip Generation Handbook* (2004).

*** To account for the origin-destination relationship of a trip, an adjustment factor of 50% is applied to the primary trips to account for only the trip destinations, i.e. the trips attracted to a land use.

Consistency with County Planning Efforts

As noted above, diverted linked trips do not add trips to a community's transportation network. The County's arterial streets are planned and constructed as a network of infrastructure and the Street Development Fees are structured in a similar manner. Diverted linked trips add no net new vehicles to the County's streets network – these vehicles are simply “diverted.” Thus, the diverted linked trip concept is consistent with the network approach of the County's street planning efforts and development fees.

CONCLUSION

Given the consistency with the County's street planning efforts, development fees, and availability of data, an adjustment for diverted linked trips in the updated Streets CIP and Development Fees is appropriate.

Figure 5.1 Types of Trips

