

REVIEW OF THE FACILITY FEE STUDY CONDUCTED BY DUNCAN ASSOCIATES FOR THE CITY OF RALEIGH

Background

In February 2006, a consultant team completed a facility fee study to update Raleigh's thoroughfare and open space fees. Duncan Associates, a nationally recognized firm with extensive experience conducting impact fee studies, led the team. The other team members were Kimley-Horn, a well known transportation planning and engineering firm with a large presence in the Triangle area, and Dr. James C. Nicholas, an impact fee authority and lead author of the highly regarded volume: A Practitioner's Guide to Development Impact Fees (APA Press, 1991).

The four major topics of their study include the legal framework for impact fees, the administration of developer reimbursements, the methodology for updating thoroughfare and open space facility fees, and the estimation of maximum fee schedules. This review of the consultant's study presents an analysis of the methodology used to estimate thoroughfare and open space facility fees. Citations refer to pages in the report.

Impact Fee Estimation

Defensible impact fee methodologies are expected to be consistent with "rational nexus" tests that address the need for additional public facilities, the proportionate capital costs of these facilities, and the benefits received by new development paying impact fees. Although the rational nexus tests are fairly clear, no consensus exists about the best methodology, and national impact-fee consultants apply different ones to meet the rational nexus tests.

Local governments often discount maximum impact fees to find politically acceptable fee levels. As impact fees have escalated, however, both estimated fees and methods employed have been increasingly subject to legal challenge. In this environment, it is advisable to follow defensible methodologies that are carefully implemented, clearly explained, and intended to be fair to all parties.

Although an "improvements-driven" methodology was used in the 1987 study that originally estimated Raleigh's facility fees, the consultant selects a "consumption-based" approach for thoroughfare and open space, as explained on pages 29-32 and 49-51, respectively. We consider the consultant's consumption-based methodology inadequate because the levels of service identified for new development are neither clearly explained nor carefully justified. We examine the level of service treatments for thoroughfare and open space facilities using single-family detached dwelling units (SFDUs) to illustrate the results.

Thoroughfare Facility Fees

The major roadway system shown in Figure 5 (pg. 28) includes all arterials, thoroughfares, and collector streets but excludes interstate highways and expressways as well as local streets.

Demand for Facilities

Travel demand is measured in average daily vehicle miles of travel (VMT) for 22 specific development types or land use categories. For each land use category:

$$\text{VMT} = \text{Daily Trips} \times \% \text{ NEW} \times \text{Trip Length}$$

where % NEW refers to primary trips in contrast to pass-by or diverted-link trips.

The primary source of information is the ITE Manual which gives trip generation for each land use type and percent primary trips. Trip length is found in two steps. First, the amount of existing development is multiplied by land-use specific trip generation rates. The total is 1.85 million daily trips on the Raleigh road network (pg. 42). Daily trips are then divided into the estimated current VMT on the road network of 5.97 million miles (from Table 52, pgs. 64-75). The resulting average trip length of 3.22 miles is applied to most land use categories. For other categories, information relating trip purpose to trip length from the 2001 National Household Travel Survey is used to modify the trip length estimates.

Daily VMT for each land use is derived using the formula above and reported in Table 32 (pg. 44). For single family units, the result is:

$$16.92 \text{ miles} = 4.79 \text{ trips} \times 100\% \text{ new trips} \times 3.53 \text{ miles per trip}$$

Except for commercial development, all trips generated by SFDUs (and most other land uses) are considered new.

Capital Cost of Facilities

The consultant estimates facility costs per daily vehicle miles of capacity (VMC). For 24 recent projects, 318,000 VMC was added at total cost of \$63 million. Here the consultant recognizes that by virtue of the Raleigh ordinance, impact fees are allowed to cover no more than 50% of facility costs. Therefore, total facility cost of \$63 million is reduced by 50%. The resulting capital cost per VMC is \$99 (pg. 35).

The consultant makes the important point that the capacity of the road network, measured as VMC, must be greater than the demand for roads as reflected in VMT because the space and time distributions of travel are quite variable. The totals below come from Table 52 which is the detailed road segment-by-segment analysis of lanes, segment length in miles, daily travel, and capacity. The results presented in Table 18 (pg. 31) follow:

$$\begin{aligned} \text{VMC} &= 9,265,244 \text{ miles} \\ \text{VMT} &= 5,968,928 \text{ miles} \\ \text{VMC/VMT} &= 1.55 \end{aligned}$$

Although the level of service on specific road segments varies, the consultant claims that this ratio reflects level of service D for the road network as a whole. Multiplying this ratio by the \$99 cost estimate results in average facility cost of \$154, that is, $\$99/\text{VMC} \times 1.55 \text{ VMC}/\text{VMT} = \$154/\text{VMT}$. After credits are recognized, the amount drops to \$130/VMT. The consultant's maximum fees are found by multiplying this amount by average daily miles traveled for each land use, which for single family with 16.92 average daily miles traveled is \$2,198 per SFDU.

Open Space Facility Fees

The inventory of open space and recreation facilities in developed parks (mini, neighborhood, community, metro, and special), undeveloped open space, and greenways is provided in Appendix C (pgs. 79-84) and shown in Figure 9 (pg. 50).

Demand for Facilities

Population generates the demand for open space facilities. Usually, only residential units are charged open space impact fees because only demand generated by the resident population is recognized.

The consultant estimates 166,528 dwelling units in Raleigh plus its ETJ and adjusts the number of multifamily units and mobile homes as if they had the same average persons per household as single-family households—equivalent dwelling units (EDUs). Table 38 reports 77,109 SFDUs in the Raleigh area (pg. 54).

Capital Cost of Facilities

Replacement cost is used for park acquisition and greenways. Table 39 provides recent cost data for 18 land acquisitions and nine greenway easements in 2005 dollars. The averages are about \$36,000 per acre for parks and \$9,000 per acre for greenways.

Table 40 shows replacement costs for all 7,630 acres of parks and greenways using these per acre cost estimates. Total replacement cost is estimated to be \$200.6 million (pg. 56). After estimating the cost of site development and park facilities, the consultant brings together the capital cost and demand estimates in Table 44 (pg. 59). Total replacement cost for land acquisition and site development is \$1,463 per SFDU. After accounting for credits the consultant's maximum impact fee becomes \$1,206 per SFDU. As noted, the consultant reduces thoroughfare facility costs to account for the 50% impact fee limitation but does not recognize this same 50% limitation on the use of impact fees for open space projects. This oversight results in the significant overestimation of maximum open space facility fees.

Methodology Issues

As noted, the consultant applies "consumption-based" methodology to estimate demand, levels of service, capital costs, and facility fees. For both thoroughfares and open space, the consultant treats existing ratios as if they were levels of service established by local public policy or consistent with planning-based standards. Level of service is the critical link from demand for public facilities to the supply of public facilities. The correct level

of service should estimate the amount and cost of needed facilities (supply) per unit of new demand in a way that treats new development the same as existing development.

System-Wide Level of Service for Thoroughfares

The consultant modifies the \$99 cost of road capacity per VMC because this ratio “implicitly assumes that the cost to accommodate an additional vehicle-mile of travel is the same as the cost to construct an additional vehicle-mile of capacity” (pg. 30). Since excess capacity is needed to maintain any level of service above F due to the uneven temporal and spatial demand for roads, new development is expected to pay more than its direct traffic impact to maintain some excess capacity. The consultant assumes that new development should pay what is needed to maintain the 55% excess capacity that currently exists in the road network. However, the consultant does not explain why this existing excess capacity should be maintained. No local reports are cited to estimate the actual current level of service for the entire network. If the applicable standard is level of service D, then the claim that the VMC/VMT ratio of 1.55 represents a system-wide level of service D is not adequately documented.

Level of service is an ordinal category that summarizes the conditions experienced by drivers on one road segment or on the overall network. Free-flow conditions refer to service level A whereas operations at very low speeds with heavy delays reflect level F. Level D occurs when the road is approaching the point where small increases in traffic could cause considerable delays. In terms of passenger cars, level D is associated with 16-22 vehicles per kilometer per lane.

The Transportation Research Board, Highway Capacity Manual, Special Report 209 published in 1994 relates levels of service A through F to demand and supply measured as the ratio of traffic volume (V) to road capacity (C). Although published over 10 years ago, these ratios are widely used in judging the quality of road segments and networks. We have added the C/V ratio for the six levels of service, which is simply the inverse of the V/C ratio. The service levels and ratios in the manual are presented below.

Level of Service			
Level	Description	V/C	C/V
A	Free flow conditions	0.00 to 0.60	1.67 >
B	Reasonably unimpeded operations	0.61 to 0.70	1.43 to 1.66
C	Stable operations	0.71 to 0.80	1.25 to 1.42
D	Approaching unstable operations	0.81 to 0.90	1.11 to 1.24
E	Operations with delays & low speeds	0.91 to 1.00	1.00 to 1.10
F	Operations with extremely low speeds	> 1.00	< 1.00

The VMC/VMT ratio is essentially the C/V ratio shown above. The level of service D range for C/V is 1.11-1.24. In other words, a network needs to provide from 11% to 24% more capacity than volume demanded to operate at level of service D. The VMC/VMT ratio of 1.55 calculated for the Raleigh network falls in the range of level of service B

where 55% excess capacity should result in relatively unimpeded travel. Clearly, if less excess capacity is needed to maintain level of service D, the consultant’s fees would be overestimated.

It is beyond the scope of this analysis to propose appropriate levels of service for thoroughfares. The analysis is presented to underscore the importance of fully justifying and carefully estimating the current level of service in impact fee calculations.

Level of Service for Open Space

The level of service used by the consultant to estimate open space fees is measured as “the ratio of replacement value of existing facilities to existing residential development expressed in equivalent dwelling units” (pg. 51). Yet the existing level of service is inadequate for two reasons. First, it implies that one overall level of service can be applied to all types of park facilities. Second, it obscures the underlying supply-demand relationships, such as acres of parks per 1,000 persons.

For roads, utilities, or schools, the concept of capacity makes sense, and reasonable estimates of capacity can be made. For parks, the concept of capacity is nebulous. Instead, planners and recreation specialists rely on standards that reflect socially acceptable ratios of acreage to population as well as distance from dwellings to facilities for neighborhood and community parks.

The 1987 study used the standards in Raleigh’s comprehensive plan as the basis for charging facility fees, namely 5.7 acres per 1,000 persons each for parks and for greenways. The open space targets for 2025 reflected in the current comprehensive plan are much higher (about 23 acres per 1,000 persons). These standards can be used as levels of service appropriate for impact fee estimation.

We compare the existing to plan-based levels of service for neighborhood parks, community parks, metro parks, special parks, and greenways below. The planned-based standards are for 2025. The appropriate level of service for impact fee calculations is the lower of the two. This important point requires further explanation.

Classification	Existing LOS	2025 Adopted LOS
Neighborhood Parks	1.67	2.55
Community Parks	3.63	3.11
Metro Parks	6.63	4.21
Special Parks	2.50	1.70
Greenway Corridors	7.54	11.14

For neighborhood parks and greenways, the lower existing level of service should be used because impact fees should not be collected to increase the current level of service. To charge above the existing level violates the proportionality rule because new households would pay more than required to maintain the level of service currently enjoyed by existing residents.

For community parks, metro parks, and special parks, the lower target levels for 2025 should be used. The higher levels indicate that open space land and facilities are currently more abundant than required to achieve the 2025 standards for these three types of facilities. To charge the 200,000 additional persons who are expected to live in Raleigh between 2005 and 2025 impact fees at these current levels of service would result in an oversupply of open space facilities by 2025. "Oversupply" is a relative term defined in reference to the 2025 standards for these three types of parks.

Conclusions

The consumption-based methodology, as applied by the consultant, risks overestimation of fees for both roads and open space. If Transportation Research Board level of service D standards are applied to the Raleigh thoroughfare network, paying facility fees at the maximum level to maintain the excess capacity of 55% is likely to raise the level of service above level D. If the open space ratio used to calculate maximum fees is based on the replacement cost of all existing acreage per existing EDU, paying facility fees that maintain this ratio increases level of service beyond certain open space standards in the Raleigh 2025 comprehensive plan. Thus, the consultant's consumption-based methodology requires new development to pay more than its proportionate share of capital costs.

About the Authors

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