
Kane County, Illinois
Division of Transportation

Technical Specifications
Manual for Impact Fees

January 13, 2004

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Section 1: Introduction to the Impact Fee and Fee Formula

The State of Illinois Road Improvement Impact Fee Law (605 ILCS 5/5 901 et seq.) entitles Kane County to levy and collect road improvement impact fees from new traffic generating development based on a fair share impact fee calculation process. Although the process is not precisely articulated, it is clear that the calculations must be based upon fair and reasonable assessment of traffic impact. This document outlines how the Kane County Division of Transportation (KCDOT) calculates the traffic impact and how the impact fee is generated from those data.

This document draws heavily on previous work completed by the DuPage County Division of Transportation in development of specifications for a fare share impact fee program in DuPage County¹. The programs in both Kane and DuPage Counties are guided by the same legislation and must conform to the same regulations.

In the approach developed for Kane County, the impact fee is based upon a conservative estimate of the “impact” each new development will have on the county highways in its area. Impact is estimated for various classes of land use by determining the number of vehicle trips a development will usually generate during the roadway design hour, and how far these vehicles are likely to travel over the county highway system. Under the premise that the county highway system is being fully utilized at the time in which a new development begins operating, it is the additional demand for highway capacity that is subject to impact fees. The gross fee is determined by calculating the additional roadway miles that new travel demand will require to maintain the roadway operational standards, and by multiplying those roadway miles by the average cost of constructing one lane-mile of highway in Kane County.

The net fee that a developer pays when he or she obtains a building permit equals the gross fee minus any credits that a development might accrue through various means. Credits are obtained as a result of payment of motor fuel taxes (which will be paid by users of the development and applied by the county to highway construction), and/or highway taxes or credits issued the developer for previous highway system capacity improvements.

The general needs-driven formula, as described in the Kane County Division of Transportation’s Fair Share Impact Fee Ordinance, has the following form:

$$\text{GROSS FEE} = \frac{((\text{TRIPS} \times \text{NT}) \times (\text{TRIP LENGTH} \times \% \text{VMT}))}{2} \times \text{COST} \\ (\text{CAPACITY})$$

$$\text{NET FEE} = \text{GROSS FEE} - \text{TAX CREDITS} - \text{IMPROVEMENT CREDITS}$$

¹ *Dupage County Fair Share Impact Fee Technical Specifications Manual*, DuPage County Division of Transportation, Wheaton, IL, Revised July 2000.

Where:

TRIPS = Number of trips generated on a weekday during the peak hour of adjacent street traffic between 4:00 p.m. and 6:00 p.m.

NT = Fraction of TRIPS that represents new trips on the roadway system (discounting pass-by and link diverted trips).

TRIP LENGTH = The average trip length by land use category in miles.

% VMT = % of vehicle-miles of travel on the KCDOT system in a given impact fee service area.

CAPACITY = Lane-mile capacity at LOS "D" in vehicles per hour.

COST = Average design, construction, and right-of-way cost of building one lane-mile of road.

TAX CREDITS = The present value of that portion of the motor fuel taxes expected to be generated by the development that are used for capital projects.

IMPROVEMENT CREDITS = The value of improvement credits completed by the development. These may be for right-of-way dedication or system improvements.

Section 2: Data Required to Determine the Impact Fee

This section describes the data used in each element of the impact fee formula as presented in Section 1, and gives the most up-to-date values employed in the calculation of the impact fees.

2.1 Impact Fee Service Areas

Impact fee service areas are those areas in the county for which unique fees are calculated. The county assesses and distributes the fees collected within a service area. Funds that are collected in one service area, for example, cannot be spent on projects in another service area, and vice versa. Impact fee service areas are maintained in the county for two reasons:

- So differences in travel characteristics between the developed and undeveloped sections of the county can be accounted for in the fees, and
- So there is a more direct relationship between fee payment and user benefit.

In Kane County, the eight Planning Partnership Areas (PPAs) previously established in the county were adopted as impact fee service areas. The boundaries and name of each service area (or PPA) are shown in Figure 2-1.

2.2 Gross Fee

The gross fee calculation relies on two primary data elements: travel demand data and cost data.

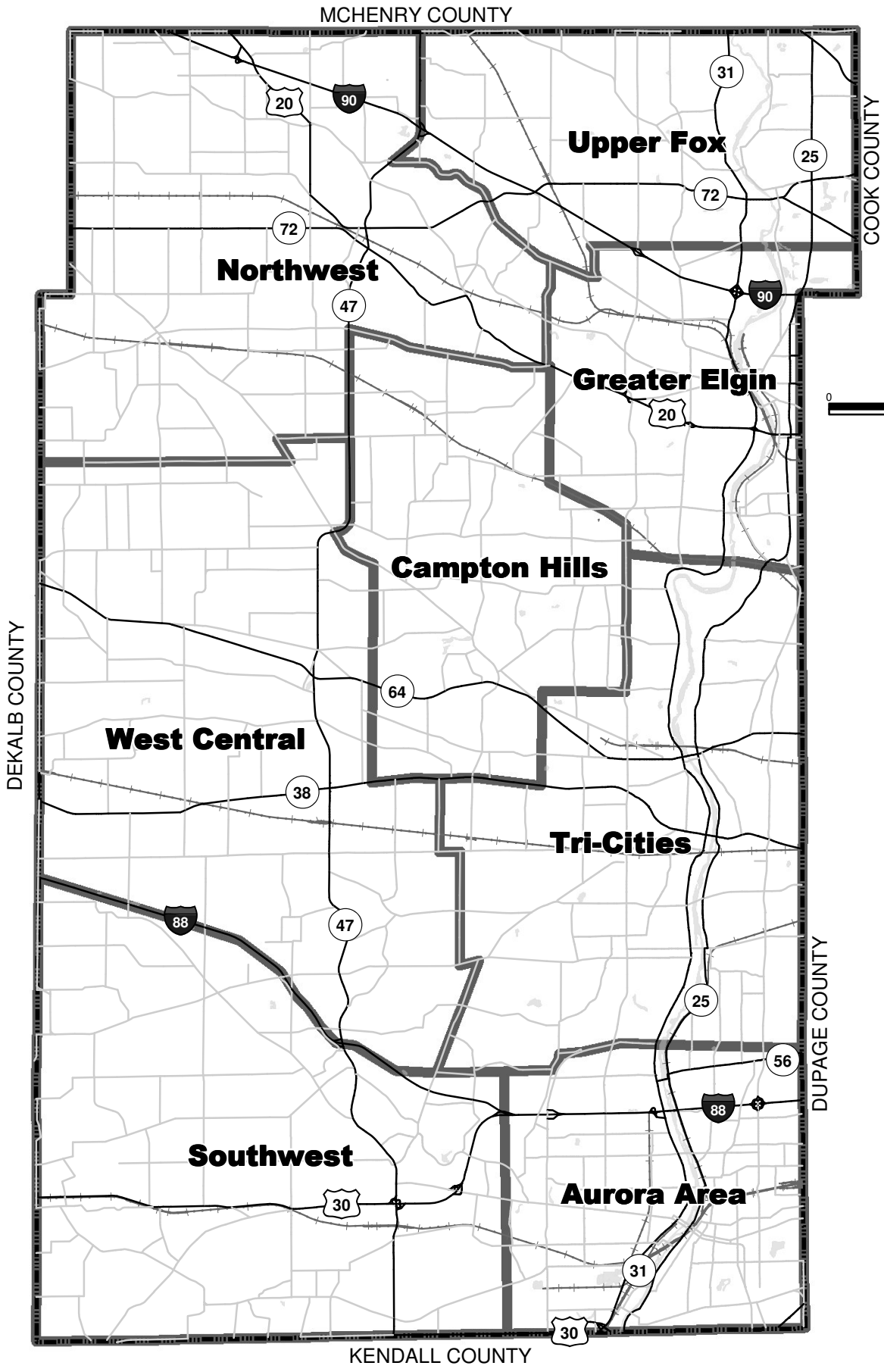
2.2.1 Travel Demand Data

Travel demand data provides a direct connection between a development and the impact fee based on the unique travel characteristics of the development. Development travel characteristics are described by the following.

Trip Generation Rates (TRIPS)

Previous studies have measured trip generation rates for various land uses for selected time periods, including average weekday, morning, and evening peak hours of adjacent street traffic, and peak hour of the day for the particular land use. The trip generation rate for the evening peak hour of adjacent street traffic (commonly taken as the “design hour”) is the preferred statistic since roadways and intersections are usually designed for this level of demand.

Trip generation rates (for the peak hour of adjacent street traffic) were drawn primarily from *Trip Generation, Sixth Edition*, published in 1998 by the Institute of Transportation Engineers (ITE). The recommended rates to be used in the impact fee calculation are presented in Table A-1. The applicable ITE land use code for each category is shown in the right-hand column of the Table.



Legend

 Service Area Boundary

**Figure 2-1
Kane County Impact Fee Service Areas**

New Trip Percentages (NT)

The trip generation rates developed for the various land use categories represent vehicles entering and exiting a site at its driveways. There are instances, however when the total number of trips generated by a site is different from the amount of new traffic added to the roadway system adjacent to the development. For specific types of land use, the ITE breaks down trips into three categories – pass-by trips, diverted linked trips, and primary trips.

Pass-by trips are made as intermediate stops on the way from an origin to the primary trip destination. Such trips may be best described as opportunity trips, such as a motorist stopping at a convenience market on the way home from work. Pass-by trips are not treated as new trips.

Diverted linked trips are trips that are attracted from the traffic volume on roadways within the vicinity of the generator, but that require diversion from that roadway to another roadway to gain access to the development site. Diverted linked trips add traffic to the streets adjacent to the site, but may not add traffic to other area roadways. For impact fee purposes, these trips are considered to be existing trips, and therefore not treated as new trips.

Primary trips are the remainder of the trips on the roadway system. These are trips made with the specific purpose of visiting the new development. The stop at the development site is the primary reason for the trip. Only primary trips are considered when assessing the impact of a new land use development on the area roadway system.

Table A-1 shows the percentage of pass-by and diverted linked trips associated with commercial-retail and some commercial-restaurant land uses. These percentages, also taken from *Trip Generation*, have been combined into a trip reduction factor for use in calculating trip generation rates that reflect the pass-by and diversion phenomena. The adjusted trip rates used in the calculation of traffic impact are also shown in Table A-1.

Trip Length (TRIP LENGTH)

Trip length plays two roles in the calculation of the impact fee. It is first used in the fee equation to estimate the capacity required to accommodate new traffic on county roadways, and is ultimately factored into the computation of gasoline consumption and motor fuel tax (MFT) credits.

The trip lengths shown in Table A-2 were derived from the Chicago Area Transportation Study (CATS) 1990 Household Travel Survey. The survey produced trip records for over 3,850 individuals and 15,212 trips in Kane County². The procedures used to reduce the survey information to impact fee service areas and land uses shown in Table A-2 are described in Technical Appendix B.

% VMT

Percent VMT represents the portion of vehicle miles of travel (VMT) in a service area that occur on roadways under the jurisdiction of the Kane County DOT. This statistic was

² CATS Household Travel Survey 1988-1991. Chicago Area Transportation Study, Information Services Division. Chicago, IL. April 1994.

developed based on travel for roads with a functional classification of collector or higher. The factor ranges from approximately 7% in the West Central Service Area to approximately 46% in the Tri-Cities Service Area (See Table A-3). It is applied to average trip length in order to determine the average trip length over county highways. This factor is used to determine the portion of total vehicle miles of travel that is assessable, since the impact fee only pertains to county highways.

Roadway Capacity (CAPACITY)

The capacity of a lane-mile of roadway has been defined for purposes of the impact fee as being the maximum volume of traffic that can be accommodated on one lane of suburban arterial (Class II) under Level of Service D (LOS D) conditions. LOS D has been taken to be the peak hour design threshold for the county roadway system.

Exhibit 10-7 of the *Highway Capacity Manual*³ presents example service volumes for urban streets. For a Class II roadway, which represents the functional category of suburban arterial (HCM Exhibit 10-3), the service volume of one lane at LOS D is 850 vehicles per hour (vph). Some of the assumed values used in this calculation are free flow speed of 40 mph, effective green ratio (G/C) = 0.45, and adjusted saturated flow rate = 1800 vph.

2.2.2 Cost Data

For each new development, the additional lane-miles of roadway needed to accommodate the travel demand is multiplied by the cost of design, construction, and right-of-way to obtain the gross impact fee.

Roadway Construction Cost

The typical roadway section used as the cost basis for the impact fee is the County's four-lane arterial highway. County records show that widening a two-lane highway to such a section costs approximately \$1.27 million (2003) per lane-mile added. This cost includes engineering and construction and is uniform across the county.

Right-of-Way Costs

A county-wide analysis of land market values was conducted to determine the average cost of right-of-way required to construct an additional lane mile of road. The results revealed high variability in land value in the County, with an average cost around \$2.00 per square foot. This value was converted to cost per lane mile of roadway based on acquiring 12 feet of right-of-way for each lane mile added to existing roadways. The average per lane-mile cost of right-of-way, using \$2.00 per square foot, is approximately \$127,000 (2003).

Total Additional Lane-Mile Cost (COST)

The cost per lane-mile used in the impact fee formula includes engineering, construction and right-of-way costs to add one lane-mile of capacity. The total cost of an additional lane-mile of road is \$1.40 million (2003).

³ *Highway Capacity Manual*, HCM 2000, Transportation Research Board, National Research Council, Washington D.C., 2000

2.3 Tax Credits

Credits are the next element of the formula and are based on the concept of fair share. Because impact fees are designed to cover only the *fair share* of improvements needed to serve new developments, existing funding sources which are specifically set aside for new highway construction must be considered and credited against the gross fee.

Current Kane County revenue sources and an explanation of their use are presented in Table 2-1.

Table 2-1: Current Kane County Primary Revenue Sources and Utilization

Primary Revenue Source	Utilization
Property Tax County Highway Levy	Operations
Property Tax County Bridge Levy	Bridge inspections and bridge maintenance
Property Tax Highway Matching Levy	Matching funds for salt purchases
State Motor Fuel Tax	Bond repayment and maintenance
Local Option Motor Fuel Tax	Resurfacing, pavement markings, maintenance

Of these, only revenues from the local option and state motor fuel tax, which are used primarily for capital improvements, would qualify as sources of credits against the transportation impact fee. The current Kane County levy for the local option motor fuel tax revenue source is \$0.02 per gallon, but the County has the option to increase this to \$0.04. Table A-3 summarizes the credit computation elements by impact fee service area.

Credits are calculated using the following equation.

$$\text{CREDITS} = (\text{LOMFT} \times \text{Gallons} \times \text{FSMFT}\% \times \text{PV}) + (\text{SMFT} \times \text{Gallons} \times \text{FSMFT}\% \times \text{PV}) + (\text{STP} \times \text{RESPOP} \times \text{FSSTP}\% \times \text{PV})$$

Where:

LOMFT = The Kane County Local Option Motor Fuel Tax = \$0.02/Gallon

SMFT = The State Motor Fuel Tax disbursed to Kane County = \$0.0166/Gallon

Gallons = ((Weekday Trips x Trip Length x ADT Days of Travel)/2) / (Miles per Gallon)
= Gallons of fuel used annually in trips to a development. Note that the number of trips is divided by 2 in order to avoid double counting. Tax revenues from gallons consumed result in motor fuel tax credit.

FSMFT% = The percentage of motor fuel tax allocation used annually for new road construction. This figure is currently 10% for the County's local option motor fuel tax and 53% for the state motor fuel tax allocation.

STP = The portion of the annual allotment of STP-R funds to Kane, Lake, McHenry and Will Counties disbursed based on population, currently \$1,560,000 per year. This value will vary depending on the funds available for disbursement.

RESPOP = The additional population due to the residential development as a percentage of the 1990 U.S. Census population for Kane, Lake, McHenry and Will Counties. The total population of these counties as of the 1990 U.S. Census

was 1,374,443. Development population is computed using average occupancy values for each residential land use category:

- 3.20 people per unit for single-family detached residential land use
- 2.34 people per unit for single family attached residential land use, and
- 1.98 people per unit for multi-family attached residential land use.

The STP-R credit should only be applied to residential development.

FSSTP% = The percentage of the annual STP-R allocation used annually for new construction. This figure is currently 100%.

PV = Present Value = 12.46. The current value of money derived from an assumed value of future dollars discounted by 5% over 20 years.

2.3.1 Motor Fuel Tax Credits

The following must be considered when computing motor fuel tax credits.

County and State Motor Fuel Tax (LOMFT and SMFT)

The county local option motor fuel tax (currently at \$0.02 per gallon) and the state motor fuel tax (approximate Kane County share of \$0.0166 per gallon) are taxes collected at the pump on each gallon of gasoline sold in Kane County. Motor fuel tax credits are extended to the fee payer for projected gasoline consumption due to the proposed development.

Gallons

As indicated above, annual gasoline consumption must be credited. Gallons consumed are estimated by multiplying the average number of weekday trips typically generated by a particular type of land use (which is shown in Table A-1) by the trip length for similar uses in the appropriate impact fee service area (see Table A-2) and the ADT-Days of travel (also found in Table A-2). This annual trip length is then divided by the average fuel efficiency of 21.07 mpg to give the annual rate of fuel consumption for each unit of development (gallons per year). Average fuel efficiency was calculated using fleetwide average rates of 21.5 mpg for passenger cars (90%) and 17.2 mpg for light trucks (10%) as reported in the 19th edition of the "Transportation Energy Data Book" prepared for the U.S. Department of Energy.

ADT-Days of travel are the number of days per year that a land use is expected to generate traffic equal to or greater than the traffic recorded on a normal weekday. As noted above, the ADT-Days figures into the amount of travel credited to a development and, therefore, the amount of fuel consumed by the development's users. ADT-Day figures were determined for each land use category using the daily and weekend trip generation rates in the 6th Edition of *Trip Generation* by the Institute of Transportation Engineers, 1997. These figures are shown in Table A-2.

Fair Share Percentage (FSMFT%)

This percentage (10% for county local option motor fuel taxes and 53% for state motor fuel taxes) is the average annual rate at which the revenues from the motor fuel tax are used for new road capacity improvements. The remainder of the motor fuel tax is

typically spent on maintenance or non-capacity related projects, which cannot be credited according to state law.

Present Value (PV)

Finally, motor fuel tax credits are calculated on the basis of the present value (PV) of annual tax assessments over the years following completion of a development. The purpose of the present value factor is to assign a value to the increased taxes generated by a development that are devoted to the capacity improvements. A key element in the determination of the present value factor is the term or number of years of payment. Normally the term is taken to be the expected life of a facility before major rehabilitation is necessary. For projects in Northern Illinois, that life is estimated at between 15 and 20 years; for right-of-way this term is indefinite. The current present value figure of 12.46 represents an interest rate of 5.0% over a 20-year period, the design life of the pavement.

2.3.2 Rural Federal Funds (STP-R)

Federal STP-R funds (FAS replacement) are distributed annually to the Counties of Kane, Lake, McHenry, and Will. The distribution arrangement is as follows:

- 50% of the allotment is allocated equally to the four counties; and
- 50% of the allotment is allocated among the four counties in proportion to the total population of those counties.

This credit is only applied to residential development.

STP-R Funds Disbursed (STP)

The latest agreement between the County Engineers of the above mentioned counties uses the 1990 U.S. Census as the basis for funds disbursements based on population. In FY 02 the total pool of STP-R funds for Kane, Lake, McHenry, and Kane Counties was \$3,120,677. Half of this amount, \$1,560,000, is disbursed based on population. These funds may be expended within the geographic confines of each county.

Residential Population (RESPOP)

The STP-R tax credit is calculated by first computing the portion of new residential population of the development to the total 1990 U.S. Census population for all four counties (1,374,443). The current agreement between the counties governs the use of 1990 U.S. Census population. This ratio is then multiplied by half the total STP-R allocated to all four counties.

The population of a residential development is computed based on the number of dwelling units planned times a standard occupancy rate established for each of the three residential land use categories.

- 3.20 people per unit for single-family detached residential land use
- 2.34 people per unit for single family attached residential land use
- 1.98 people per unit for multi-family attached residential land use.

The occupancy rate for single-family detached residential land use was based on 2000 U.S. Census Summary File 3 data for Kane County. The attached residential land use occupancy rate values are from the 6th Edition of *Trip Generation* by the Institute of Transportation Engineers, 1997.

Fair Share Percentage (FSSTP%)

This tax credit is also factored by the fair share percentage of STP-R funds used on new construction. This value is 100%.

Present Value (PV)

This tax credit is also calculated as a present value of an annual revenue stream. As discussed above, the factor used for this is 12.46.

2.3.3 Property Tax Credits

Kane County is not currently utilizing, nor does it plan to utilize, property tax funds for capacity improvements to the highway system. Therefore, no impact fee credits are provided for property tax payment.

2.4 Improvement Credits

Improvement credits are determined by the County through discussions with the developer. Improvement credits are given for road improvements or donations made by the developer. These may be for right-of-way dedication or system improvements.

Section 3: The Impact Fee

Table 3-1 present the schedule of gross impact fees and tax credits per unit by land use category for the Northwest Service Area. These fees were calculated using the formula presented in Section 1 and formula elements described in Section 2. Formula input values are contained in Appendix A.

The net impact fee is calculated by subtracting credits, outlined in Section 2, from the gross fee.

Table 3-1: Example Gross Impact Fee and Tax Credits (2003) for Northwest Service Area by Land Use Category

Land Use Category	Fee Per	Northwest Service Area		
		Gross Fee	Tax Credits	Net Fee*
Residential				
Single Family Detached	Dwelling Unit	\$538	\$114	\$424
Single Family Attached	Dwelling Unit	\$288	\$74	\$214
Multi-family Attached	Dwelling Unit	\$331	\$75	\$256
Commercial Retail				
1-50,000 sf	1,000 sf (1)	\$202	\$29	\$173
50,001-300,000 sf	1,000 sf (1)	\$262	\$37	\$225
300,001-1,000,000 sf	1,000 sf (1)	\$272	\$37	\$235
more than 1,000,000 sf	1,000 sf (1)	\$305	\$43	\$262
Supermarket	1,000 sf (1)	\$356	\$54	\$302
Convenience Market	1,000 sf (1)	\$1,169	\$223	\$946
Service Station	Veh Fuel Pos	\$317	\$49	\$268
Commercial Office				
General Office (all sizes)	1,000 sf (2)	\$692	\$53	\$639
Medical-Dental Office	1,000 sf (2)	\$1,699	\$171	\$1,528
Office Park	1,000 sf (2)	\$696	\$53	\$643
Business Park	1,000 sf (2)	\$599	\$61	\$538
Commercial Industrial				
Warehousing/Distribution Terminal	1,000 sf (2)	\$237	\$24	\$213
Light Industrial/Ind Park	1,000 sf (2)	\$455	\$33	\$422
Commercial Restaurant				
Fast Food	1,000 sf (2)	\$1,467	\$317	\$1,150
Other Restaurant	1,000 sf (2)	\$828	\$131	\$697
Commercial Service				
Day Care	1,000 sf (2)	\$100	\$6	\$94
Hospital	Bed	\$273	\$32	\$241
Nursing Home	Bed	\$45	\$8	\$37
Hotel/Motel	Room	\$134	\$25	\$109

(1) Gross Leasable Floor Area

(2) Gross Floor Area

*Values do not include improvement credits

Appendix A – Calculation Factors Tables

Table A-1: Recommended FY 2003 Trip Generation Rates

Land Use Category	Rate Per	Base Trip Generation Rate (pm)	Diverted Trip %	Pass-By Trip %	Overall Trip Reduction	Adjusted Trip Rate (pm)	Adjusted Average Weekday Trip Rate	Source
Residential								
Single Family Detached	Dwelling Unit	1.01	-	-	0.00%	1.01	9.57	ITE 6 (Code 210)
Single Family Attached	Dwelling Unit	0.54	-	-	0.00%	0.54	5.86	ITE 6 (Code 230)
Multi-family Attached	Dwelling Unit	0.62	-	-	0.00%	0.62	6.63	ITE 6 (Code 220)
Commercial Retail								
1-50,000 sf	1,000 sf (1)	7.95	25.00%	48.00%	73.00%	2.14	23.57	ITE 6 (Code 820)
50,001-300,000 sf	1,000 sf (1)	4.32	25.00%	28.00%	53.00%	2.03	21.64	ITE 6 (Code 820)
300,001-1,000,000 sf	1,000 sf (1)	2.87	25.00%	20.00%	45.00%	1.58	16.48	ITE 6 (Code 820)
more than 1,000,000 sf	1,000 sf (1)	2.50	25.00%	18.00%	43.00%	1.42	14.69	ITE 6 (Code 820)
Supermarket	1,000 sf (1)	11.51	40.00%	36.00%	76.00%	2.76	26.76	ITE 6 (Code 850)
Convenience Market	1,000 sf (1)	53.73	16.00%	61.00%	77.00%	12.36	169.74	ITE 6 (Code 851)
Service Station	Veh Fuel Pos	14.56	35.00%	42.00%	77.00%	3.35	38.77	ITE 6 (Code 844)
Commercial Office								
General Office (all sizes)	1,000 sf (2)	1.49	-	-	0.00%	1.49	11.01	ITE 6 (Code 710)
Medical-Dental Office	1,000 sf (2)	3.66	-	-	0.00%	3.66	36.13	ITE 6 (Code 720)
Office Park	1,000 sf (2)	1.50	-	-	0.00%	1.50	11.42	ITE 6 (Code 750)
Business Park	1,000 sf (2)	1.29	-	-	0.00%	1.29	12.76	ITE 6 (Code 770)
Commercial Industrial								
Warehousing/Distribution Terminal	1,000 sf (2)	0.51	-	-	0.00%	0.51	4.96	ITE 6 (Code 150)
Light Industrial/Ind Park	1,000 sf (2)	0.98	-	-	0.00%	0.98	6.97	ITE 6 (Code 110)
Commercial Restaurant								
Fast Food	1,000 sf (2)	33.48	20.00%	50.00%	70.00%	10.04	148.84	ITE 6 (Code 834)
Other Restaurant	1,000 sf (2)	7.49	18.00%	43.00%	61.00%	2.92	35.01	ITE 6 (Code 831)
Commercial Service								
Day Care	1,000 sf (2)	13.2	35.00%	54.00%	89.00%	1.45	8.72	ITE 6 (Code 565)/DuPage County DOT
Hospital	Bed	1.22	-	-	0.00%	1.22	11.77	ITE 6 (Code 610)
Nursing Home	Bed	0.20	-	-	0.00%	0.20	2.61	ITE 6 (Code 620)
Hotel/Motel	Room	0.60	-	-	0.00%	0.60	9.00	ITE 6 (Code 310/20)

(1) Gross Leasable Floor Area

(2) Gross Floor Area

Table A-2: Impact Fee Formula Land Use Category Variables

Land Use Category	Rate Per	Adjusted Trip Rate (pm)	Adjusted Average Weekday Trip Rate	ADT-Days	Average Trip Length by Service Area and Land Use Category							
					Aurora Area	Campton Hills	Greater Elgin	Northwest	Southwest	Tri-Cities	Upper Fox	West Central
Residential												
Single Family Detached	Dwelling Unit	1.01	9.57	363	3.0	6.7	3.0	6.2	6.5	3.5	3.7	7.7
Single Family Attached	Dwelling Unit	0.54	5.86	353	3.0	6.7	3.0	6.2	6.5	3.5	3.7	7.7
Multi-family Attached	Dwelling Unit	0.62	6.63	356	3.0	6.7	3.0	6.2	6.5	3.5	3.7	7.7
Commercial Retail												
1-50,000 sf	1,000 sf (1)	2.14	23.57	350	2.2	1.6	2.5	1.1	3.7	2.5	2.5	3.3
50,001-300,000 sf	1,000 sf (1)	2.03	21.64	353	3.1	2.2	3.5	1.5	5.2	3.6	3.5	4.7
300,001-1,000,000 sf	1,000 sf (1)	1.58	16.48	353	4.2	3.0	4.8	2.0	7.1	4.9	4.7	6.4
more than 1,000,000 sf	1,000 sf (1)	1.42	14.69	367	5.2	3.7	5.8	2.5	8.6	5.9	5.7	7.8
Supermarket	1,000 sf (1)	2.76	26.76	420	3.1	2.2	3.5	1.5	5.2	3.6	3.5	4.7
Convenience Market	1,000 sf (1)	12.36	169.74	374	2.2	1.6	2.5	1.1	3.7	2.5	2.5	3.3
Service Station	Veh Fuel Pos	3.35	38.77	362	2.2	1.6	2.5	1.1	3.7	2.5	2.5	3.3
Commercial Office												
General Office (all sizes)	1,000 sf (2)	1.49	11.01	276	4.2	6.1	5.3	5.4	6.8	5.5	5.0	6.7
Medical-Dental Office	1,000 sf (2)	3.66	36.13	275	4.2	6.1	5.3	5.4	6.8	5.5	5.0	6.7
Office Park	1,000 sf (2)	1.50	11.42	271	4.2	6.1	5.3	5.4	6.8	5.5	5.0	6.7
Business Park	1,000 sf (2)	1.29	12.76	276	4.2	6.1	5.3	5.4	6.8	5.5	5.0	6.7
Commercial Industrial												
Warehousing/Distribution Terminal	1,000 sf (2)	0.51	4.96	281	4.2	6.1	5.3	5.4	6.8	5.5	5.0	6.7
Light Industrial/Industrial Park	1,000 sf (2)	0.98	6.97	275	4.2	6.1	5.3	5.4	6.8	5.5	5.0	6.7
Commercial Restaurant												
Fast Food	1,000 sf (2)	10.04	148.84	393	1.8	1.2	1.7	1.7	3.3	1.7	1.3	0.5
Other Restaurant	1,000 sf (2)	2.92	35.01	356	3.5	2.4	3.5	3.3	6.6	3.4	2.5	1.0
Commercial Service												
Day Care Center	1,000 sf (2)	1.45	8.72	268	2.0	1.8	1.5	0.8	1.3	2.1	2.2	3.2
Hospital	Bed	1.22	11.77	327	3.6	5.7	4.6	2.6	4.9	4.6	4.3	5.7
Nursing Home	Bed	0.20	2.61	337	3.6	5.7	4.6	2.6	4.9	4.6	4.3	5.7
Hotel/Motel	Room	0.60	9.00	342	3.6	5.7	4.6	2.6	4.9	4.6	4.3	5.7

(1) Gross Leasable Floor Area
 (2) Gross Floor Area

Table A-3: Impact Fee Formula Service Area Variables

Service Area	% VMT On County Highways	Total Cost per Additional Highway Lane- Mile (2003)	Per Lane Capacity (vph)	Fair Share Percentages		MFT Assessments		
				Local Option MFT	State MFT	Local Option MFT (per gallon)	State MFT (per gallon)	Present Value
Aurora Area	9.41%	\$1,400,000	850	10%	53%	\$0.0200	\$0.0166	12.46
Campton Hills	34.08%	\$1,400,000	850	10%	53%	\$0.0200	\$0.0166	12.46
Greater Elgin	15.06%	\$1,400,000	850	10%	53%	\$0.0200	\$0.0166	12.46
Northwest	10.44%	\$1,400,000	850	10%	53%	\$0.0200	\$0.0166	12.46
Southwest	20.02%	\$1,400,000	850	10%	53%	\$0.0200	\$0.0166	12.46
Tri-Cities	45.79%	\$1,400,000	850	10%	53%	\$0.0200	\$0.0166	12.46
Upper Fox	14.38%	\$1,400,000	850	10%	53%	\$0.0200	\$0.0166	12.46
West Central	6.67%	\$1,400,000	850	10%	53%	\$0.0200	\$0.0166	12.46

Source: %VMT on County Highways from Kane County Travel Demand Model

Per Lane Capacity from HCS 2000

Fair Share Percentages from Kane County DOT

Appendix B – Trip Length Calculation Methodology

Trip Length Calculation Methodology

This section describes the methodology used to determine average trip lengths in each Kane County impact fee service area for use in the impact fee calculation equation. The average trip length is one of the components for calculating the net impact fee a developer pays and is unique to the service area, representing the unique travel characteristics in the vicinity of the development.

Data

The average trip length determination was based on data from the Chicago Area Transportation Study's (CATS) 1990 Household Travel Survey (HHTS), release version 1.11. This data set was compiled by CATS from questionnaires completed by 19,314 households in the six-county Chicago metropolitan area. Respondents recorded information about their household and each person in the household over 14 years of age was asked to record all trips made during one travel day. 1,741 Kane County households responded to the survey in the fall of 1990^{4,5}.

Specific travel characteristics were reported for each trip such as mode of travel, trip start and end time, trip origin and destination, and purpose of the trip. This information was recorded as a separate record for each trip in the HHTS trip table. CATS further processed the information provided by survey respondents by assigning consistent codes for trip purpose, determining longitude and latitude of the trip origin and destination, and calculating trip length in air-miles. Full technical documentation on the CATS 1990 HHTS data sets is available from CATS⁶.

Average Trip Length Calculation Methodology

The nature of the CATS 1990 HHTS allowed the calculation of average trip length for each Kane County impact fee service area. The following steps were accomplished using this data set.

- 1) Identify Kane County service area from which each trip originated.
- 2) Extract those trips that originate in Kane County and are identified as "Driver of car, truck, or van" as the type of transportation (MODE = 2)
- 3) Create a Geographic Information Systems (GIS) data layer with a single straight line representing each trip based on the origin and destination latitude and longitude.
- 4) Truncate each trip originating in Kane County at the Kane County boundary.
- 5) Calculate the peak period average ground trip length within Kane County by the Trip Origin Activity for each impact fee service area.

⁴ CATS 1990 Household Travel Survey: A Methodological Overview. Chicago Area Transportation Study, Information Services Division. Chicago, IL. April 1994.

⁵ CATS Household Travel Survey, 1988-1991. Chicago Area Transportation Study, Information Services Division. Chicago, IL. April 1994.

⁶ CATS 1990 Household Travel Survey: Technical Documentation for the Household, Person and Trip Files. Chicago Area Transportation Study, Information Services Division. Chicago, IL. April 1994.

- 6) Determine the peak period average trip length within Kane County by land use category for each impact fee service area.

As a result of these six steps, the average trip length by land use category was determined for use as input into the impact fee formula. Each of these steps will be described in more detail below.

Identify Kane County Service Area of Trip Origination

All 162,755 trip records from the CATS HHTS covering the six-county Chicago metropolitan area were imported from ASCII text file to a MS-Access 2000 database table. Using ESRI ArcMap software, the origin latitude and longitude location was compared against the Kane County impact fee service area GIS layer. Based on this comparison, the impact fee service area from which the trip originated was determined for each trip originating within Kane County. This value, Service Area of Origin, was added to the CATS 1990 HHTS Trip Table.

Extract Automobile Trips Originating in Kane County

Once the impact fee service area of origin was identified, and thus which trips originated in Kane County, these trips were extracted from the CATS 1990 HHTS Trip Table. Additionally, since the impact fee is only intended to offset cost incurred due to increased demand for roads, only automobile, van, and truck trips were included. Trips by other modes of transportation, such as walking, school bus, Pace bus or Metra commuter rail, were excluded. This operation resulted in 12,649 trip records. This represented all automobile trips originating in Kane County.

Create a GIS Layer Representing Each Trip

A GIS layer was developed representing all automobile trips originating in Kane County as a single straight line. ESRI ArcInfo workstation software was used to generate this layer using the origin and destination latitude and longitude values from the CATS 1990 HHTS trip table. 544 Kane County trip records in the CATS 1990 HHTS trip table had identical origin and destination latitude and longitude values, which result in a zero length trip, thus preventing the trip from being created in the GIS layer. A nominal adjustment of 0.01 decimal degrees, the smallest magnitude of change possible, was made to the destination longitude to allow these trips to be entered into the GIS layer. Once created, the layer was converted from its native geographic coordinate system (latitude and longitude based) to Illinois State Plane (units = feet).

Truncate Trips at the Kane County Boundary

ESRI ArcInfo software was used to perform a spatial overlay of the Kane County boundary onto the trip line layer. This operation resulted in lines representing the part of trips that fall within Kane County. This was done since this impact fee program only applies to travel demand within Kane County. GIS functions were used to add the coordinates of each trip's origin and destination for use in calculating the part of the trip length within Kane County.

Calculate Average Trip Length by Trip Origin Activity

The truncated trip records were imported into a MS-Access 2000 database table. A query was developed to calculate the ground travel distance for each trip. Each trip was

represented as a straight line in the GIS layer, from the origin to the Kane County boundary along a straight line to the trip destination. The length of this trip part within Kane County would be the straight-line or air distance. Since the Kane County road system rarely supplies a straight-line path from an origin to a destination, an assumption was made that the road network was “Manhattanized”, like a typical urban grid. This is not always the case in suburban Kane County, but is more representative of trip paths than the assumption of a straight-line path. Ground distance was approximated by assuming a right angle trip:

(origin Y-coordinate - destination Y-coordinate) + (origin X-coordinate - destination X-coordinate)

Once this calculation was complete, a second query was developed to calculate and summarize the average of the approximate ground trip length for each Trip Origin Activity within each service area. This summary was prepared only for trips with a start time between 4:00 PM and 7:00 PM, representing a window of time surrounding the typical afternoon peak hour. This summary is presented in Table B-1. For service areas that did not have any trips with a particular Trip Origin Activity during the afternoon peak, the county-wide average trip length in ground-miles for that Trip Origin Activity was used.

Calculate Average Trip Length by Land Use Category

Weighted average trip length for each land use category was calculated using the average of the approximate ground trip length calculated above. The average trip lengths for CATS 1990 HHTS Trip Origin Activities associated with a land use category were proportioned and weighted to obtain the average trip length for each land use category in each impact fee service area. These calculations, proportions and factors, can be examined in Tables B-2 through B-9. Values from these tables are direct inputs to the impact fee formula.

Table B-1: Average Trip Length within Kane County by Impact Fee Service Area and Trip Origin Activity

Afternoon Peak Period Auto, Truck, Van Trips (MODE = 2) Originating from Kane County

Peak	Service Area	MODE	PURFROM	TRIP ORIGIN ACTIVITY (PURPFROM)	Average Trip Length in Kane County (ground-miles)	
4:00 - 7:00 PM	Aurora Area	2	0	Other	3.11	
4:00 - 7:00 PM	Aurora Area	2	1	Work	4.40	
4:00 - 7:00 PM	Aurora Area	2	2	Work Related	3.71	
4:00 - 7:00 PM	Aurora Area	2	3	School	4.53	
4:00 - 7:00 PM	Aurora Area	2	4	Shopping	3.77	
4:00 - 7:00 PM	Aurora Area	2	5	Eat Meal	3.47	
4:00 - 7:00 PM	Aurora Area	2	6	Banking	2.40	
4:00 - 7:00 PM	Aurora Area	2	7	Recreational	3.64	
4:00 - 7:00 PM	Aurora Area	2	8	Pick up / drop off passengers	3.90	
4:00 - 7:00 PM	Aurora Area	2	9	Change type of transportation	3.69	
4:00 - 7:00 PM	Aurora Area	2	10	Return Home	2.75	
4:00 - 7:00 PM	Campton Hills	2	0	Other	7.26	
4:00 - 7:00 PM	Campton Hills	2	1	Work	5.84	
4:00 - 7:00 PM	Campton Hills	2	2	Work Related	6.82	
4:00 - 7:00 PM	Campton Hills	2	3	School	4.05	
4:00 - 7:00 PM	Campton Hills	2	4	Shopping	1.97	
4:00 - 7:00 PM	Campton Hills	2	5	Eat Meal	1.91	
4:00 - 7:00 PM	Campton Hills	2	6	Banking	3.93	*
4:00 - 7:00 PM	Campton Hills	2	7	Recreational	4.59	
4:00 - 7:00 PM	Campton Hills	2	8	Pick up / drop off passengers	3.63	
4:00 - 7:00 PM	Campton Hills	2	9	Change type of transportation	5.40	*
4:00 - 7:00 PM	Campton Hills	2	10	Return Home	7.27	
4:00 - 7:00 PM	Greater Elgin	2	0	Other	5.16	
4:00 - 7:00 PM	Greater Elgin	2	1	Work	5.49	
4:00 - 7:00 PM	Greater Elgin	2	2	Work Related	4.37	
4:00 - 7:00 PM	Greater Elgin	2	3	School	6.26	
4:00 - 7:00 PM	Greater Elgin	2	4	Shopping	4.09	
4:00 - 7:00 PM	Greater Elgin	2	5	Eat Meal	3.28	
4:00 - 7:00 PM	Greater Elgin	2	6	Banking	5.18	
4:00 - 7:00 PM	Greater Elgin	2	7	Recreational	4.06	
4:00 - 7:00 PM	Greater Elgin	2	8	Pick up / drop off passengers	3.05	
4:00 - 7:00 PM	Greater Elgin	2	9	Change type of transportation	4.23	
4:00 - 7:00 PM	Greater Elgin	2	10	Return Home	2.89	

Peak	Service Area	MODE	PURFROM	TRIP ORIGIN ACTIVITY (PURPFROM)	Average Trip Length in Kane County (ground-miles)	
4:00 - 7:00 PM	Northwest	2	0	Other	1.70	
4:00 - 7:00 PM	Northwest	2	1	Work	5.80	
4:00 - 7:00 PM	Northwest	2	2	Work Related	6.32	
4:00 - 7:00 PM	Northwest	2	3	School	0.51	
4:00 - 7:00 PM	Northwest	2	4	Shopping	1.20	
4:00 - 7:00 PM	Northwest	2	5	Eat Meal	3.26	*
4:00 - 7:00 PM	Northwest	2	6	Banking	4.91	
4:00 - 7:00 PM	Northwest	2	7	Recreational	2.03	
4:00 - 7:00 PM	Northwest	2	8	Pick up / drop off passengers	1.61	
4:00 - 7:00 PM	Northwest	2	9	Change type of transportation	5.40	*
4:00 - 7:00 PM	Northwest	2	10	Return Home	6.84	
4:00 - 7:00 PM	Southwest	2	0	Other	5.44	
4:00 - 7:00 PM	Southwest	2	1	Work	7.25	
4:00 - 7:00 PM	Southwest	2	2	Work Related	4.19	
4:00 - 7:00 PM	Southwest	2	3	School	7.37	
4:00 - 7:00 PM	Southwest	2	4	Shopping	6.46	
4:00 - 7:00 PM	Southwest	2	5	Eat Meal	6.61	
4:00 - 7:00 PM	Southwest	2	6	Banking	3.93	*
4:00 - 7:00 PM	Southwest	2	7	Recreational	3.56	
4:00 - 7:00 PM	Southwest	2	8	Pick up / drop off passengers	2.62	
4:00 - 7:00 PM	Southwest	2	9	Change type of transportation	5.40	*
4:00 - 7:00 PM	Southwest	2	10	Return Home	7.10	
4:00 - 7:00 PM	Tri-Cities	2	0	Other	4.08	
4:00 - 7:00 PM	Tri-Cities	2	1	Work	5.71	
4:00 - 7:00 PM	Tri-Cities	2	2	Work Related	4.92	
4:00 - 7:00 PM	Tri-Cities	2	3	School	5.94	
4:00 - 7:00 PM	Tri-Cities	2	4	Shopping	4.16	
4:00 - 7:00 PM	Tri-Cities	2	5	Eat Meal	3.25	
4:00 - 7:00 PM	Tri-Cities	2	6	Banking	4.74	
4:00 - 7:00 PM	Tri-Cities	2	7	Recreational	4.61	
4:00 - 7:00 PM	Tri-Cities	2	8	Pick up / drop off passengers	4.29	
4:00 - 7:00 PM	Tri-Cities	2	9	Change type of transportation	6.91	
4:00 - 7:00 PM	Tri-Cities	2	10	Return Home	2.94	

Peak	Service Area	MODE	PURFROM	TRIP ORIGIN ACTIVITY (PURPFROM)	Average Trip Length in Kane County (ground-miles)
4:00 - 7:00 PM	Upper Fox	2	0	Other	4.33
4:00 - 7:00 PM	Upper Fox	2	1	Work	4.65
4:00 - 7:00 PM	Upper Fox	2	2	Work Related	8.59
4:00 - 7:00 PM	Upper Fox	2	3	School	4.46
4:00 - 7:00 PM	Upper Fox	2	4	Shopping	4.23
4:00 - 7:00 PM	Upper Fox	2	5	Eat Meal	2.31
4:00 - 7:00 PM	Upper Fox	2	6	Banking	2.72
4:00 - 7:00 PM	Upper Fox	2	7	Recreational	3.98
4:00 - 7:00 PM	Upper Fox	2	8	Pick up / drop off passengers	4.40
4:00 - 7:00 PM	Upper Fox	2	9	Change type of transportation	5.99
4:00 - 7:00 PM	Upper Fox	2	10	Return Home	3.27
4:00 - 7:00 PM	West Central	2	0	Other	4.93
4:00 - 7:00 PM	West Central	2	1	Work	6.94
4:00 - 7:00 PM	West Central	2	2	Work Related	6.72
4:00 - 7:00 PM	West Central	2	3	School	5.25
4:00 - 7:00 PM	West Central	2	4	Shopping	6.06
4:00 - 7:00 PM	West Central	2	5	Eat Meal	0.41
4:00 - 7:00 PM	West Central	2	6	Banking	2.00
4:00 - 7:00 PM	West Central	2	7	Recreational	5.40
4:00 - 7:00 PM	West Central	2	8	Pick up / drop off passengers	6.34
4:00 - 7:00 PM	West Central	2	9	Change type of transportation	11.56
4:00 - 7:00 PM	West Central	2	10	Return Home	7.34

* Average trip lengths within the county for all trips originating in the county were used for these Service Area/Trip Origin Activity combinations. This was done when there were no records in the survey representing a mode 2 trip with that Trip Origin Activity, originating in that PPA, between 4:00 and 7:00 PM.

Source: CATS 1990 Household Travel Survey.

Table B-2: Aurora Area Impact Fee Service Area Average Trip Length Calculation

CATS HHTS 90 Trip Origin Activity	Average Trip Length in Kane County (ground-miles)	Weight	Weighted Average Trip Length (miles)	Factor	Land Use Category	Average Trip Length (miles)
RESIDENTIAL						
Pick up / drop off passengers	3.90	0.10	2.96	1.00	Single Family Detached	3.0
Change type of transportation	3.69	0.10		1.00	Single Family Attached	3.0
Return Home	2.75	0.80		1.00	Multifamily Attached	3.0
		1.00				
COMMERCIAL RETAIL						
Other	3.11	0.05	3.69	0.60	1 - 50,000 SF	2.2
Work	4.40	0.05		0.85	50,001 - 300,000 SF	3.1
Shopping	3.77	0.75		1.15	300,001 - 1,000,000 SF	4.2
Eat Meal	3.47	0.05		1.40	1,000,000 SF and OVER	5.2
Banking	2.40	0.05		0.85	Supermarket	3.1
Pick up / drop off passengers	3.90	0.05		0.60	Convenience Market	2.2
		1.00	0.60	Service Station	2.2	
COMMERCIAL OFFICE						
Other	3.11	0.10	4.20	1.00	General Office (all sizes)	4.2
Work	4.40	0.80		1.00	Medical-Dental Office	4.2
Work Related	3.71	0.10		1.00	Office Park	4.2
		1.00	1.00	Business Park	4.2	
COMMERCIAL INDUSTRIAL						
Other	3.11	0.10	4.20	1.00	Warehousing/Distribution Terminal	4.2
Work	4.40	0.80		1.00	Light Industrial/Industrial Park	4.2
Work Related	3.71	0.10				
		1.00				
COMMERCIAL RESTAURANT						
Other	3.11	0.05	3.50	0.50	Fast Food	1.8
Work	4.40	0.05		1.00	Other Restaurant	3.5
Eat Meal	3.47	0.90				
		1.00				
COMMERCIAL SERVICE						
Pick up / drop off passengers	3.90	0.50	1.95	1.00	Day Care Center	2.0
Other	3.11	0.40	3.63	1.00	Hospital	3.6
Work	4.40	0.20		1.00	Nursing Home	3.6
Recreational	3.64	0.20		1.00	Hotel/Motel	3.6
Pick up / drop off passengers	3.90	0.20				
		1.00				

Table B-3: Campton Hills Impact Fee Service Area Average Trip Length Calculation

CATS HHTS 90 Trip Origin Activity	Average Trip Length in Kane County (ground-miles)	Weight	Weighted Average Trip Length (miles)	Factor	Land Use Category	Average Trip Length (miles)
RESIDENTIAL						
Pick up / drop off passengers	3.63	0.10	6.72	1.00	Single Family Detached	6.7
Change type of transportation	5.40	0.10		1.00	Single Family Attached	6.7
Return Home	7.27	0.80		1.00	Multifamily Attached	6.7
		1.00				
COMMERCIAL - RETAIL						
Other	7.26	0.05	2.61	0.60	1 - 50,000 SF	1.6
Work	5.84	0.05		0.85	50,001 - 300,000 SF	2.2
Shopping	1.97	0.75		1.15	300,001 - 1,000,000 SF	3.0
Eat Meal	1.91	0.05		1.40	1,000,000 SF and OVER	3.7
Banking	3.93	0.05		0.85	Supermarket	2.2
Pick up / drop off passengers	3.63	0.05		0.60	Convenience Market	1.6
		1.00	0.60	Service Station	1.6	
COMMERCIAL - OFFICE						
Other	7.26	0.10	6.08	1.00	General Office (all sizes)	6.1
Work	5.84	0.80		1.00	Medical-Dental Office	6.1
Work Related	6.82	0.10		1.00	Office Park	6.1
		1.00	1.00	Business Park	6.1	
COMMERCIAL - INDUSTRIAL						
Other	7.26	0.10	6.08	1.00	Warehousing/Distribution Terminal	6.1
Work	5.84	0.80		1.00	Light Industrial/Industrial Park	6.1
Work Related	6.82	0.10				
		1.00				
COMMERCIAL RESTAURANT						
Other	7.26	0.05	2.38	0.50	Fast Food	1.2
Work	5.84	0.05		1.00	Other Restaurant	2.4
Eat Meal	1.91	0.90				
		1.00				
COMMERCIAL - SERVICE						
Pick up / drop off passengers	3.63	0.50	1.81	1.00	Day Care Center	1.8
Other	7.26	0.40	5.72	1.00	Hospital	5.7
Work	5.84	0.20		1.00	Nursing Home	5.7
Recreational	4.59	0.20		1.00	Hotel/Motel	5.7
Pick up / drop off passengers	3.63	0.20				
		1.00				

Table B-4: Greater Elgin Impact Fee Service Area Average Trip Length Calculation

CATS HHTS 90 Trip Origin Activity	Average Trip Length in Kane County (ground-miles)	Weight	Weighted Average Trip Length (miles)	Factor	Land Use Category	Average Trip Length (miles)
RESIDENTIAL						
Pick up / drop off passengers	3.05	0.10	3.04	1.00	Single Family Detached	3.0
Change type of transportation	4.23	0.10		1.00	Single Family Attached	3.0
Return Home	2.89	0.80		1.00	Multifamily Attached	3.0
		1.00				
COMMERCIAL - RETAIL						
Other	5.16	0.05	4.18	0.60	1 - 50,000 SF	2.5
Work	5.49	0.05		0.85	50,001 - 300,000 SF	3.5
Shopping	4.09	0.75		1.15	300,001 - 1,000,000 SF	4.8
Eat Meal	3.28	0.05		1.40	1,000,000 SF and OVER	5.8
Banking	5.18	0.05		0.85	Supermarket	3.5
Pick up / drop off passengers	3.05	0.05		0.60	Convenience Market	2.5
		1.00	0.60	Service Station	2.5	
COMMERCIAL - OFFICE						
Other	5.16	0.10	5.35	1.00	General Office (all sizes)	5.3
Work	5.49	0.80		1.00	Medical-Dental Office	5.3
Work Related	4.37	0.10		1.00	Office Park	5.3
		1.00	1.00	Business Park	5.3	
COMMERCIAL - INDUSTRIAL						
Other	5.16	0.10	5.35	1.00	Warehousing/Distribution Terminal	5.3
Work	5.49	0.80		1.00	Light Industrial/Industrial Park	5.3
Work Related	4.37	0.10				
		1.00				
COMMERCIAL RESTAURANT						
Other	5.16	0.05	3.49	0.50	Fast Food	1.7
Work	5.49	0.05		1.00	Other Restaurant	3.5
Eat Meal	3.28	0.90				
		1.00				
COMMERCIAL - SERVICE						
Pick up / drop off passengers	3.05	0.50	1.53	1.00	Day Care Center	1.5
Other	5.16	0.40	4.59	1.00	Hospital	4.6
Work	5.49	0.20		1.00	Nursing Home	4.6
Recreational	4.06	0.20		1.00	Hotel/Motel	4.6
Pick up / drop off passengers	3.05	0.20				
		1.00				

Table B-5: Northwest Impact Fee Service Area Average Trip Length Calculation

CATS HHTS 90 Trip Origin Activity	Average Trip Length in Kane County (ground-miles)	Weight	Weighted Average Trip Length (miles)	Factor	Land Use Category	Average Trip Length (miles)
RESIDENTIAL						
Pick up / drop off passengers	1.61	0.10	6.18	1.00	Single Family Detached	6.2
Change type of transportation	5.40	0.10		1.00	Single Family Attached	6.2
Return Home	6.84	0.80		1.00	Multifamily Attached	6.2
			1.00			
COMMERCIAL - RETAIL						
Other	1.70	0.05	1.76	0.60	1 - 50,000 SF	1.1
Work	5.80	0.05		0.85	50,001 - 300,000 SF	1.5
Shopping	1.20	0.75		1.15	300,001 - 1,000,000 SF	2.0
Eat Meal	3.26	0.05		1.40	1,000,000 SF and OVER	2.5
Banking	4.91	0.05		0.85	Supermarket	1.5
Pick up / drop off passengers	1.61	0.05		0.60	Convenience Market	1.1
				1.00	0.60	Service Station
COMMERCIAL - OFFICE						
Other	1.70	0.10	5.44	1.00	General Office (all sizes)	5.4
Work	5.80	0.80		1.00	Medical-Dental Office	5.4
Work Related	6.32	0.10		1.00	Office Park	5.4
				1.00	1.00	Business Park
COMMERCIAL - INDUSTRIAL						
Other	1.70	0.10	5.44	1.00	Warehousing/Distribution Terminal	5.4
Work	5.80	0.80		1.00	Light Industrial/Industrial Park	5.4
Work Related	6.32	0.10				
			1.00			
COMMERCIAL RESTAURANT						
Other	1.70	0.05	3.31	0.50	Fast Food	1.7
Work	5.80	0.05		1.00	Other Restaurant	3.3
Eat Meal	3.26	0.90				
			1.00			
COMMERCIAL - SERVICE						
Pick up / drop off passengers	1.61	0.50	0.81	1.00	Day Care Center	0.8
Other	1.70	0.40	2.57	1.00	Hospital	2.6
Work	5.80	0.20		1.00	Nursing Home	2.6
Recreational	2.03	0.20		1.00	Hotel/Motel	2.6
Pick up / drop off passengers	1.61	0.20				
		1.00				

Table B-6: Southwest Impact Fee Service Area Average Trip Length Calculation

CATS HHTS 90 Trip Origin Activity	Average Trip Length in Kane County (ground-miles)	Weight	Weighted Average Trip Length (miles)	Factor	Land Use Category	Average Trip Length (miles)
RESIDENTIAL						
Pick up / drop off passengers	2.62	0.10	6.49	1.00	Single Family Detached	6.5
Change type of transportation	5.40	0.10		1.00	Single Family Attached	6.5
Return Home	7.10	0.80		1.00	Multifamily Attached	6.5
		1.00				
COMMERCIAL - RETAIL						
Other	5.44	0.05	6.14	0.60	1 - 50,000 SF	3.7
Work	7.25	0.05		0.85	50,001 - 300,000 SF	5.2
Shopping	6.46	0.75		1.15	300,001 - 1,000,000 SF	7.1
Eat Meal	6.61	0.05		1.40	1,000,000 SF and OVER	8.6
Banking	3.93	0.05		0.85	Supermarket	5.2
Pick up / drop off passengers	2.62	0.05		0.60	Convenience Market	3.7
		1.00		0.60	Service Station	3.7
COMMERCIAL - OFFICE						
Other	5.44	0.10	6.77	1.00	General Office (all sizes)	6.8
Work	7.25	0.80		1.00	Medical-Dental Office	6.8
Work Related	4.19	0.10		1.00	Office Park	6.8
		1.00		1.00	Business Park	6.8
COMMERCIAL - INDUSTRIAL						
Other	5.44	0.10	6.77	1.00	Warehousing/Distribution Terminal	6.8
Work	7.25	0.80		1.00	Light Industrial/Industrial Park	6.8
Work Related	4.19	0.10				
		1.00				
COMMERCIAL RESTAURANT						
Other	5.44	0.05	6.59	0.50	Fast Food	3.3
Work	7.25	0.05		1.00	Other Restaurant	6.6
Eat Meal	6.61	0.90				
		1.00				
COMMERCIAL - SERVICE						
Pick up / drop off passengers	2.62	0.50	1.31	1.00	Day Care Center	1.3
Other	5.44	0.40	4.86	1.00	Hospital	4.9
Work	7.25	0.20		1.00	Nursing Home	4.9
Recreational	3.56	0.20		1.00	Hotel/Motel	4.9
Pick up / drop off passengers	2.62	0.20				
		1.00				

Table B-7: Tri-Cities Impact Fee Service Area Average Trip Length Calculation

CATS HHTS 90 Trip Origin Activity	Average Trip Length in Kane County (ground-miles)	Weight	Weighted Average Trip Length (miles)	Factor	Land Use Category	Average Trip Length (miles)
RESIDENTIAL						
Pick up / drop off passengers	4.29	0.10	3.47	1.00	Single Family Detached	3.5
Change type of transportation	6.91	0.10		1.00	Single Family Attached	3.5
Return Home	2.94	0.80		1.00	Multifamily Attached	3.5
		1.00				
COMMERCIAL - RETAIL						
Other	4.08	0.05	4.23	0.60	1 - 50,000 SF	2.5
Work	5.71	0.05		0.85	50,001 - 300,000 SF	3.6
Shopping	4.16	0.75		1.15	300,001 - 1,000,000 SF	4.9
Eat Meal	3.25	0.05		1.40	1,000,000 SF and OVER	5.9
Banking	4.74	0.05		0.85	Supermarket	3.6
Pick up / drop off passengers	4.29	0.05		0.60	Convenience Market	2.5
		1.00		0.60	Service Station	2.5
COMMERCIAL - OFFICE						
Other	4.08	0.10	5.47	1.00	General Office (all sizes)	5.5
Work	5.71	0.80		1.00	Medical-Dental Office	5.5
Work Related	4.92	0.10		1.00	Office Park	5.5
		1.00		1.00	Business Park	5.5
COMMERCIAL - INDUSTRIAL						
Other	4.08	0.10	5.47	1.00	Warehousing/Distribution Terminal	5.5
Work	5.71	0.80		1.00	Light Industrial/Industrial Park	5.5
Work Related	4.92	0.10				
		1.00				
COMMERCIAL RESTAURANT						
Other	4.08	0.05	3.42	0.50	Fast Food	1.7
Work	5.71	0.05		1.00	Other Restaurant	3.4
Eat Meal	3.25	0.90				
		1.00				
COMMERCIAL - SERVICE						
Pick up / drop off passengers	4.29	0.50	2.14	1.00	Day Care Center	2.1
Other	4.08	0.40	4.55	1.00	Hospital	4.6
Work	5.71	0.20		1.00	Nursing Home	4.6
Recreational	4.61	0.20		1.00	Hotel/Motel	4.6
Pick up / drop off passengers	4.29	0.20				
		1.00				

Table B-8: Upper Fox Impact Fee Service Area Average Trip Length Calculation

CATS HHTS 90 Trip Origin Activity	Average Trip Length in Kane County (ground-miles)	Weight	Weighted Average Trip Length (miles)	Factor	Land Use Category	Average Trip Length (miles)
RESIDENTIAL						
Pick up / drop off passengers	4.40	0.10	3.66	1.00	Single Family Detached	3.7
Change type of transportation	5.99	0.10		1.00	Single Family Attached	3.7
Return Home	3.27	0.80		1.00	Multifamily Attached	3.7
		1.00				
COMMERCIAL - RETAIL						
Other	4.33	0.05	4.09	0.60	1 - 50,000 SF	2.5
Work	4.65	0.05		0.85	50,001 - 300,000 SF	3.5
Shopping	4.23	0.75		1.15	300,001 - 1,000,000 SF	4.7
Eat Meal	2.31	0.05		1.40	1,000,000 SF and OVER	5.7
Banking	2.72	0.05		0.85	Supermarket	3.5
Pick up / drop off passengers	4.40	0.05		0.60	Convenience Market	2.5
		1.00		0.60	Service Station	2.5
COMMERCIAL - OFFICE						
Other	4.33	0.10	5.01	1.00	General Office (all sizes)	5.0
Work	4.65	0.80		1.00	Medical-Dental Office	5.0
Work Related	8.59	0.10		1.00	Office Park	5.0
		1.00		1.00	Business Park	5.0
COMMERCIAL - INDUSTRIAL						
Other	4.33	0.10	5.01	1.00	Warehousing/Distribution Terminal	5.0
Work	4.65	0.80		1.00	Light Industrial/Industrial Park	5.0
Work Related	8.59	0.10				
		1.00				
COMMERCIAL RESTAURANT						
Other	4.33	0.05	2.53	0.50	Fast Food	1.3
Work	4.65	0.05		1.00	Other Restaurant	2.5
Eat Meal	2.31	0.90				
		1.00				
COMMERCIAL - SERVICE						
Pick up / drop off passengers	4.40	0.50	2.20	1.00	Day Care Center	2.2
Other	4.33	0.40	4.34	1.00	Hospital	4.3
Work	4.65	0.20		1.00	Nursing Home	4.3
Recreational	3.98	0.20		1.00	Hotel/Motel	4.3
Pick up / drop off passengers	4.40	0.20				
		1.00				

Table B-9: West Central Impact Fee Service Area Average Trip Length Calculation

CATS HHTS 90 Trip Origin Activity	Average Trip Length in Kane County (ground-miles)	Weight	Weighted Average Trip Length (miles)	Factor	Land Use Category	Average Trip Length (miles)
RESIDENTIAL						
Pick up / drop off passengers	6.34	0.10	7.67	1.00	Single Family Detached	7.7
Change type of transportation	11.56	0.10		1.00	Single Family Attached	7.7
Return Home	7.34	0.80		1.00	Multifamily Attached	7.7
		1.00				
COMMERCIAL - RETAIL						
Other	4.93	0.05	5.58	0.60	1 - 50,000 SF	3.3
Work	6.94	0.05		0.85	50,001 - 300,000 SF	4.7
Shopping	6.06	0.75		1.15	300,001 - 1,000,000 SF	6.4
Eat Meal	0.41	0.05		1.40	1,000,000 SF and OVER	7.8
Banking	2.00	0.05		0.85	Supermarket	4.7
Pick up / drop off passengers	6.34	0.05		0.60	Convenience Market	3.3
		1.00		0.60	Service Station	3.3
COMMERCIAL - OFFICE						
Other	4.93	0.10	6.72	1.00	General Office (all sizes)	6.7
Work	6.94	0.80		1.00	Medical-Dental Office	6.7
Work Related	6.72	0.10		1.00	Office Park	6.7
		1.00		1.00	Business Park	6.7
COMMERCIAL - INDUSTRIAL						
Other	4.93	0.10	6.72	1.00	Warehousing/Distribution Terminal	6.7
Work	6.94	0.80		1.00	Light Industrial/Industrial Park	6.7
Work Related	6.72	0.10				
		1.00				
COMMERCIAL RESTAURANT						
Other	4.93	0.05	0.97	0.50	Fast Food	0.5
Work	6.94	0.05		1.00	Other Restaurant	1.0
Eat Meal	0.41	0.90				
		1.00				
COMMERCIAL - SERVICE						
Pick up / drop off passengers	6.34	0.50	3.17	1.00	Day Care Center	3.2
Other	4.93	0.40	5.71	1.00	Hospital	5.7
Work	6.94	0.20		1.00	Nursing Home	5.7
Recreational	5.40	0.20		1.00	Hotel/Motel	5.7
Pick up / drop off passengers	6.34	0.20				
		1.00				