

Impact Fee Study

for Road, Park, Police and Fire Facilities



White House, Tennessee

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SERVICE AREA

In an impact fee system, a "service area" is the geographic area in which the capital facilities provide service to new development. Impact fees are calculated on the basis of the facilities that are provided within that service area, and impact fees collected within a service area must be spent within the same service area. A small or compact community may have only one service area, while a larger one may have several.

The City of White House is a small community. The estimated population within the current City limits is less than 5,000, and its incorporated area covers less than nine square miles. It has one fire hall and one police station, and its several parks are easily accessible to all City residents. If the revenues from impact fees are divided between two or more districts, it may take longer than it reasonably should to accumulate enough funds in the reserves of either district to carry out important projects. Consequently, it is recommended that the City assess impact fees within a single, jurisdiction-wide service area.

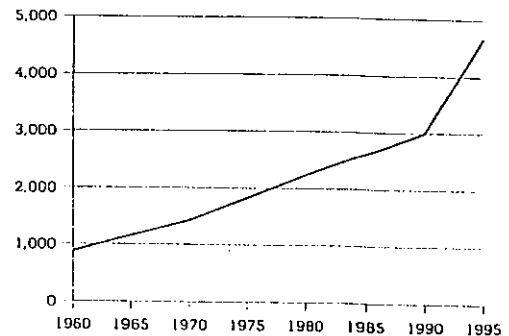
The City's land development regulations also apply to a planning area adjacent to the city limits in Sumner County. The planning area jurisdiction extends from one-tenth to one mile into the unincorporated county. It would be possible for the City to collect impact fees from new development in this area. However, the City does not currently provide many services to this area. It does not construct or maintain roads, and is not obligated to provide police and fire protections services, although it does respond to some emergency calls from the area pursuant to mutual aid agreements. While residents of the planning area may utilize City park facilities, the City does not currently have any park facilities in the area. There is also no data on the population of the area or the number of housing units existing in the area. For these reasons, we recommend that the impact fee service area for all four types of facilities be limited to the City's incorporated jurisdiction.

The recommended service area for all four types of impact fees is the entire incorporated area, as illustrated in *Figure 1*.

GROWTH TRENDS

While the City is small, it is growing rapidly. Prior to 1990, the City's population growth was essentially linear (see Figure 2). The City's population increased by 50 to 100 persons annually, and its annual growth rate gradually declined from a high of 5.1 percent in the 1960s to a low of 1.7 percent in the late 1980s (see Table 2). Since 1990, however, growth has been extremely rapid. The City has not annexed any land since 1990, so the growth has come entirely from new development.

Figure 2
CITY POPULATION, 1960-1995



Projecting future growth for a small community is a difficult undertaking. The growth pressures experienced by the City since 1990 are unprecedented in its history. A single large residential development, or a major annexation, could easily double the City's population in a single year. The most reasonable approach is to assume that recent trends will continue in the near term. Since the City has historically grown in a linear fashion, a linear projection (assuming the addition of a fixed number of persons per year) may be more appropriate than an exponential projection (using a compounded annual growth rate). Over the near term, the two methodologies will produce reasonably similar results. To be conservative, the linear projection will be assumed for the purposes of this study. Based on the linear method, the current 1995 population of the city is estimated to be 4,578, and the population is projected to increase to 6,168 by the year 2000, as shown in Table 2.

Table 2
POPULATION TRENDS AND PROJECTIONS, 1960-2000
City of White House, Tennessee

Year	Population	Avg. Annual Growth	Annual Growth Rate
1960	865	NA	NA
1970	1,423	56	5.10%
1980	2,225	80	4.58%
1986	2,795	95	3.88%
1990	2,987	48	1.68%
1994	4,260	318	9.28%
1995	4,578	318	7.46%
2000	6,168	318	5.44%

Sources: 1960, 1970, 1980 and 1990 decennial censuses and 1986 and 1994 special censuses for City of White House; 1995 and 2000 estimates assume annual population growth of 318 persons.

assessment of impact fees. A diverted trip is similar to a pass-by trip, but a diversion is made from the regular route to make an interim stop. On a system-wide basis, this trip also does not add an additional burden on the street system, so it is not considered in assessing impact fees. The reduction for pass-by and diverted trips was drawn from the ITE manual and other published information.

Local data on average trip lengths is not available. However, a reasonable estimate of average trip length can be determined based on the physical size of the community. White House is roughly three miles across at its widest dimension. A trip from the outskirts of the city to the geographic center of the city would be about one and one-half miles. Since only travel on major roads is of interest, an estimated trip length of one mile should be reasonable for most types of trips.

As noted above, the travel demand generated by a land use is a product of trip generation, primary trip factors and average trip length. The travel demand factors and VMT generation for a representative range of land uses are presented in *Table 3*.

Using these travel demand characteristics and available information about existing land use in the city, it is possible to develop a rough estimate of system-wide daily VMT on the City major road system. As shown in *Table 4*, existing development in the city is estimated to generate approximately 17,694 VMT per day on the City's major road system.

Table 4
ESTIMATED TOTAL VMT, 1995

Land Use	Unit Type	Units	VMT/Unit	VMT
Single-Family	Dwelling	1,454	4.78	6,950
Duplex	Dwelling	118	3.24	382
Multi-Family	Dwelling	118	3.24	382
Mobile Home	Dwelling	18	2.41	43
Office (Est.)	1,000 sf	100.0	9.98	998
Commercial (Est.)	1,000 sf	250.0	19.44	4,860
Industrial	1,000 sf	544.0	3.49	1,899
City Buildings	1,000 sf	40.6	9.98	405
Library/Museum	1,000 sf	6.3	22.75	143
Elem School	Student	620	0.55	341
High School	Student	1,706	0.69	1,177
Park	Acre	102.9	1.12	115
Total VMT				17,694

Source: Number of units from *Appendix Table A-4*; VMT per unit from *Table 3*.

Roadway Capacity

The supply side of the demand/supply service unit equivalency is represented by vehicle-miles of capacity (VMC). For a roadway, the VMC, or number of service units provided, is simply the product of the daily capacity of the roadway and the length of the roadway.

The actual capacity of an individual roadway segment is affected by a host of factors, including frequency of signalized intersections, signal timing, intersection configuration (including turn lanes), lane width, percent of truck traffic, etc. The engineering analysis required to precisely estimate the capacity of individual segments is generally not appropriate for impact fee analysis, however, both because it would be prohibitively expensive and because it is simply not practical to do for future roadway improvements in advance of engineering design. Instead, planning-level capacity estimates are appropriate for impact fee analysis.

An inventory of the City's major roadway system was developed as part of this study. It identifies the length of each road segment and paving and shoulder widths. Average daily vehicle capacities for rural state highways and local roadways were adjusted for paving and shoulder widths for each roadway

Current traffic count information is unavailable for most of the major roadways, making it impossible to determine whether and to what extent existing traffic may be exceeding capacity on individual roadway segments. Such information, however, is not essential in developing a road impact fee system. Road impact fees are most appropriately based on the system-wide relationship between demand and capacity, rather than the level of traffic on individual roadway segments.

Typically, road impact fees charge new development the cost of adding a unit of capacity to the roadway system for every unit of travel demand placed on the roadway system. The City's current major road system provides far more than one unit of capacity for every unit of demand (for example, City-maintained streets alone provide more than three VMC for every VMT). While some portions of the major roadway system are currently experiencing congestion (i.e., Highway 76 west of the Interstate), it is also clear that most of the rest of the system has considerable excess capacity.

Road Cost

The cost per road service unit is determined by dividing the cost of a mile of roadway by the capacity of a roadway. According to City staff, the estimated cost of constructing a roadway to City design standards is about \$750,000 to \$800,000 per mile with curb and gutter and about \$600,000 to \$750,000 per mile with open swale drainage. These cost estimates are likely to be conservative, since they cover only construction costs and do not include right-of-way costs. Taking the midpoint of these estimates, and dividing by the average capacity of a City street, yields an estimated cost of \$97 per vehicle-mile of capacity, as shown in Table 6.

Table 6
COST PER ROAD SERVICE UNIT

Cost Factor	Value
Road Cost/Mile	\$750,000
ADT Capacity	7,700
Cost/Service Unit	\$97

Source: Road cost from City of White House Public Works Department; capacity from Table 5.

The cost per service unit used in the impact fee calculations should be reduced to account for other taxes and user fees that will be generated by new development and available for capacity-expanding improvements to the major roadway system. The primary source of such funding likely to be available will come from gasoline and other motor fuel taxes. Based on current gasoline tax rates, average motor fuel efficiency and the percentage of such funds spent on capital improvements, new development should receive a gas tax credit of \$17 per VMT, as shown in Table 7.

Table 9
MAXIMUM ROAD IMPACT FEE SCHEDULE

Land Use	Units	VMT/ Unit	Net Cost/ VMT	Maximum Fee
Single Family	Dwelling	4.78	\$80	\$381
Duplex	Dwelling	3.24	\$80	\$258
Multi-Family	Dwelling	3.24	\$80	\$258
Mobile Home	Dwelling	2.41	\$80	\$192
Hotel/Motel	Room	5.10	\$80	\$407
Bank	1000 sf	19.89	\$80	\$1,586
Church	1000 sf	4.66	\$80	\$371
Community College	1000 sf	6.44	\$80	\$513
Convenience Market	1000 sf	55.35	\$80	\$4,412
Day Care Center	1000 sf	5.94	\$80	\$474
Discount Store	1000 sf	26.30	\$80	\$2,096
Elem/Secondary School	1000 sf	5.36	\$80	\$427
Golf Course	Hole	18.80	\$80	\$1,499
High School	1000 sf	5.45	\$80	\$434
Hospital	1000 sf	8.39	\$80	\$669
Library	1000 sf	22.75	\$80	\$1,813
Light Industry	1000 sf	3.49	\$80	\$278
Medical Clinic/Office	1000 sf	17.09	\$80	\$1,362
Mini-Warehouse	1000 sf	1.31	\$80	\$104
Office (25,000 sf+)	1000 sf	8.31	\$80	\$662
Office (<25,000 sf)	1000 sf	11.65	\$80	\$929
Park	Acre	1.12	\$80	\$89
Racquet Club	1000	8.57	\$80	\$683
Restaurant, Fast Food	1000 sf	85.34	\$80	\$6,803
Restaurant, Quality	1000 sf	48.23	\$80	\$3,845
Service Station	Hose	7.24	\$80	\$577
Shopping Center	1000 sf	19.44	\$80	\$1,550
Supermarket/Food Store	1000 sf	17.56	\$80	\$1,400
Warehousing	1000 sf	2.44	\$80	\$195

Source: VMT/unit from Table 3; net cost/VMt from Table 8.

Table 12
OUTSTANDING PARK DEBT

Bond Issue	Original Total Debt	Outstanding Total Debt	Percent Outstanding	Original Park Debt	Outstanding Park Debt
Series 1990	\$1,000,000	\$675,000	67.5%	\$580,000	\$391,500
Series 1992A	\$1,345,000	\$1,185,000	88.1%	\$850,000	\$748,850
Series 1992B	\$1,000,000	\$975,000	97.5%	\$650,000	\$633,750
Total	\$3,345,000	\$2,835,000	NA	\$2,080,000	\$1,774,100

Source: City of White House, 1995 (outstanding park debt is product of percent of original total issue outstanding by original park debt).

Subtracting the \$1.77 million in outstanding park debt from the \$3.03 million in total park replacement costs results in a net park replacement cost of about \$1.26 million. Dividing the net park cost by the existing population yields a net park cost of \$274 per person, as shown in Table 13.

Table 13
NET PARK COST PER PERSON

Net Cost Factor	Value
Total Park Replacement Cost	\$3,031,510
Outstanding Park Debt	\$1,774,100
Net Park Replacement Cost	\$1,257,410
Estimated 1995 Population	4,578
Net Park Cost per Person	\$274

Source: Total cost from Table 11; outstanding debt from Table 12; 1995 population from Table 2.

Local Park Cost Share

The cost of park facilities attributable to new development should also be reduced to take into account the availability of outside funding sources. There are currently three sources of park grant funds available to Tennessee cities: the Natural Resource Trust Fund (NTRF), the Land and Water Conservation Fund (LWCF), and the Local Parks and Recreation Fund (LPRF). The NTRF and LWCF are federally-funded, and the amounts of funding are subject to major fluctuations in response to shifting federal budget priorities. On the other hand, the state-funded LPRF has a more stable source of revenue derived from a portion of the property transfer tax. This fund is accumulating at a rate of about \$2 million annually, and

POLICE FACILITIES

The police impact fee is designed to fund capital improvements for the City's Police Department. The City provides police protection for the entire community from a single, centrally-located station. Therefore, a single jurisdiction-wide service area is appropriate for the City's police impact fees.

Existing Police Facilities

The City's existing police facilities include the police station located on land shared with the community center, and a firing range and radio building, both of which are located on land owned by the City sewer utility. Existing capital equipment includes 16 vehicles and radio building and station equipment. The total replacement cost of existing capital facilities and equipment, exclusive of any land costs, is just under \$1 million, as shown in *Table 16*. The location of existing police and fire facilities is shown in *Figure 4*.

Table 16
EXISTING POLICE FACILITIES AND COSTS

Facility/ Equipment	Number	Unit Cost	Replacement Cost
Police Station	1	NA	\$460,500
Firing Range	1	NA	\$5,000
Radio Building	1	NA	\$5,600
Patrol Vehicle	9	\$22,000	\$198,000
Chief's Vehicle	1	\$19,000	\$19,000
Detective's Vehicle	1	\$19,000	\$19,000
Blazer	1	\$25,000	\$25,000
Truck	1	\$19,000	\$19,000
Ambulance	1	\$30,000	\$30,000
Animal Control	1	\$15,000	\$15,000
Communication Truck	1	\$50,000	\$50,000
Station Equipment	1	NA	\$94,400
Hand-held Radios	8	\$2,500	\$20,000
Radio Bldg Equip	1	NA	\$5,000
Total Replacement Cost			\$965,500

Source: Replacement costs for buildings, station equipment and radio building equipment from City insured value listings; unit costs from City of White House Police Department, 1995.

Police Debt Credit

The City's police impact fees cannot be based on the full cost of existing facilities, since existing residents have not completely paid for these facilities. The only outstanding debt on police facilities is the portion of the total outstanding debt from the 1990 bond issue attributable to the remodeling of the police station. The original cost of the police station remodeling was \$70,000. Since 67.5 percent of the original bond debt is still outstanding (see *Table 12*), the outstanding debt attributable to police facilities is \$47,250. Subtracting this amount from the total police replacement costs and dividing the result by the existing population yields a net police cost of \$200 per person, as shown in *Table 17*.

Table 17
NET POLICE COST PER PERSON

Net Cost Factor	Value
Total Replacement Cost	\$965,500
Outstanding Debt	\$47,250
Net Replacement Cost	\$918,250
1995 Population	4,578
Net Cost per Person	\$200

Source: Total cost from *Table 16*; outstanding debt is \$70,000 station remodeling times 67.5% outstanding principal on 1990 bond from *Table 12*; 1995 population from *Table 2*.

The City has not historically received any grant funds for capital improvements for the police department, nor are any such funds anticipated to be available in the foreseeable future. The City is currently receiving a three-year COPS grant from the US Department of Justice, Office of Community Oriented Policing Services. However, this grant is exclusively designed to cover 75 percent of the salary and fringe benefits of one additional police officer, and does not cover any capital costs. Consequently, no reduction from the net cost per person is warranted in computing the police impact fees.

Maximum Police Impact Fees

While the net capital costs for police facilities have been calculated on a per capita basis, they will be allocated to both residential and nonresidential development based on the "functional population" associated with the land use. The concept of functional population and the calculations used to derive the functional population for various land use types are described in *Appendix A*. Based on the data, analysis and assumptions presented in this study, the maximum police impact fees that could be charged by the City are presented in *Table 18*.

FIRE FACILITIES

The fire impact fee is designed to fund capital improvements for the City's Fire Department. The City provides fire protection for the entire community from a single, centrally-located station. Therefore, a single jurisdiction-wide service area is appropriate for the City's fire impact fees.

Existing Fire Facilities

The City's existing fire station (see *Figure 5*) occupies half of a building located on a portion of the Municipal Park tract. The other half of the building is occupied by the Parks Department maintenance facility. Existing capital equipment includes two fire engine/pumpers, a rescue/pumper, two other vehicles and fire fighter gear. The total replacement cost of existing capital facilities and equipment, exclusive of any land costs, is about \$0.67 million, as shown in *Table 19*.

Table 19
EXISTING FIRE FACILITIES AND COSTS

Facility/ Equipment	Number	Unit Cost	Replacement Cost
Fire Station	1	NA	\$127,414
Pumpers	2	\$175,000	\$350,000
Rescue/Pumper	1	\$125,000	\$125,000
Utility Vehicle	1	\$25,000	\$25,000
Automobile	1	\$19,000	\$19,000
Turnouts	10	\$1,000	\$10,000
Air Packs	8	\$1,500	\$12,000
Total Replacement Cost			\$668,414

Source: Replacement costs for station from City insured value listings; numbers and unit costs from City of White House Fire Department, 1995.

Figure 5
EXISTING FIRE STATION



Table 21
MAXIMUM FIRE IMPACT FEE SCHEDULE

Land Use	Unit	Functional Population per Unit	Net Cost per Person	Maximum Fee/Unit
Single-Family	Dwelling	1.41	\$132	\$186
Multi-Family	Dwelling	1.04	\$132	\$137
Mobile Home	Dwelling	0.87	\$132	\$115
Commercial	1,000 sq. ft.	1.25	\$132	\$165
Office	1,000 sq. ft.	4.03	\$132	\$532
Industrial	1,000 sq. ft.	1.87	\$132	\$247

Source: Functional population/unit from *Table A-2* and *A-3*; net cost per person from *Table 20*.

Table A-1
PERSONS PER UNIT BY TYPE
City of White House, 1995

Housing Type	1990 Census Housing Count	1995 Estimated Housing Units	Regional Average Household Size	Expected 1995 Population	Estimated 1995 Population	Persons per Unit
Single-Family	962	1,454	3.308	4,810	4,084	2.81
Duplex	78	118	2.434	287	244	2.07
Multi-Family	78	118	2.052	242	205	1.74
Mobile Home	12	18	2.958	53	45	2.50
Total	1,130	1,708	NA	5,392	4578	2.68

Sources: 1990 housing units by type from census; 1995 estimated total housing units derived from 1995 population estimate of 4,578 (see Table 2) and total average persons/unit of 2.68 from 1990 census; 1995 housing units by type based on total and 1990 housing distribution; average household size for South Atlantic census division from Robert W. Burchell, et. al., *The New Practitioner's Guide to Fiscal Impact Analysis*, Center for Urban Policy Research, 1985, p. 64; expected 1995 population by housing type is product of 1995 units by regional average household size; estimated 1995 population by unit type is expected population times ratio of total estimated population to total expected population; persons per unit by type is ratio of estimated 1995 population to estimated 1995 housing units.

Of the 16-hour day used in the functional population calculations, it is assumed that people spend eight hours, or one-half of their waking hours, at home. The other half of the day spent away from home accounts for working, shopping and other away-from-home activities. This functional population factor for residential development essentially distributes the cost of public safety facilities evenly between residential and nonresidential development. The functional population for single-family, duplex, multi-family and mobile home units is shown in Table A-2.

Table A-2
RESIDENTIAL FUNCTIONAL POPULATION PER UNIT

Housing Type	Persons/ Unit	Occupancy Factor	Functional Population per Unit
Single-Family	2.81	0.50	1.41
Duplex	2.07	0.50	1.04
Multi-Family	1.74	0.50	0.87
Mobile Home	2.50	0.50	1.25

Source: Persons/unit from Table A-1; occupancy factor assumed (see text).

Table A-3
NONRESIDENTIAL FUNCTIONAL POPULATION PER 1,000 SQ. FT.

Factor	Commercial	Office	Industrial
Weekday ADT/1000 sf	23.41	5.93	3.49
Weekend ADT/1000 sf	30.39	0.36	0.50
Employees/1000 sf	1.96	3.58	1.66
Average Vehicle Occupancy	1.78	1.47	1.16
Visitors/1000 sf	39.71	5.14	2.39
Weekday Func Pop/1000 sf	3.71	2.56	1.19
Weekend Func Pop/1000 sf	4.82	0.16	0.17
Total Func Pop/1000 sf	4.03	1.87	0.90

Source: Institute of Transportation Engineers, *Trip Generation*, 5th Edition, 1991; employees per 1,000 sq. ft. from National Association of Office and Industrial Parks, *America's Future Office Space Needs*, 1990 p. 22; average vehicle occupancy from Federal Highway Administration, *1990 Nationwide Personal Transportation Study*; functional population from formula in Figure A-1.

Total functional population for the City can be estimated based on existing land use data and functional population ratios for various land use categories. As can be seen from Table A-4, the City's current functional population estimate of 4,269 is slightly lower than the current population estimate of 4,578 (see Table 2). This is due to the fact that White House is somewhat of a bedroom community, and more people leave the city for jobs or shopping than enter the city for such reasons. Nevertheless, the functional population is reasonably close to the residential population. The public safety impact fees will be based on the cost per residential population and the functional population associated with various land use types. This is a conservative approach, since the cost per person is lower than the cost per functional population.