IMPACT FEE STUDY

CITY OF ATLANTA GEORGIA

Atlanta

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The purpose of this study is to assist the City of Atlanta in complying with the recently-adopted Georgia *Development Impact Fee Act*. After November 30, 1992, the *Act* requires that all developer exaction practices by cities and counties within the state be discontinued, other than those developed in compliance with the *Act* or for strictly project-related improvements. The choice that faces the City is whether to adopt impact fees as an alternative to traditional exaction practices for financing needed infrastructure improvements.

INTRODUCTION

Impact fees are one-time charges paid by new development to finance the construction of public facilities needed to serve new development. Impact fees would represent a major departure from past municipal facility financing policies for the City. Historically, local residents and property owners have been charged taxes to build facilities that accommodate new growth, which in turn provides homes and jobs. But taxes have risen faster than taxpayers can tolerate. As a result, the City is reluctant to raise taxes as needed to support new growth and development.

Impact fees became popular in the 1980s due to declining state and federal assistance to cities. Twenty years ago, for example, Atlanta received 75 cents in federal revenue for every 25 cents that it spent on wastewater treatment facilities. Those days are gone. Yet the federal government still requires Atlanta to make expensive wastewater system improvements (in addition to expanding its facilities to accommodate future new growth.)

To provide needed public facilities, Atlanta has required developers to contribute land or improvements on a case-by-case basis during the development review and approval process. These developer contributions are known as "exactions." In the last five years, the City has received the equivalent of more than $3 million annually in exactions.

However, the new state law, which was actively promoted by local developers and homebuilders, prohibits the continued use of exactions for public facilities unless they meet certain strict "impact fee" guidelines. Many believe that exactions are not as fair as impact fees since they do not distribute facility needs and costs equitably among current and future users. With exactions there is also no fixed-fee schedule for developers to use in predetermining project costs.

Impact fees must be based on an in-depth study of facility needs and meet extensive planning and procedural criteria set forth in the 1990 Georgia *Development Impact Fee Act*. In September, the City selected a consultant team headed by James Duncan and Associates to prepare the study and ordinances to enable the City Council to adopt technically sound and legally defensible impact fees.

PROPOSED FEES

This study calculates maximum impact fees that the City may charge for transportation, parks and public safety (fire/EMS and police) facilities, consistent with the requirements of the *Act*, available data and recommended service levels and areas. It incorporates policy decisions by the City to charge park impact fees covering only land costs, to discount transportation fees by 50 percent in the southern part of the city, and to discount the park fees by charging 60 percent of the full cost in the Northside and 30 percent in the Southside and Westside service areas.

The study recommends that the City employ the option available under the *Act* to communities that have their own utilities of adopting water and wastewater system "connection" fees rather than impact fees. While connection fees are similar in most respects to impact fees, the statutory requirements governing them are much more flexible.

The proposed fees for a new single-family residential unit and 1,000 square feet of office and commercial development on Atlanta's north side (North transportation service area and Northside parks service area) and south side (South transportation service area and Southside and Westside parks service areas) are summarized in *Table 1*. The wastewater connection fee is very low because the City's water reclamation plants have been largely financed by the federal government.

The total fees on the south side are considerably lower due to lower park land costs and the City's policy decisions to discount the fees in the south in order to encourage development in the area. Single-family fees in the south are about three-quarters those in the north, and nonresidential fees in the south are only about one-half the fees in the north. In addition, much of the new residential development in the south should qualify for affordable housing exemptions.

Table 1
PROPOSED IMPACT FEES

Facility	Single-family		Office		Commercial	
	South	North	South	North	South	North
Transportation	$480	$873	$596	$1,133	$598	$1,144
Water	$1,130	$1,130	$86	$86	$86	$86
Wastewater	$188	$188	$14	$14	$14	$14
Parks and Recreation	$148	$491	$83	$278	$192	$641
Fire/EMS	$114	$114	$64	$64	$146	$146
Police	$33	$33	$16	$16	$42	$42
Total	$2,093	$2,829	$859	$1,591	$1,078	$2,073

Notes: Fees per single-family dwelling unit and per 1,000 square feet of nonresidential uses; nonresidential fees based on 210,000 square foot building; water/wastewater fees based on 5/8" meter for single-family and 3" compound meter for nonresidential uses.

FEE REVENUES

If the impact fees and connection fees were adopted at the proposed level, they could generate close to $10 million annually (*Table 2*), based on population and employment projections. Major revenue sources would be transportation impact fees and water connection fees, which together would account for almost 80 percent of projected revenues.

The City Council may also decide to waive or reduce fees for projects that meet certain established community objectives. These might include exemptions for projects that promote affordable housing or job opportunities for low-income families. The exemption policy currently under consideration by the City (see description in *Appendix C*) would reduce fee revenues by about 16 percent, resulting in an annual net fee revenue total of about $8.3 million, as shown in *Table 2*.

Table 2
ESTIMATED ANNUAL FEE REVENUES

Facility	Gross Revenues	Estimated Exemptions	Net Revenues
Transportation	$3,873,855	$258,273	$3,615,582
Water	$3,927,880	$944,680	$2,983,200
Wastewater	$651,671	$157,168	$494,503
Parks & Recreation	$998,913	$140,131	$858,782
Fire/EMS	$344,208	$69,404	$274,804
Police	$96,960	$20,188	$76,772
Total	$9,893,487	$1,939,267	$8,303,613

Source: see *Appendix C: Revenue Projections*.

When impact fee exemptions are granted, the *Act* requires that the impact fee funds be reimbursed from another revenue source. This requirement, however, does not apply to utility connection fees, nor to "recoupment" impact fees. Recoupment fees are impact fees that simply reimburse the City for existing excess capacity that the City has already paid for, and recoupment revenues can be used for any purpose the City desires.

An important use of recoupment revenues is to reimburse non-recoupment impact fee accounts for lost fees due to exemptions. As currently structured, the parks and public safety fees would be recoupment fees, while the transportation impact fees would be non-recoupment. Together, the parks and public safety fees would generate about $1.2 million annually in net recoupment revenue. About 21 percent of this revenue would need to be set aside to reimburse the transportation impact fee account for the approximately $258,000 in annual exemptions.

The City Council may also wish to phase-in initial impact fees. It is in fact a common practice to phase new fees in over a reasonable period of time in order to accommodate developers who have projects in process. While reducing initial revenues to the City, fee-phasing minimizes the burden on developers who did not anticipate the added cost of impact fees.

The most common method of phasing impact fees is to initially adopt the fees at a certain percentage of the full fee, and then gradually increase the percentage. A major drawback of this common approach, however, is that the City would be receiving less fee revenue in the beginning than would be necessary to maintain the adopted level of service. In the context of a multi-facility impact fee system, a better phasing approach is to adopt the fees for various facilities sequentially, but at the full amount needed to maintain the level of service.

The phasing plan currently under consideration anticipates transportation impact fees to be adopted by about March 1, 1993, parks and public safety impact fees to be adopted by July 1, 1993, and water/wastewater connection fees to be adopted by January 1, 1994. If this phasing schedule is implemented, and if reimbursements for exemptions must be made during the same calendar year, approximately 35 percent of recoupment revenue during this year would be required to finance exemptions to transportation impact fees (see *Appendix C*).

COMPARATIVE FEES

Adoption of proposed impact and connection fees at the maximum level would not place Atlanta at a competitive disadvantage with surrounding communities. Most of other jurisdictions have either already adopted or are now considering impact fee systems (see *Table 3*). Georgia cities and counties that do not adopt impact fees will face difficult choices. They will either have to find other revenues — possibly increased taxes — or not provide needed facilities. They will no longer be able to exact from developers as they have in the past.

Similarly, impact fees will not place Atlanta at a competitive disadvantage with other major cities, since most also already have impact fees (see *Table 4*). Businesses and industries seeking to relocate look for certain characteristics in a new community: skilled labor, market access, sound fiscal policies and adequate public facilities. Atlanta has all of these attributes. Its competitiveness for economic opportunities will be further enhanced by the new or expanded infrastructure that will be paid for in part by future impact fees. It should also be noted that the Georgia impact fee act allows exemptions for uses that increase economic opportunities and create jobs.

Table 3
COMPARATIVE IMPACT FEES
Atlanta and Suburban Jurisdictions

Facility	Atlanta (Northside)	Alpharetta	Roswell	Fulton Co. (S. Shores)	DeKalb Co. (Dunwoody)	Gwinnett County
Single-Family (per unit)						
Roads	873	1,131	683	609	2,159	1,155
Water	1,130	0	0	0	230	696
Wastewater	188	1,810	1,810	1,810	367	1,378
Parks	491	545	1,187	0	0	0
Fire/EMS	114	264	139	0	0	0
Police	33	0	0	0	0	0
Total	2,829	3,750	3,774	2,419	2,756	3,229
Office (210,000 sf Building per 1000 sf)						
Roads	1,133	1,308	1,210	680	1,494	1,237
Water	86	0	0	0	1	35
Wastewater	14	113	113	113	2	68
Parks	278	14	0	0	0	0
Fire/EMS	64	192	149	0	0	0
Police	18	0	0	0	0	0
Total	1,591	1,627	1,472	793	1,497	1,340
Commercial (210,000 sf Center per 1000 sf)						
Roads	1,144	4,166	1,810	2,490	3,274	2,146
Water	86	0	0	0	1	35
Wastewater	14	113	113	113	2	68
Parks	641	14	0	0	0	0
Fire/EMS	146	192	75	0	0	0
Police	42	0	0	0	0	0
Total	2,073	4,485	1,998	2,603	3,277	2,249

Notes:

Atlanta's fees based on North transportation service area and Northside parks service area. Water and wastewater fees represent impact fees or capital expansion component of utility connection fees. Where water/wastewater fees for nonresidential uses are based on size of water meter, 3" meter is assumed. Roswell road impact fee reflects adopted fee at 55% of full impact cost. Gwinnett County road fee represents full fee to be charge after 3-year phase-in schedule (currently adopted at 15%).

Table 4
COMPARATIVE IMPACT FEES
Atlanta and Other Sunbelt Cities

Facility	Atlanta (North)	Orlando	Tampa	Palm Beach Co.	Miami (Dade)	Jackson-ville	Raleigh	Charlotte	Nashville	Dallas	Arlington
Single-Family (per unit)											
Roads	873	1,214	1,772	1,650	879	0	292	0	0	0	998
Water	1,130	491	0	600	392	0	178	123	0	0	306
Wastewater	188	1,140	2,159	1,800	945	403	178	332	500	0	230
Parks	491	0	0	617	1,248	0	365	0	0	0	450
Fire/EMS	114	0	0	79	167	0	0	0	0	0	0
Police	33	0	0	79	95	0	0	0	0	0	0
Other	0	0	0	484	0	0	0	0	0	0	0
Total	2,829	2,845	3,931	5,309	3,726	403	987	455	500	0	1,984
Office (210,000 sf Building per 1000 sf)											
Roads	1,133	1,276	2,772	755	1,198	0	318	0	0	0	2,409
Water	86	164	0	109	112	0	44	10	0	0	47
Wastewater	14	381	620	313	270	352	44	28	167	0	35
Parks	278	0	0	0	0	0	0	0	0	0	0
Fire/EMS	64	0	0	56	231	0	0	0	0	0	0
Police	16	0	0	156	150	0	0	0	0	0	0
Other	0	0	0	67	0	0	0	0	0	0	0
Total	1,591	1,821	3,392	1,456	1,961	352	406	38	167	0	2,491
Commercial (210,000 sf Center per 1000 sf)											
Roads	1,144	4,022	4,326	2,330	1,516	0	1,093	0	0	0	2,195
Water	86	164	0	109	112	0	44	10	0	0	47
Wastewater	14	381	620	313	270	352	44	28	167	0	35
Parks	641	0	0	0	0	0	0	0	0	0	0
Fire/EMS	146	0	0	78	284	0	0	0	0	0	0
Police	42	0	0	156	150	0	0	0	0	0	0
Other	0	0	0	132	0	0	0	0	0	0	0
Total	2,073	4,567	4,946	3,118	2,332	352	1,181	38	167	0	2,277

Notes:

Atlanta's fees based on North transportation service area and Northside parks service area. With exception of Atlanta, all fees are adopted. Water and wastewater fees represent impact fees or capital expansion component of utility connection fees. For communities with multiple service areas, fees shown represent average fees (compared to Atlanta north service area with highest fees). Where water/wastewater fees for nonresidential uses are based on size of water meter, 3" meter is assumed.

LOCAL POLICY OBJECTIVES

Throughout the study, every attempt has been made to structure recommended impact fees to accommodate the unique characteristics of the city of Atlanta and the goals and objectives of its citizens. Levels of service are recommended for all facilities that avoid the creation of existing deficiencies that would have to be remedied with non-impact fee revenues. The parks and recreation impact fees are significantly lower in the southern and western areas of the city, in recognition of lower land costs. Park facility costs were excluded from the park fees, and the impact fees have been discounted from the full cost to ensure Atlanta's competitiveness with other jurisdictions. Finally, transportation and park fees have been discounted in the southern service areas to be consistent with the City's policy of encouraging development in the southern part of the city.

The fees have also been designed to maximize the City's options to waive fees for affordable housing and economic development projects. While state law allows such exemptions, it requires local governments to reimburse the impact fee accounts from other funding sources—a requirement that would be difficult for the City to meet. However, reimbursement is not required for water and wastewater connection fees, nor for impact fees designed to "recoup" past City investments. By taking full advantage of these provisions, about three-quarters of the combined fee for residential uses and 30-45 percent of the combined fees for nonresidential uses could be waived in the southern and western areas of the city without any reimbursement requirement.

An additional advantage of "recoupment" impact fees, which simply pay the City back for prior investments in public facilities that will serve future growth, is that they are not subject to the normal expenditure and accounting requirements that apply to non-recoupment impact fees. The citizen Impact Fee Advisory Committee has recommended that these revenues be earmarked for the types of facilities and the service areas in which they are collected. However, a significant amount of these recoupment revenues will be needed to finance the City's exemptions from non-recoupment impact fees. The remaining recoupment fee revenue should be subject the restrictions recommended by the Advisory Committee. Even with these restrictions, however, recoupment fees can be spent on improvements that do not meet the minimum 10-year useful life and capacity expansion requirements of the *Act*. This additional flexibility would apply to parks and public safety fees, which account for just under 15 percent of total anticipated annual net revenues.

For Atlanta to continue to attract new residents, businesses and industries, it must have adequate public facilities. As any community continues to age and grow, it must both maintain the current condition and expand the future capacity of its infrastructure. As Atlanta prepares for its role as host to the 1996 Olympics, it has a tremendous responsibility to ensure that its public infrastructure can accommodate the increased number of visitors that will attend the many events. Impact fees can assist in that effort.

Impact fees can help Atlanta to equitably and efficiently meet its future public facility needs and obligations. While not the entire answer by any means, impact fees can play a key role in the City's overall capital financing plans. Traditional funding sources, such as property taxes and utility rates, can not continue to shoulder the entire fiscal burden. All revenue options must be considered as major American cities, such as Atlanta, compete in today's global economy.

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OVERVIEW OF REPORT

Chapter 1: Introduction analyzes issues involved in complying with the *Development Impact Fee Act*. It describes important requirements of the *Act*, outlines important policy directions that guided development of the impact fee studies, analyzes the City's current comprehensive plan and capital improvements program and recommends changes to comply with the *Georgia Planning Act*, and summarizes national and state judicial trends in the treatment of development exactions and impact fees.

Chapter 2: Transportation calculates the maximum impact fees that can be charged for the impact of new development on the City's major roadway network. Only arterial roads are covered by this analysis, and the city is divided into North and South service areas. Because an average level of service is recommended, and because the recommended level is below the existing level of service in both service areas, no existing deficiencies are required to be remedied. The proposed impact fees in the South service area reflect the City's policy decision to discount fees by 50 percent in that area to encourage development.

Chapter 3: Water and Wastewater calculates maximum connection fees designed to recapture system capital costs attributable to new customers. The *Act* gives considerably more discretion to city-owned water and wastewater utilities that adopt "connection" fees as opposed to "impact" fees. Connection fees can be collected outside the city limits, and relieve the City of some of the procedural requirements that apply to impact fees. Finally, utility connection fees, like the parks and public safety "recoupment" fees discussed below, can be waived without reimbursement from other revenue sources.

Chapter 4: Parks and Recreation calculates appropriate park and recreation impact fees for the city of Atlanta. Three service areas — northside, southside and westside — are identified. The level of service is based on a "functional population" methodology that assesses impacts on both residential and nonresidential development based on "full-time person equivalents" present at a land use during a 24-hour day. The recommended level of service creates excess capacity in all three service areas, so that impact fees would be for "recoupment" of the cost of such excess capacity. The fees have been calculated to cover only land costs, in order to be competitive with other jurisdictions and to be conservative in the calculation of recoupment value. The recoupment fees would be lower than in the northside, due to higher land costs. The proposed impact fees reflect the City's policy decision to discount fees by charging only 60 percent of the full impact cost in the Northside service area and only 30 percent of the full impact cost in the Southside and Westside service areas.

Chapter 5: Public Safety calculates maximum impact fees for fire/EMS and police facilities. These fees would apply uniformly citywide, and are based on the same functional population methodology used in the park impact fee methodology. These fees are "recoupment fees" that could be waived for affordable housing and economic development projects. The consultant team also analyzed potential impact fees for correctional and emergency management facilities, but found that credits of debt service financing of these facilities would result in negative or insignificant fees.

CHAPTER 1

LEGAL, PLANNING AND POLICY ISSUES

OVERVIEW OF GEORGIA IMPACT FEE ACT

In 1990, the Georgia Legislature passed House Bill 796, enacting the *Development Impact Fee Act* (the "*Act*"). The Act amended *Title 36* of the *Official Code of Georgia Annotated* to add *Chapter 71: Development Impact Fees*. Its purpose is to provide minimum standards for impact fee ordinances adopted by Georgia's municipalities and counties.

One of the most significant implications of the *Act* for local governments is the requirement that development exaction requirements for system improvements, other than impact fees developed in compliance with the *Act*, must be discontinued by November 30, 1992. After the compliance deadline, Georgia communities, including Atlanta, may no longer require right-of-way dedications or other developer contributions as a condition of development approval, other than for internal or strictly project-related improvements. After the deadline, impact fees will represent the only mechanism by which local governments in Georgia may require developer contributions for system improvements.

Only cities and counties that have adopted a comprehensive plan containing a capital improvements element that complies with statutory requirements may enact an impact fee ordinance. One of the first tasks in preparing an impact fee system is the division of the City into service areas for each type of facility. A community's comprehensive plan also must specify the level of service for the facility on which the impact fees are based.

Furthermore, the *Act* restricts the use of impact fee revenues to "system improvements that create additional service available to serve new growth and development." These provisions make it clear that impact fee revenues cannot be used to solve capacity problems that existed when the impact fee ordinance was adopted.

In summary, the *Act* mandates that Atlanta discontinue its current practice of developer exactions. The choice that faces the City is whether to adopt impact fees as an alternative technique for financing needed infrastructure improvements.

Eligible Facilities

The *Development Impact Fee Act* limits impact fees to the financing of seven categories of capital facilities (O.C.G.A. 36-71-2):

- Water supply, treatment and distribution;
- Wastewater collection, treatment and disposal;
- Roads, streets and bridges;

- Stormwater collection, retention, detention, treatment and disposal facilities, flood control facilities, and bank and shore protection and enhancement improvements;
- Parks, open space, recreation areas and related facilities;
- Public safety facilities (police, fire, emergency medical and rescue facilities); and
- Libraries and related facilities.

The list excludes schools, public transit and solid waste facilities. In addition, the City has chosen not to undertake studies for stormwater management or libraries at this time. Within each category addressed by the City's current efforts, impact fee collected can be spent only on capital facilities.

The *Act* limits impact fee financing to facilities with a useful life of ten or more years. Police cars, for example, usually do not last longer than three years. However, not all vehicles are prohibited from impact fee financing. Fire engines and airplanes commonly last much longer than ten years. These provisions limit local governments' use of impact fees especially in the area of public safety. For example, impact fees may be used for a new police station, but may not be used for new patrol cars. Local governments must be careful in structuring impact fees so that only eligible improvements are included.

Proportionate Share Requirement

The *Act* places many restrictions on the way in which impact fees are calculated. The *Act* establishes the principle that local governments may not charge developments more than a "proportionate share" of the cost of new facilities. "Proportionate share" is defined as "that portion of the cost of system improvements which is reasonably related to the service demands and needs of the project." The *Act*'s proportionate share rule assures consistency with the *rational nexus test*, which has been established through professional practice and case law.

There are various approaches to calculating impact fees and crediting development for past and future contributions made toward system improvements. The *Act* does not specify a single fee calculation method; however, it does identify some factors that must be taken into account. The most important rules for calculating impact fees are covered in O.C.G.A. 36-71-5. Specifically, the *Act* establishes the following requirements to ensure compliance with the "proportionate share" standard:

- *Levels of service*. Calculation of impact fees must be based on levels of service that are adopted in the local jurisdiction's comprehensive plan and applicable to existing development as well as new development. The level of service should be based on sound planning and apply uniformly.
- *Service areas*. Impact fees must be calculated and imposed based on service areas. Impact fees collected within a service area must be spent on the type of facility for which the fee was collected and within the service area in which it was collected.

- *Improvement costs.* Calculation of impact fees must be based on "actual system improvement costs or reasonable estimates of such costs." Obviously, basing impact fees on inflated or unrealistically high improvement cost estimates would violate proportionate share criteria.

- *Revenue credits.* Calculation of impact fees must provide credits for the present value of future revenues "that will be generated by new development and that will be available to pay for system improvements."

Improvements-Based versus Consumption-Based Systems

There are essentially two approaches in designing impact fee systems—"improvements-based" and "consumption-based" — both of which are valid under Georgia law. Under the improvements-based approach, specific facilities are identified as necessary by a certain horizon year. The total cost of facilities is then prorated among anticipated units of growth during that same period. Use of this approach requires a very strong link between the design of the impact fee system and capital improvements programming. The weaknesses of the approach are that long-range growth projections are usually unreliable, and many assumptions are often required to convert from projections to future facility demand estimates. Due to these shortcomings, a consumption-based approach has been used in this study.

Although some attempt must be made under the consumption-based approach to show that programmed capital improvements are reasonably sufficient to meet projected demands, the estimated cost of those improvements and the growth projections do not directly determine the fee level. Instead, the consumption-based approach determines the marginal cost to construct additional capacity and charges new development based on the capacity required to serve it, regardless of whether that capacity exists. Marginal cost can be determined based on the cost of and capacity created by typical past improvements, or on a list of potential or planned future improvements. Unlike the improvements-based approach, however, the cost of past or future capital improvements is divided by the capacity created by the improvements, rather than by projected demand, to determine marginal costs on which the fees are based.

Fee Calculation Methodology

Regardless of whether a consumption- or improvements-based approach is used, the calculation of impact fees must follow essentially the same steps. They include an analysis of the following:

- *Capital cost.* The capital cost of constructing new capacity to serve new development has been calculated on a "per unit" basis. Under a consumption-based approach, this is typically the marginal cost of an additional unit of capacity. Non-local funding sources have been excluded from these cost calculations or calculated as revenue credits.

- *Demand schedule.* For each land use (or, in the case of water and wastewater, each meter size) the demand generated per unit of development (dwelling unit, floor area, etc.) has been estimated and then multiplied by capital cost estimates to determine the total cost per unit of development.

- *Revenue credits.* The total capital cost has been reduced by the present value of future payments made by new development for the very facilities for which they are being assessed impact fees, such as through general obligation bonds retired by property taxes. The result is "net capital cost." This is the maximum impact fee that may be adopted by the City.

- *Construction credits.* For individual development projects, the fee calculated from the impact fee schedule may be reduced to credit new development for developer contributions made toward system improvements in compliance with past exaction requirements or as part of developer agreements. Such credits must be determined on a case-by-case basis.

POLICY FRAMEWORK

The development of a multi-facility impact fee system for the City of Atlanta must be based on a consideration of the unique characteristics of the community. Unlike many cities that have adopted impact fees, Atlanta represents a largely developed central city that is surrounded by a large suburban area. As a result, most of the City's future growth will come in the form of redevelopment and infill, rather than outward expansion.

Atlanta's daytime population, swollen by the in-migration of commuting employees, shoppers and visitors, vastly exceeds its resident population, and future growth will be primarily of a nonresidential character. Much of the City's infrastructure is in need of replacement, and the expansion of certain facilities, such as the widening of roads, is severely constrained by the pattern of existing development. The community has experienced chronic fiscal problems in recent years, which have made it difficult to maintain existing infrastructure, much less expand to meet demands caused by growth. The city also has a significant low-income population, and affordable housing and economic development are big concerns.

While the proposed impact fee system must be based on sound technical analysis and comply with the Georgia *Development Impact Fee Act*, it also must reflect local policy decisions. Based on an analysis of the City's characteristics and discussions with the citizens Impact Fee Advisory Committee and staff Impact Fee Task Force, the consultant team has identified the following recommended general policies to guide the development of impact fees for the City.

- **Target nonresidential development.** Because it is expected that nonresidential development will constitute most future growth in the City, it will be important to gauge the public facility demands posed by new nonresidential development. Most park impact fees, for example, assume that only residential development generates new demands for parks. An analysis of park usage in Atlanta, however, provides significant evidence of park usage by nonresidential development. The methodology used in the park impact fee study therefore assesses both residential and nonresidential development.

- **Minimize negative impacts on affordable housing and economic development.** While the *Development Impact Fee Act* authorizes exemptions for affordable housing and economic

development, it also requires that the City find non-impact fee funds to "pay" the impact fees for the exempted development. This requirement, however, does not apply to water and wastewater connection fees, or to the proposed parks and public safety recoupment fees. Thus, only waivers of transportation impact fees would require replacement from non-impact fee revenues.

- **Avoid current deficiencies.** Existing facility deficiencies can be avoided by setting levels of service at or below current levels. Based on initial discussions with City staff, it appears that, for many types of facilities, current service levels, though not ideal, are reasonably acceptable. If higher service levels are desired, they will "create" a deficiency in current service levels that requires new City investment from revenues other than impact fees. By adopting current service levels, few if any deficiencies will be created. This avoids the need for using non-impact fee funds to remedy deficiencies.

- **Recoup past investments.** The parks and public safety impact fees have been designed to recoup past investments that created excess capacity in existing facilities to accommodate new growth. Levels of service for these facilities have been set below current levels, which creates excess facility capacity. The value of this excess capacity has been used as the basis for assessing recoupment impact fees, which, because they are reimbursements to the City for funds that have already been spent, can be used by the City in any appropriate manner.

  However, the City has made the policy decision that a percentage of such recoupment fees should be set aside for reimbursement of transportation impact fee exemptions, with the remainder earmarked for expenditure on the types of facilities, and in the service areas, for which they were collected. While these recommendations would constrain the flexibility in the expenditure of these funds, they would still have advantages over non-recoupment impact fees. First, recoupment fees can be waived for affordable housing and economic development projects without replacing the waived fees with non-impact fee revenues. Second, parks and police recoupment fees could be spent on improvements that would not qualify as system improvements under the 10-year-life and capacity-expansion requirements of the *Act*, such as the purchase of police cars or the replacement of a roof.

- **Keep impact fees up-to-date.** Many communities adopt impact fees, but then fail to update them regularly to reflect increases in construction costs, thus allowing fees to fall below actual impact costs. The City's annual update process for its comprehensive plan and capital improvements program should be integrated with an annual update of its impact fee systems. In addition, more complete and precise data should be incorporated into fee updates as better information comes available. Fees calculated in this study are sometimes conservatively derived to present legally defensible fees in spite of incomplete data. The City could improve its revenue recovery by improving information on which fees are based.

LEVELS OF SERVICE

The *Development Impact Fee Act* states that:

> "Development impact fees shall be calculated based on *levels of service* for public facilities that are adopted in the municipal or county comprehensive plan that are applicable to existing development as well as the new growth and development." [emphasis added]

The *Act* defines "level of service" (LOS) as a "measure of the relationship between service capacity and service demand for public facilities in terms of demand-to-capacity ratios or the comfort or convenience of use or both." If, for example, roadways are severely congested, the parks are overcrowded, and water rationing is required every summer, one would conclude that the level of service provided by these facilities is low. However, in some cases a community might be willing to tolerate a relatively low level of service. This could be because a low level of service is less expensive to provide, or because it promotes another policy objective (i.e., congestion could encourage use of mass transit alternatives).

Adopted vs. Existing Levels of Service

A distinction should be made between the actual level of service, which can be measured at a given time, and the desired level of service. For the purpose of impact fees, the desired level of service must be formally adopted in the City's comprehensive plan. The relationship between the adopted level of service that is used to calculate impact fees for new development, and the actual level of service existing at the time of impact fee adoption, has important implications in the context of an impact fee system. These implications are summarized in *Table 1-1*.

Table 1-1
LEVEL OF SERVICE STANDARD

Characteristic	Adopted Level of Service Compared to Existing Level of Service		
	Below	Same	Higher
Amount of Impact Fee	Low	Moderate	High
Future Level of Service	Decline	Maintain	Improve
Existing Deficiencies	None	None	Must Remedy
Excess Capacity	Recoupment	None	None

If a community establishes a desired level of service that is higher than the existing level, existing facilities will be found to be deficient when compared to the adopted standard. New developments will pay impact fees calculated on the cost to maintain the adopted level of service, but will be sharing existing facilities that operate at a lower level of service. As the impact fees are spent, facilities will be upgraded and the level of service will improve for all users. However, new developments would not be

receiving the level of service for which they are being charged, and existing users would be benefiting from the improved level of service paid for by new development.

Such a situation would clearly violate the "proportionate fair-share" intent of the Development Impact Fee Act. It would be inconsistent with the requirement that levels of service must be "applicable to existing development as well as the new growth and development," and inconsistent with the restriction on the use of impact fee revenues to finance "system improvements that create additional service available to serve new growth and development." Thus, if the City decides to adopt a level of service higher than the existing service level, it must find non-impact fee revenue sources to upgrade existing facilities to the adopted service level. Such revenues should be available based on realistic projections to remedy any deficiencies over a reasonable period.

Adoption of a higher-than-existing level of service would result in higher impact fee revenues and improvement, over time, in the actual level of service provided. However, given the City's current fiscal problems, it is unlikely that sufficient non-impact fee funds could be found to remedy the deficiencies in existing facilities that would be created. Consequently, the consultant team has recommended that the City adopt levels of service that are at or below existing levels to avoid the creation of existing deficiencies.

At the other extreme, the City could adopt a level of service that is below the level currently provided. Such an approach would mean that existing facilities have excess capacity that would be available to serve new development. The *Act* specifically allows recoupment of the cost of constructing this excess capacity by authorizing "imposition of a development impact fee for system improvement costs previously incurred by a municipality or county to the extent that new growth and development will be serviced by the previously constructed system improvements."

Recoupment fees are calculated and handled administratively in the same manner as any other impact fee except that, because such fees are collected to reimburse local governments for money they have already spent on infrastructure, they need not be earmarked for expenditure. If facilities were built with outstanding bond issues or other debt instruments, impact fee revenues could be used to retire the debt. If the facilities have been paid for, the impact fee revenues may be returned to the general fund or used for any other purpose, including tax reductions. In the case of water and wastewater facilities, fee revenues could be returned to the respective enterprise funds. Like all fee calculation methods, recoupment must respect the general principles of not double-charging and adjusting credits to reflect the time value of money. The recoupment option therefore requires careful analysis of how and when each applicable capital project was originally financed.

While recoupment can be used for revenue enhancement, setting an artificially low level of service for this purpose alone would be short-sighted. While more of the sunk costs of existing facilities would be recaptured, impact fees collected for future system expansion would be limited to the costs of providing the lower level of service. In addition, the lower the level of service that is adopted, the lower the annual amount of impact fee revenues received.

The third option, of course, is to adopt a level of service that is identical to the existing level of service. In many ways this is the simplest and most direct approach. It does not create any existing deficiencies

or excess capacity, and simply charges new development the cost to maintain the level of service that existed prior to the development.

Varying Level of Service by Service Areas

The *Development Impact Fee Act* clearly anticipates the potential for different levels of service for different service areas within the same jurisdiction. For example, the City may be willing to tolerate higher levels of traffic congestion in the downtown area, where alternative transportation options such as mass transit are more readily available, than in outlying areas, where the automobile is the primary transportation mode. If there is a logical reason for providing more intensive services in a particular part of a jurisdiction, or constraints that prevent extending capital facilities to certain areas, it is best to state the reasons for the decisions a community has made in the comprehensive plan.

The possibility of recoupment fees as a revenue source may create a situation where the City may be able to remedy existing deficiencies. For example, if the City establishes multiple service areas and adopts a level of service at the city-wide average, the existing levels of service within the individual service areas would likely be either above or below the city-wide average. Thus, some service areas would have deficiencies, while others would have excess capacity. Until the excess capacity is used up, impact fee revenues collected in service areas with excess capacity could be used to remedy deficiencies in other service areas. Used in this way, impact fees could help bring about a more uniform level of service to all areas of the City.

Level of Cost Recovery

Another issue that relates to the level of service is the level of cost recovery desired by the community. For a variety of reasons, many communities adopt impact fees at a level that is below the actual cost to serve new development. The impact fee level established in neighboring jurisdictions with which the community considers itself in competition for new development is often a major factor in such considerations.

There are basically two approaches to lowering impact fees. Probably the most common approach is to calculate the full cost to serve new development at the existing level of service standard, but then charge impact fees at a fixed percentage of the calculated cost. In the context of the Georgia *Development Impact Fee Act*, however, a preferable approach would be to calculate the impact fees based on a lower-than-existing level of service. The City could then charge the full cost of the lower level of service, keep impact fees competitive with its neighbors, and have greater flexibility in the expenditure of the "recoupment" impact fee revenues.

SERVICE AREAS

Service areas are geographic areas used in the implementation of impact fee systems. The *Act* defines "service area" as:

> ...a geographic area defined by a municipality, county or intergovernmental agreement in which a defined set of public facilities provides service to development within the area. Service areas shall be designated on the basis of sound planning or engineering principles or both.

For each type of facility, a single service area encompassing the entire jurisdiction may be designated, or the jurisdiction may be divided into more than one service area. Designating multiple service areas has both drawbacks and advantages. The approach recommended in this study is for the City to use the fewest number of service areas required to accomplish its objectives.

Criteria for Delineating Service Areas

The *Act* states that service area boundaries should be based on "sound engineering or planning criteria." Natural or environmental boundaries such as aquifer recharge areas, watersheds or flood plains might be used in defining service areas. Planning considerations might include political divisions or utility service boundaries. Other planning considerations include traffic analysis zones, census tracts, facility maintenance districts, neighborhood planning units, park or school districts. *Table 1-2* summarizes the service area criteria recommended for use. Under the *Act*, service areas serve both as "assessment districts" and "benefit districts." These separate functions of service areas are discussed below.

Service Areas as Assessment Districts

The use of service areas as "assessment districts" is reflected in the requirement of the *Act* that "impact fees shall be calculated and imposed on the basis of service areas." Different impact fee schedules may apply within different service areas, reflecting differences in desired level of service, the cost to construct facilities or in the demand generated by new development.

In the case of road impact fees, for example, different impact fee schedules between service areas could reflect lower right-of-way costs in rural areas due to lower land values, lower construction costs in rural areas due to swale drainage, and longer average trip lengths in more remote areas. Besides these potential cost and demand differentials, different levels of service may be appropriate for different service areas. For example, as part of Montgomery County, Maryland's growth management system, different levels of service adopted for subareas of the county reflect the relative availability of mass transit alternatives.

Service Areas as Benefit Districts

The use of service areas as "benefit districts" is consistent with the requirement of the *Act* that impact fee revenues must be spent within the service area from which they are collected. This provision is designed to ensure that the improvements constructed with impact fee funds provide reasonable benefit to fee-paying development. Thus, service areas assure that there is a reasonable relationship between the assessment of impact fees on new development and the delivery of facilities benefiting new development.

In their role as "benefit districts," service area boundaries must be consistent with rational nexus principles. Service areas are intended to ensure that capital facilities are built within reasonable proximity to the new development and serve its residents or occupants. The actual distance from a development project to a capital improvement serving it is not important as long as a benefit link can be established.

Once service areas are established and impact fees are collected to help finance facilities within them, they will not be simple to change. Service areas will also limit the flexibility with which impact fees can be spent. A poorly-drawn service area might include many proposed new facilities, but not much developable area. Similarly, without proper planning, a particular service area might include considerable development potential, but no new facilities. If service areas are too small, there may never be enough money for major improvements. On the other hand, if a service area is too large, some improvements may be so far from the contributing development that it is difficult to show reasonable benefit.

Two service areas have been recommended for transportation impact fees, and three for parks and recreation impact fees. Single city-wide service areas are recommended for all other facilities. These service area recommendations will provide maximum flexibility in fee expenditures while also ensuring reasonable benefit to fee-paying developments. The recommended service area criteria are summarized in *Table 1-2*.

Table 1-2
RECOMMENDED SERVICE AREA CRITERIA

Facility	Number Recommended	Area	Rationale
Transportation	2	North South	Fees based only arterial roadways that provide transportation service on a community-wide basis. However, north part of city has greater congestion.
Water	1	Citywide	Water system operates as a pressurized, integrated system, with many redundancies for service reliability.
Wastewater	1	Citywide	Delineating separate service areas (drainage basins) will undermine security pledges to service debt incurred to build the systems. Moreover, "pumpovers" and other system "interconnects" cloud the delineation of service areas.
Park and Recreation	3	Southside Westside Northside	Focus is on medium-size community parks that serve more than one neighborhood, though not the entire City.
Public Safety (police, fire, EMS)	1	Citywide	Services are offered throughout the community on-demand, at roughly the same response time and quality.

PROCEDURAL ISSUES

In addition to the general planning and methodological requirements discussed above, impact fees are subject to many procedural requirements under the *Act*. These requirements are discussed below.

Connection Fees

It should be noted at the outset of this section that water and wastewater entities have the option of adopting connection fees in lieu of impact fees. This option would relieve the City of many administrative and procedural requirements associated with impact fees under the Georgia *Act*. (For a complete discussion of the recommended approach to water and wastewater fees, see *Chapter 3*.)

Fee Schedule

An impact fee ordinance must contain a fee schedule, based on a proportionate fair-share methodology that specifies a fee per unit for various land use types. For example, the schedule should specify the fee for each dwelling unit in a multi-family project, or for each 1,000 square feet of gross floor area in a shopping center. One fee schedule may apply within the local government's entire jurisdiction, or there may be different fee schedules applicable to various service areas. Payment of the impact fee according to the adopted fee schedule constitutes "full and complete payment of a project's proportionate share of system improvement costs," and no other contributions toward system improvements may be required.

Individual Assessments

Besides a fee schedule, an impact fee ordinance also must contain provisions allowing developers the option of "individual assessments" of required impact fees for specific projects. Applicants who believe that their proposed developments are unique in their impacts are entitled to request individual assessments. The *Act* does not specify the nature of the individual assessment process, except that the process must conform to guidelines established in the impact fee ordinance. Many road impact fee ordinances, for example, require individual assessments to be prepared by a professional traffic engineer, and establish criteria for preparation and review of individual assessments. A fee may be charged to cover the administrative costs of reviewing an individual assessment. Generally, the final determination of an impact fee based on an individual assessment rests with an impact fee administrator.

Fee Certification

The *Act* requires impact fee ordinances to include a process allowing a developer to receive a certification of the impact fee for a particular project based on the current fee schedule or approved individual assessment. This is to provide certainty for developers by fixing the fee for 180 days from date of certification. The 180-day period also could be used to establish an expiration date for individual assessments to ensure that data used in the individual assessment does not become outdated.

Appeals

The *Act* requires impact fee ordinances to provide for appeals of administrative determinations of the impact fee for a particular development project. The appeal may be to the governing body or another body designated in the impact fee ordinance. A developer also may pay an impact fee under protest to obtain development approval, while retaining the right to appeal and the right to any refund for any fees deemed illegally collected. The ordinance may provide an option for resolution of conflicts over the amount of the impact fee through binding arbitration. In general, there are two kinds of administrative decisions that are subject to appeal. First, applicants choosing to use the fee schedule may disagree with the administrative classification of the land use applicable to the proposed project. Second, applicants choosing an individual assessment may appeal the impact fee resulting from that process.

Exemptions

The *Act* allows for exemptions from the payment of impact fees for all or part of particular development projects that create "extraordinary economic development and employment growth or affordable housing." As with any system in which government collects revenues, various groups sometimes seek exemptions from local impact fees. Here the General Assembly has taken from the City the problem of having to respond to many requests by specifying only two classes of activities that can be granted exemptions.

Federal agencies are clearly exempt from payment of impact fees under the separation of powers doctrine, and the City may not be able to compel payment by state agencies. Despite whether it can actually collect the fee, however, the City should assess impact fees on all new development in order to comply with the *Act*.

The policy supporting such exemptions must be contained in the City's comprehensive plan. In addition, the exempt development's proportionate share of system improvements must be "funded through a revenue source other than development impact fees." This later requirement will make it difficult to craft exemptions in jurisdictions like Atlanta which lack other revenue to cover the *proportionate share* of exempted facilities. The *Act* does not permit any waivers of this requirement. However, this requirement does not apply to "recoupment" impact fees, as discussed elsewhere in this Chapter. City-owned water and wastewater utilities may represent another exception to this rule, since the requirements applicable to impact fees do not necessarily apply to utility connection fees.

Construction Credits

Credits for in-kind or monetary contributions made by individual developers are often called "construction credits" to distinguish them from "revenue credits." Revenue credits reflect future payments common to all feepayers, such as property taxes or utility rates, and such credits are reflected in the impact fee schedule. In contrast, construction credits are deducted from impact fee calculated from the fee schedule on a case-by-case basis.

The situation in which a developer has a substantial investment in facilities that might otherwise be financed through impact fees can arise in two ways. First, a developer might have invested in such facilities before the adoption of the local impact fee ordinance ("pre-ordinance credits"). Alternatively, a developer might voluntarily invest in such facilities after impact fee ordinance adoption to provide access or some other essential service to a proposed development ("post-ordinance credits").

Pre-ordinance credits

Pre-ordinance credits are addressed by the *Act* in the following section:

> In the calculation of development impact fees for a particular project, credit shall be given for the present value of any construction of improvements or contribution or dedication of land or money required or accepted by the county or municipality from a developer or his predecessor in title or interest for system improvements . . .. (O.C.G.A. 36-71-7a)

The use of the past tense and the reference to exaction requirements (which are illegal after the November 30th deadline) indicate that this credit requirement applies specifically to system improvements made or financed before the adoption of a local ordinance or before adoption of the *Act*. Such a provision is entirely consistent with common practice and with the "proportionate share" approach of the Georgia act.

The *Act* creates some confusion regarding partially-built projects. The construction credit provisions address the cost side of the equation, but not the revenue side. For example, assume that a developer

had approval to build a 1,000 unit single-family project, had invested $1 million in system improvements and had built 999 of the units prior to the effective date of the impact fee ordinance. While the developer is certainly entitled to a $1,000 credit on the impact fees for the next unit, is the developer also entitled to a refund of the other $999,000? Clearly, that could not have been the intent of the legislature, which made the "proportionate share" concept govern the entire *Act*. A reasonable interpretation of the *Act* is that the cost of system improvements built or funded prior to impact fee requirements should be pro-rated between that portion of the project constructed before the requirement (and not subject to impact fees) and that portion built after. Thus, if a developer built $1 million in system improvements for a 1,000 unit project and completed 500 units prior to adoption of the impact fee ordinance, then the remaining development would be eligible for $500,000 in credits. This would be consistent with the *Act*.

Many actual development projects, of course, will consist of a variety of land use types, so that the determination of how much of a project has been built will not be as easy as in the above example. Instead of calculating the credit per dwelling unit, it will often be necessary to convert the development into "demand units," (i.e., vehicle-miles of travel or living unit equivalents of water consumption). These calculations become problematic, however, if the ultimate build-out of the project is not known. Additional complexities could arise in cases of additions or changes of use affecting completed projects for which developer contributions have been made.

The drafters apparently tried to solve the problem of accounting for construction credits by using the "present value" concept used elsewhere in the *Act*. Any sort of "present value" approach to valuing a physical facility takes depreciation into account. Thus, after a reasonable period of time, there would be no remaining credit.

One way to limit the exposure of the community to credits for facilities built before adoption of the new ordinance and to allow the City's auditors to account for such potential credits is to require anyone claiming such a credit to apply to the City for a certificate of credit within a reasonable time after adoption of the ordinance. Such a provision is sometimes included in land use controls providing a "grandfather" provision for existing circumstances that do not conform to a new code. The concept is similar. To enhance the defensibility of such a requirement, the City should provide a reasonable period of time (perhaps a year) and take some affirmative steps to ensure that there is actual notice to people active in real estate and land development in the Atlanta area.

Another area of ambiguity in the *Act* relates to who should receive pre-ordinance construction credits. The language of the *Act* indicates that credits can either run with the land ("predecessor in title") or the project ("predecessor . . . in interest"). This provision is significant to the City, because most developers sell lots to homebuilders, who then build homes and retail them. Thus, there could be multiple parties in interest to the credit provision. Perhaps the simplest approach is to clarify in the ordinance that pre-ordinance construction credits run with the land.

Post-ordinance credits

After November 30th, developers cannot be required to make contributions for system improvements as a condition of development approval. However, they can voluntarily enter into agreements with the City to participate in such improvements in return for credits against impact fees. If the value of the developer

contribution exceeds the impact fees that will be due for the project, the *Act* allows for the developer to be reimbursed for such excess contribution through impact fee revenues paid by other developments within the same service area:

> In the event that a developer enters into an agreement with a county or municipality to construct, fund or contribute system improvements such that the amount of the credit created by such construction, funding or contribution is in excess of the development impact fees that would otherwise have been paid for the development project, the developer shall be reimbursed for such excess construction, funding or contribution from development impact fees paid by other development located in the service area that is benefitted by such improvements. (O.C.G.A. 36-71-7(b)).

This provides the potential for ultimate equity to the developer who decides to extend the major road or sewer line into an undeveloped area. If other developers use the facility for new development, their impact fees will help to reimburse the original entrepreneur. If no one else chooses to build within that service area, then the developer may receive no reimbursement. There appears to be no time limit on the recovery of reimbursement.

Credit for Lapsed Approvals

A somewhat different credit provision applies to instances where an impact fee has been paid and the building permit expires due to failure to proceed with development:

> ... in the event a building permit is abandoned, credit shall be given for the present value of the development impact fee against future development impact fees for the same parcel of land. (O.C.G.A. 36-71-4(n))

Unlike the provision for pre-ordinance credits, this provision makes clear that the credit runs with the land, not with the original feepayor. The "present value" language indicates that any interest earned on the impact fee should be included in the credit calculation.

Collection of Fees

The *Act* specifies that impact fees shall be paid at the time of issuance of a building permit or certificate of occupancy. This means that impact fees may not be required at the time of zoning, subdivision or site plan approval.

There are three general reasons for requiring payment of impact fees prior to the issuance of either a building permit or certificate of occupancy. One is to prevent projects for which building permits have been issued, but that have not been completed or occupied, from avoiding payment of impact fees. The second is to ensure impact fee assessment and collection for a change of use that does not require a building permit, but does increase demand on the system. The third is to allow impact fees to be assessed

for shell buildings based on the intended use at the time, with the understanding that the fee will be reviewed at the time an ultimate user is found.

As discussed in Chapter 3, water and wastewater utilities have the option of adopting connection fees in lieu of impact fees. Connection fees allow the collection of fees at time of tap when service demands of customers are best determined.

Refunds

There are two situations identified in the *Act* when impact fees must be refunded. The first situation occurs when an impact fee has been paid and capacity is available and service is denied. The second situation occurs when impact fees have been paid but not "encumbered" or construction has not begun within six years of payment. According to the *Act*, "encumber" means "to legally obligate by contract or otherwise commit to use by appropriation or other official act."

To determine whether impact fees paid by a particular project have been spent or encumbered, the *Act* specifies that impact fees are to be considered encumbered on a first-in, first-out (FIFO) basis. Upon determining that a right to a refund exists, the local jurisdiction must provide notice to the fee payor and publish such notice within 30 days of the expiration of the six year period. An application for a refund must be made within one year of the expiration of the six-year period or the date of notice publication, whichever is later. Refunds must be made within 60 days of receipt of a valid application, and must include a pro rata share of the interest earned on the impact fee account.

Entitlement to refunds does not "run with the land." Refunds must be made to the person or entity who initially paid the impact fee unless the right to any refund has been expressly transferred to a successor in interest in the property. As a practical matter, communities rarely fail to expend fee revenue in a timely manner if service area definitions are broad enough to allow expenditure on a wide range of projects.

Accounting Requirements

The *Act* provides that:

> Expenditures of development impact fees shall be made only for the categories of system improvements and in the service area for which the development impact fee was imposed as shown by the capital improvements element and as authorized by this chapter (O.C.G.A. 36-71-8).

Impact fees are thus restricted to the category of facilities for which they were collected. Transportation impact fees, for example, may only be spent on "roads, streets and bridges, including rights-of-way, traffic signals, landscaping, and any local components of state or federal highways." Impact fee revenues also must be spent within the service area from which they were collected.

Impact fee funds are limited to capital improvements that expand system capacity and may not be spent on maintenance, personnel training or other operating costs. The following types of costs are eligible for impact fee financing.

- planning, including cost of qualified staff or consultants to prepare capital improvements element;
- design and engineering;
- land acquisition, including related costs such as court costs and attorney fees;
- interest payments on bonds used to finance capital improvements; and
- administration, limited to a maximum of three percent of total fee revenues.

The *Act* requires impact fee revenues to be maintained in interest-bearing accounts. Separate accounting records must be maintained for each type of facility and service area. Interest on impact fees are considered funds of the account and subject to the same expenditure limitations as direct impact fee payments. An annual report must be prepared describing, for each facility and service area, the amount of impact fees collected, encumbered and spent during the preceding year.

Adoption Procedures

The City Council must hold two "duly noticed" public hearings on the proposed impact fee ordinance prior to adoption. The second hearing must be held at least two weeks after the first hearing. To ensure that those who are most directly affected by impact fees are involved in developing the impact fee system, the *Act* requires the establishment of a Development Impact Fee Advisory Committee. The committee must consist of five to ten members appointed by the local governing body, with at least 40 percent of the membership representing the development, building and real estate industries. An existing appointed body meeting these criteria can serve as the Development Impact Fee Advisory Committee. However, the committee is advisory and no committee action is required prior to adoption of an ordinance.

DEVELOPMENT EXACTIONS

Many local governments routinely impose development exactions on new development in the form of cash or in-kind contributions (e.g., land dedications, required improvements or funds for expanding capital facilities). After November 30, 1992, it will be unlawful for local governments in Georgia to impose exactions for system improvements without complying with the new law. After the November deadline, communities will be able to require *project improvements*, but *system improvement*-based requirements will only be permitted if carried out in compliance with the *Development Impact Fee Act*.

The City of Atlanta has no adopted regulations requiring developer exactions for system improvements as a condition of development approval. Instead of stipulated regulatory standards, most developer exactions have been determined on a case-by-case basis during the rezoning and special use permit approval process. The most common developer exactions received by the City are for transportation improvements, although other financial and in-kind contributions have been received.

The City also has certain regulations that have resulted in agreements with developers for cost participation in the upgrading of some substandard facilities. These regulations require developers to retain stormwater runoff on-site and to prohibit connections to overloaded sanitary sewer lines. The City has received significant contributions to upgrade the combined sewer system serving downtown to add stormwater capacity, while contributions for upgrading sanitary sewers appear to be rare. The following provides an analysis of current City exaction practices and recommends future practices in light of the *Act's* limitations.

Future of Exactions Under *Act*

Definitions of the terms "development exaction," "system improvement" and "project improvement" provide a critical framework for understanding the implications of the *Act*.

> *Development Exaction* . . . a requirement attached to a development approval or other municipal or county action approving or authorizing a particular development project, including but not limited to a rezoning, which requirement compels the payment, dedication or contribution of goods, services, land, or money as a condition of approval.
>
> *System Improvements* . . . capital improvements [having a life expectancy of at least ten years] that are public facilities and are designed to provide service for the community at large, in contrast to project improvements.
>
> *Project improvements* . . . site improvements and facilities that are planned to provide service for a particular development project and that are necessary for the use and convenience of the occupants or users of the project and are not system improvements. The character of the improvement shall control a determination of whether an improvement is a project improvement or a system improvement and the physical location of the improvement on site or off site shall not be considered determinative of whether an improvement is a project improvement or a system improvement.

The *Act* specifies that, "If an improvement or facility provides or will provide more than incidental service or facilities capacity to persons other than users or occupants of a particular project," or, if a project is "included in a plan for public facilities approved by the governing body of a municipality or county," it is a system improvement subject to the limitations and requirements of the *Act*. (O.C.G.A. 36-71-2). System improvements must also "create additional service capacity to serve new growth and development" (O.C.G.A. 36-71-9).

Separating the two is not always clear. For example, improvements to an arterial highway adjacent to a development project would benefit a community's entire transportation system. Since this would clearly fit the *Act*'s definition of a system improvement, it could be eligible for impact fee financing, at least in part. But are right-of-way dedications for acceleration-deceleration lanes that improve access to the development considered project or system improvements? While road rights-of-way add capacity to the road network, accel-decel lanes serve abutting development and are considered project improvements.

Transportation

As part of the earlier *Impact Fee Cost/Benefit Study*, a review of all City of Atlanta zoning and special use permit approvals was conducted by the Bureau of Planning to identify all of the development ordinances adopted in the past five years that included exactions as conditions of approval. The exactions consisted of right-of-way (ROW) dedications, requirements for developers to add a lane to an adjacent thoroughfare or construct a road through the project, developer participation in the cost of road construction projects, and requirements to pay for the cost of traffic signals in the vicinity of the project.

That study estimated that, over the last five years, the City has imposed developer exactions totalling about 7.5 acres of ROW, 13.8 lane-miles of roadways and three traffic signals. The value of those exactions was estimated at about $6.3 million, of which about 55 percent was in developer contributions for road construction, 43 percent in ROW dedications and the remaining two percent in contributions for signalization. The average value of roadway exactions was estimated to be about $1.25 million annually. In addition to the exactions required as a condition of zoning or special use permit approval, the City also receives some developer contributions for roadway improvements during the site plan review and building permit process. After November 30th, the City will no longer be able to require such developer contributions for roadway system improvements, although the City may continue to require dedication and construction of internal or strictly project-related improvements.

Water Supply

The City's current water connection charges do not exceed the actual cost of setting the meter and connecting to the system; nor does the City require contributions for system improvements as a condition for connection to the water system. However, the City does have some substandard lines of less than the eight-inch diameter required for adequate fire flow, and any developer who disturbs a substandard line is required to replace it with a minimum eight-inch line. This practice, however, would not appear to be a development exaction under the *Act* since it does not involve a "more than incidental" benefit to the public-at-large. All system improvements thus appear to be financed through water rates.

Wastewater Treatment

The City finances capital improvements and maintenance costs for its water reclamation centers from its rate revenues. As is the case with water, wastewater connection charges and tap fees do not constitute developer exactions, since they cover only the actual costs.

Petitions for extensions of sanitary sewer lines, which are typically for an eight-inch line, require Council approval. If construction of the extension is approved, it is funded out of the Water and Sewer Account revolving fund. The fund is then reimbursed from assessments of property adjacent to the new line, based on a $14.50 per foot of frontage charge that typically does not completely cover construction costs. Since these extended sewer lines only serve the property that is being assessed, and do not provide

additional capacity for other users, they probably qualify as project improvements and are therefore exempt for the requirements of the *Act*.

Environmental regulations and City ordinances do not allow connection to existing sanitary sewer lines that are already operating at full capacity. In such cases, a developer will often negotiate with the City to participate in upgrading the sewer in order to enable the development to proceed. In 1991, for example, the developer of the Piedmont/Peachtree Road hotel development agreed to pay approximately 15 percent of the cost to upgrade the Shadowlawn Trunk Sewer. The above example is the only instance in which an exaction has been identified for the sanitary sewer system, excluding the combined sewers, which are discussed below. While there undoubtedly have been others, it is likely that the value of the individual exactions has been small.

Since the upgrade of the Shadowlawn Trunk Sewer is clearly a system improvement that serves many other developments, the negotiated developer contribution, which was required in order for the developer to connect to the system, it would appear to constitute an exaction under the terms of the *Act*. Therefore, the City should not accept such contributions after the compliance deadline established in the *Act* without a written agreement addressing payment of fees and reimbursements. In the absence of wastewater impact or connection fees, the alternatives will be for the City to finance the entire improvement or deny the permit or connection application. However, if an impact or connection fee is adopted, the City could approve an agreement to accept the contribution in return for impact or connection fee credits.

Stormwater Management

The City's regulatory standard for stormwater management is that a development shall not increase the amount of runoff from the property, based on a 25-year frequency storm. In order to meet this standard, developers are required to install on-site stormwater detention facilities. Such facilities are clearly "project improvements" under the terms of the *Act*, and as such may continue to be required after the compliance deadline imposed by the *Act*.

Developments that result in disturbance or relocation of existing storm sewer lines are required to replace substandard pipes with the current minimum 18-inch diameter pipes from manhole to manhole in the area of disturbance. Since this is the minimum size for local lines needed to serve the project, the requirement probably does not constitute an exaction under the *Act*. However, requiring developers to upgrade to pipe sizes in excess of the minimum standard or existing size constitutes an exaction that requires reimbursement or credit against impact fees. If stormwater impact fees are not adopted by the City, the developer should be reimbursed by the City for the cost of such oversizing.

In cases where on-site detention facilities would be inconvenient, impractical or excessively costly, downtown developers often negotiate with the City to enlarge the storage capacity of the combined sewer system to accommodate the runoff from the site. According to the staff of the Bureau of Highways and Streets, these kinds of negotiated agreements have been averaging between 25 and 50 percent of the cost of upgrading sewers, including repair of sidewalks and streets. The *Impact Fee Cost/Benefit Study* estimated that the annual value of such developer contributions is about $1.45 million. Such an arrangement benefits both the developer and the City. The developer gets to proceed with the

development and obtains greater flexibility in the design of the site, while the City secures the developer's participation in the cost of replacing old and inadequately sized sewers with new and enlarged facilities.

While mutually beneficial, such arrangements may run afoul of the *Act* unless they are carefully structured to ensure that the developer contribution is proportional to the impact of the development. If the developer's contribution is strictly limited to the cost to expand the capacity of the system to accommodate the additional runoff generated by the development, the case could be made that the contribution is a "project improvement," even though it is located off-site.

Parks and Public Safety

The analysis of the City's development approvals for the last five years indicates that the City is not currently receiving any development exactions for park land or improvements. In addition, negotiated contributions for public safety facilities have been rare. If public safety impact fees are adopted, the City could enter into voluntary agreements with developers for system improvements, with reimbursement to the developer in the form of impact fee credits for the project and repayment of any excess contribution with impact fees received from other developments in the same service area.

PLANNING REQUIREMENTS

Under the terms of the *Development Impact Fee Act*, only cities and counties that have adopted a comprehensive plan that meets the *Minimum Planning Standards and Procedures* established by the Georgia Department of Community Affairs (DCA) pursuant to the *Georgia Planning Act* of 1989 may enact impact fees. This required link between impact fees and planning is intended to ensure that impact fees are expended only for capital facilities that support planning policies adopted pursuant to the *Georgia Planning Act*.

> Municipalities and counties that have adopted a comprehensive plan containing a capital improvements element are authorized to impose by ordinance development impact fees as a condition of development approval on all development pursuant to and in accordance with the provisions of this chapter. (O.C.G.A. 36-71-4)

In order to comply with the *Act*, communities wishing to impose impact fee requirements must have adopted comprehensive plans that contain implementation provisions and the following elements: population, economic development, natural and historic resources, community facilities, housing and land use. The *Act* further requires that local comprehensive plans include a number of other important features, including clearly identified service area boundaries, level of service standards, facility needs projections, a five-year schedule of improvements and a listing of proposed capital facility funding sources. The following provides an assessment of the City's *Comprehensive Development Plan* (CDP) program relative to these and other important *Act* requirements.

Capital Improvements Element

Under the terms of the *Act*, the adoption of a Capital Improvements Element (CIE) is a prerequisite to the imposition of valid impact fee requirements. A CIE is closely related to the Community Facilities Element that is required pursuant to the *Minimum Planning Standards and Procedures*. Both have similar functions and contain overlapping, interrelated data. However, the Community Facilities Element must cover all major types of community facilities and infrastructure, while the CIE must address only those improvements for which impact fees are to be assessed. For improvements to be funded with impact fee revenue, the CIE must include information at a much more detail than required in the Community Facilities Element. The CIE goes beyond the Community Facilities Element in that it:

- must establish future service levels for categories of improvements to be financed with impact fees (service levels must be defined in quantifiable terms so that the local government's progress in attaining its stated service level goals can be measured);

- must delineate service areas (this will involve defining exactly where within its jurisdiction the specific capital facilities and service levels will be provided during the planning period); and

- must show capital improvement costs and identify prospective funding sources including impact fees and separate improvements and costs by service area.

A CIE must include clearly defined service areas, level of service standards and projections of needed facilities. In essence, the CIE should serve to strengthen the relationship between impact fees and public policy by clearly stating those policies and the role of impact fees in effecting them.

The *Minimum Planning Standards and Procedures* allow a great deal of flexibility in formatting local comprehensive plans. This is especially true for the CIE. In general, the CIE need not be organized or presented as a separate chapter of the plan. As long as all of the required information is included somewhere in the plan document and can be easily identified during the local plan review process, DCA encourages local governments to design the format and presentation of CIEs that best suits their needs.

A local government should organize CIE components to ensure an orderly flow of information, rational analysis, and a clear understanding of the relationship between infrastructure expansion and the overall goals, strategies and policies established in the comprehensive plan. For example, a plan might merge the CIE's required schedule of improvements with the Short Term Work Program that is required for the other five planning elements. The CIE might be completely integrated with the Community Facilities Element, or written as a separate chapter of the plan. The same principle applies to goal and policy statements. A policy exempting affordable housing projects from paying impact fees might be grouped with the other policies related to the Housing Element.

When a CIE is being added to an already approved plan, documentation should be included on how data in other plan elements has been reconciled, amended or updated. The best way to handle inconsistencies with a previously approved plan is to amend other plan elements while adding the CIE to remove or modify any information that has been superseded. However, if this is not practical for some reason, a local government should list by page or section any data or text that is no longer valid, and indicate why.

The CIE should also indicate how data from other elements has been used to arrive at the projects in the schedule of improvements or indicate if more recent or specific data has been employed in developing the CIE. If a CIE is developed concurrently with the comprehensive plan, there should be no problem explaining the relationships between the CIE and information presented in other plan elements. Problems may arise in assuring that CIEs added later are coordinated with the rest of the plan. The *Georgia Planning Act* requires internal consistency between the CIE and other plan elements.

The *Georgia Planning Act* requires a three-step planning process to meet the *Minimum Planning Standards and Procedures* for preparing the six basic planning elements (population, economic development, natural and historic resources, community facilities, housing and land use). The CIE, which is only required if impact fees will be assessed, must follow this three-step process. The steps are: (1) preparation of an inventory and assessment; (2) determination of needs and goals; and (3) development of an implementation strategy.

Levels of Service

The *Act* mandates that acceptable *service levels* be defined in the CIE. *Level of service* (LOS) is defined in the *Act* as "a measure of the relationship between service capacity and service demand for public facilities in terms of demand-to-capacity ratios or the comfort or convenience of use or both." Such standards serve as the basis for calculating the need for additional capacity to serve new development. Service level standards should relate capacity to demand and allow accurate assessment of progress toward attainment of service level goals. Service levels for different categories of capital facilities can be measured and expressed using a variety of relationships, units and criteria.

Service level policies drive the capital facility planning process. To be consistent with the *Act*, local governments must clearly define the level of service to be achieved and maintained for affected public facilities over the planning horizon. Establishing appropriate service levels is a policy decision that should be stated in the form of goals or policies within the plan and the CIE. The establishment of levels of service involves policy considerations that have been discussed in detail in the previous analysis.

Table 1-3 summarizes the extent to which the City's current *Comprehensive Development Plan* complies with the requirement to adopt levels of service for all facilities subject to impact fees, and recommends appropriate action by the City prior to adoption of impact fees. Recommended levels of service standards are discussed in more detail in the individual impact fee studies.

Table 1-3
CDP LEVEL OF SERVICE STANDARDS

Facility	LOS Standard	Recommended Action
Transportation	None	Adopt 0.80 ratio of system demand/system capacity at LOS D (See Chapter 2)
Water	None[1]	Adopt existing demand/capacity ratio for each type of facility (See Chapter 3)
Wastewater	None[1]	Adopt existing demand/capacity ratio for each type of facility (See Chapter 3)
Park and Recreation	None	Adopt 5.75 acres per 1,000 functional population (See Chapter 4)
Fire/EMS	None	Adopt 470 square feet fire station floor area per 1,000 functional population (See Chapter 5)
Police	None	Adopt 660 square feet building floor area per 1,000 functional population (See Chapter 5)

[1] Not required for recommended "connection" fees.

Service Areas

The *Act* defines a service area as an identified geographic area "in which a defined set of public facilities provides service to development within the area." A fundamental tenet of the *Act* is that impact fees must be calculated on the basis of such service areas.

The delineation of service areas helps to ensure that there is a reasonable relationship between the assessment of impact fees on new development and the delivery of facilities that benefit the development. They may cover all or part of a community; they may even span jurisdictional boundaries. Service areas for various categories of services or facilities may be completely different or they may overlap, but they must be based on sound engineering or planning criteria.

A number of factors may influence the delineation of services areas, and some of these have been discussed in a previous section of this report. Other considerations might include natural or environmental boundaries (such as aquifer recharge zones, watersheds or flood plains), political divisions, utility service areas, traffic analysis zones, census tracts, facility maintenance districts, neighborhood planning units, or park and school district boundaries. Service areas aslo can be used to support growth management objectives, economic development strategies or land use patterns established in the *CDP*'s Land Use Element. In short, as long as the respective service areas are defined based on sound engineering and planning considerations, they will likely be considered valid under the *Act*.

Plans should include projections of total residential, commercial and industrial development by service area. Where there is more than one service area for any given facility category, general land use projections should be made for those service areas.

Since the *Act* requires local governments to establish a rational nexus between charges and benefits, delineating service areas will be one of the most important aspects of developing the CIE and of providing legal support for the impact fee system. *Table 1-4* summarizes the extent to which the City's current *Comprehensive Development Plan* complies with the requirement to delineate service areas, and recommends appropriate action by the City prior to adoption of impact fees. Recommended service areas for specific facilities are discussed in more detail in the individual impact fee studies.

Table 1-4
CDP SERVICE AREA DELINEATION

Facility	Identified Service Areas	Recommended Action
Transportation	None	Adopt two service areas—north and south
Water	None[1]	Adopt one facility-wide service area
Wastewater	None[1]	Adopt one facility-wide service area
Park and Recreation	None	Adopt three service areas—northside, southside, westside
Fire/EMS	None	Adopt one citywide service area
Police	None	Adopt one citywide service area

[1] Not required for recommended "connection" fees.

Projections of Facility Needs

The *Act* requires that facility needs be clearly identified. Needs assessments should be based on population projections and employment forecasts developed in the plan and tailored to individual facility categories. Such projections should take into account how extending or upgrading services to various areas within a jurisdiction might affect the local economy, as well as the rate, direction and quality of development. The provision of services to various areas also should be assessed in terms of impacts on natural and historic resources. Since growth often follows, or even hinges upon, the availability of infrastructure and public services, investments in these items will be a powerful force in realizing the community's future vision for development. Projections of facility needs should include:

- current levels of service for all facilities for which impact fees are to be charged;
- determination of whether existing service levels are adequate to meet current needs and an identification of major deficiencies or under-utilized existing facilities;

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- description of variations in current service levels throughout the jurisdiction, such as geographic areas that differ in regard to available capacity, distribution systems or quality of service delivery;
- identification of any parts of the community where the provision of services is, or will be, limited by engineering, economic, or environmental factors;
- identification of areas where new infrastructure will be needed to support local government's desired future land use distribution and promote other goals established in the plan;
- methodologies used in assessing capital facility capacity needs that are consistent with information provided in other plan elements, such as population projections, economic forecasts, established development densities for various housing types and land use; and
- general description of infrastructure needs for the horizon of the comprehensive plan.

State *Minimum Planning Standards and Procedures* do not dictate which data sources a community must use for planning. However, once these sources are chosen, they should be used as the basis for determining the projected needs listed in the CIE. The CIE should show how the infrastructure needs of the projected new population will be met. If the Population and Economic Development Elements of a community's plan support a slow growth scenario, while the CIE describes several infrastructure improvement projects aimed at fostering rapid growth, this would constitute an unacceptable internal inconsistency between the CIE and the rest of the plan.

The needs projection should include a description of infrastructure needs for the entire planning horizon of the comprehensive plan. Project costs and growth projections become more uncertain the further into the future they are extended. However, the CIE is required to anticipate long-range needs along with short range priorities. When a community is building major facilities it may be most cost effective to size some types of facilities to meet the needs of the projected population of 10 or 15 years into the future. Other facilities may be designed to be developed in phases. Major capital facility needs for the entire planning period should be anticipated, even if they will not be addressed during the five-year period covered in the schedule of improvements. While it may not be reasonable to define every project required to meet long range needs, an overview or general indication of major infrastructure investments anticipated should be included in the CIE. For example, if a local government knows that a new east-west highway is needed by the year 2005, this knowledge may affect the planning and placement of other infrastructure in the meantime.

Table 1-5 summarizes the extent to which the City's current *Comprehensive Development Plan* complies with the requirement to project future demand for all facilities subject to impact fees, and recommends appropriate action by the City prior to adoption of impact fees.

Table 1-5
CDP NEEDS ASSESSMENTS

Facility	Needs Projected	Recommended Action
Transportation	No; implied at CDP pp. 182-192	Project future travel demand on major roadway system (See Table 2-14)
Water	Yes — CDP, p. 146[1]	Convert CDP figures to LUEs (See Chapter 3)
Wastewater	Yes — CDP, p. 147[1]	Convert CDP figures to LUEs (See Chapter 3)
Park and Recreation	No	Include needs assessments found in Chapter 4
Fire/EMS	No	Include needs assessments found in Chapter 5
Police	No	Include needs assessments found in Chapter 5

[1] Not required for recommended "connection" fees.

Schedule of Improvements

To meet *Minimum Planning Standards and Procedures*, the CIE must consider system improvements for the entire planning horizon of the comprehensive plan, which for many plans will be 20 years. This means that major long-range projects that will be financed with impact fees, but may not be initiated within five years of plan adoption, must be identified or described only in general terms. These projects will often be covered in sufficient detail in the Community Facilities Element of the Plan.

The specific capital improvement projects and funding sources listed in a schedule of improvements are not set in stone. If a given revenue source does not materialize to complete a new facility, or priorities shift within a service area so that different projects take precedence at a later date, these changes can simply be reflected in the annual update of the schedule of improvements. On the other hand, changes in service area boundaries or modifications of officially adopted service levels are major policy shifts that would require a plan amendment.

As part of the implementation strategy for the CIE, the schedule of improvements is only *required* to list projects (including joint or inter-jurisdictional projects) to be initiated within the first five years after plan adoption. In order to assure coordination of community facility development and other local government projects, DCA recommends combining the CIE schedule of improvements with the rest of a plan's proposed capital improvements in the Short Term Work Program. However the schedule of improvements is formatted, the CIE must identify the service area(s) of each capital improvement project. The schedule of improvements must include (1) a listing, by year, of all impact fee-related capital improvements to be undertaken over the five-year period after adoption of the CIE and (2) a listing of

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all capital projects that will be required to upgrade service levels for existing development within each service area.

The listing of impact fee-related capital improvements to be undertaken over the five-year period after adoption of the CIE should include:

- brief description of each project (This can be as simple as, "Widen Jones Road from two to four lanes from Broad Street to I-75," or, "Build Fire Station Number 5 in Service Area One").

- assignment of each project to specific service area or areas.

- implementation time frame (i.e., anticipated start and completion dates). A breakdown of a project by phases should be included when: (1) the project phases will occur in different years; (2) part of the project will occur outside the short term planning horizon; and (3) funding sources or responsible administrative entities are separate and distinct for various parts of a project.

- amount of additional capacity that will be created to serve new development (if any). Since projects undertaken for the purpose of raising current service levels for existing development must be listed in the schedule of improvements, it is possible that none of the additional capacity of a listed project would be intended to serve new development. Ideally, a CIE should describe additional capacity to serve new development in terms of demand units. For example, "this treatment plant will accommodate 600 living unit equivalents." However, for some categories of infrastructure in which individual projects have an interactive effect on the whole system of a service area, this may not be possible. The main idea is to indicate that the projects listed provide sufficient capacity to serve the projected demand in the particular service area.

While not required by *Minimum Planning Standards and Procedures*, local governments are encouraged to ensure that capital improvement projects proposed for each service area are consistent with any policies stated in the plan regarding the distribution of future growth or differential rates of growth between service areas. *Table 1-6* summarizes the extent to which the City's current *Comprehensive Development Plan* and *Capital Improvements Program* comply with the requirement to establish a schedule of improvements for all facilities subject to impact fees, and recommends appropriate action by the City prior to adoption of impact fees.

Table 1-6
CDP AND CIP SCHEDULED IMPROVEMENTS

Facility	Improvements Listed	Recommended Action
Transportation	Yes — in CIP for 5-year period at pp. 87-107 and CDP for 15-year period at pp. 187-191	None
Water	Yes — in CIP for 5-year period at pp. 122-130 and CDP for 15-year period at pp. 156-7[1]	None
Wastewater	Yes — in CIP for 5-year period at pp. 115-118 and CDP for 15-year period at pp. 158-9[1]	None
Park and Recreation	Yes — in CIP for 5-year period at pp. 60-81 and CDP for 15-year period at pp. 276-280	None
Fire/EMS	Yes — in CIP for 5-year period at pp. 53-55 and CDP for 15-year period at p. 308	None
Police	Yes — in CIP for 5-year period at pp. 58-59 and CDP for 15-year period at p. 300	None

[1] Not required for recommended "connection" fees.

Description of Funding Sources

The CIE should be as accurate as possible in estimating project costs and listing funding sources. If project costs are adjusted or financing strategies change, these changes should be addressed in the required yearly updates of scheduled improvements. To provide the most efficient use of public revenues, traditional financing methods will have to be adapted and combined with impact fees. Ideally, the combination of funding sources listed for each capital improvement project should only be established after consideration of various alternatives. The description of funding sources in the implementation strategy should represent the optimum combination that will be to the best advantage of the community.

The description of funding sources in the CIE must include the following considerations: (1) accurate total project costs for each capital improvement project listed in the schedule of improvements; (2) an analysis of the percentage of each project's stated total cost that is directly attributable to adding capacity to serve new development; and (3) a description of proposed sources of funds other than impact fees that are expected to make up the remaining portion of each project's cost.

If special studies are required to identify costs, and such studies cannot be conducted prior to the development of the CIE, the studies themselves should be listed as work items in the schedule of improvements along with the years when they will begin and be completed. If specific project costs are unknown, the community will need to examine cost data for similar recent projects, seek assistance from experts, or request information from other local governments that have installed comparable facilities.

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Local governments are, to some extent, free to define "total project cost" as they deem appropriate. However, consistency must be demonstrated. A local government might establish service level goals that involve expenses that cannot be financed with impact fees, such as adding specialized equipment, vehicles or personnel. In such a case, the total cost of reaching stated goals might include major costs that may integral to expanding services, but not classified as capital improvements or otherwise not eligible for impact fee financing.

The requirement that CIEs include an assessment of the percentage of total cost that is directly attributable to adding capacity to serve new development is intended to establish the portion of the total cost stated that is actually a "system improvement cost." The portion of the total cost designated as a system improvements cost represents the maximum amount eligible for impact fee financing. It is important to note, however, that CIE requirements do not require local governments to establish the percentage of the total cost that will be paid for by any particular financing source, including impact fees. As a matter of policy, some local governments may choose not to collect the entire costs of system improvements through impact fees. Although it will be important for a local government to calculate the portion of the total cost of each project that will be generated through impact fees when developing an impact fee schedule, presenting this level of detail on funding sources in the CIE is optional.

Sometimes a capital cost is incurred by a local government for a specific development and is really a project improvement. The *Act* prohibits use of impact fees to finance project improvements. Thus, the funding source for such facilities must include other than impact fees. Where part of the facility is a project improvement but part is a system improvement, impact fees may be shown as a source of revenue for the system improvement. Ideally, the CIE would indicate the percent of each facility improvement that is a system improvement. Similarly, the CIE should indicate the percent of a system improvement that remedies deficiencies and identify other than impact fee revenues to finance deficiencies.

Since the *Act* allows local governments to recoup the cost of excess capacity remaining in existing systems, the present value of such existing capital improvement should be stated in the CIE as a total project cost. The existing capacity or demand units available to serve new development should be stated in the CIE, rather than (or in addition to) the original capacity of the project, since some of the original capacity will have been absorbed between the time the capital improvement was built and the adoption of the CIE. Funding sources are required to be more precisely described in the CIE than in the Short Term Work Program. Instead of stating that additional funding will come from grants, for example, the CIE should include specific information on the source of grant funds. When "local government" revenues are to be used, the CIE should specify the actual budget source (i.e., general fund, special option sales tax, revenue bonds, private contributions, or other general categories of financing).

Capital improvement projects required to upgrade service levels for existing development must be included and identified in the CIE or Short Term Work Program in order to demonstrate that a local government has planned to meet this provision of the *Act*. The *Act* says that "development impact fees shall be calculated on the basis of levels of service . . . that are applicable to existing development as well as new growth and development." In addition to listing projects required to meet service level goals for existing development in the schedule of improvements, specific funding must be identified.

The City's current *Comprehensive Development Plan* does not currently identify the percentage of project costs attributable to system improvements or to remedying existing deficiencies for any of the recommended impact fee facilities. It is therefore recommended that the CDP should be amended to include such an analysis, pursuant to the findings presented in the respective chapters of this report.

Recoupment

The *Act* allows local governments with excess capacity to charge impact fees to recover the cost of existing infrastructure that was built before the impact fee ordinance was adopted. This concept is often referred to as "recoupment." Impact fees that are based on the principle of recoupment require careful analysis of how and when each applicable capital project was originally financed, since, like all fee calculation methodologies, recoupment fees must avoid double-charging, and include credits that reflect the time value of money.

A community's plan should clearly indicate whether impact fee revenue will be used to recover the costs of existing capital facilities with excess capacity. Local governments that plan to recover the cost of facilities or infrastructure already in place should indicate their intention to do so in the capital improvements element of the plan. Communities that use recoupment also must be prepared to document how much service capacity existed for each eligible facility or service at the time of plan adoption.

If a local government wishes to assess recoupment fees, it must establish a point-in-time estimate of the excess capacity remaining in capital facilities. *Table 1-7* summarizes the extent to which the City's current *Comprehensive Development Plan* identifies existing excess capacity for all facilities eligible for "recoupment" impact fees, and recommends appropriate action by the City prior to adoption of fees.

Table 1-7
CDP-IDENTIFIED EXCESS CAPACITY

Facility	Excess Capacity Identified	Recommended Action
Transportation	No — implied at pp. 186-192	None
Water	No — implied at p. 146[1]	Convert figures at CDP p. 146 to LUEs;
Wastewater	No — implied at p. 147[1]	Convert figures at CDP p. 147 to LUEs;
Park and Recreation	No — implied at pp. 276-280	Include capacity assessments found in Chapter 4
Fire/EMS	No — implied at pp. 306	Include capacity assessment found in Chapter 5
Police	No — implied at pp. 300	Include capacity assessment found in Chapter 5

[1] Not required for recommended "connection" fees.

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JUDICIAL TRENDS IN EXACTIONS AND IMPACT FEES

In adopting the *Development Impact Fee Act*, the Georgia legislature gave specific authorization to a practice that has evolved naturally in the system of land use controls in the United States. Although several states have now expressly authorized impact fees with enabling legislation, the use of impact fees and their antecedents predates that legislation by decades. Subject to limitations similar to those now contained in the Georgia legislation, the courts have generally supported the use of impact fees. Georgia has resolved the principal legal issue involved in such fees—the question of whether a local government has the authority to adopt them—with the statutory authorization contained in Chapter 71 of Title 36 of the Georgia Code of 1981.

Early Exactions

Early land use controls focused primarily on subdivision design issues. Alignment of streets, often in accordance with a master street plan, was a key issue. Gradually, local governments developed higher expectations for developers. Many began to require more than merely the construction of streets. They began to require developers to pave streets, to install curbs and gutters and sometimes to build sidewalks. As the use of public sewer and water systems spread, local governments began to require that developers install lines under the streets of the new subdivision.

There was little litigation over these early exaction practices and little reason for dispute. Clearly, if communities did not require developers to make minimal improvements, they would be faced with paving rutted roads or retrofitting neighborhoods with sewer lines. Paying for such improvements would involve special assessments or general taxes, neither of which was an attractive alternative to local officials.

Subdividers also may have seen increased value accruing to their lots from the installation of such public improvements. A developer lacking such basic facilities in a new subdivision would, after all, have a less marketable project in most urbanized areas. Thus, the direct benefits of the improvements may have been as influential as the obvious need for the improvements in limiting the number of court challenges to early exaction requirements.

All of these early exactions involved the dedication of land and the installation of improvements *within* subdivisions. As the regulatory system evolved, however, communities began to go farther. In the 1940s, for instance, Los Angeles required a landowner who wanted to resubdivide land along busy Sepulveda Boulevard dedicate additional right-of-way to permit widening of the boulevard. The owner refused, noting that the land involved was not even permitted access to Sepulveda Boulevard. The owner's argument was quite logical—because the land would enjoy no benefit from the street widening, it should not have to contribute to the cost of that activity. The California Supreme Court, however, sided with the City, holding in part that:

> In a growing metropolitan area, each additional subdivision adds to the traffic burden. It is no defense to the conditions imposed in a subdivision map proceeding that their fulfillment will incidentally also benefit the city as a whole. *Ayres v. City of Los Angeles* 34 Cal.2d 31, 207 P.2d 1, 5. (1949).

Requiring the dedication or improvement of roads adjacent to subdivisions does raise some questions regarding the connection between the property and the need for or benefit of the road. In some cases, as in above-referenced *Ayres* case, there may be no apparent direct benefit to the property from the improvement. In others, there may be a clear benefit, although it may accrue equally to an entire neighborhood or to several properties. A different but related situation involves a requirement that a developer improve a road leading up to a relatively remote subdivision. Clearly the development will enjoy the benefit of improved access. However, equally clearly, other land adjacent to the road will also enjoy a benefit.

Dedication of land for parks raises similar philosophical issues, although the physical issues may be different. Parks (whether contained within the boundaries of a subdivision or not) will be used by people who live in homes not located in the subdivision. Like the road leading up to the subdivision, the park clearly provides some benefit to the subdivision and part of the need for it arises from the subdivision itself. Part of the need, however, may be attributable to the activity of other subdividers, and part of the benefit will undoubtedly accrue to persons who purchase from those other subdividers.

There are two distinct lines of cases that evolved in the first four decades of litigation over this iss The broad view is that reflected in the *Ayres* case. That case permitted a very general connection between the need for or benefit of the facility and the land on which the burden fell. Other relatively early cases espousing such a broad view included *Jordan v. Village of Menomonee Falls*, 28 Wis.2d 608, 137 N.W.2d 442 (Wis. 1965), which upheld park dedication requirements.

Two other, similar lines of early cases took a much narrower view of the issue, however. In *Pioneer Trust and Savings Bank v. Village of Mt. Prospect*, 166 N.E.2d 799 (Ill. 1961), the Illinois Supreme Court ruled that an exaction would be permissible if authorized and "[i]f the burden cast upon the subdivider is specifically and uniquely attributable to his activity . . .; if not it is forbidden and amounts to a confiscation of private property." 166 N.E. 2d at 833-4.

The Montana Supreme Court adopted that rule in an early case, but upheld the dedication requirement, finding that it met the test. *Billings Properties v. Yellowstone County*, 394 P.2d 182 (Mont. 1964). Similarly, Connecticut adopted the "specifically and uniquely attributable" rule in a case in which it upheld the dedication requirement, finding that the need for a park was, in fact, uniquely attributable to the subdivision. *Aunt Hack Ridge Estates v. Planning Commission of Town of Danbury*, 273 A.2d 881 (Conn. 1970). Illinois reaffirmed the rule squarely in 1976. *Krughoff v. City of Naperville*, 354 N.E.2d 489 (Ill 1976).

Taken literally, the "specifically and uniquely attributable" rule probably does not permit the pro-ration of costs of a facility that relates to several subdivisions. New Jersey developed a rule with a similar

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philosophical basis, requiring that any dedication requirement bear a "rational nexus" to the need created by the subdivision and the benefits conferred upon it. *Brazier v. Borough of Mountainside*, 262 A.2d 857 (N.J. 1970).

As the use of fees-in-lieu of dedication and impact fees has increased, one issue facing the courts is what happens to the fees after the local government collects them. How carefully the local government protects the funds to ensure their use for the intended purpose makes a good deal of difference in the outcome of impact fee litigation. It was very significant to the Montana Supreme Court in deciding *Lechner* that the "system development fee" would not be used to recover the costs of or to replace existing facilities; the sole purpose of the fee was for system expansion. The more detailed rules for use of impact fees have evolved out of the Florida cases and their major provisions have been incorporated into many state enabling acts, including Georgia's. The basic parts of the rule are that the fee:

- must actually be used for the purpose for which it was levied;
- must not exceed the cost of the improvements required; and
- must adequately benefit the development that contributed to the improvements.

For discussion of the Florida rules, see *Hollywood, Inc. v. Broward County*, 431 So. 2d 606 (Fla. D.C. App. 1983), and *Home Builders and Contractors Association of Palm Beach County v. Board of County Commissioners of Palm Beach County*, 446 So. 2d 140 (Fla. D.C. App. 1983).

Recent Legal Developments

The two lines of development exaction cases basically merged in 1987, when the U.S. Supreme Court decided *Nollan v. California Coastal Commission*, 483 U.S. 825 (1987), one of the now-famous "trilogy" of land use cases decided by the high court that year. The facts of Nollan are important. The Nollans purchased a beach bungalow. They wanted to tear it down and replace it with a much larger single-family home. In order to do so, they needed the approval of the California Coastal Commission.

The Commission ultimately granted the approval, but it placed a condition on it—the Nollans had to dedicate a trail easement across their beach, in order to provide a link in a total trail system leading up to a public beach. Finding little connection between the limited impact of replacing a home with a home on an existing lot and the need for a trail system in the area, the Supreme Court ruled for the Nollans, citing most of the conservative lines of cases (Illinois and New Jersey and related) on exactions and fees. It adopted a "rational nexus" test, although it did not elaborate on what the phrase meant.

Although it is too early to have a significant number of decisions interpreting what "rational nexus" under *Nollan* means, some trends are emerging: (1) the requirement is more narrow than the old California rule in *Ayres*; (2) it does not appear to be so narrow as some of the early cases that actually held that if the need for improvements was not "specifically and uniquely attributable" to a single subdivision, then the dedication or fee was invalid; (3) the Florida rules, or something very similar, are key elements in a defensible system; (4) careful technical studies to determine the projected impacts of different types of

development on different systems are crucial to establishing the "rational nexus," or connection between the proposed development and the imposed fee.

Post *Nollan* case law has generally supported fee systems. Despite the general reluctance of courts to allow one entity of local government to regulate another, the Utah Supreme Court upheld the imposition of a drainage fee on a school district in *Salt Lake County v. Board of Education of Granite School District*, 808 P.2d 1056 (Utah 1991). In the context of New Jersey's long-standing adherence to the "rational nexus" test of its own, a mid-level appellate court in New Jersey upheld a plat condition requiring that the developer contribute to the construction of a bridge not located within the subdivision. *Squires Gate, Inc., v. County of Monmouth*, 588 A.2d 824 (N.J.Super. 1991).

Similarly, a mid-level court in Washington upheld a project approval condition that required that the developer contribute to the improvement of an existing road—including the cost of installing a street light. *Southwick, Inc., v. Lacey*, 795 P.2d 712 (Wash.App. 1990). In *Lincoln Property N.C., Inc., v. Cucamonga School Dist.*,280 Cal. Rptr. 68 (Cal.App. 4 Dist. 1991), the California court upheld a school fee.

Although exactions law evolved from subdivision practice, it is not inextricably tied to the subdivision process. In early U.S. practice, most development took place through the subdivision process. However, development may take place through a variety of processes and the courts have had no difficulty in recent cases in accepting the imposition of exactions on development, regardless of the particular stage of the development. See, for example, *Lacey, supra*, which involved a conditional zoning approval. Many local governments defer the imposition of impact fees to the building permit or certificate of occupancy stage of the development process for two reasons: first, that helps developers by deferring the cost until the end of the process, when the developer can often collect the fee directly from a consumer and thus be relieved of having to borrow "construction" money to pay a fee; second, it helps the local government by bringing under the scope of the fee lots that were subdivided before the fee system was adopted. In some communities, there is a large inventory of such lots. Exempting them from the fee would greatly reduce the funds available to build improvements.

Further, the vacant lots have virtually no impact on roads, schools, sewer and water and other public systems. Thus, system expansions are likely to be necessary to help the community to serve those who occupy the lots once actual development of them takes place. The Georgia act has institutionalized that common practice in Ga. Code 1981 Sect. 36-71-4(d).

Georgia has joined Arizona, California, Illinois, Maine, Nevada, Oregon, Texas, Vermont, Virginia and Washington in adopting clear authorization for the use of impact fees. The state's *Development Impact Fee Act* reflects impact fee practices that have evolved from nearly five decades of experience with impact fees and related exactions. It is entirely consistent with the rules that have evolved from litigation in the field, most of which has occurred in the last two decades. As such, it provides a solid legal basis for the implementation of a fair and defensible impact fee system for the City of Atlanta.

CHAPTER 2
TRANSPORTATION

This chapter calculates the maximum impact fees that can be charged for the impact of new development on the City's major roadway network. Only arterial roads are covered by this analysis. The City is divided into two transportation service areas. Because a system-wide average level of service is recommended, and because the recommended level is below the existing level of service in both service areas, no existing deficiencies are required to be remedied. The chapter is organized around the following subject areas:

- Existing facilities
- Service areas
- Levels of service
- Capital costs
- Revenue credits
- Travel demand
- Fee schedule.

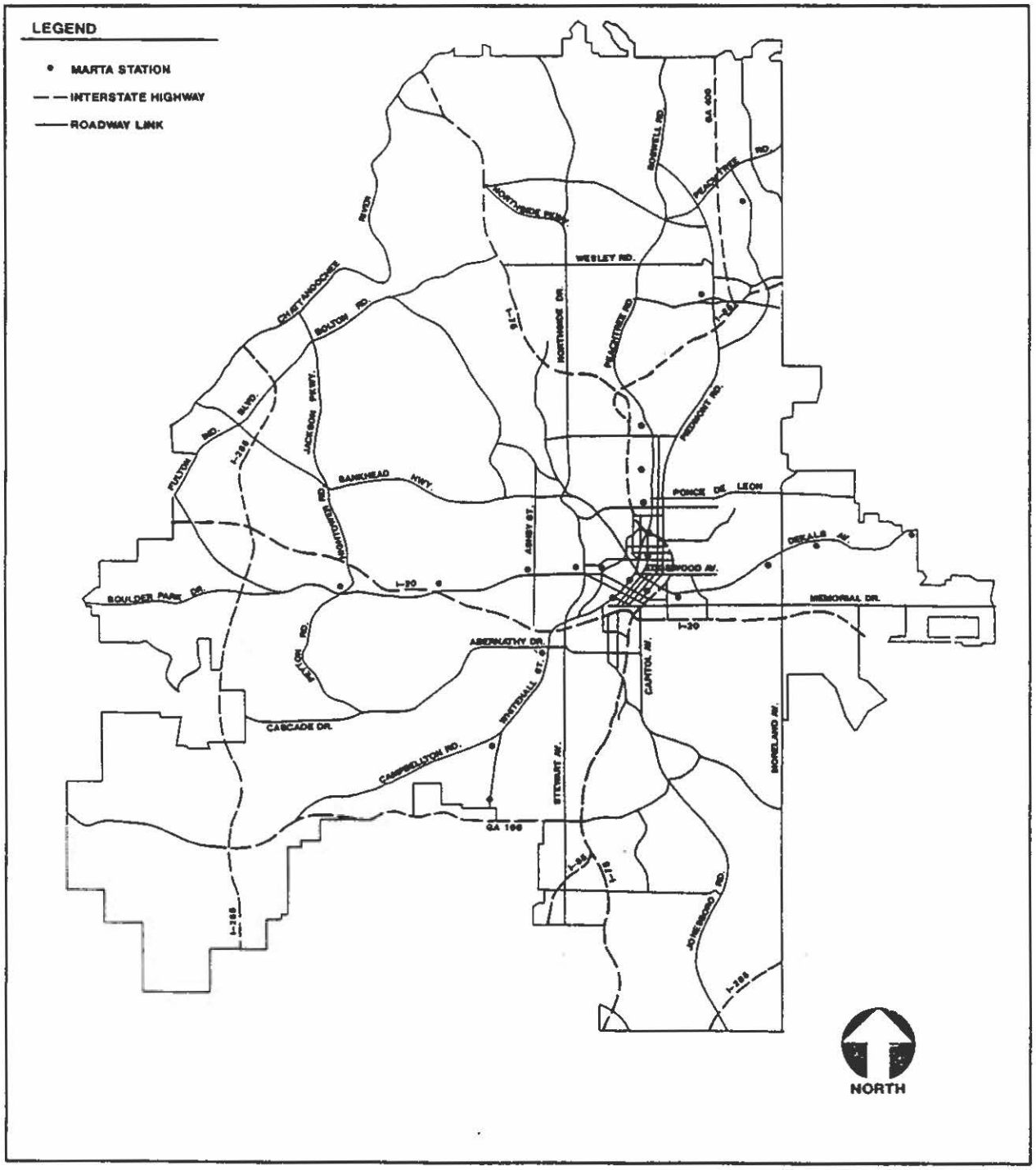
EXISTING FACILITIES

The roadway inventory that was analyzed includes all roadways classified as arterials on the City's Roadway Classification Map. In addition, the inventory includes three major collectors that function as arterials: Lenox Road, Ralph McGill Boulevard and a segment of 14th Street. The major roadway system is depicted in *Figure 2-1*.

Interstate highways were not included in the roadway inventory. State highways were included, however, because the City is responsible for right-of-way acquisitions for improvements to these roadways. Collector roads, with the exceptions noted, were excluded from the inventory, as were local streets. Local streets primarily provide access to adjacent properties. Impact fees are not appropriate for local streets, which are usually built by developers. Unlike arterials, which serve primarily to move traffic from one part of town to another, collectors function both to serve through traffic and to provide access to adjacent property. While impact fees can be used for collector roads, the absence of local data and the limited time available to complete this study made it impractical to include them. The City may wish to include additional collector roads in subsequent study updates.

Because most of the information on the existing roadway system needed for this study was not readily available from the City, the consultant team conducted extensive field investigations to compile the inventory. Roads were divided into roadway links, or stretches of road where the principal characteristics (number of through lanes in each direction, divided or undivided) did not change. Each roadway link was assigned a link identification number, and the characteristics of the link were entered into a horizontal row on the roadway inventory spreadsheet (*Table A-1* in the *Technical Appendix*).

Figure 2-1
MAJOR ROADWAY SYSTEM



For each roadway link, the following characteristics were identified:

- description (street name/from-to)
- length (miles)
- through lanes (number)
- configuration (divided/undivided)
- movement (one/two-way)
- number of signalized intersections
- number of signalized intersections with left turn lanes
- peak hour traffic volumes (date/source).

Most available traffic counts were derived from 24-hour counts obtained from the Georgia Department of Transportation (GDOT). Some actual afternoon (4-6 PM) peak hour counts were available from the City and from previous studies conducted by LRE Engineering. The ratio of PM peak hour to 24-hour counts for those links for which both types of counts were available averaged ten percent, and this factor was used to convert GDOT 24-hour counts to PM peak hour counts.

For roadway links for which no counts were available, traffic volumes were estimated by averaging the counts on adjacent links of the same roadway. However, this still left 15 links (seven percent of the total) for which no counts were available or could be estimated. These links were included in the inventory, but excluded from summary calculations.

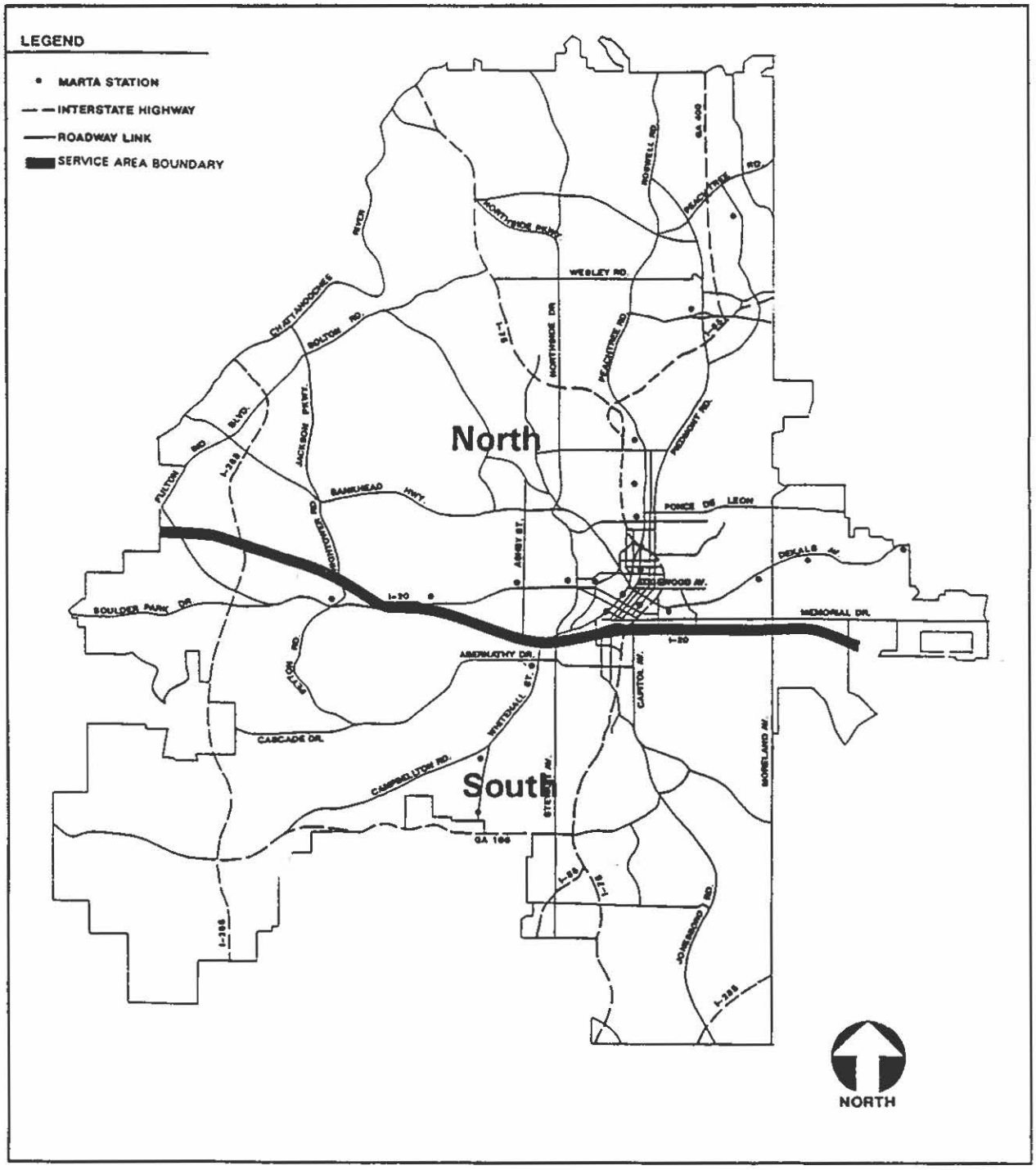
The City's major roadway system was divided into 211 roadway links. The link inventory data is included in *Table A-1* in the *Technical Appendix*. The major roadway system consists of 172 centerline miles and 641 lane-miles.

SERVICE AREAS

One advantage of limiting the analysis to arterials is that it is not necessary to define a large number of service areas for the arterial network. The arterial roadway network functions as an integrated system designed to move traffic efficiently from one part of the city to another. This is particularly the case when the focus is on peak hour capacity, as it is in this study, since most peak hour travel is in the form of long home-to-work trips. Thus, trips that originate in one part of the city tend to have destinations a considerable distance away. For this reason it makes little sense to attempt to calculate the level of service or the cost to add capacity in a small subarea of the city.

However, analysis of the roadway inventory data did reveal significant differences in traffic congestion between north and south areas of the city. Much of Atlanta's growth has been occurring to the north, and road improvements have not been able to keep pace with increased traffic in this area. Interstate 20, which crosses Atlanta from east to west, has been selected as a reasonable boundary defining North and South transportation service areas, which are depicted in *Figure 2-2*.

Figure 2-2
TRANSPORTATION SERVICE AREAS



LEVELS OF SERVICE

A level of service for transportation facilities is essentially the relationship of demand to capacity, with both demand and capacity expressed in terms of vehicle trips or vehicle-miles of travel. Both demand and capacity can be measured in terms of average daily trips (ADT) or peak hour trips (PHT). Since PHT is generally a more meaningful measure of roadway capacity in an urban commuting environment, it is recommended for use in the Atlanta study.

While existing travel demand can be determined from actual traffic counts, the capacity of a roadway system depends on the desired level of service, as well as the methodology used to translate the desired level of service into the maximum rate of vehicle flow that can be accommodated by various facilities. It should be understood that, for a study of this type, determinations of road capacity are based on generalized planning standards rather than detailed operational studies. Such studies would be extremely expensive and would yield much more information on operating conditions than needed for this project. It is not necessary to determine the precise capacity of every component of the roadway system in order to arrive at a reasonable estimate of the overall capacity of the major roadway system.

Because of the difficulty of widening roadways in a built-out urban environment such as Atlanta, intersection capacity is especially crucial to the roadway system. However, while detailed intersection capacity analyses yield valuable data on turning movements and delay that are crucial for optimal intersection design and signal timing, such information is not particularly useful in calculating impact fees because it cannot readily be used to calculate the capital improvement cost associated with an additional vehicle-mile of travel demand.

In light of these considerations, this study uses a modified roadway link capacity analysis that takes into account the two most important intersection characteristics: spacing of signals and number of left turn lanes.

The most commonly used level of service measure for roadways is a qualitative measurement that classifies operating conditions into six broad categories applicable to all types of roadways. Each level of service (LOS) category generally describes driving conditions in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. The distinguishing characteristics of the six LOS categories are summarized in *Table 2-1*. As can be seen, average speeds decline from 35 to 13 mph on a Class I arterial as the level of service declines from LOS A to LOS E.

In a highly urban setting like Atlanta, the choice of a realistic level of service is generally confined to LOS D or LOS E. Because the Georgia Department of Transportation bases its improvement programming on maintaining LOS D, it is recommended that the City use LOS D in its impact fee system.

Before a level of service can be used to determine the capacity of a roadway, however, it must be quantified. This is done with service volume capacity tables. In contrast to LOS, service volume capacity is a quantitative measure, expressed in terms of the rate of flow (vehicles passing a point during

a period of time). Service volume capacity represents the maximum rate of flow that can be accommodated by a particular type of roadway while still maintaining a specified LOS. Because service volume capacities (rates used in capacity tables) are defined as the maximum for each level of service, they effectively define flow boundaries between the various LOS categories for a particular type of roadway.

Table 2-1
TRANSPORTATION LEVEL OF SERVICE CATEGORIES

Level of Service	Traffic Flow	Freedom to Maneuver	Comfort and Convenience	Average Speed
A	Free	Very High	Excellent	35 mph
B	Stable	Good	Good	28 mph
C	Stable	Requires Vigilance	Noticeable Decline	22 mph
D	High Density	Severely Restricted	Poor	17 mph
E	Unstable	Extremely Difficult	Extremely Poor	13 mph
F	Stop-and-Go	Virtually Non-Existent	High Frustration	Varies

Source: National Research Council, Transportation Engineering Board, *Highway Capacity Manual*, 1985.

The starting point for constructing such a capacity table for Atlanta was the *Generalized Level of Service Tables* prepared by the Florida Department of Transportation (FDOT). These tables were designed for general planning applications in Florida, and were based on the definitions and methodology of the 1985 *Highway Capacity Manual*. The tables recognize three distinct types of areas: (1) urbanized; (2) areas transitioning into urbanized areas or areas over 5,000 population not in urbanized areas; and (3) rural undeveloped areas or cities and developed areas less than 5,000 population. The urbanized area tables were judged to be the most appropriate for use in the City of Atlanta.

The FDOT tables divide roadways into "signal groups" based on the average number of signalized intersections per mile. They assume divided multi-lane roads, two-way directional flow and left-turn bays at all intersections. However, adjustment factors are provided to adjust capacities to account for localized variations from these assumptions (*Table 2-2*).

The most significant of these adjustment factors is the 15 percent reduction for no left turn bays. Many of the links inventoried in the city have a mixture of intersections with and without left turn lanes. For that reason, the capacity reduction was based on the percentage of intersections without left turn lanes. For example, the capacity reduction for a roadway link containing five intersections, three of which do not have left turn lanes, would be 3/5 x -15% = -9%.

Table 2-2
CAPACITY ADJUSTMENT FACTORS

Two-Way Roads			
Lanes (1)	Median	Left Turn Bays (2)	Adjustment Factor
2	Divided	Yes	+5%
2	Undivided	No	-15%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-20%
One-Way Roads			
One-Way Lanes	Corresponding 2-Way Lanes		Adjustment Factor
2	4 Divided		-40%
3	6 Divided		-40%
4	8 Divided		-40%
5	8 Divided		-25%
6*	8 Divided		-10%

Notes:

1. The capacity of roadways with reversible lanes or uneven number of lanes in each direction were calculated by determining the number of lanes in each direction at the peak hour, calculating the capacity of the lanes in each direction as one-half of the capacity of a two-way road with twice the number of lanes, and summing the two capacity estimates.

2. The ratio of signalized intersection with left turn bays was multiplied by the adjustment factor in the table to determine the adjustment factor used in the calculations in *Table A-1*.

* determined by LRE Engineering.

Source: Florida Department of Transportation, *Generalized Two-Way Peak Hour Volumes for Florida's Urbanized Areas*, 1991.

Because service volumes in the FDOT tables were developed using data representing typical operating conditions on Florida roadways, it was necessary to compare these volumes to actual conditions in Atlanta in order to ascertain their local applicability. Actual travel time runs on eight roadways consisting of 37 links were performed by the consultant to determine average travel speeds. From these average travel speeds a level of service for each link was determined using the criteria given in *Table 11-1: Arterial Level of Service* in the 1985 *Highway Capacity Manual*. Although the travel time approach does not consider link-specific traits such as lane width, signal timing, etc., it does provide a good basis for establishing general levels of service that can be used to calibrate the FDOT capacity tables.

A comparison of levels of service based on travel time runs and the FDOT tables was made using the adjustment factors and left turn reduction described above. It was found that the level of service based on the FDOT tables was generally worse than that based on the travel time runs. The FDOT capacities were therefore adjusted upward by 25 percent to provide a capacity table that better reflects actual operating characteristics on Atlanta's roadway system (*Table 2-3*).

Table 2-3
MAXIMUM PEAK HOUR CAPACITIES FOR TWO-WAY ARTERIALS

Lanes/ Median	Level of Service				
	A	B	C	D	E
Signal Group A (0.0 to 0.50 signalized intersections per mile)					
2 Und.	513	1,375	1,850	2,275	2,813
4 Div.	1,250	3,175	4,175	4,863	5,713
6 Div.	1,863	4,825	6,288	7,325	8,563
8 Div.	2,350	6,038	7,875	9,175	10,700
Signal Group B (0.50 to 2.49 signalized intersections per mile)					
2 Und.	***	1,313	1,675	1,825	1,850
4 Div.	***	2,950	3,625	3,888	3,888
6 Div.	***	4,588	5,500	5,825	5,825
8 Div.	***	5,688	6,800	7,138	7,138
Signal Group C (2.50 to 4.50 signalized intersections per mile)					
2 Und.	***	***	1,075	1,525	1,713
4 Div.	***	***	2,338	3,338	3,663
6 Div.	***	***	3,563	5,125	5,550
8 Div.	***	***	4,363	6,338	6,875
Signal Group D (more than 4.50 signalized intersections per mile)					
2 Und.	***	***	***	1,275	1,625
4 Div.	***	***	***	2,800	3,525
6 Div.	***	***	***	4,263	5,388
8 Div.	***	***	***	5,288	6,613
Signal Group E (more than 4.50 signalized intersections per mile, CBD)					
2 Und.	***	***	***	1,438	1,625
4 Div.	***	***	***	3,163	3,525
6 Div.	***	***	***	4,850	5,388
8 Div.	***	***	***	6,013	6,613

*** Indicated level of service cannot be achieved.

Source: Derived from Florida Department of Transportation, *Generalized Two-Way Peak Hour Volumes for Florida's Urbanized Areas*, 1991; adjusted upward by 25 percent to reflect operating conditions in Atlanta.

Roadway characteristics included in the link inventory, the capacity table and the adjustment factors discussed earlier can be used to calculate peak hour capacity (maximum number of trips) that can be accommodated on each roadway link without exceeding the specified level of service. As noted above, the analysis will be based on LOS D. The peak hour capacity of each link at LOS D is shown in the link inventory (*Table A-1* in the *Technical Appendix*).

Average versus Link-Specific Level of Service

Assuming that the City chooses LOS D as its desired standard, the next question is whether to adopt LOS D as a "link-specific" or "average" level of service standard. A "link specific" level of service standard would require all roadway links to function at a minimum operational level. In contrast, an "average" level of service standard is based on a measure designed to summarize the overall operating condition of the major roadway system.

If a link-specific level of service standard is adopted as the basis for transportation impact fees, there will be some roadway facilities that are deficient with respect to the adopted standard. At the roadway link level, the relationship between traffic volume and service capacity is known as the volume-to-capacity (V/C) ratio. For example, a roadway link with a V/C ratio of 1.0 is accommodating the maximum number of daily trips at the specified level of service, while a link with a V/C ratio of greater than 1.0 is exceeding its maximum capacity at that level of service.

At LOS D, there are currently 36 roadway links with a V/C ratio greater than 1.0. The combined excess of travel demand (vehicle-miles of travel or VMT) over roadway capacity (vehicle-miles of capacity or VMC) on these links is 29,849 VMT (based on the information in *Table A-1*). According to the *Development Impact Fee Act*, the City would have to use non-impact fee revenues to correct those deficiencies. At the average capital cost of $1,495 per unit of capacity calculated later in this chapter (see *Table 2-6*) the City would have to identify $44.6 million in remedial non-impact fee revenues.

Thus, several factors argue against the selection of a link-specific level of service for the City of Atlanta, including the high cost to remedy deficiencies, the lack of readily available non-impact fee revenues to finance improvements and the difficulty of expanding the capacity of existing roads in a largely built-out environment.

The problems associated with a link-specific level of service can be avoided by adopting an "average" level of service standard, which reflects the operating characteristics of the roadway *network*, rather than an individual roadway *link*. The system-wide equivalent of the link V/C ratio is the *VMT/VMC ratio*, which relates system demand (vehicle-miles of travel or VMT) to system capacity (vehicle-miles of capacity or VMC). The VMT/VMC ratio summarizes the overall relationship between demand and capacity for an entire roadway system.

The VMT/VMC ratio is an important measure of the operating characteristics of a roadway system. All roadway systems, at any given point in time, contain a large number of roadway links that are not being utilized to their full capacity. Because of this fact, functioning roadway systems need to have more overall capacity than the total service demands placed on them. Roadway systems tend to require a VMT/VMC ratio considerably lower than 1.0 to function at an acceptable level.

Most road impact fees that are based on a link-specific level of service charge new development only for the cost of capacity directly consumed by the traffic generated by the development. In other words, the cost of constructing a unit of capacity is assumed to be sufficient to mitigate the impact of an additional unit of travel. Such a one-to-one replacement of consumed capacity, however, ignores the need to maintain needed "slack" in the system. Only in a hypothetical situation—where the traffic on every road is proportional to the capacity of that road—would the revenue received from such a link-specific impact fee approach be sufficient to maintain the desired level of service. In contrast, the average level of service approach recommended in this study *does* account for the need to maintain the existing ratio of demand to capacity.

Existing and Recommended Level of Service

In order to calculate the VMT/VMC ratio, the number of trips on each roadway link must be multiplied by the length of the link and aggregated for the entire roadway system (or service area) to determine total travel demand (VMT). Next, the capacity of each roadway link at the desired level of service (i.e., LOS D) is multiplied by the length of the link and aggregated to determine total system capacity (VMC). Total demand is then divided by total capacity to derive the VMT/VMC ratio.

Most of the data required to determine the current VMT/VMC ratio for Atlanta's arterial roadway system are summarized in *Table A-1: Roadway Link Inventory*. However, total travel demand should first be adjusted upward to account for two factors: 1) estimated travel demand on links for which no traffic counts were available, and 2) the increase in traffic since the traffic counts were taken (while there are 1992 counts on some links, most of the counts were taken in 1991). These calculations reveal that the existing level of service is considerably better in the South service area than in the North service area. As shown in *Table 2-4*, the road network in the North service area is operating at about 76 percent of its maximum overall capacity, compared to only about 58 percent in the South.

Table 2-4
EXISTING TRANSPORTATION LEVEL OF SERVICE

Level of Service Factor	Service Area		City-Wide
	North	South	
1991 VMT (Links w/Counts) (1)	237,710	76,373	314,083
Ratio of VMC (All Links)/VMC (Links w/Counts) (1)	1.0699	1.0220	NA
1991 Estimated VMT (All Links)	254,326	78,053	332,379
Annual VMT Growth (2)	1.0147	1.0147	NA
1992 Estimated VMT (All Links)	258,065	79,200	337,265
1992 VMC (All Links) (1)	340,704	137,513	478,217
1992 VMT/VMC Ratio	0.7574	0.5759	0.7053

Source: (1) *Table A-1: Roadway Link Inventory*; (2) derived by dividing annual projected VMT growth from *Table 2-11* (73,315 ÷ 15 years = 4,888) by 1991 total VMT (332,379).

To be conservative, it is recommended that the City adopt a level of service for each service area that is slightly worse than the existing level in the North service area. The recommended level of service is therefore a VMT/VMC ratio of 0.80 for each service area. To maintain a VMT/VMC ratio of 0.80, 1.25 units of capacity must be added for every additional unit of travel demand placed on the roadway system.

If only impact fee revenues are used to make future system improvements for roads, the level of service will tend to decline over time toward the adopted level. For the North service area, the level of service should decline only slightly, from a demand/capacity ratio 0.76 to 0.80. The South service area, on the other hand, would experience a greater decline in the level of service, as the demand/capacity ratio increases from 0.58 to 0.80.

The existence of a large margin of excess capacity in the South service area road system suggest the potential for recoupment fees. Unfortunately, however, there is insufficient data on which to calculate such fees, since we do not know when each road was built and who paid for it.

The City has indicated that it intends to implement its policy of encouraging development in the southern parts of the city by discounting transportation impact fees by 50 percent in the South service area. This policy decision is particularly appropriate since the City does not need impact fee revenue for road improvements in the South service area as much as it does in the North, due to the excess capacity that currently exists.

CAPITAL COSTS

As noted above, the City must construct 1.25 additional vehicle-mile of capacity (VMC) for every for every additional vehicle-mile of travel (VMT) that is added to the major roadway system in order to maintain the adopted level of service over the long-term. Thus, the capital cost per VMT is 1.25 times the cost to construct an additional VMC. However, because the City has not undertaken significant road improvement projects in recent years, there is little recent historical cost information available on which to estimate the average cost to construct an additional unit of capacity.

The City's current Capital Improvements Program (CIP) was reviewed to determine which transportation projects could be considered to be "system improvements" under the *Development Impact Fee Act*. As discussed earlier, a system improvement must expand the capacity of the system to serve new growth and development. Improvements to local or collector roads not included in the major roadway inventory were excluded. Road, bridge and viaduct reconstruction projects and replacement of obsolete traffic signals do not qualify as system improvements and were therefore excluded. Projects such as street or intersection realignments that were likely to do more to improve safety than capacity were also excluded. Finally, projects that were not directly related to road improvements, such as the construction of a truck and equipment wash facility and an employee assembly building, were also excluded.

The CIP includes projected capital improvement costs for the 15-year period from 1992 to the year 2006. Anticipated expenditures for non-aviation transportation projects total $275.3 million. Over one-half of this amount ($153.7 million) is for projects classified as system improvements under the *Act* that would be eligible for impact fee financing (see *Table A-2: Planned Transportation Improvements*).

While the CIP does indicate the type of roadway system improvements needed, it does not contain sufficient information on the nature of specific projects to calculate the amount of capacity that would be added by the improvement. In addition, it is very difficult to calculate the capacity added by certain types of improvements, such as modernization of the traffic signal computer system and the addition of new traffic signals, even though they improve the efficiency and capacity of the road system.

More detailed information on many of the same projects found in the CIP is included in the Atlanta Regional Commission's *Transportation Improvement Program* (TIP). Data on TIP projects that covered links in the roadway link inventory (*Table A-1*) was therefore used to calculate the cost to add a unit of capacity, using the same methodology used to calculate the existing capacity of Atlanta's roadway network. The marginal cost of adding capacity was calculated for three types of improvements—new road construction, road widening projects and turn lane additions, as shown in *Table 2-5*.

The nineteen projects analyzed in *Table 2-5* are sufficient to generate reasonable estimates of average city-wide costs, but were determined to be too small a sample to estimate reliable cost differentials by service area. All four of the sampled intersection projects, for example, are in the North service area, and there is detailed information on only two new road projects. In addition, it should be noted that almost one-quarter of the roadway system improvement funds programmed in the CIP over the next 15 years are for signalization and intersection improvements (see *Table 2-6*), which are unlikely to vary by service area. Thus, the lack of statistically significant evidence of cost differentials, and the extent of programmed improvements that are unlikely to vary in cost by service area, argue in favor of the reasonableness of using city-wide average costs for both service areas.

If there are significant differences in capital costs by service area, they are likely to be related to right-of-way costs. The higher land costs in the northern area of Atlanta (as evidenced by the differential land costs reported in *Table 4-9*) might lead one to expect somewhat higher per unit capital costs in the North service area. The use of city-wide average costs for the North service area, therefore, is likely to be conservative. By the same token, one might expect somewhat lower-than-average capital costs in the South service area, due to lower right-of-way costs. However, while the use of city-wide average costs may tend to overstate the net impact cost, the policy decision to discount the impact fees by 50 percent in the South service area will ensure that the actual impact fees charged do not exceed actual impact costs.

For these reasons, average city-wide capital costs will be used to calculate appropriate impact fees in both service areas. While the use of city-wide average costs is reasonable and in compliance with the *Development Impact Fee Act*'s requirements, the City may wish to collect additional cost data by service area in order to further refine the cost estimates at some later date.

Table 2-5
ROADWAY SYSTEM IMPROVEMENT COSTS

Link# (1)	TIP#	Location			Imprvt Type (2)	Miles	Sig Grp	Capacity at LOS D			Added VMC (3)	Total Cost	Cost/ Added VMC
		Street	From	To				Exist	New	Addl			
(99)	AT15	Cleveland Av	Jonesboro Rd	Moreland Av	0-4U	0.2	B	0	3694	3694	739	$1463000	$1980
(23)	AT47	Sidney Marcus	Piedmont	Lindbergh Dr	0-4D	0.4	C	0	3338	3338	1335	$1600000	$1198
Total New Road Projects											2074	$3063000	$1477
61	AT1	Bankhead Hwy	Hightower Rd	Harwell Rd	2U-4U	1.4	B	3171	4869	1698	1189	$2310000	$1478
6869	AT5	Hightower Rd	Bankhead Hwy	I-20	2U-4U	1.4	B	1734	3509	1775	2485	$1997000	$930
(51)	AT7	Marietta Blvd	Bolton Rd	City Limit	2U-4U	0.2	B	2104	4273	2169	3687	$1463000	$1656
1	AT12	Northside Pkwy	Cobb County	Mt Paran Rd	4U-6U	0.7	C	1734	3509	1775	2485	$1757000	$804
103	AT13	Jonesboro Rd	I-285	Macedonia Rd	2U-4U	0.7	B	1825	3694	1869	935	$1900000	$3209
96-99	AT16	Cleveland Av	I-75	Jonesboro Rd	2U-4U	1.9	B	1275	2660	1385	139	$2604000	$2158
63	AT17	Fulton Ind Blvd	Aviation C	Bankhead Hwy	2U-4U	1.7	A	1825	3694	1869	1308	$6107000	$1453
95	AT18	Cleveland Av	I-85	Sylvan Rd	2U-4U	0.4	D	1551	3140	1588	3178	$1936000	$3776
42-43	AT26	Howell Mill	Bellmeade Av	Chattahoochee	2U-4U	0.1	D	1449	3013	1564	2972	$300000	$876
88	AT27	Campbellton Rd	Star Mist Dr	Venetian Dr	2U-4U	3.6	B	1747	3535	1788	6437	$1320000	$205
90	AT32	Campbellton Rd	City Limit	Butner Rd	2U-4U	2.0	B	1825	3694	1869	374	$12000000	$3912
104	AT36	Jonesboro Rd	Constitution	Sawtell Av	2U-4U	1.0	B	1084	2261	1177	471	$2800000	$4110
24	AT43	Lindbergh Dr	Peachtree Crk	Cheshire Br	2U-4U	0.5	B	1643	3324	1681	1681	$3000000	$1666
Total Widening Projects											27341	$50002851	$1444
116	AT20	Moreland Av	@Ponce deLeon	Left Turn Lns	0.2-0.4	1.4	C	1551	1825	274	164	$160000	$1220
164	AT28	Cheshire Br	@ Sheridan	Left Turn Lns	0.75-1	0.5	D	1231	1449	218	87	$280000	$1379
24	AT37	Lindbergh Dr	@ Cheshire Br	Left Turn Lns	0-1	0.4	C	3898	4050	152	76	$120000	$3684
128-129	AT56	Boulevard	@ Memorial	Left Turn Lns	0-1	0.6	B	2791	2886	95	133	$200000	$1203
Total Intersection Improvements											460	$1060000	$1652

Notes: (1) Links in parentheses indicate adjacent link; (2) Existing to improved lane configuration or left turn signal ratio; (3) Added vehicle-miles of capacity derived by multiplying length of improvement times added capacity (see *Table 2-2* and *Table 2-3*).

Source: Atlanta Regional Commission, *1992 Transportation Improvement Program*.

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The average costs for the three types of improvements calculated in *Table 2-5* were weighted by the amounts programmed for these improvements in the CIP to calculate an average marginal cost to expand capacity. This was accomplished by dividing the costs for particular types of projects by the average marginal cost calculated above to estimate the vehicle-miles of capacity generated. Total programmed costs were then divided by total estimated VMC to calculate the average cost to add a unit of VMC. The result is an average cost of $1,495 per vehicle-mile of capacity, as shown in *Table 2-6*.

Table 2-6
AVERAGE COST OF PLANNED TRANSPORTATION CAPACITY, 1992-2006

Improvement Type	Total Programmed Cost	Estimated Added VMC	Avg Cost/ Added VMC
Road widening	$101,649,000	70,394	$1,444
New roads	$10,166,000	6,883	$1,477
Right-of-way	$2,300,000	1,574	$1,461
Signals	$32,240,000	19,516	$1,652
Turn lanes	$3,200,000	1,937	$1,652
Other intersection improvements	$1,200,000	726	$1,652
Convert to one-way	$2,900,000	1,755	$1,652
Total/Average Cost per VMC	$153,655,000	102,785	$1,495

Notes: The average cost per VMC of turn lane additions was used as an approximation of the cost of other types of intersection and signalization improvements. For undesignated right-of-way acquisition costs, the average of the costs of new road and road widening projects was used.

Source: *Table A-2: Planned Transportation Improvements* and *Table 2-5: Roadway System Improvement Costs.*

As noted earlier, the cost per vehicle-mile of travel to maintain a system-wide ratio of demand to capacity of 0.80 is 1.25 times the cost per vehicle-mile of capacity. The capital cost to accommodate an additional VMT is therefore 1.25 times $1,495, or $1,869 per VMT.

REVENUE CREDITS

For purposes of equity, and as required by the *Development Impact Fee Act*, new development should not be charged twice for system improvements required to accommodate its impacts—once with impact fees, and then again through tax revenues or user fees that it will generate. This section calculates appropriate credits for gasoline and property taxes that will be generated by new development.

Gasoline Tax Credits

Gasoline tax credits are taken into consideration by using only the local share of the total capital cost in impact fee calculations. According to the City's CIP, the major anticipated revenue source for road improvements over the next six years is Federal and State grants, which come primarily from gasoline tax and other roadway user fees. The next major category is for projects with unidentified funding, much of which will presumably come from transportation impact fees, if adopted. General obligation bonds are currently anticipated, but this revenue source should be switched to non-impact-fee eligible projects if impact fees are adopted. The small percentage of developer participation is also likely disappear with the adoption of impact fees. The anticipated revenue sources over the next six years are summarized in *Table 2-7.*

Table 2-7
TRANSPORTATION SYSTEM FUNDING, 1992-1996

Revenue Source	Amount Programmed	Percent Total Revenues
Federal/State grants	$28,967,000	42.1%
Unidentified funding source	$28,938,000	42.0%
General obligation bonds	$10,440,000	15.2%
Developer participation	$481,000	0.7%
Total	$68,826,000	100.0%

Source: City of Atlanta, *1992 Capital Improvements Program*, June 1992 (see *Table A-2*).

The anticipated level of Federal/state funding appears to be reasonable, based on historical funding patterns. On average over the last five years, the City has received $8.8 million annually from federal and state grants for non-interstate roadway improvements, according to GDOT.[1] This is consistent with CIP projections, which indicate that the City anticipates receiving about $7.2 million annually in federal and state money over the next four years, all of which is programmed for system-expanding capital improvements.

[1] State and federal roadway capital improvement projects, excluding interstates, in the 5th Congressional District, which closely approximates the City of Atlanta, totalled $43,927,968 for 1987-1991, according to Georgia Department of Transportation, September 22, 1992.

Since Federal and state grants, which essentially represent gasoline taxes, will finance 42.1 percent of future system capital improvements, the total capital cost to accommodate an additional unit of travel demand ($1,869) should be reduced by that amount. The net result is a local share cost of $1,082 per VMT.

Property Tax Credits

Transportation impact fees must also give credit for future property tax revenues that will be used to pay off outstanding debt incurred to expand roadway system capacity. The City currently has an outstanding general obligation (GO) bond debt principal of $74.49 million. Of this amount, however, $37.16 million is for school bonds and $11.66 million is for a library bond which was assumed by Fulton County. Excluding this debt leaves a net outstanding principal of $25.67 million.

The bulk of the outstanding principal—$20.3 million—represents the remaining principal on the $24 million in annual bonds issued by the City since 1987. Of that $24 million, $5,425,430 went toward improvements to the municipal court building, which is not included in the public safety facilities analyzed in this study, $1,497,480 went for correctional facilities, which is also not included in this study, and $240,000 went to art projects, which are not included in the parks and recreation facility costs. The only impact-fee-eligible facilities for which annual bonds have been issued are roads, which have accounted for $16,837,090, or 70.2 percent of the total annual bond expenditures since 1987 (see *Table 2-8*). Taking this percentage of the $20.3 million in outstanding debt on the annual bonds yields an estimate of $14,250,600 in outstanding annual road bonds.

The remaining $5.37 million in City GO bond debt represents the consolidation of debt from pre-1987 bond issues. Unfortunately, existing data does not permit a disaggregation of this consolidated debt according to the purpose for which it was spent. It has therefore been assumed that the same percentage (70.2 percent) of the remaining outstanding GO debt, or $3,769,740, can also be attributed to road improvements. Added to the $14,250,600 in outstanding annual bond debt attributable to roads yields an estimated $18,020,340 in outstanding road improvement bond debt.

Table 2-8
USE OF GENERAL OBLIGATION BONDS SINCE 1987

Year	Transportation	Corrections	Courts	Art	Total
1987	$3,637,520	$322,480		$40,000	$4,000,000
1988	$3,960,000	$0		$40,000	$4,000,000
1989	$2,000,000	$0	$1,960,000	$40,000	$4,000,000
1990	$494,570	$0	$3,465,430	$40,000	$4,000,000
1991	$2,785,000	$1,175,000		$40,000	$4,000,000
1992	$3,960,000	$0		$40,000	$4,000,000
Total	$16,837,090	$1,497,480	$5,425,430	$240,000	$24,000,000
Percent	70.2	6.2	22.6	1.0	100.0

Source: City of Atlanta Finance Department, September 28, 1992.

The $18,020,340 in outstanding road improvement bond debt represents 24.2 percent of the total outstanding City, school and library debt of $74.49 million. The present value of the future stream of property tax payments to retire the road portion of the remaining combined GO bond debt service is $1.26 per $1,000 of market value, as shown in *Table 2-9*.

Table 2-9
TRANSPORTATION PROPERTY TAX CREDITS PER $1,000 MARKET VALUE

Year	Total Market Value (1)	Transportation Share of GO Debt Service (2)	Credit/ $1,000 Market Value
1992	$18,043,753,200	$2,325,976	$0.1289
1993	$18,284,683,170	$2,273,107	$0.1243
1994	$18,525,080,145	$2,232,991	$0.1205
1995	$18,765,477,120	$2,132,216	$0.1136
1996	$19,005,874,095	$1,926,066	$0.1013
1997	$19,246,271,070	$1,873,419	$0.0973
1998	$19,486,668,045	$1,824,813	$0.0936
1999	$19,727,065,020	$1,774,755	$0.0900
2000	$19,967,461,995	$1,726,046	$0.0864
2001	$20,200,924,517	$1,679,364	$0.0831
2002	$20,434,387,038	$1,212,587	$0.0593
2003	$20,667,849,560	$1,161,948	$0.0562
2004	$20,901,312,081	$1,111,213	$0.0532
2005	$21,134,774,603	$1,033,809	$0.0489
2006	$21,368,237,124	$1,010,447	$0.0473
2007	$21,601,699,646	$957,860	$0.0443
2008	$21,835,162,167	$905,032	$0.0414
2009	$22,068,624,689	$851,937	$0.0386
2010	$22,302,087,210	$653,400	$0.0293
2011	$22,535,549,732	$128,502	$0.0057
Totals		$28,795,488	$1.4632
Present Value Credit/$1,000 Market Value (3)			$1.26

Notes:

1. Market values estimated based on assessment at 40% of market value. Total 1992 assessed value for the City provided by Office of the Tax Commissioner, 6-22-92. Assessed value figures exclude exemptions. Future growth in assessed value in real terms estimated using average 1992 assessed value per daytime functional population and daytime functional population growth projections. Daytime functional population growth projections based on simple interpolation between 1992 and 2000, and between 2000 and 2010 (see *Table B-8*).

2. 24.2 percent of debt service, based on *Table 2-8* and preceding text; combined City, library and school debt service schedule provided by City of Atlanta Finance Department, September 25, 1992.

3. Present value calculations based on assumed inflation of 4% and assumed interest rate of 6%.

Average market values for various types of new development must be calculated in order to determine the appropriate property tax credits. Building permit data was analyzed to determine average per unit improvement costs. The analysis of nonresidential improvement costs showed no significant variation by service area. For single-family dwelling, estimates of total value were derived from home sales data. Taking into consideration higher land costs in the North service area, estimates of average property values for five general land use types were calculated, as summarized in *Table 2-10*.

Table 2-10
AVERAGE PROPERTY VALUES

Land Use Type	Unit of Development	Building Permit Value (1)	New Units (1) Permitted	Improvement Value/ Unit (2)	Total Value/Unit	
					North (3)	South (4)
Single-family	Dwelling unit	$28,221,031	283	$99,721	$183,324	$114,560
Multi-family	Dwelling unit	$26,055,605	462	$56,397	$94,014	$64,933
Office	1,000 sf	$89,896,084	1,009.801	$89,024	$148,403	$102,499
Commercial	1,000 sf	$49,198,905	624.910	$78,830	$131,243	$90,647
Industrial	1,000 sf	$36,453,384	656.225	$55,550	$92,602	$63,958

Notes:

1. 1991 building permit data for residential uses provided by City of Atlanta, Bureau of Buildings, January 1, 1992; nonresidential building permit square footage and total values based on projects valued at $500,000 and over for 1990, 1991 and first half of 1992, summarized in Atlanta Bureau of Planning, *Development '90, Development '91, Development Update, First Quarter 1992* and *Development Update, Second Quarter 1992*.

2. Total building permit value divided by total units.

3. Single-family figure represents average market value of 822 units sold in North service area (approximated using zip codes 30327, 30342, 30303, 30306, 30307, 30308, 30309, 30312, 30313, 30314, 30317, 30318, 30324 and 30326) during March and May 1991 and 1992, according data compiled by Dataman Information Services and reported in the July 12, 1992 and October 11, 1992 issues of *The Atlanta Journal/The Atlanta Constitution*. Figures for other land uses derived by assuming improvement value equals 60% of total value.

4. Single-family figure represents average market value of 330 units sold in South service area (approximated using zip codes 30310, 30311, 30315, 30316, 30331 and 30354) during March and May 1991 and 1992, according data compiled by Dataman Information Services and reported in the July 12, 1992 and October 11, 1992 issues of *The Atlanta Journal/The Atlanta Constitution*, multiplied by a factor of 1.5 to estimate new home value (as opposed to resale home value). Figures for other land uses derived by adding improvement value to 22.7% of land value for North service area (based on ratios of Northside to Southside/Westside land values reported in *Table 4-9*).

Property tax credits for transportation impact fees can be calculated by multiplying the credit per $1,000 of market value by the average market value per unit in each service area. As would be expected, property tax credits are higher in the North service area, due to higher property values, as shown in *Table 2-11*.

Table 2-11
TRANSPORTATION PROPERTY TAX CREDITS

Land Use Type	Unit of Development	Average Value		Credit/ $1,000	Credit/Unit	
		North	South		North	South
Single-family	Dwelling unit	$183,324	$114,560	$1.26	$231	$144
Multi-family	Dwelling unit	$94,014	$64,933	$1.26	$118	$82
Office	1,000 sf	$148,403	$102,499	$1.26	$187	$129
Commercial	1,000 sf	$131,243	$90,647	$1.26	$165	$114
Industrial	1,000 sf	$92,602	$63,958	$1.26	$117	$81

Source: see *Table 2-9* and *Table 2-10*.

TRAVEL DEMAND

The *Development Impact Fee Act* requires impact fees to be "reasonably related to the service demands" placed by new development on the local jurisdiction's capital facilities. The travel demand component of a road impact fee methodology provides the link between the type of development and the "amount" of transportation facility required to serve a new unit of development.

Units used to measure development vary depending on the type of land use. For residential uses, development is measured in dwelling units. For nonresidential uses, development is measured in several different ways, but most commonly in thousand square foot increments. Other units of measurement include hotel rooms and nursing home beds. The demand placed on the roadway system by a unit of development is expressed in vehicle-miles of travel (VMT) generated during the peak hour. Evening rush hour traffic is generally the most critical, so PM peak hour travel will be used in the analysis.

There are three important variables that determine the travel demand generated by a particular land use: trip generation rate (average number of PM peak hour vehicle trips generated per weekday), trip length (average length of a trip in miles on the arterial road network) and new trips factor (percent of travel miles that would not otherwise be on the system). Multiplying these variables together yields the total vehicle-miles of travel (VMT) placed on the major roadway system during the peak hour by a land use.

The schedule constraints of this project do not allow time to conduct local origin-and-destination surveys to determine local travel demand characteristics. In fact, few communities conduct such studies and most

road impact fee studies around the nation rely on secondary national or regional sources for trip rate, trip length and percent new trips data.

Trip Rates

Trip generation rates are expressed in terms of the number of trips generated per unit of development (e.g., 1,000 square feet of gross building area, dwelling unit, or other appropriate independent variable). The most commonly accepted source of trip generation estimates is the Institute of Transportation Engineers'(ITE) *Trip Generation* manual. The fifth edition of the manual, published in 1991, serves as the primary source of trip rate data used in this study.

As noted earlier, this study uses afternoon peak hour traffic as the critical period for Atlanta's roadway system. Consequently, the trip rates used are "Average Daily Vehicle Trip Ends on a Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 P.M."

The trip generation rates reported in the ITE manual represent total trip ends, or the total number of vehicles entering and leaving a site. A round-trip from home to a shopping center and back, therefore, is counted as two trip ends for the residential use and two trip ends for the shopping center. To avoid double-counting, the trip rate is divided by two, so that 50 percent of the trip is attributed to the origin and 50 percent the destination. The result is referred to as "one-way trips" to distinguish it from total trip ends.

The ITE manual includes variable trip rates for certain land use types, notably general office buildings and shopping centers. As the size of such land uses increases, the number of trips generated per 1,000 square feet of floor area decreases. Where a range of sizes is indicated in the ITE manual (e.g., general office or shopping centers), the trip rate corresponding to the largest size facility within the range has been used. Using this approach produces a fee that is somewhat low for developments that are smaller than the largest facilities included within the size range, but the relatively minor difference is offset by administrative efficiencies associated with this approach.

While the ITE manual contains trip generation data for a large number of very specific land use types, only a few general land use categories are recommended for inclusion in the impact fee schedule. Use of a few general categories will simplify administration of the impact fee ordinance by reducing the number of potential categories into which a particular land use may be classified. By avoiding undue specificity, the problem of future land use changes is also reduced. For example, a developer may claim an intention to establish a specific type of retail use with a low trip generation rate, while the site is later occupied by a high trip generation use. The application of a general retail rate applicable to all types of retail uses avoids this problem.

Residential uses are classified into two categories. The "single-family" category applies to detached single-family dwellings on fee-simple lots, while the "multi-family" category applies to all other dwelling unit types.

Most nonresidential uses are classified into three general categories. The "commercial" category includes shopping centers, as well as free-standing retail and service uses. The "office" category includes business, medical and government offices. The "industrial" category includes manufacturing, distribution and warehousing uses. Four more specific uses—hotel/motel, church, hospital and nursing home—are also included in the fee schedule. These nonresidential categories should be adequate for 95 percent of the land uses that are likely to be encountered. Applicants who feel that their proposed use is not related to any of these categories can undertake an optional independent fee calculation study.

For Atlanta, these rates should be locationally adjusted to reflect the proximity and availability of MARTA transit opportunities. It is recommended that transportation impact fees within the "core area" surrounding MARTA stations should be reduced to reflect increased transit usage.[1]

Percent New Trips

The new trips factor is the second variable used in estimating travel demand associated with different land use types. The new trips factor recognizes that some trips to a development do not introduce additional travel onto the roadway system, but rather are "pass by" trips going somewhere else on the adjacent roadway. Commercial establishments, such as shopping centers, attract a portion of their trips from traffic passing the site on the way from one location to another.

To take this phenomenon into account, the trip rates for commercial uses are reduced by a new trips factor. The new trips factor is based on the weekday PM peak hour passby rate for shopping centers reported in the ITE manual.[2]

Trip Length

Reliable estimates of average trip lengths to and from a development are the third critical element to be considered in measuring travel demand. As with trip generation rates, trip length estimates are necessary to establish a direct relationship between a project's impact and its fee assessment. After all, if two developments generate the same number of trips, but trips associated with one development are longer than those associated with the other, the development that places a greater demand on the road system should be charged a higher fee.

While ITE surveys provide a great deal of data on trip generation rates, reliable information on trip lengths is more difficult to obtain. Relatively few trip length studies have been conducted by

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[1] "Core area" defined as "anywhere from 1,000-2,000 feet across based on average walking distance" in *Atlanta Urban Framework Plan*, May 1973.

[2] Figure VII-1A: Shopping Center Pass-By Trips (Weekday, PM Peak Hour of Adjacent Street Traffic, Institute of Transportation Engineers, *Trip Generation*, 1991.

communities, largely because such studies are costly to prepare. As more communities prepare impact fee studies, however, more information on average trip lengths has become available in recent years.

In the absence of local data on trip lengths, this study uses as a starting point trip-length data based on studies in a number of Florida communities. The trip lengths derived from the Florida database were recently compared to the results of origin and destination studies conducted by Gwinnett County and found to be conservative, especially for retail uses. The local studies indicated average trip lengths ranging from 29 to 70 percent higher than the Florida averages for retail uses. Trip lengths for residential and office uses ranged from 6 to 25 percent higher than the Florida averages.

The trip length data used in Gwinnett County are not entirely consistent with the nature of this study. Not only is Gwinnett County a suburban area, but the trip length data used there are based on average daily trips, rather than peak hour trips, and they include travel on collector roads. For these reasons, they need to be calibrated against observed overall travel demand on Atlanta's arterials. Despite these shortcomings, however, the data should provide a reasonable measure of the proportional relationship between the trip lengths generated by different uses.

In order to calibrate the trip lengths, estimates of existing development in Atlanta had to be prepared. Estimates on the total number of dwelling units were available, but total nonresidential square footage had to be estimated by multiplying employment estimates by square foot per employee factors. The amount of development in each land use category was then multiplied by the travel demand factors calculated earlier and the Gwinnett County trip lengths to determine an "expected" total VMT on the arterial system (*Table 2-12*).

The result was that the total observed travel demand on the system was only 38 percent of the expected demand using the Gwinnett County trip lengths. It is likely that the "expected" travel demand is somewhat inflated by the square footage estimates, and also by the fact that it does not account for trip reduction in the vicinity of transit stations. For these reasons, the Gwinnett County trip lengths were adjusted by a 40 percent factor to approximate actual PM peak hour trip lengths on Atlanta's arterial system.

Table 2-12
EXPECTED AND OBSERVED TRAVEL DEMAND

Land Use	Unit	1-way PM PHT (1)	% New Trips (1)	Assumed Trip Length (2)	Expected VMT/Unit	1992 Units (3)	1992 Expected VMT
Single-family	Dwelling	0.51	100%	5.0	2.55	96,624	246,391
Multi-family	Dwelling	0.25	100%	5.0	1.25	92,461	115,580
Office	1,000 sf	0.80	100%	5.1	4.08	63,750	260,100
Commercial	1,000 sf	2.05	72%	2.4	3.54	48,373	171,240
Industrial	1,000 sf	0.43	100%	5.1	2.19	41,634	91,178
Total "Expected" 1992 VMT							884,489
Total Observed 1992 VMT (4)							336,099
Ratio Observed/Expected VMT							0.38

Notes:

1. Institute of Transportation Engineers, *Trip Generation*, 1991; office and commercial based on average of size categories for general office and shopping center; industrial based on average of light industry and warehousing; see *Table 2-13: Travel Demand by Land Use* for ITE codes and size categories.

2. James Duncan and Associates, *Gwinnett County Transportation Impact Fee Study*, August 1992; commercial trip length based on average of shopping center size categories.

3. Residential units based 1990 dwelling unit estimate of 187,235 from City of Atlanta, *1993 Comprehensive Development Plan*, p. 194; 51.1 percent single-family structure type based on City of Atlanta, Bureau of Planning, *Table 4C: Structure Type, April 1, 1990*, excluding census tracts 101.01, 102.01 and 103; 1992 units estimated using average annual population growth rate of 0.495 percent from 1990 to 2010 (see *Table B-5* and *Table B-7*). Nonresidential units based on linear interpolation of 1990 and 2000 employment estimates (see *Table B-5* and *Table B-6*) with the following modifications: office assumed 75 percent of "commercial" employment category, and commercial equals "retail" and 25 percent of "commercial" employment category; resulting employment estimates converted to square footage using following multipliers derived from ITE *Trip Generation* manual: office—304 sq. ft./employee, commercial—400 sq. ft./employee (assumed), industrial—562 sq. ft./employee.

4. See *Table 2-4*.

Travel Demand Summary

The recommended travel characteristics presented in this section are derived from the most reliable sources, surveys and studies available. Based on recommended trip rates, percent new trips and trip lengths, the estimated peak hour travel demand generated by a unit of development for a range of use types can be calculated. The estimated average daily vehicle-miles of travel generated by each land use during the peak hour is calculated by multiplying the three travel demand components.

The results of these calculations are shown in *Table 2-13*. It should be noted that the recommended travel demand characteristics may not be appropriate for all developments. Some land use types may not be readily associated with one of the land uses included in the impact fee schedule. Other developments may be unique in their travel demand impacts. Provisions allowing for individual assessments of travel demand will be included in the impact fee ordinance.

Table 2-13
TRAVEL DEMAND BY LAND USE

ITE Code	Land Use Type	Unit of Measurement	Daily Peak Hour Travel Demand			
			Trip Rate (1)	New Trips (1)	Trip Length (2)	Travel Miles
210	Single-family	dwelling	0.51	100%	2.0	1.02
220	Multi-family	dwelling	0.25	100%	2.0	0.50
310	Hotel/motel	room	0.30	100%	2.6	0.78
520	Elementary school	1,000 sf	0.14	100%	0.8	0.11
530	High school	1,000 sf	0.42	100%	1.6	0.67
560	Church	1,000 sf	0.36	100%	1.6	0.58
610	Hospital	1,000 sf	0.53	100%	2.6	1.38
620	Nursing home	1,000 sf	0.18	100%	1.1	0.20
710	Office <50,000 sf	1,000 sf	1.12	100%	2.0	2.24
710	Office <100,000 sf	1,000 sf	0.93	100%	2.0	1.86
710	Office <200,000 sf	1,000 sf	0.77	100%	2.0	1.54
710	Office <500,000 sf	1,000 sf	0.61	100%	2.0	1.22
710	Office 500,000 sf+	1,000 sf	0.51	100%	2.0	1.02
820	Commercial <100,000 sf	1,000 sf	3.28	55%	0.7	1.26
820	Commercial <200,000 sf	1,000 sf	2.55	65%	0.7	1.16
820	Commercial <300,000 sf	1,000 sf	2.20	69%	0.8	1.21
820	Commercial <400,000 sf	1,000 sf	1.98	72%	0.9	1.28
820	Commercial <500,000 sf	1,000 sf	1.83	74%	1.0	1.35
820	Commercial <600,000 sf	1,000 sf	1.71	76%	1.0	1.30
820	Commercial <1,000,000 sf	1,000 sf	1.48	79%	1.2	1.40
820	Commercial 1,000,000 sf+	1,000 sf	1.33	82%	1.4	1.53
110	Industry	1,000 sf	0.49	100%	2.0	0.98
150	Warehousing	1,000 sf	0.37	100%	2.0	0.74

Sources: (1) Institute of Transportation Engineers, *Trip Generation*, 5th edition, 1991; (2) 40 percent of trip lengths used in James Duncan and Associates, *Gwinnett County Transportation Impact Fee Study*, August 1992.

As estimated earlier, the transportation improvements included in the 15-year CIP would add slightly more than 102,000 new vehicle-miles of capacity to the major roadway system (see *Table 2-6*). This is consistent with estimates of new travel demand on Atlanta's major roadway system over the same period.

As shown in *Table 2-14*, projected population and employment growth over the 15-year period from 1992 to 2007, when translated into dwelling units and nonresidential square footage and applied to the travel demand factors, would generate an additional 73,000 peak hour vehicle-miles of travel on the major roadway system. To maintain the recommended VMT/VMC ratio of 0.75, it would be necessary to add almost 98,000 new vehicle-miles of capacity. There is thus a very close relationship between the capacity that would be added by planned improvements and the capacity needed to accommodate projected growth in travel over the next 15 years.

Table 2-14
PROJECTED TRAVEL DEMAND, 1992-2007

Land Use Type	Unit of Measurement	New Units 1992-2007	VMT/ Unit	VMT
Single-family	dwelling	7,167	1.02	7,310
Multi-family	dwelling	6,858	0.50	3,429
Office	1,000 sf	21,101	1.58	33,340
Commercial	1,000 sf	14,440	1.31	18,916
Industrial	1,000 sf	12,000	0.86	10,320
Total New Vehicle-Miles of Travel (VMT)				73,315
÷ Required Ratio of VMT to VMC				0.75
= Total Needed New Vehicle-Miles of Capacity (VMC)				97,753

Notes: New units 1992-2007 derived using methodology described in note 3 to *Table 2-12*; VMT/unit based on *Table 2-13*, using averages for office/commercial size categories and industry/warehouse.

FEE SCHEDULE

The transportation impact fees presented in *Table 2-15* represent the net cost to provide additional transportation facilities to accommodate new development at the recommended level of service (a system-wide VMT/VMC ratio of 0.80 at LOS D) in the North service area. The recommended fees for the South service area, shown in *Table 2-16*, represent a 50 percent discount of the full net cost to maintain the recommended level of service.

It is recommended that transportation impact fees within the "core area" around MARTA stations should be reduced to reflect increased transit usage and to be consistent with the City's policy of encouraging development in these areas. This policy could be implemented by reducing fees by 50 percent within 1,000 feet of a MARTA station.

The net unit cost is derived by calculating the local impact cost resulting from a unit of new development, and subtracting the revenue credit applicable to the development. The formula used to derive the transportation impact fees is shown in *Figure 2-3*.

Figure 2-3
TRANSPORTATION IMPACT FEE FORMULA

Net Impact Cost	=	**Local Impact Cost - Property Tax Credit**
Local Impact Cost	=	**Travel Demand x Local Impact Cost/VMT**
Travel Demand	=	**1-Way PM Peak Hour Trips x New Trips Factor x Trip Length**
Local Impact Cost/VMT	=	**Total Impact Cost/VMT x Local Cost Share**
Total Impact Cost/VMT	=	**Capital Cost/VMC ÷ VMT/VMC Ratio**
Property Tax Credit	=	**Property Tax Credit Rate x Market Value**

Where:

Travel Demand is the average vehicle-miles of travel (VMT) generated by a unit of development for various land uses during the peak hour of adjacent street traffic on a weekday (see *Table 2-13*).

Local Impact Cost/VMT is the local share of the capital cost required to accommodate an additional unit of travel at the adopted level of service; calculated to be $1,082 ($1,495 ÷ 0.80 x 0.579).

Capital Cost/VMC is the average capital cost to construct an additional vehicle-mile of capacity; it has been calculated to be $1,495 (see *Table 2-6*).

VMT/VMC Ratio is the adopted level of service, defined as the ratio of vehicle-miles of travel to vehicle-miles of capacity; recommended ratio to be adopted is 0.80 (see *Table 2-4* and following text).

Local Cost Share is the share of anticipated local funding to finance roadway system improvement in the 15-year CIP; calculated to be 57.9 percent (see *Table 2-7*).

Property Tax Credit is the present value of future property tax payments that will be generated by new development and used to retire outstanding general obligation bonds used to finance existing transportation system improvements (see *Table 2-11*).

Property Tax Credit Rate is the present value of future property tax payments per $1,000 of market value that will be used to retire outstanding general obligation bonds used to finance existing transportation system improvements; calculated to be $1.26 per $1,000 of market value (see *Table 2-9*).

Market Value is the average property value for each of five general land use types (see *Table 2-10*).

Table 2-15
TRANSPORTATION IMPACT FEE SCHEDULE
North Service Area

Land Use Type	Unit	Pk Hr VMT/ Unit	Cost/ Pk Hr VMT	Cost Per Unit	Prop Tax Credit	Net Cost/ Unit
Single-family	dwelling	1.02	$1,082	$1,104	$231	$873
Multi-family	dwelling	0.50	$1,082	$541	$118	$423
Hotel/motel	room	0.78	$1,082	$844	$118	$726
Elementary School	1,000 sf	0.11	$1,082	$119	$187	$0
High School	1,000 sf	0.67	$1,082	$725	$187	$538
Church	1,000 sf	0.58	$1,082	$628	$187	$441
Hospital	1,000 sf	1.38	$1,082	$1,493	$187	$1,306
Nursing home	1,000 sf	0.20	$1,082	$216	$187	$29
Office						
<50,000 sf	1,000 sf	2.24	$1,082	$2,424	$187	$2,237
<100,000 sf	1,000 sf	1.86	$1,082	$2,013	$187	$1,826
<200,000 sf	1,000 sf	1.54	$1,082	$1,666	$187	$1,479
<500,000 sf	1,000 sf	1.22	$1,082	$1,320	$187	$1,133
500,000 sf +	1,000 sf	1.02	$1,082	$1,104	$187	$917
Commercial						
<100,000 sf	1,000 sf	1.26	$1,082	$1,363	$165	$1,198
<200,000 sf	1,000 sf	1.16	$1,082	$1,255	$165	$1,090
<300,000 sf	1,000 sf	1.21	$1,082	$1,309	$165	$1,144
<400,000 sf	1,000 sf	1.28	$1,082	$1,385	$165	$1,220
<500,000 sf	1,000 sf	1.35	$1,082	$1,461	$165	$1,296
<600,000 sf	1,000 sf	1.30	$1,082	$1,407	$165	$1,242
<1,000,000 sf	1,000 sf	1.40	$1,082	$1,515	$165	$1,350
1,000,000 sf +	1,000 sf	1.53	$1,082	$1,655	$165	$1,490
Industrial						
Industry	1,000 sf	0.98	$1,082	$1,060	$117	$943
Warehousing	1,000 sf	0.74	$1,082	$801	$117	$684

Note: Impact fees reduced by 50 percent within 1,000 feet of a MARTA station.

Table 2-16
TRANSPORTATION IMPACT FEE SCHEDULE
South Service Area

Land Use Type	Unit	Pk Hr VMT/ Unit	Cost/ Pk Hr VMT	Cost Per Unit	Prop Tax Credit	Net Cost/ Unit	With 50% Discount
Single-family	dwelling	1.02	$1,082	$1,104	$144	$960	$480
Multi-family	dwelling	0.50	$1,082	$541	$82	$459	$230
Hotel/motel	room	0.78	$1,082	$844	$82	$762	$381
Elementary School	1,000 sf	0.11	$1,082	$119	$129	$0	$0
High School	1,000 sf	0.67	$1,082	$725	$129	$596	$298
Church	1,000 sf	0.58	$1,082	$628	$129	$499	$250
Hospital	1,000 sf	1.38	$1,082	$1,493	$129	$1,364	$682
Nursing home	1,000 sf	0.20	$1,082	$216	$129	$87	$44
Office							
<50,000 sf	1,000 sf	2.24	$1,082	$2,424	$129	$2,295	$1,148
<100,000 sf	1,000 sf	1.86	$1,082	$2,013	$129	$1,884	$942
<200,000 sf	1,000 sf	1.54	$1,082	$1,666	$129	$1,537	$769
<500,000 sf	1,000 sf	1.22	$1,082	$1,320	$129	$1,191	$596
500,000 sf +	1,000 sf	1.02	$1,082	$1,104	$129	$975	$488
Commercial							
<100,000 sf	1,000 sf	1.26	$1,082	$1,363	$114	$1,249	$625
<200,000 sf	1,000 sf	1.16	$1,082	$1,255	$114	$1,141	$571
<300,000 sf	1,000 sf	1.21	$1,082	$1,309	$114	$1,195	$598
<400,000 sf	1,000 sf	1.28	$1,082	$1,385	$114	$1,271	$636
<500,000 sf	1,000 sf	1.35	$1,082	$1,461	$114	$1,347	$674
<600,000 sf	1,000 sf	1.30	$1,082	$1,407	$114	$1,293	$647
<1,000,000 sf	1,000 sf	1.40	$1,082	$1,515	$114	$1,401	$701
1,000,000 sf +	1,000 sf	1.53	$1,082	$1,655	$114	$1,541	$771
Industrial							
Industry	1,000 sf	0.98	$1,082	$1,060	$81	$979	$490
Warehousing	1,000 sf	0.74	$1,082	$801	$81	$720	$360

Note: Impact fees reduced by 50 percent within 1,000 feet of a MARTA station.

CHAPTER 3
WATER AND WASTEWATER

Included in this Chapter are fees for water and wastewater facilities. In the City of Atlanta, wastewater services are administratively separated into water pollution control (water reclamation centers and lift stations) and sewer (wastewater collection lines). For purposes of this study, water pollution control and sewer will be collectively known as wastewater service facilities. The Chapter is organized around the following topics:

- Legal Considerations
- Service Areas
- Levels of Service
- Existing Facilities
- Capital Costs
- Revenue Credits
- Fee Administration
- Fee Schedule

LEGAL CONSIDERATIONS

The Georgia *Development Impact Fee Act* provides special treatment for development exactions for water and wastewater system improvements. Section 36-71-12 (c) of the *Act* states:

> "Nothing in this chapter shall limit a municipality, county, or other government entity which provides water or sewer service from collecting a proportionate share of the capital cost of water or sewer facilities by way of hook-up or connection fees as a condition of water or sewer service to new or existing users, provided that the development impact fee ordinance of a municipality or county or other government entity that collects development impact fees pursuant to this chapter shall include a provision for credit for such hook-up or connection fees collected by the municipality or county to the extent that such hook-up or connection fee is collected to pay for system improvements."

Under the *Act*, the City of Atlanta can decide whether new users, or existing users requiring additional service, shall pay the cost of water or wastewater system improvements in the form of a connection fee or a development impact fee. Since the state legislation does not specify the methods of calculating, collecting and spending connection fees, or the terms and conditions of ordinances relating to connection fees, their use offers more financial flexibility than development impact fees.

Flexibility in the calculation, collection and expenditure of connection fees is limited, however. The standards for water or wastewater connection fees are the same as for any rate calculation; the fee assessed must bear a reasonable relationship to the cost of services provided and must be spent for those facilities. Connection fees may be calculated to recover both system and project capital costs as well as other costs (labor, meter, access to water or wastewater line) associated with provision of service, but the fees must be cost-based. The requirement for cost-based utility charges stems from the Fourteenth Amendment of the Constitution of the United States, which prohibits arbitrary, capricious, unjust, unreasonable or discriminatory rates, fees and charges.[1]

On the other hand, unlike development impact fees for water or wastewater, a connection fee:

- need not be based on the Capital Improvements Element of the Comprehensive Plan;
- need not be based on an adopted level of service within a designated service area;
- may include system improvement costs, project improvement costs and other costs, such as labor and meters, in one fee;
- need not be calculated considering other available revenues, such as user rates and fees;
- may be collected from the potential user at any time as a prerequisite of service;
- may be assessed without meeting notice and hearing requirements relating to impact fees;
- is not limited to technical approaches set out in the *Act* or in state impact fee guidelines; and
- may be waived without meeting the requirement that alternative funds be found.

The reason for this special treatment for water and wastewater facilities may be long-term practice and the constitutional limitations on water and wastewater rates and fees. Nonetheless, regardless of whether the City chooses to enact water and wastewater connection fees or water and wastewater impact fees, the City may collect no more from developers than their proportionate share of capital costs.

Using developer financing for system improvements could change the existing system for financing system improvements through rates. At present, capital costs—both system and project improvement costs—are being recovered on a proportionate share basis, through rates established by the City. Existing

[1] But, see *City of Moultrie v. Burgess*, 212 Ga 22, at 24, Georgia, 1955, wherein the Georgia Supreme Court held that a city's provision of water service did not make that water service a public utility and the review of water rates by Georgia State courts would be subject only to the same review as for any other contract. Therefore, the prohibition against the taking of property without due process of law, which imposes the requirements for justness and reasonableness of rates, would not be applied to water or wastewater service.

customers of the water and wastewater system pay rates to retire debt for capital facilities needed to provide service in accordance with uniform (water pressure, water quality) service levels. New customers negotiate with City officials to determine what project facilities are needed to connect to the City water or wastewater system and what the cost of connection will be. Connection fees under the *Act* give the option of shifting system improvement costs to up-front charges and out of the rate structure.

Three issues that do arise in providing water or wastewater service to the area that can reasonably be served by a water treatment plant or water reclamation plant are: (1) timing of service availability; (2) extension of service outside city limits; and (3) fees for wholesale, as opposed to retail, customers.

Section 36-71-13 (c) of the *Act* makes it clear that the City can charge "a proportionate share of the capital cost of water or sewer facilities by way of hook-up or connection fees as a condition of water or sewer service . . . . ." Because the *Act* does not specify when service is to be provided, connection fees may be collected prior to the availability of water or wastewater service.

Nothing in the *Act* precludes the City from using connection fees for system improvements that cannot be built until several developers have paid their proportionate share of the costs of system improvements. If one developer wishes to begin a project ahead of others that might reasonably be served by the system improvements, there may be an incentive to enter into an agreement with the City for construction of system improvements and reimbursement by later developers.

The City is specifically authorized to collect water and wastewater fees from any person who desires water or wastewater service. There is no limitation on this right to collect a connection fee to persons inside the city limits, and the City may collect the fee from any potential customer. In fact, the *Act* clarifies the City's ability to collect water or wastewater connection fees outside the city, but leaves open the question of collection of impact fees outside the city, where the City has no authority to approve development.

Nothing in the *Act*, however, authorizes the collection of fees from the retail customers of a wholesale customer of the City, if the wholesale customer has already paid the costs associated with service to the retail customer. In some cases, the City may find it desirable to contract with wholesale customers who will be requiring additional service from the City.

If connection or impact fees are adopted, there will be much less incentive to require developers to make system improvements as a condition of connection, since the *Act* requires the City to credit the developer for the present value of any contributions to system improvements. However, there may be cases where it is more efficient to require a developer to install a system improvement, such as an oversized line.

While the *Act* does not specify how developer credit is to be managed, presumably the existence of a credit imposes a duty on the City to refund the credit in a reasonable manner. The City may either collect a fee from later developers using those system improvements to repay the developer who made the initial investment, or refund the cost of the system improvement from rate revenues. Developers may want to insist upon a schedule and method for repayment of the credits due from the connections, but the *Act* does not specify the terms of reimbursement. The City has broad discretion in handling credits and can consider the rate impact of various repayment alternatives. Even if the *Act* did not require credits

for developer contributions to system improvements, the constitutional prohibition against unjust, unreasonable and discriminatory charges mandates that the City charge no more than its actual cost of providing the service.

The absence of special procedural requirements provides additional flexibility in the use of connection fees. The City may enact connection fees by ordinance without notice and hearing beyond what is required for any fee, and with no relationship to the adoption of a comprehensive plan. More importantly, the City may collect connection fees at any time in the development process, including before the issuance of a building permit. And, finally, there are no requirements on the encumbrance of fees or the use of funds from fees within six years. The procedural flexibility authorized for connection fees support a decision to avoid impact fees for water and wastewater system improvements.

The City may collect a proportionate share of water and wastewater capital improvements from developers in the form of impact fees or connection fees. Both fees limit the City to charging developers a proportionate share, and both fees require credits for contributions to system improvements. The *Act* gives special consideration to connection fees, however, and provides greater discretion in enacting and administering such fees. In general, the broader discretion and the opportunities to negotiate for mutual benefits support the adoption of connection fees to finance water and wastewater system improvements.

For these reasons, this study will calculate *additional* charges to include in the City's existing water and wastewater connection fees. Thus, the total connection fee for each utility will include current tap or connection charges ("project"-related charges), plus an amount for the capital costs of "system" improvements associated with each new connection. Nevertheless, despite the less stringent legal requirements for connection fees, the consultant has generally approached the calculation of connection fees in a manner consistent with the *Act*.

SERVICE AREAS

The first task for water and wastewater connection fee development was to define current service areas. In contrast to other types of facilities, determining the service area for water and wastewater facilities is relatively straight-forward. *Figure 3-1* and *Figure 3-2* illustrate water and wastewater service areas, respectively. These service areas include all the area inside the present city limits.

In addition, the water utility serves both retail and wholesale customers outside the city limits. Retail service is provided to Fulton County south of the Chattahoochee River. Wholesale service is provided to seven surrounding jurisdictions: the cities of Fairburn, Union City, Hapeville and Forest Park; and the counties of Clayton, Fayette and northern Fulton. Wastewater treatment service outside the city is provided through interlocal agreements to serve portions of the cities of Decatur, College Park, East Point and Hapeville; and the counties of Gwinnett, DeKalb and Fulton.

Water and wastewater facilities are interconnected and readily perceived as serving a system-wide service area. The service area of each utility is considered in total. Because of system redundancy and various system interconnections, no service subareas were distinctly defined.

Figure 3-1
WATER SERVICE AREAS

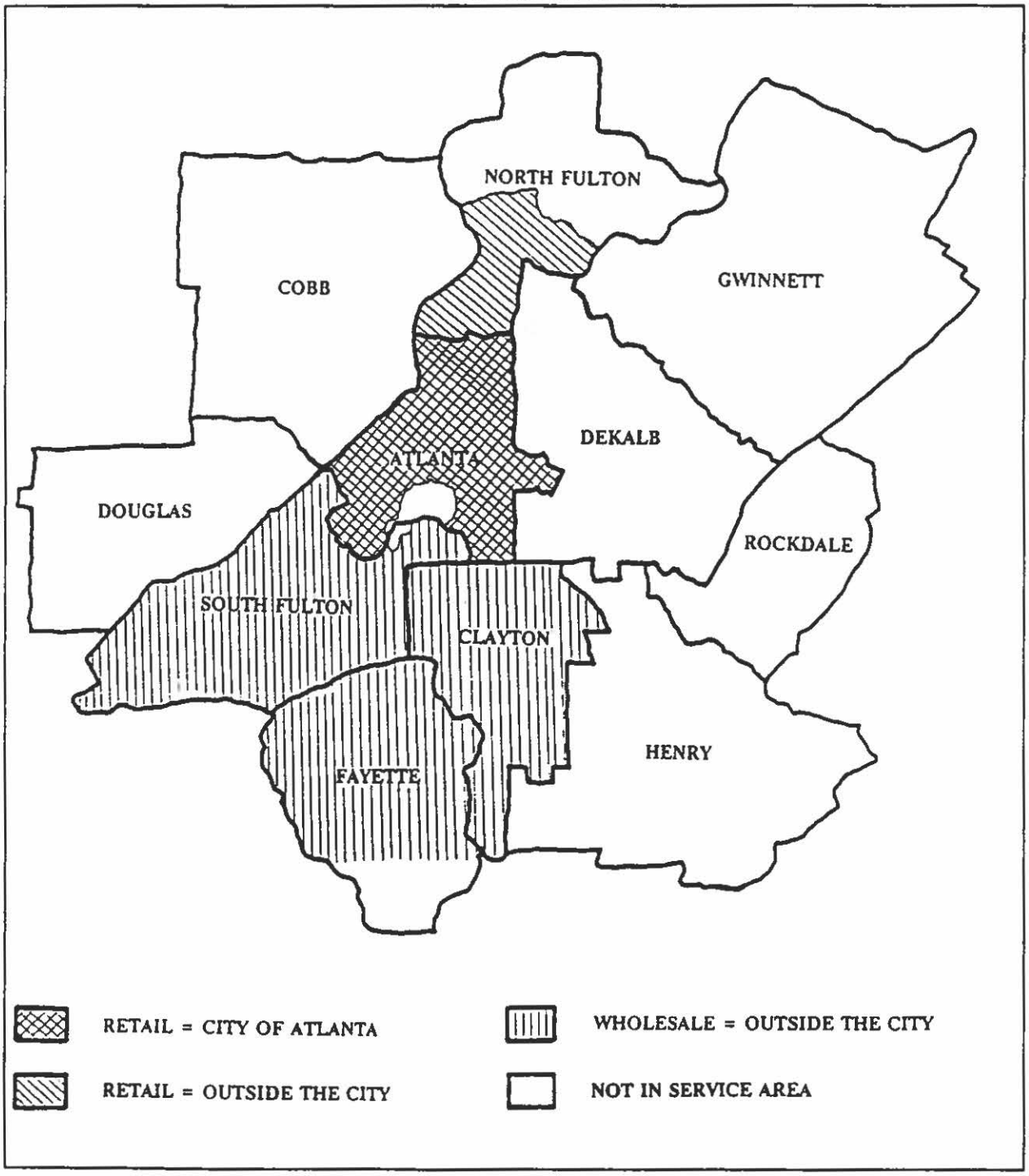
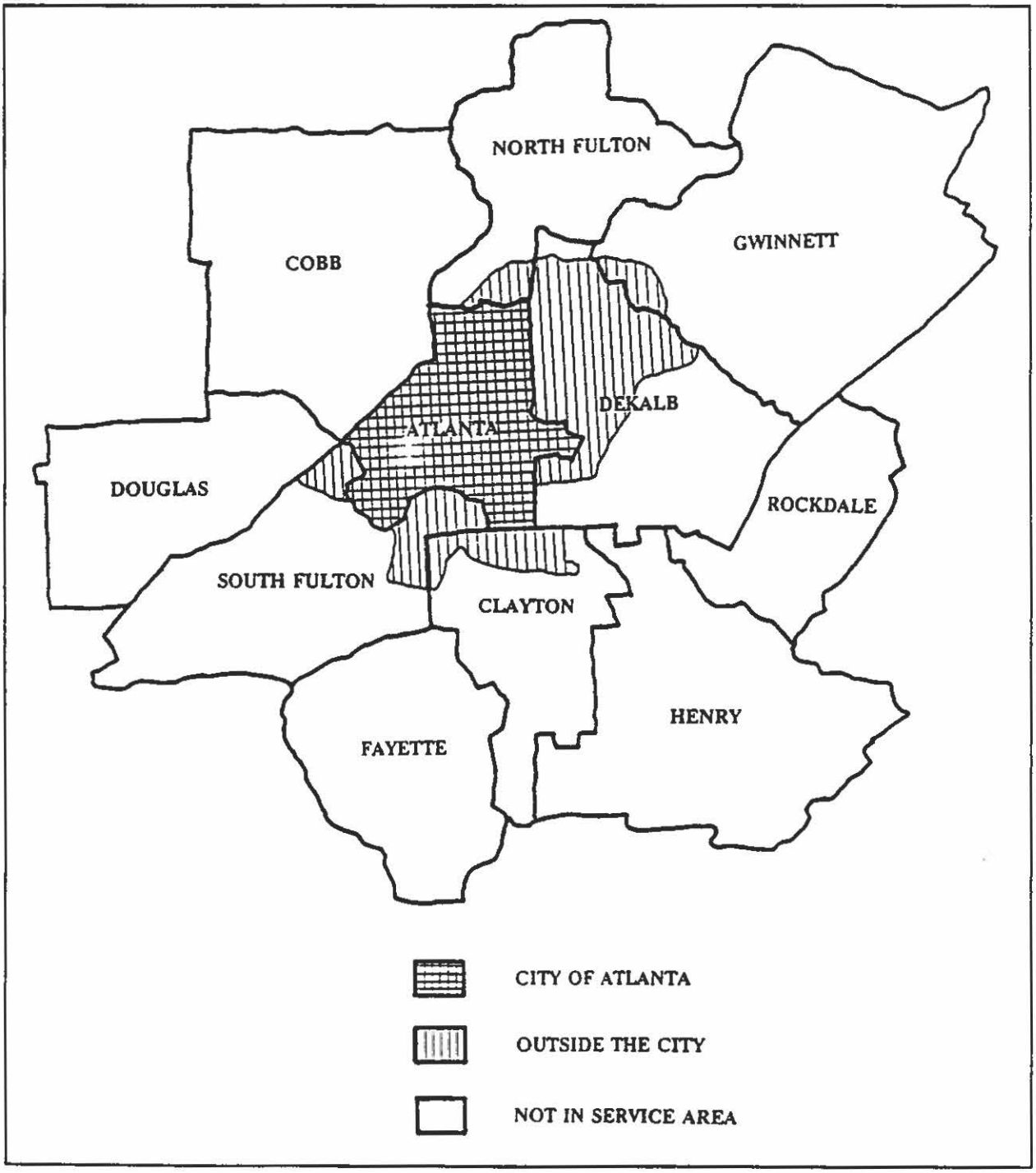


Figure 3-2
WASTEWATER SERVICE AREAS



LEVELS OF SERVICE

The level of service provided by water and wastewater facilities varies according to type of facility. Water supply is typically designed for average or peak day demand, water treatment is designed for peak day and transmission lines (including storage) are designed for a variety of purposes, including peak day or hour demand, system reliability and fire flow. Wastewater treatment and collection facilities are designed generally for peak day flow, while pumping facility capacities are determined by operational requirements. All demand, however, originates in average day statistics. Levels of service may be based either on engineering design criteria or current operational performance. This study uses existing service levels for each facility, which is a more conservative approach than using engineering design standards that typically result in higher fees per connection and are often unrealistic in depicting actual demand.

Service Demand

Recent service consumption information provided by City staff was converted into unit usage statistics to estimate service demand. *Tables 3-1 and 3-2* show water and wastewater data for the past five years.

Table 3-1
WATER PRODUCTION AND CONSUMPTION, 1987-1991

Description	1987	1988	1989	1990	1991
Water Production (mg)	42,949.80	40,920.04	40,501.78	41,631.03	39,299.97
Water Consumption (mg)	35,793.60	33,766.63	32,244.06	34,832.19	33,024.07
Retail	33,447.96	31,579.21	30,390.81	32,875.04	31,679.84
Wholesale	2,345.64	2,187.42	1,853.25	1,951.15	1,374.23

Source: City of Atlanta Staff, derived from Department of Water Quarterly Unaccounted for Water Reports.

Table 3-2
WASTEWATER VOLUMES AND CUSTOMERS

Description	FY 1990-91
Wastewater Volumes (mg)	52,925.0
Retail	34,492.5
Wholesale	18,432.5
Wastewater Retail Customers	134,017

Source: City of Atlanta Department of Public Works.

For the purposes of this study, water meter size was chosen to indicate the capacity required by both water and wastewater customers. Moreover, capacity in various sizes of water meters is expressed in living unit equivalents (LUEs). An LUE is a common denominator that converts all classes of customers into a common unit of expression.

An LUE is the potential flow through the smallest water meter used in the system (5/8"). The standard used for the ratio of the continuous duty maximum flow rate is derived from the American Water Works Association (*AWWA C700-C703*) in gallons per minute (gpm). The ratio of each larger meter's continuous duty maximum flow rate to the rate of the base meter determines the LUE multiplier applied to each larger size meter.

Table 3-3 shows the number of water meters, by size, currently in use in Atlanta. The table also contains a conversion factor to translate meters of various sizes into LUEs. (Normally, different conversion factors are used for simple, compound and turbine meters of the same diameter due to their different hydraulic capacities. However, since no local data was available on meter type, an average conversion factor was used for each of the larger meter sizes that have more than one type of mechanism available.) Finally, the table shows the calculated number of LUEs currently in the system.

Table 3-3
WATER CUSTOMERS AND LUE CONVERSIONS

Water Meter Size	Customers			LUE Factor	Living Unit Equivalents		
	Retail	Wholesale	Total		Retail	Wholesale	Total
5/8" X 3/4"	91,931	0	91,931	1.0	91,931	0	91,931
3/4"	29,602	0	29,602	1.5	44,403	0	44,403
1"	5,580	0	5,580	2.5	13,950	0	13,950
1-1/2"	2,599	0	2,599	5.0	12,995	0	12,995
2" Simple, Compound, Turbine	1,802	0	1,802	11.5	20,723	0	20,723
3" Compound, Turbine	596	0	596	20.0	11,920	0	11,920
4" Compound, Turbine	281	2	283	33.5	9,413	67	9,480
6" Compound, Turbine	1,529	16	1,545	50.0	76,450	800	77,250
8" Compound, Turbine	522	8	530	80.0	41,760	640	42,400
10" Compound, Turbine	14	5	19	115.0	1,610	575	2,185
12" Turbine	12	1	13	330.0	3,960	330	4,290
Total	134,468	32	134,500		329,115	2,412	331,527

Source: City of Atlanta, Listing of Meter Size Totals, October 12, 1992; LUE conversion factors derived from American Water Works Association, C700-C703.

Table 3-4 converts wastewater connection and flow information into an estimate of wastewater LUEs. It is assumed that inside the city there are the same number of wastewater LUEs per connection as there are water LUEs per connection. Based on this assumption, inside-city wastewater LUEs were estimated. For outside-city service areas, connection information was not readily available. Thus, the assumption was made that the same average number of gallons of wastewater were treated per outside-city LUE as per inside-city LUE. This is shown in the *Table 3-4* estimation of outside-city LUEs. Finally, inside-city and outside-city LUEs are summed for a total system LUE figure.

Table 3-4
WASTEWATER CUSTOMERS AND LUE CONVERSIONS

Description	Value
Inside-City Wastewater Customers	134,017
LUEs per Connection	2.45
Inside-City Wastewater LUEs	328,012
Wastewater Flow per LUE (gpd)	288.1
Total Outside-City Wastewater (mgd)	50.5
Estimated Outside-City Wastewater LUEs	175,286
Total Wastewater LUEs	503,298

Demand for Facilities

As explained above, capacity demand for each type of facility in each utility derives from different operational requirements. In order to develop a conservative and defensible fee, level of service statistics were developed for each facility type based upon recent actual experience, rather than upon design criteria that are typically higher than experience. *Table 3-5* shows demand by facility type for water; *Table 3-6* shows comparable information for wastewater facilities.

Table 3-5
WATER SERVICE DEMAND BY FUNCTION

Function (Unit of Measurement)	1991 Demand per LUE
Water Supply (peak gpd)	380
Water Treatment (peak gpd)	492
Water Pumping (peak gpd)	1,470
Raw Water Storage (gpd)	662
Finished Water Storage (gpd)	70

Source: Derived from *Tables 3-7* through *3-9*.

Table 3-6
WASTEWATER SERVICE DEMAND BY FUNCTION

Function (Unit of Measurement)	1991 Demand per LUE
Wastewater Treatment (peak gpd)	391
Wastewater Pumping (peak gpd)	107

Source: Derived from *Tables 3-10* and *3-11*.

EXISTING FACILITIES

Water Supply

The City has three water treatment complexes: Hemphill Water Treatment Plant, Chattahoochee Water Treatment Plant and the Atlanta-Fulton County Water Treatment Plant (which is jointly owned with Fulton County). Associated with these complexes are raw water intake structures from the Chattahoochee River, raw water storage, underground storage facilities, clearwells, ground storage, elevated storage, high service pumps, re-pump stations, booster pumps and major transmission lines.

For the purposes of this study, major transmission lines are defined as those 16-inches in diameter or greater. Lines smaller than 16 inches are "project"-related and not included. (The City may require developers to contribute such project-related lines.) The cost of water meters and related service lines are already included in connection fees as project-related costs, and are not addressed in this study.

Tables 3-7 through *3-9* show the capacity for each existing water facility and the estimated capacity needed to serve the current customer demands from each facility or group of facilities. Excess capacity is then shown as the subtraction of current demand from total capacity. Replacement costs were estimated for each facility. Costs were then summed for the growth-related portion of existing facilities based on the percentage of existing capacity available for new growth.

Special attention must be given water transmission lines. The amount of total capacity in the transmission system is unknowable without a large-scale engineering study, including extensive water modelling. For that reason, it was necessary to make assumptions about the capacity of the transmission system. Transmission lines are designed in consideration of expected demand (often based upon population or population equivalents) over a 20 to 50 year planning horizon. *Tables 3-7* through *3-8* make the conservative assumption that the transmission system is adequate to serve an Atlanta population with a citywide density of six persons per acre—or about twice the current density.

Given that Atlanta is substantially developed, and that city population projections do not come close to a doubling of population in the near future, this assumption is likely to be quite conservative (i.e., it results in a comparatively low fee). Moreover, line costs in other cities tend to range from a few hundred

dollars to about $1,500. The $265 cost shown for water transmission lines in this study is based upon very conservative planning principles and likely to be less than the full cost of service.

Table 3-7
EXISTING WATER SUPPLY, TREATMENT AND PUMPING FACILITIES

Facility	Total Cost (a)	Capacity (peak mgd) (b)			Customer Costs		Cost per LUE
		Total	Current	Excess	Current	Future	
Raw Water Intake at Chattahoochee	$12,000,000	180.000	115.000	65.000	$7,666,667	$4,333,333	
Raw Water Intake at AFC	$3,750,000	23.000	11.000	12.000	$1,793,478	$1,956,522	
Subtotal Water Supply	$15,750,000	203.000	126.000	77.000	$9,460,145	$6,289,855	$31.05
Hemphill Water Treatment Plant	$210,513,333	136.500	95.000	41.500	$146,511,111	$64,002,222	
Chattahoochee WTP	$100,244,444	65.000	57.000	8.000	$87,906,667	$12,337,778	
Atlanta-Fulton County WTP	$34,700,000	22.500	11.000	11.500	$16,964,444	$17,735,556	
Subtotal Water Treatment	$345,457,778	224.000	163.000	61.000	$251,382,222	$94,075,556	$758.25
Chattahoochee PS - Raw Water	$33,000,000	220.000	132.000	88.000	$19,800,000	$13,200,000	
Chattahoochee PS - Finished Water	$19,100,000	65.000	57.000	8.000	$16,749,231	$2,350,769	
Hemphill Pump Station	$30,000,000	140.000	91.219	48.781	$19,546,929	$10,453,071	
Atlanta-Fulton County - Raw Water	$6,750,000	45.000	11.000	34.000	$1,650,000	$5,100,000	
AFC - Finished Water	$6,330,000	42.200	11.000	31.200	$1,650,000	$4,680,000	
Adamsville Zone Re-Pump Station	$6,750,000	45.000	37.341	7.659	$5,601,112	$1,148,888	
Jett Ferry Zone Re-Pump Station	$1,410,000	9.400	7.800	1.600	$1,170,010	$239,990	
Northside Zone Re-Pump Station	$6,000,000	40.000	33.192	6.808	$4,978,766	$1,021,234	
Peachtree-Dunwoody Rd Re-Pump	$255,000	1.700	1.411	0.289	$211,598	$43,402	
Sandy Springs Zone Re-Pump	$285,000	1.900	1.577	0.323	$236,491	$48,509	
Dupree Drive Zone Re-Pump	$645,000	4.300	3.568	0.732	$535,217	$109,783	
Glenridge Drive Booster Pump	$2,250,000	15.000	12.447	2.553	$1,867,037	$382,963	
Roswell Road Booster Pump	$604,800	4.032	3.346	0.686	$501,860	$102,940	
Mt. Paran Road Booster Pump	$648,000	4.320	3.585	0.735	$537,707	$110,293	
Dilbeck Place Booster Pump	$216,000	1.440	1.195	0.245	$179,236	$36,764	
West Wieuca Road Booster Pump	$151,200	1.008	0.836	0.172	$125,465	$25,735	
Welcome All Road Booster Pump	$750,000	5.000	4.149	0.851	$622,346	$127,654	
Hartsfield Booster Pump Station	$2,700,000	18.000	14.936	3.064	$2,240,445	$459,555	
Peachtree Booster Pump Station	$9,000,000	60.000	49.788	10.212	$7,468,149	$1,531,851	
Long Island Creek Booster Pump	$1,792,800	11.952	9.918	2.034	$1,487,655	$305,145	
Subtotal Water Pumping	$128,637,800	735.252	487.306	247.946	$87,159,254	$41,478,546	$245.89

Sources: (a) Williams-Russell & Johnson; (b) total and current capacities provided by Water Bureau staff; pumping capacities from *Water Distribution System Hydraulic Study*, 1985; and *Atlanta Water System Lead/Copper Pipe Monitoring Program*, 1992; pump demand estimated by Water Bureau staff and *Water Distribution System Hydraulic Study*.

Table 3-8
EXISTING WATER STORAGE FACILITIES

Facility	Total Cost (a)	Capacity (mgd) (b)			Customer Costs		Cost per LUE
		Total	Current	Excess	Current	Future	
Hemphill Raw Water Reservoir	$14,000,000	457.000	196.552	260.448	$6,021,278	$7,978,722	
Atlanta-Fulton County Raw Water	$6,000,000	193.000	22.759	170.241	$707,522	$5,292,478	
Subtotal Raw Water Storage	$20,000,000	650.000	219.310	430.690	$6,728,800	$13,271,200	$20.38
Hemphill Clearwell Storage	$9,000,000	25.000	7.420	17.580	$2,671,060	$6,328,940	
Chattahoochee Clearwell Storage	$2,160,000	6.000	1.781	4.219	$641,054	$1,518,946	
Atlanta-Fulton County Clearwell	$3,168,000	5.500	1.632	3.868	$940,213	$2,227,787	
Northside Storage	$3,600,000	10.000	2.968	7.032	$1,068,424	$2,531,576	
Adamsville Ground Storage 1 & 2	$3,600,000	10.000	2.968	7.032	$1,068,424	$2,531,576	
Dupree Drive Ground Storage	$1,080,000	3.000	0.890	2.110	$320,527	$759,473	
Hartsfield Underground Storage	$600,000	10.000	2.968	7.032	$178,071	$421,929	
Stonewall Tell Road Elevated	$540,000	1.500	0.445	1.055	$160,264	$379,736	
Sandy Springs Elevated Storage	$180,000	0.500	0.148	0.352	$53,421	$126,579	
Pitts Road Elevated Storage 1	$720,000	2.000	0.594	1.406	$213,685	$506,315	
Pitts Road Elevated Storage 2	$360,000	1.000	0.297	0.703	$106,842	$253,158	
Jett Ferry Elevated Storage 1	$180,000	0.500	0.148	0.352	$53,421	$126,579	
Jett Ferry Elevated Storage 2	$180,000	0.500	0.148	0.352	$53,421	$126,579	
Pitts Road Standpipe	$900,000	2.500	0.742	1.758	$267,106	$632,894	
Subtotal Finished Water Storage	$26,268,000	78.000	23.149	54.851	$7,795,933	$18,472,067	$23.52

Sources: (a) Williams-Russell & Johnson replacement cost estimates; (b) total capacities provided by Water Bureau staff; current demand for raw water storage equal to three-day average use; finished water capacities provided by Water Bureau staff and taken from *Water Distribution System Hydraulic Study*, 1985; and *Atlanta Water System Lead/Copper Pipe Monitoring Program*, 1992; current demand extrapolated from *Water Distribution System Hydraulic Study*.

Table 3-9
EXISTING WATER TRANSMISSION FACILITIES

Facility	Total Cost (a)	Capacity (Linear Feet) (b)			Customer Costs		Cost per LUE
		Total	Current	Excess	Current	Future	
16" Cast Iron Pipe	$58,475,340	649,726	[System-wide basis for capacities, costs]				
20" Cast Iron Pipe	$21,896,595	208,539					
24" Cast Iron Pipe	$30,655,680	255,464					
30" Cast Iron Pipe	$15,750,240	110,528					
36" Cast Iron Pipe	$15,849,240	96,056					
42" Cast Iron Pipe	$123,188	657					
48" Cast Iron Pipe	$5,063,730	24,113					
60" Cast Iron Pipe	$284,070	1,114					
16" Steel Pipe	$28,861	589					
20" Steel Pipe	$1,125,960	17,060					
24" Steel Pipe	$1,793,330	23,290					
30" Steel Pipe	$3,398,006	36,149					
36" Steel Pipe	$882,006	7,946					
42" Steel Pipe	$528,768	4,131					
48" Steel Pipe	$1,569,190	10,822					
54" Steel Pipe	$68,364	422					
60" Steel Pipe	$390,578	2,182					
72" Steel Pipe	$5,275,371	24,767					
78" Steel Pipe	$25,530	111					
30" Concrete Pipe	$757,785	15,465					
42" Concrete Pipe	$2,286,418	28,942					
78" Concrete Pipe	$115,928	533					
Subtotal Major Water Transmission	$166,344,177	1,518,606	801,717	716,889	$87,817,976	$78,526,201	$264.89

Sources: (a) Williams-Russell & Johnson; (b) pipe lengths from City of Atlanta, *Atlanta Water System Lead/Copper Pipe Monitoring Program*, 1992.

Wastewater Treatment System

The City has four wastewater treatment facilities: R. M. Clayton, South River, Utoy Creek and Intrenchment Creek. Associated with these are a number of lift and pump stations, major wastewater collection lines and combined sewer lines. Sewer lines less than 12 inches in diameter and localized lift stations were considered "project"-related facilities and not included in the inventory. However, as with the water utility, the City may require developers to contribute such facilities as project facilities. Tap related costs are already calculated and enacted as connection fees by ordinance and are not included here.

Table 3-10
EXISTING WASTEWATER TREATMENT AND PUMPING FACILITIES

Facility	Total Cost (a)	Capacity (peak mgd) (b)			Customer Costs		Cost per LUE
		Total	Current	Excess	Current	Future	
Utoy Water Reclamation Center	$36,600,000	36.000	31.000	5.000	$31,516,667	$5,083,333	
R. M. Clayton WRC	$33,500,000	85.000	85.000	0.000	$33,500,000	$0	
Intrenchment Creek WRC	$14,200,000	28.000	15.000	13.000	$7,607,143	$6,592,857	
South River WRC	$19,720,000	65.800	65.800	0.000	$19,720,000	$0	
Phosphorus Reduction (Proposed)	$167,722,779	214.800	196.800	18.000	$153,667,798	$14,054,981	
Subtotal Wastewater Treatment	$271,742,779	214.800	196.800	18.000	$246,011,608	$25,731,171	$558.97
CSO Tunnel, Bldgs, Pumps, Equip	$38,000,000	20.000	13.000	7.000	$24,700,000	$13,300,000	
Bolton Road Station	$1,460,000	48.000	10.200	37.800	$310,250	$1,149,750	
Phillip Lee Station	$1,850,000	65.000	24.000	41.000	$683,077	$1,166,923	
Niskey Lake Station #1	$324,000	2.160	0.054	2.106	$8,100	$315,900	
Niskey Lake Station #2	$324,000	2.160	0.095	2.066	$14,175	$309,825	
South River Ind. Station	$86,400	0.576	0.020	0.556	$3,000	$83,400	
Rebel Forest Station	$367,200	2.448	0.260	2.188	$39,015	$328,185	
Paul Avenue Station	$43,200	0.288	0.024	0.264	$3,630	$39,570	
Hanover West Station	$86,400	0.576	0.177	0.399	$26,550	$59,850	
Woodward Way Station	$86,400	0.576	0.120	0.456	$18,000	$68,400	
Rivermead Station	$64,800	0.432	0.037	0.395	$5,520	$59,280	
Cascade Road Station	$36,600	0.244	0.012	0.232	$1,815	$34,785	
Flint River Station	$1,050,000	7.000	6.000	1.000	$900,000	$150,000	
Subtotal Wastewater Lift Stations	$43,779,000	149.460	53.999	95.461	$26,713,132	$17,065,868	$19.18

Sources: (a) Williams-Russell & Johnson; (b) total and current capacities by Water Pollution Control staff; phosphorus reduction assumed for all plant facilities.

Table 3-11
EXISTING MAJOR WASTEWATER COLLECTOR FACILITIES

Facility	Total Cost (a)	Capacity (LUEs)			Customer Costs		Cost per LUE
		Total	Current	Excess	Current	Future	
Peachtree Creek Trunk Relief	$1,572,112						
Buckhead Sewer Relief	$8,584						
Clear Creek Open Channel	$1,339,064						
Collier Road Outfall	$60,086						
William Place N.W. Outfall	$98,713						
Sandy Creek Improvements	$50,884,419						
Ferrell Creek Relief	$617,171						
Howell Mill Road Outfall	$94,421						
Peachtree Creek Trunk	$662,193						
Fourth Street Relief	$154,507						
Sixth Street Relief	$41,202						
Highland Trunk Relief	$1,126,616						
East Avenue Relief	$90,129						
Highland Sewer E. Branch	$198,284						
Lopenhill Sewer	$149,357						
Glendale - Foote Outfall	$44,743						
Blvd. Drive Outfall Relief	$66,747						
Sugar Creek Trunk	$631,497	[System-wide basis for capacities, costs]					
Eastlake Outfall	$52,575						
Kirkwood-Oakhurst	$149,640						
Irwin Street Relief	$413,307						
Old Wheat Street Relief	$66,953						
South Boulevard Trunk	$2,948,515						
Glenwood Avenue Trunk	$234,336						
Grant Park Relief	$772,537						
Lloyd Street Trunk	$1,836,921						
Windsor Richardson	$214,594						
Sawtell-Alexander	$429,187						
Joe Allen Trunk	$643,781						
Boynton Street Relief	$225,323						
Gordon-White Relief	$100,430						
Montreat Avenue Outfall	$46,352						
Beecher-Gasten Relief	$104,035						
White Street Relief	$463,522						
Confederate Avenue Open Channel	$669,532						

Table 3-11
EXISTING MAJOR WASTEWATER COLLECTOR FACILITIES

Facility	Total Cost (a)	Capacity (LUEs)			Customer Costs		Cost per LUE
		Total	Current	Excess	Current	Future	
Milton Avenue Relief Main	$77,254						
McDaniel Open Channel	$2,094,433						
Tenth Ward Relief Main	$429,187						
South River Relief Main	$1,030,049						
Hapeville Outfall	$482,458						
Jonesboro Road Relief Main	$909,314						
Plunket Town Improvement	$450,646						
Bellwood Sewer	$429,187						
Procter Creek Open Channel	$2,711,389						
Harlon-Tee Outfall	$214,594						
Treadwell Circle Outfall	$61,803		[System-wide basis for capacities, costs]				
Boulder Park Drive Outfall	$82,404						
Willis Mill Outfall	$54,078						
Cativo Drive Outfall	$81,116						
County Line Road Outfall	$191,954						
Niskey Lake Outfall	$179,829						
W. Kimberly Road Outfall	$537,342						
Rex Avenue Outfall	$20,601						
Daniel Road-Blanton Ave. Outfall	$198,284						
Shoreland-Pinella Outfall	$84,121						
Combined Sewer System	$3,073,463						
Subtotal Major Collection Lines	$80,680,001	953,344	503,298	450,046	$42,593,341	$38,086,659	$84.63

Sources: (a) Williams-Russell & Johnson.

Table 3-11 data represents only a portion of all major collection lines. Costs are conservative due to lack of available data. Combined sewer costs are included, as they pertain to sanitary sewer costs. According to the City, combined sewers devote only one percent of their capacity to sanitary sewer and 99 percent to stormwater flow. Capacity assumptions similar to water were made resulting in a conservative assumption that the existing system will collect about twice as much flow as it does now.

CAPITAL COSTS

Once the demand per LUE was known, it was necessary to determine the cost of the various capacities of each type of facility needed to provide one LUE of service for each utility. Original cost information was generally not available and insured cost information was incomplete. Thus, replacement costs for each facility were calculated by the consultant. The methodology used in this study for determining the cost of each new LUE of water and wastewater service is a weighted average cost of the excess capacity in existing facilities.

As a final cost calculation, *Tables 3-7* through *3-11* sum the costs of excess capacity in existing facilities for a total cost of major growth-related facilities. The total cost is then divided by the total number of new LUEs that could be served by the excess capacity to yield a cost per growth LUE for each type of facility. These results are summarized in *Table 3-12*.

Table 3-12
WATER AND WASTEWATER SYSTEM COMPONENT COSTS

System Component	Cost Per LUE
Water Supply	$31.05
Water Treatment	$758.25
Water Pumping Stations	$245.89
Raw Water Storage	$20.38
Finished Water Storage	$23.52
Major Water Transmission Lines	$264.89
Water System Subtotal	$1,343.98
Wastewater Treatment	$558.97
Wastewater Lift Stations	$19.18
Major Wastewater Collection Lines	$84.63
Wastewater System Subtotal	$662.78
Water and Wastewater System Total	$2,006.76

REVENUE CREDITS

Although there is no statutory requirement for revenue credits to connection fees, the City could nevertheless be subject to a constitutional challenge if such credits were not provided. Since the water and wastewater utilities are enterprise funds, the offsets required are for debt service payments in water and wastewater rates. These are in the form of existing debt service that will be paid by feepayers as well as existing customers; and in the form of future capital costs for existing customers, which may either be in the form of future debt service or future funding from current [i.e., rate] revenues.

Equity Residual Approach

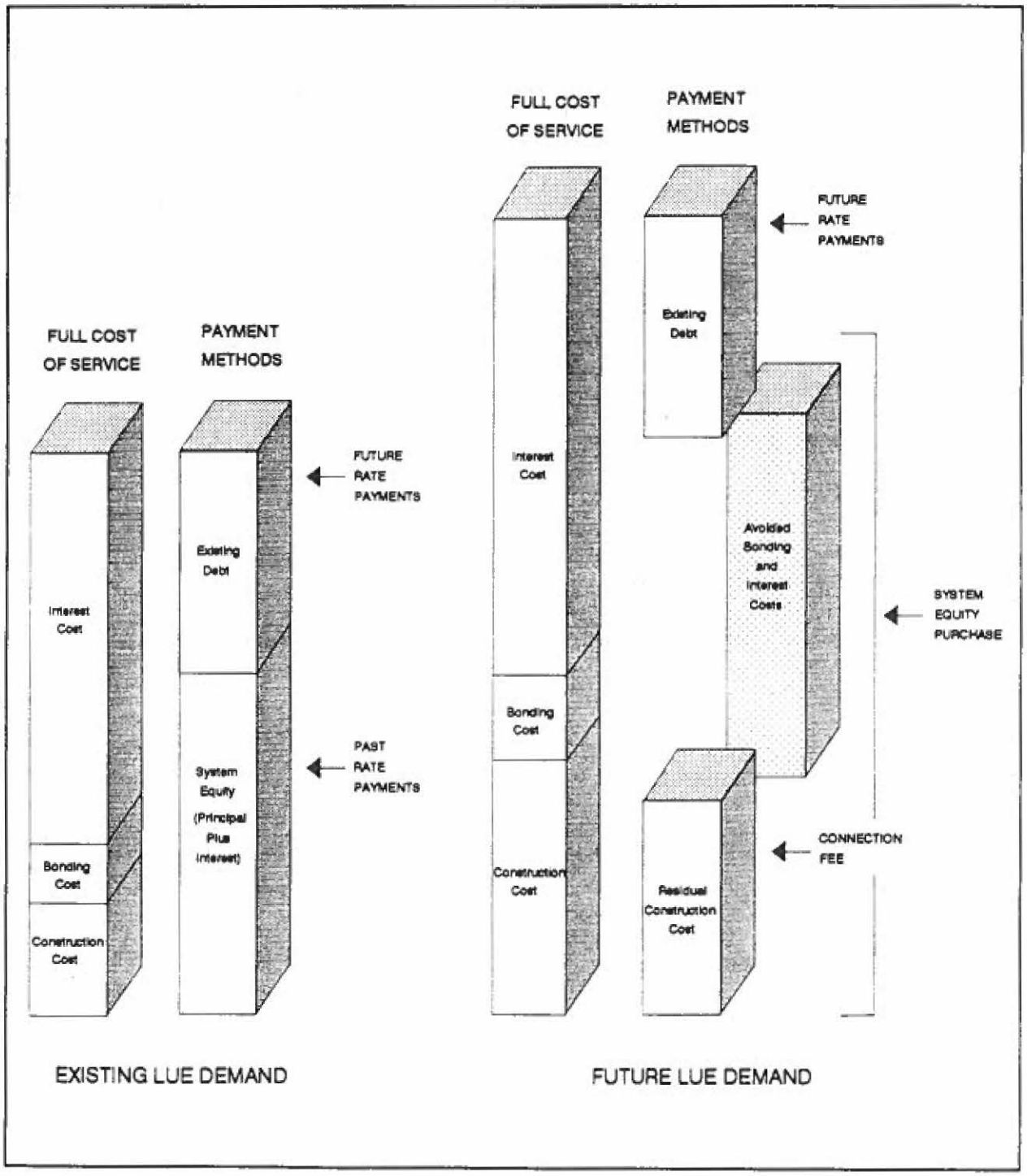
Connection fee credits are not subject to the *Georgia Development Impact Fee Act* or to Georgia Department of Community Affairs guidelines for credit calculation. Thus, this study will use an approach used in other jurisdictions for calculating utility revenue credits. This approach is called the "Equity Residual" approach to fee calculation. This methodology provides that each new customer contributes "equity" in the utility systems comparable to that owned by other existing customers. Once that equity payment is made through the connection fee, each new customer would pay the remainder of his or her capital-related cost of service through rate payments equal to the rate payments of existing customers. This minimizes cross-subsidization (one customer group paying for the costs of another) and provides for full cost recovery for the utilities.

The Equity Residual methodology (*Figure 3-3*) recognizes and utilizes the concept that all customers pay part or all of the cost of service through public-sector financing by virtue of the fact that they pay rates to retire debt service. The central tenet of the Equity Residual approach is that future utility customers will partially pay for their own costs of service through rate payments in an amount about equal to the remaining debt service payback for existing customers. The remainder of their costs of service, or the "residual" amount, will be subject to payment through a connection fee.

Future customers, therefore, will be permitted to pay a portion of their costs of service through rates, similar to existing customers. However, existing customers will not, in the long-term, bear the cost of facilities for future customers. The Equity Residual approach allows future customers to pay their costs of service partially through the public sector (with rate payments equal to existing customers) and partially through the private sector (a connection fee). The following discussion details this approach.

Components of Utility Capital Cost of Service. For purposes of this study, costs are defined for a common measurement of capacity and demand; that service unit of measurement is "living unit equivalent" or LUE. Each service unit has a capital cost associated with the comprehensive group of facilities required to provide service (treatment, transmission, pumpage, storage, etc.). This value is the construction cost of service (see *Figure 3-3*). If a facility is funded through bonding, however, four additional costs are incurred for each service unit of demand: bonding, interest, reserve requirements and times coverage costs.

Figure 3-3
EQUITY RESIDUAL MODEL



Bonding costs for bond issues are statistically small—in the neighborhood of three to ten percent. On the other hand, interest costs can effectively double or triple costs, depending on the current interest rate and term of the bonds. While reserve requirements must be met, these funds are eventually expended on debt service retirement and are ultimately not an additional cost of service. Times coverage provides revenues beyond debt service requirements and thus provides funds to the utility for capital expenditures, or perhaps other uses. However, times coverage does not add to the capital cost of services and therefore, is not included as a cost of service element in the Equity Residual model.

System Equity and Remaining Indebtedness for Existing LUE Demand. On the left side of *Figure 3-3* is a representation of the cost of service for each unit of existing demand and the method for paying those costs. (Prior to the adoption of connection fees, construction costs were fully bonded and thus subjected to bonding and interest costs.) Assuming that existing customers paid only connection costs and not capital costs at the time of connection, existing customers have been permitted to pay their full cost of service through rates. That approach is indicated in the second bar for existing service demand. The second left-hand bar is in two segments: system equity and remaining indebtedness. Existing customers, on the date a connection fee is adopted, will have theoretically paid some portion of their full cost of service through past rate payments. This equity is shown on the bottom of the second bar. Existing customers also have a corresponding amount of remaining indebtedness to be paid through future rate payments as shown on the top of the bar. These two payment components—equity and remaining indebtedness—describe the total payment of each customer's full cost of service for existing unit demand.

Calculation of Cost of Service for Future Service Unit Demand. On the right side of *Figure 3-3* is a depiction of the cost of service for future LUE demand. The cost of service for future customers will be higher than that for existing customers due to inflation and possibly due to technological and regulatory changes. If these new facilities are bonded, they will have not only construction-related costs, but also bonding and interest costs (similar to those for existing customers). These latter costs also will be higher than comparable costs for existing customers because bonding and interest costs are directly proportional to the higher new construction costs.

Equity Residual and Equity Contribution for Future LUE Demand. A key concept in the Equity Residual methodology is that rate payments of future customers are dedicated to retirement of debt for facilities for future needs, while rate payments of existing customers are used to pay for facilities for existing needs. Application of this concept has two primary results: (1) Cross-subsidization between existing and future customers is minimized; and (2) Future customers enter the utility systems on an equal basis with existing customers.

This approach is effected by purposefully setting the total payback indebtedness of future customers to the same amount as the total payback for existing customers. Thus, in *Figure 3-3*, the remaining indebtedness for each service unit of existing demand is the same as for each service unit of future demand. In order to accomplish this equalization, however, future customers will have to submit a "system equity" payment to contribute their remaining cost of service and to put them on a par status with existing customers (see discussion below). The second bar in the right-hand diagram of *Figure 3-3* shows the payment methods for future customers. At the top of the bar is indebtedness equal to that of existing customers. This indebtedness includes construction and bonding costs (both principal payments) and interest payments.

Below the indebtedness payback are shown the components of the remaining Cost of Service, or the portion that must be paid to achieve fairness through the rate structure. This portion of the Cost of Service has been designated "System Equity," in the same manner as past debt payments by existing customers and includes construction cost, bonding cost and interest cost. If the construction costs in the System Equity portion of the cost of service were to be paid in cash, corresponding bonding and interest costs would be avoided. Any construction costs remaining after cash contributions are deducted from these costs, the "residual," would be the actual payment required of new customers. The residual cost is included in the connection fee.

In sum, the Equity Residual approach to funding improvements will result in a payment for cost of service for future service demand that has the following characteristics:

- A portion of the cost of service will be paid through rates; the total payback on this portion of the cost of service will equal that for total capital indebtedness for existing customers reflected in the rate structure;
- New customers will contribute equity status in the utility system by paying the remaining, unbonded portion of construction costs ("residual") through a connection fee;
- Bonding and interest costs associated with residual construction costs will be avoided.
- This approach will result in full cost recovery for growth from payments made by future customers.

Debt Service Credits

Table 3-13 contains calculations of rate credits for existing debt for each utility. These computations attribute a portion of existing debt to current customers according to the capacity needed by these customers. The remainder of existing debt responsibility is assigned to future customers. *Table 3-13* shows the dollar amount of debt service payback proportionately attributed to each LUE of existing service. This same amount of debt service payback is allotted to each future customer under the Equity Residual approach. Only the principal amount is shown as a capital credit against the full capital cost.

Future Construction Credits

In addition to credits for existing debt, it is necessary to provide a credit to feepayers for future costs for renovations or upgrades for existing customers. This is based upon project descriptions and costs in the Capital Improvement Program for the water and wastewater utilities. These calculations are presented in *Table 3-14* and *Table 3-15*. The cost of each project (for the years 1992-1996) is shown, followed by the percent of the cost of each project attributable to existing customers. These percentages are taken from the percent of each project demand currently required to serve existing customers, as shown in *Table 3-7* through *Table 3-11*.

Table 3-13
FUTURE DEBT SERVICE CREDITS

Facility	Percent of Total Debt (a)	Debt Principal (b)	Current Customer Share		
			Percent of Capacity (c)	Debt Principal	Debt per LUE
Water Supply	0.98%	$699,096	62.07%	$433,922	$1.31
Water Treatment	23.98%	$17,074,624	72.77%	$12,424,838	$37.48
Water Pumping	7.78%	$5,537,141	66.28%	$3,669,876	$11.07
Raw Water Storage	0.64%	$459,009	33.74%	$154,870	$0.47
Finished Water Storage	0.74%	$529,523	29.68%	$157,154	$0.47
Major Water Transmission Lines	8.38%	$5,964,857	52.79%	$3,149,023	$9.50
Subtotal Water	42.50%	$30,264,250		$19,989,683	$60.30
Wastewater Treatment	48.49%	$34,532,529	91.62%	$31,638,742	$62.86
Wastewater Pumping	1.66%	$1,184,952	36.13%	$428,113	$0.85
Major Wastewater Collection Lines	7.34%	$5,228,269	52.79%	$2,760,157	$5.48
Subtotal Wastewater	57.50%	$40,945,750		$34,827,012	$69.19
Total Water and Wastewater	100.00%	$71,210,000		$54,816,695	$129.49

Sources: (a) *Report to Bond Holders*, 1984; (b) City of Atlanta *Budget*, 1992; (c) Based on Current Demand divided by Total Capacity in *Tables 3-7* through *3-11*.

Where possible, percentages were applied to specific projects; otherwise, percentages used were those for a group of facilities with the same function (e.g., water treatment plants). When a project description indicated that it was intended to both renovate existing capacity and to add additional capacity, the simplifying assumption was made that all costs were attributable to existing capacity, thus providing a conservative assumption. Costs expected to be funded by "Other Governments" were excluded from the calculations. The percent of cost for existing customers was applied to the total cost to yield the cost attributable for existing customers. Finally, current customer costs were divided by total current LUEs (*Table 3-3* and *Table 3-4*) to estimate the future costs attributable for each existing LUE of each utility.

Table 3-14
FUTURE CONSTRUCTION CREDITS - WATER

Facility/CIP Project	Total Cost	Current Customer Costs		
		% of Ttl.	Future Cost	Cost/LUE
WP-052 River Intake Drainage System	$750,000	62.07%	$465,517	$1.40
WP-029 River Sill Improvements	$8,097,380	62.07%	$5,025,960	$15.16
Subtotal Water Supply	$8,847,380	62.07%	$5,491,477	$16.56
WP-005 Hemphill Bulk Chem. Feed Sys.	$3,590,000	69.60%	$2,498,535	$7.54
WP-031 Hemphill Instrumentation	$1,500,000	69.60%	$1,043,956	$3.15
WP-040 Hemphill Flocculation Basin	$2,000,000	69.60%	$1,391,941	$4.20
WP-084 Hemphill Yard Piping	$1,984,034	69.60%	$1,380,830	$4.16
WP- Chattahoochee Yard Piping	$1,060	87.69%	$930	$0.00
WP- Hemphill Filter Rehab	$5,000,000	69.60%	$3,479,853	$10.50
WP- Hemphill General Improvements	$61,337	69.60%	$42,689	$0.13
WP- Chattahoochee Chemical House	$200,000	87.69%	$175,385	$0.53
WP- Chattahoochee Instrumentation	$1,500,000	87.69%	$1,315,385	$3.97
WP- Chattahoochee Drainage Improve	$200,000	87.69%	$175,385	$0.53
WP-062 New Chemical Processes	$3,000,000	72.77%	$2,183,036	$6.58
Subtotal Water Treatment	$19,036,431	71.90%	$13,687,925	$41.29
WP-006 Hemphill PS Discharge Piping	$11,000,000	65.16%	$7,167,207	$21.62
WP-017 Hemphill PS Renovation	$9,502,321	65.16%	$6,191,373	$18.67
WP-024 Pump Station Renovations	$800,000	66.28%	$530,220	$1.60
WP- Hemphill Pump Wash Water Sys.	$400,000	65.16%	$260,626	$0.79
WP- Hemphill PS General Improve.	$44,764	65.16%	$29,167	$0.09
WP- Hemphill, Chattahoochee Re-Use	$2,000,000	72.30%	$1,446,039	$4.36
Subtotal Water Pumping	$23,747,085	65.80%	$15,624,632	$47.13
WP-004 Tank Throttling	$150,000	29.68%	$44,518	$0.13
WD- Downtown Storage	$4,000,000	0.00%	$0	$0.00
WP-006 Hemphill Clearwell Expansion	$14,450,000	100.00%	$14,450,000	$43.59
WP-063 Chattahoochee Clearwell Expan.	$1,354,256	100.00%	$1,354,256	$4.08
Subtotal Finished Water Storage	$19,954,256	79.43%	$15,848,774	$47.80
WD-002 New Water Mains	$14,291,000	0.00%	$0	$0.00
WD- 54" Hemphill Airport Main	$11,122,000	0.00%	$0	$0.00
WD- 48" Main Utility Bridge	$200,000	52.79%	$105,586	$0.32
WP- Replace Flow Meters	$500,000	52.79%	$263,965	$0.80
Subtotal Major Water Transmission Lines	$26,113,000	1.42%	$369,551	$1.12
Total Water System	$97,698,152	52.22%	$51,022,359	$153.90

Source: City of Atlanta, *Capital Improvements Program, 1992.*

Table 3-15
FUTURE CONSTRUCTION CREDITS - WASTEWATER

Facility/CIP Project	Total Cost	Current Customer Costs		
		% of Ttl.	Future Cost	Cost/LUE
PC-005 S. River Sludge Incinerator	$9,000,000	86.14%	$7,752,665	$15.40
PC-011 R.M. Clayton Power Generation	$2,250,000	100.00%	$2,250,000	$4.47
PC-012 R.M. Clayton Admin. Bldg.	$2,400,000	100.00%	$2,400,000	$4.77
PC-013 Phosphorus Reduction	$155,833,000	91.62%	$142,774,369	$283.68
PC- R.M. Clayton General Improve.	$1,842,500	100.00%	$1,842,500	$3.66
PC- R.M. Clayton Emission Controls	$2,475,000	100.00%	$2,475,000	$4.92
PC- Utoy Creek General Improve.	$1,797,064	86.11%	$1,547,472	$3.07
PC- Utoy Creek Emission Controls	$1,760,000	86.11%	$1,515,556	$3.01
PC- S. River General Improvements	$2,896,067	100.00%	$2,896,067	$5.75
PC- Intrenchment Crk. Gen. Improve.	$1,704,750	53.57%	$913,259	$1.81
Subtotal Wastewater Treatment	$181,958,381	91.43%	$166,366,888	$330.54
SE-002 Outfall Sewer Construc./Repair	$44,000	52.79%	$23,229	$0.05
SE-003 Intrenchment Crk. Interceptor	$452,948	52.79%	$239,125	$0.48
SE-004 Peachtree Interceptor Sewer	$3,500,000	52.79%	$1,847,753	$3.67
SE-006 Veterans Hospital Trunk Sewer	$1,167,520	0.00%	$0	$0.00
SE-009 S. Delta Blvd. Stockade Trunk	$2,000,000	52.79%	$1,055,859	$2.10
SE-011 Sugar Creek Trunk Sewer	$3,976,076	52.79%	$2,099,087	$4.17
SE-013 Indian Creek Outfall Sewer	$5,231,974	52.79%	$2,762,113	$5.49
SE-024 Mineral Springs Trunk Sewer	$4,000,000	52.79%	$2,111,717	$4.20
SE-026 Trunk Sewer Construc/Repair	$18,000,000	52.79%	$9,502,729	$18.88
SE- Butler Street Trunk	$33,428,487	52.79%	$17,647,880	$35.06
PC-009 Combined Sewer Overflow Facil.	$839,600	52.79%	$443,249	$0.88
Subtotal Major Wastewater Collection Lines	$72,640,605	51.94%	$37,732,740	$74.98
Total Wastewater System	$254,598,986	80.17%	$204,099,628	$405.52

Source: City of Atlanta *Capital Improvements Program, 1992.*

FEE CALCULATION

Table 3-16 shows the remainder of the fee calculation process. Referring to the table, capital construction costs for water and wastewater service for future customers amount to $1,129.79 and $662.78 per LUE, respectively, for a total of $2,006.76 for the two utilities. Each existing LUE of service is responsible for $60.30 in total water bond principal and $69.20 in wastewater bond principal. This represents the outstanding capital costs of existing customers that they will pay through their rates. In addition, over

the next five years, the City anticipates that it will incur $153.90 in water improvements for each existing LUE, and $405.52 in wastewater improvements for each existing LUE. Thus, in order to establish future customers on an equity basis with existing customers, a total of $214.20 and $474.71 in credits for water and wastewater respectively are subtracted from the total cost for future customers, leaving a remainder of $1,129.78 (water) and $188.07 (wastewater) for each new LUE. These amounts would be added to the existing connection fees.

Table 3-16
WATER AND WASTEWATER NET COST PER LUE

Facility	Cost per LUE	Credits		Net Cost per LUE
		Principal Payback	Future Cost	
Water Supply	$31.05	$1.31	$16.56	$13.18
Water Treatment	$758.25	$37.48	$41.29	$679.48
Water Pumping Stations	$245.89	$11.07	$47.13	$187.69
Raw Water Storage	$20.38	$0.47	$0.C	$19.91
Finished Water Storage	$23.52	$0.47	$47.80	($24.75)
Major Water Transmission Lines	$264.89	$9.50	$1.12	$254.27
Subtotal Water System	$1,343.98	$60.30	$153.90	$1,129.78
Wastewater Treatment	$558.97	$62.86	$330.54	$165.57
Wastewater Lift Stations	$19.18	$0.85	$0.00	$18.33
Major Wastewater Collection Lines	$84.63	$5.48	$74.98	$4.17
Subtotal Wastewater System	$662.78	$69.19	$405.52	$188.07
Total Water and Wastewater	$2,006.76	$129.49	$559.42	$1,317.85

FEE ADMINISTRATION

The connection fees calculated in this study are fees in addition to the existing connection fees, which include meter costs (water only), tap costs and some service line costs. The existing connection fees cover a portion of "project" costs for each new connection.

As discussed above, water meter size (expressed in the common units of LUEs) was determined to be the most appropriate measure for calculating the "system"-related portion of the connection fees due from any individual customer. Water meter size was selected as the unit determinant for fee collection for the following reasons:

- It is consistent with the current manner of assessing connection fees.

- It allows the use of an American Water Works Association (AWWA) published standard.
- It enables both safe continuous flow and safe maximum flow, which will thereby accommodate all requests for service.
- It is used by building owners, professional engineers and architects, and City staff for sizing meters and plumbing fixtures.
- It is a physical element that can be maintained and controlled by the City, allowing the monitoring of the accuracy of meter sizing. The City can require replacement of meters that are too small and collect additional fees required by the change in meters.
- Particularly in the larger meter sizes, the builder may have to pay for more capacity than needed for the development, thus resulting in a potential payment above actual costs. However, these large-meter customers will be able to use that excess capacity if later building expansions occur or if use patterns change. Moreover, the capacity purchased would be a marketable amenity that would add value to the property.
- It allows equitable cost assignment to all customer classes.

The following policies are suggested:

- The standard used for the ratio of the continuous duty maximum flow rate should be derived from *AWWA C700-C703* (in gpm).
- The City's smallest water meter should be the base unit for fee assessment.
- The ratio of each larger meter's continuous duty maximum flow rate to the rate of the base meter would determine the fee multiplier.
- The fee ordinance should have the schedule published as shown in *Table 3-17*, which includes both compound and turbine meters.
- The use of a turbine meter, in connection with displacement meters in a compound meter installation, would require the use of the turbine meter schedule.
- The fee assessment should be adjusted when the City determines that unique water pressure system conditions result in a meter size not indicative of actual flow (as when pressure is unusually low or high). In this instance, the ordinance should provide for individual review.

Table 3-17 shows a conversion table for various types and sizes of water meters in the Atlanta water system. Because the fee calculation was based on water meter size, the LUE/meter conversion table applies equally to all land uses.

Typically, some concern is expressed that water meters are not always a reasonable means of calculating wastewater flows, particularly for certain consumptive types of commercial uses (car washes, restaurants) or industrial processes (canneries, bottling companies). Additionally, any land use might have a large meter for irrigation purposes, thus over-representing its wastewater flows. However, few such customers choose to have a separate wastewater meter because of the installation and maintenance expense incurred. Given the potential that some consumptive commercial and industrial customers may be considerably overcharged for wastewater capacity demand when water meter size is used for calculating wastewater impact fees, the consultants recommend that the ordinance provide for exceptions. Specifically, the ordinance should permit individual wastewater customers to present data, prepared by a professional engineer, documenting expected wastewater flow below that indicated by meter-size determinations for a lower wastewater fee.

FEE SCHEDULE

The City may collect connection fees from any customer that purchases a water or wastewater tap. Fees may readily be collected from both inside- and outside-City retail customers. In the relatively rare event of a wastewater connection when there is no water meter, authorized City engineers may approve the amount of the connection fee based upon engineering criteria for the development.

Until amendments are made to wholesale customer agreements, the City probably has little ability to charge a connection fee to wholesalers. This is, of course, an inequitable situation that probably cannot be avoided in the short-term. It is likely that arguments will be made that such inequity will encourage further development in other jurisdictions in lieu of development in Atlanta. This inequity can be offset by adjustments in the rate structure to reflect the lower fee contributions from wholesale customers. It is possible, however, that a wholesale customer who requests a larger meter, or a new wholesaler initially requesting service, could be assessed a connection charge based upon the meter size.

However, master meters in the larger diameters are not generally representative of the population behind the master meter. For example, a 12 inch meter is equivalent to 330 LUEs; but, due to the variability in the timing of peak consumption behind the master meter, a 12 inch meter will actually serve many more LUEs than 330. Thus, it is most equitable for the City to obtain agreement from its wholesale customers to charge equivalent connection fees (for the system-related portion of the fees) and pass these on to Atlanta. This will necessarily force wholesale customers to develop their own connection fee programs.

For the wastewater utility, the City has interlocal agreements with a number of other cities and counties. In each case, the other jurisdiction agreed to pay its prorata share of the wastewater facilities needed to provide it with service. In these instances, the City has no identifiable capital cost for serving these customers (other than that already reimbursed to the City) and thus has neither the legal jurisdiction nor the cost basis for charging connection or impact fees within the service areas of each of its partners in these agreements.

Table 3-17
WATER AND WASTEWATER CONNECTION FEE SCHEDULE

Water Meter Size	Living Unit Equivalents	Water Fee Component	Wastewater Fee Component	Combined Connection Fee
5/8" X 3/4"	1.0	$1,130	$188	$1,318
3/4"	1.5	$1,695	$282	$1,977
1"	2.5	$2,824	$470	$3,294
1-1/4"	3.1	$3,502	$583	$4,085
1-1/2"	5.0	$5,649	$940	$6,589
2" Simple Compound	8.0	$9,038	$1,505	$10,543
2" Turbine	15.0	$16,947	$2,821	$19,768
3" Compound	16.0	$18,076	$3,009	$21,085
3" Turbine	24.0	$27,115	$4,514	$31,629
4" Compound	25.0	$28,245	$4,702	$32,947
4" Turbine	42.0	$47,451	$7,899	$55,350
6" Compound	50.0	$56,489	$9,404	$65,893
6" Turbine	92.0	$103,940	$17,302	$121,242
8" Compound	80.0	$90,382	$15,045	$105,428
8" Turbine	160.0	$180,765	$30,091	$210,856
10" Compound	115.0	$129,925	$21,628	$151,553
10" Turbine	250.0	$282,445	$47,018	$329,463
12" Turbine	330.0	$372,827	$62,063	$434,890

CHAPTER 4
PARKS AND RECREATION

The *Development Impact Fee Act* allows impact fees to be collected to finance "parks, open space, and recreation areas and related facilities." This chapter calculates parks and recreation impact fees for the City of Atlanta. Based on policy decisions made by the City, the fees cover only the costs of acquiring and development of land, but not construction of buildings or other facilities. It is organized into the following sections:

- Existing Facilities
- Service Areas
- Levels of Service
- Capital Costs
- Revenue Credits
- Fee Schedule

EXISTING FACILITIES

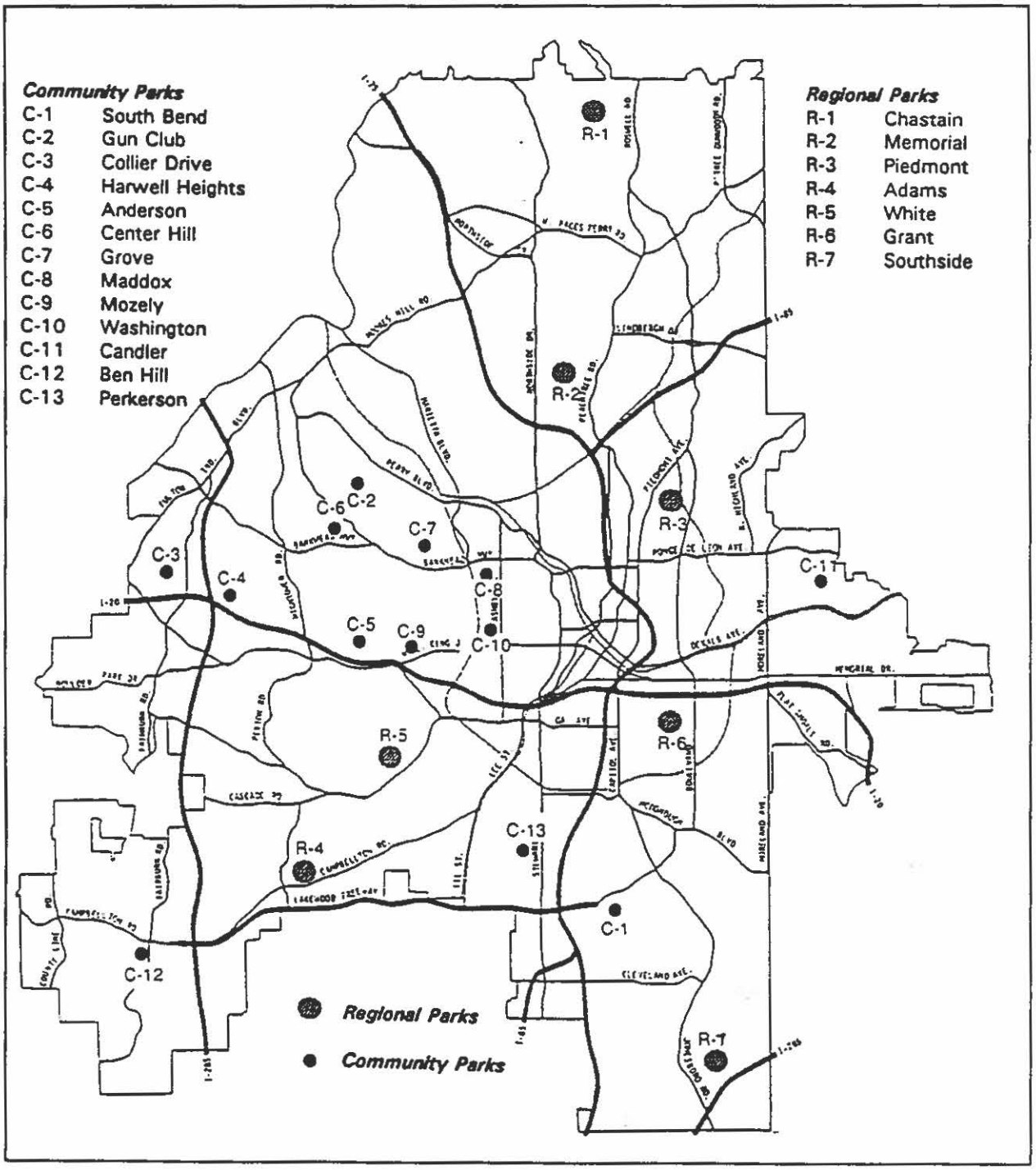
The Department of Parks, Recreation and Cultural Affairs (DPRCA) has the responsibility for the City's parks and recreation facilities. The City's park system consists of 3,200 acres of land, and includes block, neighborhood and community parks; conservation parks and nature preserves; and golf courses and other special recreational facilities.

The inventory of park facilities used in this analysis includes golf courses, nature preserves and conservation areas, since these facilities have trails and other features that contribute to the recreational opportunities of the city. Parks and recreation programs are designed to accommodate the widest possible range of recreation demand, including golfing, passive hiking and simple enjoyment of natural areas. The inventory also includes the Freedom/East of Moreland Park, which is composed of the former Presidential Parkway land. Although the park is not yet developed, its addition to the park system is imminent.

Excluded, however, is the Civic Center, Lakewood Amphitheater and Fairgrounds, land leased by the City at Lake Alatoona and land owned or leased by the City outside the city limits. The locations of the City's major parks are shown in *Figure 4-1*. The parks inventory is included as *Table A-3* in the *Technical Appendix*.

The DPRCA also manages 32 recreational and community centers distributed throughout the city. These facilities provide a variety of services including gymnasiums, play courts, art centers, swimming pools and racquetball courts. There is slightly less than 300,000 square feet of enclosed space within those centers. *Table A-4* in the *Technical Appendix* summarizes recreation center characteristics.

Figure 4-1
MAJOR PARKS AND RECREATION AREAS



SERVICE AREAS

Atlanta has no true regional parks (defined by the National Park and Recreation Association as 300 acres or more serving an area within one hour driving time). At the other extreme, however, block and neighborhood parks comprise only about 20 percent of Atlanta's park land. In addition, one of the City's park planning objectives, as expressed in the *Comprehensive Development Plan*, is to "cluster major recreational facilities in larger, centralized community parks." For these reasons, it is appropriate to measure the level of service at the community level (serving several neighborhoods), rather than at the block, neighborhood or regional level.

In order to avoid creating significant existing deficiencies, the boundaries of service areas should be drawn so that the level of service for individual service areas is as close as possible to the existing city-wide average. In addition, each of the service areas should have significant growth potential in order to justify the need for impact fee expenditures. Three proposed parks and recreational service areas have been defined that meet these criteria (*Figure 4-2*).

LEVELS OF SERVICE

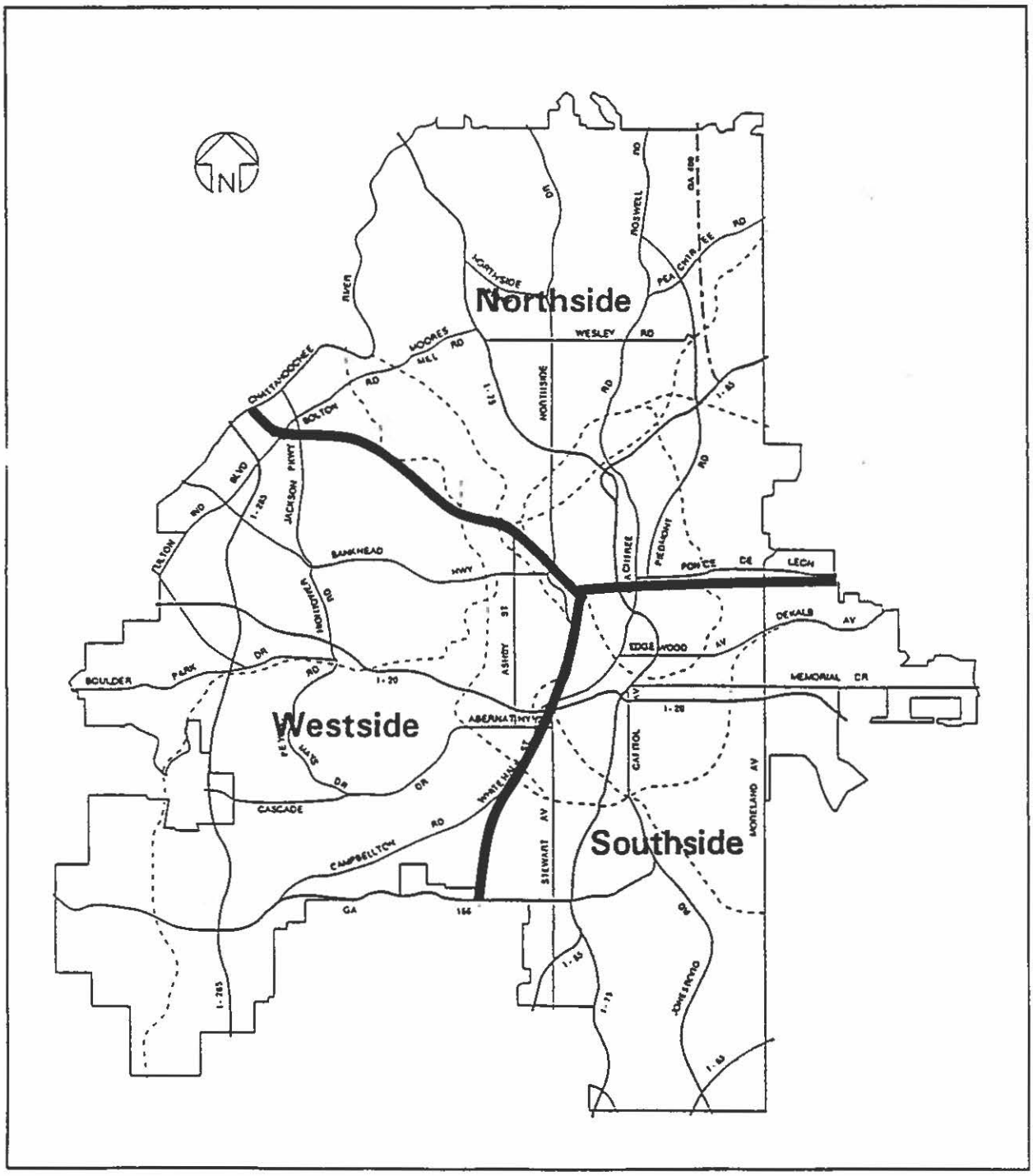
Parks and recreation facilities are land-extensive, so levels of service are generally measured in terms of acres or square feet of land to population. However, park capital facilities consist of improvements as well as land. Thus, while the level of service is expressed in terms of land, it normally also includes the typical mix of capital improvements associated with developed park land. However, the impact fees calculated in this study address only park land acquisition and initial development, and exclude facility costs.

The National Park and Recreation Association (NPRA) recommends a minimum standard of 6.25 acres of active park land per 1,000 persons. Atlanta has 3,200 acres of park land (including the forthcoming Freedom/East of Moreland park, the Oakland Cemetery and City golf courses). Based on an estimated 1990 population of 437,078 residents, the City provides 7.32 acres of park land per 1,000 residents. The City's 1968 parks plan established a minimum standard of 10 acres of park land per 1,000 residents, and this standard, although never met, has never been revised.

As with NPRA standards and the City's current park standard, most park impact fees are based on level of service standards that relate acres of park land to population. However, the demand for parks and recreation facilities increases with the total physical development of a city. Nonresidential development is just as critical as residential development in determining a city's growth. In fact, it is often considered the more important factor since people cannot live in an area without jobs.

For a major central city like Atlanta, with its large daily influx of workers, shoppers and tourists that make use of City parks and recreation facilities, placing the full burden of paying for growth-related park expansion on residential development is even less appropriate. For these reasons, it is recommended that park impact fees should be assessed on nonresidential as well as residential development.

Figure 4-2
PARKS AND RECREATION SERVICE AREAS



The approach recommended here is to base facility demand calculations on the number of people that spend time at the site of the land use. It is people who create the demand for recreation facilities, not houses or businesses. In a sense, businesses are simply people in another facet of their daily lives. The parks and recreation impact fee will be based on the number of "full-time equivalent" people present in the city, a subarea of the city, or at the site of a land use. This "full-time equivalent" population is represented by the concept of "functional population." The concept of functional population and the technical calculations of functional population estimates are presented in detail in *Appendix B*.

In the case of parks there are additional reasons for choosing the functional population basis. As shown in *Table 4-1*, more than 90 percent of the reservations made for ballfields of all types city-wide were made by business or related nonresidential land uses. About 60 percent of the reservations for major picnic facilities were made by business or related nonresidential land uses. While it is normally assumed that only residents use parks, the reservation data clearly shows the extent to which nonresidential development uses local parks. The functional population approach allows improved attribution of benefits and burdens for providing parks and recreation facilities and is, therefore, the recommended basis for determining impact.

Table 4-1
RESERVATION HISTORY FOR BALLFIELDS AND PICNIC AREAS
July 1, 1991 to June 30, 1992

Facility	Total Days Reserved	Business Days Reserved		Non-Business Days Reserved	
		Number	Percent	Number	Percent
Ballfields					
Candler Park	143	108	76%	35	24%
Frankie Allen	81	81	100%	0	0%
Harwell Heights	134	133	99%	1	1%
John A. White	155	155	100%	0	0%
Maddox	0	0	NA	0	NA
Piedmont	159	147	92%	12	8%
Shady Valley	116	116	100%	0	0%
Underwood Hills	119	119	100%	0	0%
Walker	31	31	100%	0	0%
Washington	133	132	99%	1	1%
Wilson Hills	108	108	100%	0	0%
Total Ballfields	1,179	1,130	96%	49	4%
Picnic Facilities					
Chastain	96	56	58%	40	42%
Piedmont	86	53	62%	33	38%
Total Picnic Facilities	182	109	60%	73	40%

Source: Atlanta Department of Parks, Recreation and Cultural Affairs, September 1992.

As shown in *Table 4-2*, the current city-wide average level of service is about 7 acres per 1,000 functional population. The range is from a low of 6.1 acres in the Westside to a high of 8.1 acres in the Southside. Significant growth is anticipated in all three service areas.

As noted earlier in this report, the level of service should be established no higher than the existing level of service in each service area. While the level of service could be established at the existing level for each service area without creating any deficiencies, such an approach would tend to perpetuate existing disparities in the levels of service among service areas.

It is recommended that a single level of service of 5.75 acres per 1,000 functional population should be applied for each service area. This recommended level of service is slightly below the existing level in the Northside service area, which has the lowest level of service of the three service areas, and avoids the potential for requiring use of non-impact fee revenue to pay for current deficiencies. At this level of service, there will be sufficient excess capacity to accommodate anticipated development in each service area for the next seven years, as shown in *Table 4-2*.

Table 4-2
CURRENT PARK LEVELS OF SERVICE

Service Area	Park Acres	1992 Functional Population	Acres/ 1,000	2010 Functional Population	Adopted LOS = 5.75 Ac/1,000		
					Excess Capacity (Acres)	Annual Acres Consumed	Years Recoup-ment
Northside	1,013.8	154,814	6.55	201,103	123.6	14.8	8.4
Southside	1,323.3	162,698	8.13	182,050	387.8	6.2	62.7
Westside	863.0	141,362	6.10	162,985	50.2	6.9	7.3
Citywide	3,200.1	458,874	6.97	546,138	561.6	27.9	NA

Note: Proposed service areas are defined by the following census tracts: Northside — tracts 1-6, 10.95-15, 88-102.1, 201, 202; Southside — tracts 16-21, 27-35, 44-58, 63-66.01, 67-75, 203-209; Westside — tracts 7-8, 22-26, 36-43, 60-62, 66.02, 76.01-87.02, 103.

Source: See *Table A-3* for park acreage by service area and *Table B-8* for 1992 and 2010 functional population estimates by service area.

Because of existing excess capacity at the recommended level of service, and in order to ensure that impact fees adopted by the City are competitive with other jurisdictions, the City has made a policy decision to charge only 60 percent of the full cost of acquiring and developing park land in the Northside service area. The cost of constructing facilities was excluded from the fee calculations in order to ensure competitiveness and to be conservative in the calculation of recoupment fees. Because of the City's policy of encouraging growth in these areas, the City has decided to charge only 30 percent of the full cost of park land acquisition and development in the Southside and Westside service areas.

These discounted fees will be recoupment fees that essentially reimburse the City for excess capacity that already exists to accommodate new development. As discussed elsewhere in this report, recoupment fees can be waived for projects meeting the City's affordable housing and economic development policies without replacement with non-impact fee funds (see discussion of level of service and exemptions in *Chapter 1*). While recoupment fees do not have to be earmarked, the City has indicated that some percentage of all recoupment fees will be used to reimburse other non-recoupment impact fee accounts for exemptions, with the remaining park recoupment funds to be spent for parks and recreation purposes in the service areas in which they were collected.

Because of limited excess capacity in these areas, the park fees in the Northside and Westside service areas will be recoupment for only the next 7 to 8 years. After that time, the fees will be needed to maintain the adopted level of service in these areas, and the City may wish to reconsider the discounts and to consider charging for facilities as well as land. *Table 4-3* summarizes anticipated growth and new park land requirements for the Northside and Westside service areas by the year 2010.

Table 4-3
FUTURE PARK NEEDS

Service Area	Acres/ 1,000 Functional Population	Existing Acres	Existing (1992) Conditions		Future (2010) Conditions	
			Needed Acres	Excess Acres	Needed Acres	Needed New Acres (Surplus)
Northside	5.75	1,013.8	890.2	123.6	1,156.3	142.5
Southside	5.75	1,323.3	935.5	387.8	1,046.8	(276.5)
Westside	5.75	863.0	812.8	50.2	937.2	74.2

CAPITAL COSTS

Capital costs for parks and recreation facilities consist of both land and improvements. However, the City has decided to adopt park impact fees only to cover the cost of park land and development, but not to cover facility costs. Consequently, the facility costs calculated in this section are for informational purposes only, and do not enter into the impact fee calculations.

Land costs will be addressed first. Recent park land purchases have all been located in the Southside and Westside service areas. The average cost of acquiring an acre of land for park purposes in the southwestern portion of the city has been about $10,000 per acre in current dollars, as shown in *Table 4-4*.

Table 4-4
RECENT PARK LAND ACQUISITION COSTS, SOUTHSIDE AND WESTSIDE

Location	Purchase Date	Acres	Purchase Price	ENR Index Factor	Current Value 1992
Confederate & Gilbert	2-89	0.50	$6,360	1.0676	$6,790
2700 Cascade Road	5-89	1.80	$55,000	1.0676	$58,718
Cleveland & Springdale	7-90	20.70	$167,750	1.0412	$174,661
Total		23.00	$229,110		$240,169
Average Cost per Acre					$10,442

Note: Park purchases since 1989; all are located in Southside and Westside service areas; ENR index described in *Appendix D*.

Source: City of Atlanta Real Estate Department.

There are no similar figures for the Northside service area. It is not reasonable to assume that land prices will be comparable in the Northside service area, where residential land prices often exceed $100,000 per acre. *Table 4-5* presents information collected by the Department of Planning and Development on the assessed value of vacant land in and near the proposed Chattahoochee River Park. The result of this limited analysis shows an average 1992 land value of $46,047 per acre. Most of the inventoried parcels have no immediate utility access and are further restricted to low density residential development. While this average is assumed to be lower than the average purchase price of new parks in the Northside service area, until better information becomes available it is the figure used for impact fee calculation purposes.

Table 4-5
CURRENT PARK LAND VALUES, NORTHSIDE

Location	Acres	Assessed Value	Assessment Date	ENR Index Factor	Value* 1992
2999 Parrot Avenue, NW	4.63	$20,720	1983	1.2118	$62,770
2085 Butler Way, NW	2.40	$8,380	1975	2.2274	$46,665
2000 Bolton Road, NW	35.00	$206,630	1985	1.1745	$606,718
2180 Jackson, NW	40.51	$828,450	1985	1.1745	$2,432,538
2256 Jackson, NW	3.60	$16,920	1975	2.2274	$94,220
2540 Paul Avenue, NW	4.17	$9,330	1975	2.2274	$51,955
2300 Bolton Road, NW	4.00	$26,650	1980	1.5221	$101,410
2402 W. Weslen Road	9.50	$53,160	1980	1.5221	$202,288
4495 Northside Parkway	30.19	$675,840	1980	1.5221	$2,571,740
Total	134.00	$1,846,080			$6,170,303
Average Value per Acre					$46,047

* Assessed value multiplied by 2.5 to adjust for market value and multiplied by ENR factor (see *Appendix D*) to adjust to current value.

Source: City of Atlanta, Department of Planning and Development.

Future parks in Atlanta will be of the neighborhood and community variety. The City has developed prototype improvement cost characteristics for future parks based on existing neighborhood and community park characteristics. The average number of such improvements for the 89 existing neighborhood and community parks (consisting of a total of 1,073.65 acres) is summarized in *Table 4-6*.

Table 4-6
TYPICAL PARK FACILITY IMPROVEMENTS

Characteristic	Lit Ball Fields	Unlit Ball Fields	Basket Ball Courts	Lit Football Soccer	Unlit Football Soccer	Multi-Use Courts	Multi-Use Fields	Lit Tennis Courts	Unlit Tennis Courts	Rec. Centers (sq. ft.)
Number of Facilities	24	26	49	5	5	9	15	50	41	296,677
Average per Park	0.26	0.29	0.55	0.06	0.06	0.10	0.17	0.56	0.46	3,333
Average per Acre	0.022	0.024	0.046	0.005	0.005	0.008	0.014	0.047	0.038	276

Source: *Table A-4* and *Table A-5* in the *Technical Appendix*.

Estimates of average capital costs for developing raw land and constructing various park facilities were provided by DPRCA. These land development and facility costs are summarized in *Table 4-7*.

Table 4-7
TYPICAL PARK FACILITY IMPROVEMENT COSTS

Improvement Type	Cost
Facility Costs per Unit	
Ball Fields, Lighted	$96,000
Ball Fields, Unlighted	$55,000
Tennis Courts, Outdoor, Lighted	$32,000
Tennis Courts, Outdoor, Unlighted	$23,000
Basketball, Multi-Use Courts, Outdoor	$32,000
Playfields, Playgrounds, Multi-Use Fields	$25,000
Group Picnic Shelters	$25,000
Recreation Centers (per square foot)	$120
Land Development Costs per Acre	
Grading, Clearing, Grubbing	$12,000
Utilities	$10,000
Road Access	$5,000
Parking	$8,000
Landscaping	$3,000
Planning, Design and Engineering	$5,000
Total Development Cost per Acre	$43,000

Source: City of Atlanta, Department of Parks, Recreation and Cultural Affairs, October 28, 1992.

The average cost of improvements to an acre of park land is calculated using the typical mix of improvements and the estimated cost for each improvement. As shown in *Table 4-8*, the average cost of park improvements that typify Atlanta's neighborhood and community parks totals $87,263 per acre.

Impact fees for all three service areas are designed to "recoup" the cost of capacity provided by past expenditures to serve future development. Unfortunately, no information is available on when particular park facilities were installed in parks in these areas, nor their current value. Furthermore, many of the recreation centers, and perhaps other park facilities in these areas were financed with non-local funds (i.e., Community Development Block Grants). For these reasons, the recoupment fees are limited to the current value of land plus the typical cost of developing raw land, and exclude all other improvement costs. The effect is to be conservative by underestimating potential recoupment amounts.

Table 4-8
AVERAGE PARK IMPROVEMENT COST PER ACRE

Feature	Units Per Acre	Cost Per Unit	Cost Per Acre
Land Development	1.000	$43,000	$43,000
Ball Fields, Lighted	0.027	$96,000	$2,592
Ball Fields, Unlighted	0.029	$55,000	$1,595
Tennis Courts, Outdoor, Lighted	0.047	$32,000	$1,504
Tennis Courts, Outdoor, Unlighted	0.038	$23,000	$874
Basketball, Multi-Use Courts, Outdoor	0.054	$32,000	$1,728
Playfields, Playgrounds, Multi-Use Fields	0.014	$25,000	$350
Group Picnic Shelters	0.100	$25,000	$2,500
Recreation Centers (square feet)	276	$120	$33,120
Total Improvement Cost per Acre			$87,263

Note: Units per acre are based on current average for neighborhood and community parks, except that one group picnic shelter assumed per 10 acres.

Source: *Tables 4-6* and *4-7*.

For the Southside and Westside service areas, the estimated current land values of $10,442 per acre and the estimated land development costs of $43,000 add up to a total recoupment value of $53,442 per developed park acre, excluding facility replacement costs. For the Northside service area, the estimated land costs of $46,047 per acre and the estimated land development costs of $43,000 add up to a total recoupment value of $89,047, as shown in *Table 4-9*.

Table 4-9
PARK LAND COSTS PER ACRE BY SERVICE AREA

Service Area	Land Cost per Acre	Improvement Cost per Acre	Total Cost per Acre
Northside	$46,047	$43,000	$89,047
Southside	$10,442	$43,000	$53,442
Westside	$10,442	$43,000	$53,442

REVENUE CREDITS

DPRCA's revenue sources include the general fund, a dedicated Park Improvement (PI) property tax, general obligation bonds, state and federal grants, and operating surpluses from the Cyclorama enterprise operation. Other facilities not included in this report, such as the Zoo, Omni, Atlanta-Fulton County Stadium, Georgia Dome and Underground are financed in part from hybrid revenue bonds, dedicated sales tax revenues and some PI funds. In addition, golf courses and the Lakewood Amphitheater are leased by private operations.

The *Parks Improvement (PI) Fund* is supported by a half-mill property tax. It is used exclusively for capital improvements to the city's parks, recreation, and cultural facilities. Up to half of this fund's annual receipts can be used for constructing a stadium and related facilities, or retiring debt on those facilities. The PI Fund cannot be used to purchase park land. It is anticipated that these revenues will be used for improvements that are not eligible for impact fee financing once impact fees are adopted.

Since 1986, the City has been authorized by the state to issue $8 million annually in *General Obligation (GO) Bonds*, half of which goes for the school system, without seeking voter approval. GO bonds are typically used for public works projects such as roads. While the Civic Center will receive some of these funds, it is not included in the park facilities eligible for impact fee financing. The DPRCA also receives one percent of the $4 million in annual bond funds, or $40,000 per year, for art. Again, art is not included in the eligible impact fee facility costs and no credit for these bond expenditures is required. As a result, no property tax revenue credits are required for parks and recreation facilities.

FEE SCHEDULE

Based on this study, maximum recoupment impact fees that may be charged for park land acquisition and development in the Northside service area, and the fees reflecting the policy decision to charge only 60 percent of the full cost, are shown in *Table 4-10*. The maximum recoupment impact fees that may be charged for park land acquisition and development in the Southside and Westside service areas, and the fees reflecting the policy decision to charge only 30 percent of the full cost, are shown in *Table 4-11*.

These fee schedules are based on functional population estimates for each land use type (see *Tables B-2* and *B-3* in *Appendix B: Functional Population*), recommended level of service standard of 5.75 acres per 1,000 functional residents and calculated capital costs per acre (see *Table 4-9*).

Table 4-10
PARKS AND RECREATION IMPACT FEE SCHEDULE
Northside Service Area

Land Use	Unit	Func Pop/ Unit	Acres Per 1,000	Acres Per Unit	Cost/ Acre	Net Cost/ Unit	Impact Fee (60%)
Single-family	Dwelling	1.60	5.75	0.0092	$89,047	$819	$491
Multi-family	Dwelling	1.11	5.75	0.0064	$89,047	$570	$342
Hotel/motel	Room	0.72	5.75	0.0041	$89,047	$365	$219
Elem. School	1,000 sf	1.71	5.75	0.0098	$89,047	$873	$524
High School	1,000 sf	1.74	5.75	0.0100	$89,047	$890	$534
Church	1,000 sf	0.74	5.75	0.0043	$89,047	$383	$230
Hospital	1,000 sf	1.86	5.75	0.0107	$89,047	$953	$572
Nursing home	1,000 sf	1.36	5.75	0.0078	$89,047	$695	$417
Office							
<50,000 sf	1000 sf	1.04	5.75	0.0060	$89,047	$534	$320
<100,000 sf	1000 sf	0.99	5.75	0.0057	$89,047	$508	$305
<200,000 sf	1000 sf	0.94	5.75	0.0054	$89,047	$481	$289
<500,000 sf	1000 sf	0.90	5.75	0.0052	$89,047	$463	$278
500,000 sf +	1000 sf	0.87	5.75	0.0050	$89,047	$445	$267
Commercial							
<100,000 sf	1000 sf	2.78	5.75	0.0160	$89,047	$1,425	$855
<200,000 sf	1000 sf	2.28	5.75	0.0131	$89,047	$1,167	$700
<300,000 sf	1000 sf	2.08	5.75	0.0120	$89,047	$1,069	$641
<400,000 sf	1000 sf	1.90	5.75	0.0109	$89,047	$971	$583
<500,000 sf	1000 sf	1.81	5.75	0.0104	$89,047	$926	$556
<600,000 sf	1000 sf	1.73	5.75	0.0099	$89,047	$882	$529
<1,000,000 sf	1000 sf	1.57	5.75	0.0090	$89,047	$801	$481
1,000,000 sf +	1000 sf	1.45	5.75	0.0083	$89,047	$739	$443
Industrial							
Industry	1000 sf	0.66	5.75	0.0038	$89,047	$338	$203
Warehouse	1000 sf	0.37	5.75	0.0021	$89,047	$187	$112

Table 4-11
PARKS AND RECREATION IMPACT FEE SCHEDULE
Southside and Westside Service Areas

Land Use	Unit	Func Pop/ Unit	Acres Per 1,000	Acres Per Unit	Cost/ Acre	Net Cost/ Unit	Impact Fee (30%)
Single-family	Dwelling	1.60	5.75	0.0092	$53,442	$492	$148
Multi-family	Dwelling	1.11	5.75	0.0064	$53,442	$342	$103
Hotel/motel	Room	0.72	5.75	0.0041	$53,442	$219	$66
Elem. School	1,000 sf	1.71	5.75	0.0098	$53,442	$524	$157
High School	1,000 sf	1.74	5.75	0.0100	$53,442	$534	$160
Church	1,000 sf	0.74	5.75	0.0043	$53,442	$230	$69
Hospital	1,000 sf	1.86	5.75	0.0107	$53,442	$572	$172
Nursing home	1,000 sf	1.36	5.75	0.0078	$53,442	$417	$125
Office							
<50,000 sf	1000 sf	1.04	5.75	0.0060	$53,442	$321	$96
<100,000 sf	1000 sf	0.99	5.75	0.0057	$53,442	$305	$92
<200,000 sf	1000 sf	0.94	5.75	0.0054	$53,442	$289	$87
<500,000 sf	1000 sf	0.90	5.75	0.0052	$53,442	$278	$83
500,000 sf +	1000 sf	0.87	5.75	0.0050	$53,442	$267	$80
Commercial							
<100,000 sf	1000 sf	2.78	5.75	0.0160	$53,442	$855	$257
<200,000 sf	1000 sf	2.28	5.75	0.0131	$53,442	$700	$210
<300,000 sf	1000 sf	2.08	5.75	0.0120	$53,442	$641	$192
<400,000 sf	1000 sf	1.90	5.75	0.0109	$53,442	$583	$175
<500,000 sf	1000 sf	1.81	5.75	0.0104	$53,442	$556	$167
<600,000 sf	1000 sf	1.73	5.75	0.0099	$53,442	$529	$159
<1,000,000 sf	1000 sf	1.57	5.75	0.0090	$53,442	$481	$144
1,000,000 sf +	1000 sf	1.45	5.75	0.0083	$53,442	$444	$133
Industrial							
Industry	1000 sf	0.66	5.75	0.0038	$53,442	$203	$61
Warehouse	1000 sf	0.37	5.75	0.0021	$53,442	$112	$34

CHAPTER 5
PUBLIC SAFETY

The *Development Impact Fee Act* authorizes cities to establish impact fees for "public safety facilities, including police, fire, emergency medical and rescue services." This chapter calculates the maximum impact fees that may be charged for public safety facilities. Public safety facilities are actually comprised of the following two distinct sets of facilities:

- fire/emergency medical services
- police facilities

Each of these sets of facilities will be treated as essentially a separate impact fee study, with recommended levels of service and maximum impact fee calculations. Impact fee revenues collected for each set of facilities should be earmarked for expenditure on those same facilities, unless the fees represent recoupment of previous investments.

The public safety impact fee studies share a common methodology for determining level of service, and all are recommended to apply to a single city-wide service area. The level of service for each is based on "functional population," as described and calculated in *Appendix B: Functional Population*.

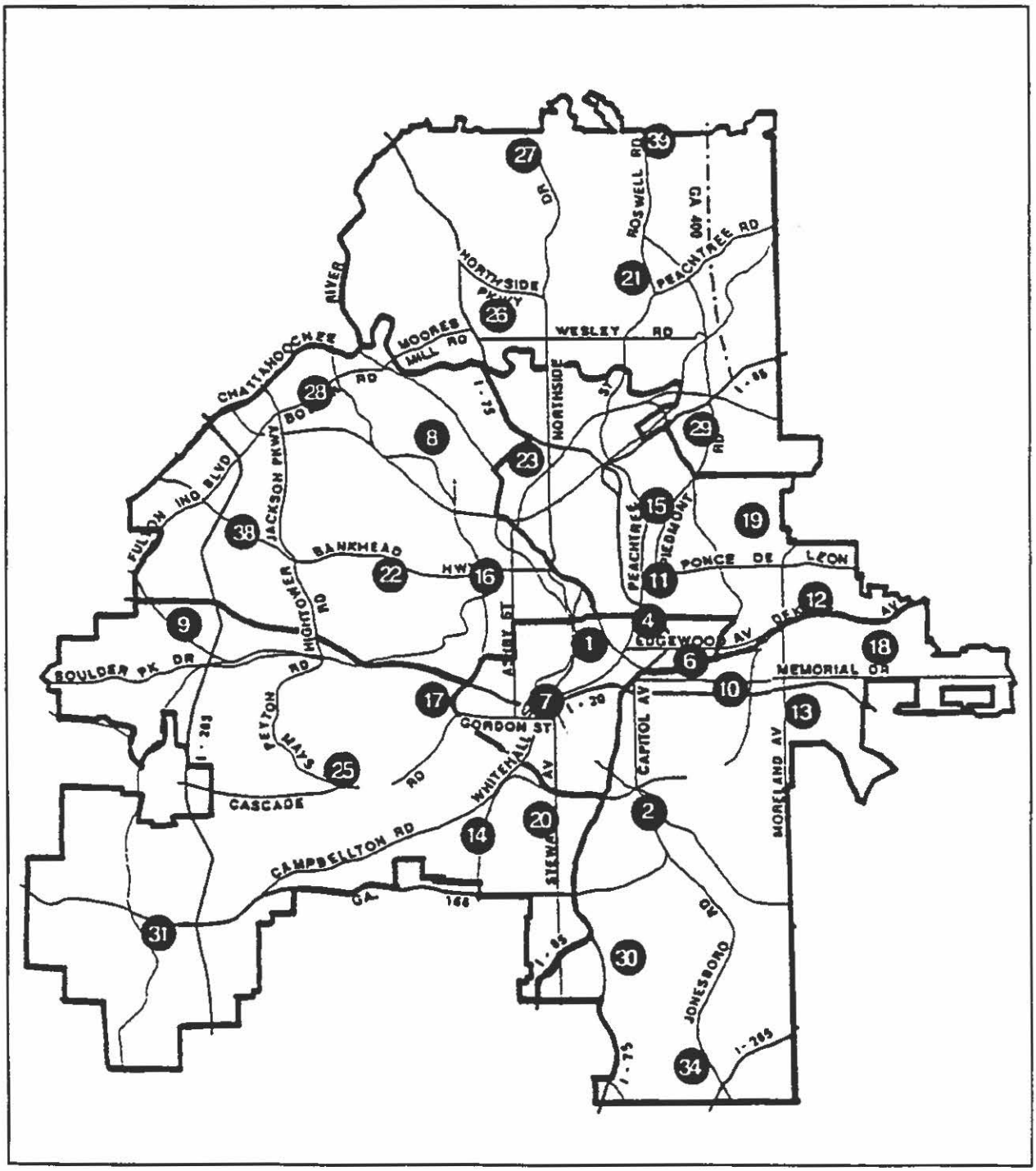
FIRE/EMERGENCY MEDICAL SERVICES

This section calculates impact fees for fire protection and emergency medical services (EMS) facilities. It includes an analysis of the service area, facility inventory, level of service, needs assessment, impact costs and recoupment potential for such facilities.

The Atlanta Fire Department is charged with providing fire protection and EMS throughout the community. Within its 132 square-mile service area, the Department serves more than 400,000 residents, 400,000 workers and 16.5 million visitors annually. The Department responds to 40,000 incidents annually, many of which require the dispatching of fire fighting equipment and rescue vehicles. Of the approximately 22,000 EMS responses a year, about 17,000 include an engine and a rescue unit. Fire protection and EMS also share facilities, and are appropriately considered together.

In providing fire protection and emergency medical services to the city, the Fire Department has a four-minute average response time, as measured from the time of call to the time of arrival. The Department manages 37 stations, with 34 engines, 16 trucks and 27 other mobile units. The City has an Insurance Services Office (ISO) rating of 2. Only five cities in the nation have a better (higher) rating. *Figure 5-1* depicts the location of existing fire stations. Four of the fire stations are located on the grounds of Hartsfield International Airport, which is outside the city limits. Since these stations and their associated equipment serve only the airport, they have been excluded from the facility inventory used to calculate fire/EMS impact fees.

Figure 5-1
FIRE STATIONS



Fire/EMS Service Areas

Although the Fire Department operates several stations that are designed to serve particular geographic areas of the community, the City's fire protection/emergency medical services organization operates as a single "system." More than one station, for example, may respond to an incident, and equipment from one station will often be used to replace equipment at another that is responding to an incident. In short, people receive fire and EMS service no matter where they live, work or shop. If response times decline in any section of the city, fire insurance ratings for the entire city may increase, which would result in higher insurance rates for everyone. As a result of these considerations, one service area encompassing the entire city will be used for fire/EMS impact fees.

Fire/EMS Facilities and Capital Costs

The existing inventory of fire/EMS facilities is comprised of three categories of capital facilities—stations, equipment and support facilities. However, equipment with a useful life of less than ten years has been excluded from the inventory, consistent with the requirement of the *Act*. Support facilities have also been excluded, due to uncertainties regarding future plans for these facilities.

Although some fire station structures are quite old, they are routinely maintained through major and minor renovations. In essence, when a station becomes obsolete, it is replaced. In the case of fire stations, therefore, current value is defined as the replacement cost of existing facilities, since the cost of replacement is the maintenance cost incurred. Replacement value can, in turn, be considered the marginal cost or long-term average cost, which is the theoretical foundation for development impact fees. Depreciation of fire station facilities is not considered for this reason. The cost of major renovations and station replacement is not used in calculating development impact fees, which assures that new development is not charged twice for existing stations.

Since the *Act* limits impact fee financing to facilities and equipment with a useful life of ten years or more, only data on such equipment will be used in calculating impact fees. *Table A-5* in the *Technical Appendix* presents inventory data for existing fire/EMS equipment with a useful life of more than ten years. According to this data, the current total depreciated value of capital equipment is $10,603,987. *Table 5-1* provides inventory and value data for existing fire stations located within the city limits.

The inventory data includes information on the year that facilities were built, land area, building area, adjustment of construction cost to current value using *Engineering News and Record* (ENR) adjustment factors (see *Appendix D* for description), and estimation of facility replacement value based on the most recent cost figures. Based on this data, the total current replacement value of existing fire stations is estimated at $24,387,903.

Adding the replacement value of fire stations to the total depreciated value of capital equipment yields a current system value of $34,991,890. With 230,253 square feet of existing fire station space, this total figure translates into an existing value of just over $152 per square foot ($152.04) of fire station space.

Table 5-1
EXISTING FIRE/EMS STATIONS

Station	Year Built	Land Area	Bldg Area	Insured Value	Construction Cost	ENR Index	Adjusted Cost 1992	Replacement Cost
1	1961	24,000	14,336	$987,000				$1,641,902
2	1978	20,000	7,450	$838,000				$853,249
3	1991		9,064		Installed by developer			
4	1960	11,000	8,009	$961,000				$917,271
5	1991	96,764	9,600 (1)		$1,014,000	1.02	$1,034,280	$1,099,488
6	1894	3,000	4,968	$596,000				$568,985
7	1910	13,000	6,178	$741,000				$707,566
8	1969	40,000	7,910	$799,000				$905,932
9	1967	20,000	8,465	$815,000				$969,496
10	1958	25,000	6,817	$818,000				$780,751
11	1907	3,300	6,186	$773,000				$708,483
12	1958	18,000	7,247	$595,000				$829,999
13	1921	3,200	1,950	$234,000				$223,334
14	1913	5,000	3,308	$397,000				$378,865
15	1987	30,000	8,150	$800,000	Installed by developer			
16	1963	20,000	7,744	$769,000				$886,920
17	1988	23,900	8,190					$938,001
18	1937	15,000	2,570	$308,000				$294,342
19	1924	3,500	5,428	$678,000				$621,669
20	1938	10,000	4,068	$488,000				$465,908
21	1984	96,264	14,432	$904,000				$1,652,897
22	1938	70,000	2,653	$318,000				$303,848
23	1948	12,000	5,265	$632,000				$603,000
25	1948	25,000	5,549	$665,000				$635,527
26	1954	16,000	4,674	$561,000				$535,313
27	1953	7,000	3,862	$483,000				$442,315
28	1953	10,000	4,280	$514,000				$490,188
29	1958	22,000	6,845	$596,000				$783,958
30	1956	50,500	4,048	$606,000				$463,617
31	1958	24,000	4,703	$588,000				$538,635
34	1989	20,500	8,528		$973,728	1.07	$1,041,889	$976,712
38	1972	30,000	8,028	$778,000				$919,447
39	1975	40,000	19,648	$1,410,000				$2,250,285
Total Fire Station Replacement Value (2)								$24,387,903
Total Capital Equipment Depreciated Value (3)								$10,603,987
Total Capital Value								$34,991,890
Total Station Building Square Feet								230,153
Avg Value per Building Square Foot								$152.04

Notes to *Table 5-1*:

1. Space in Station 5 assumes average of space in Stations 5 and 34.
2. Current replacement value is an estimate of marginal cost and excludes contributions made by developers. Fire stations are routinely renovated and updated to maintain reasonably current value. Current value does not reflect full market value of land. Useful life for fire stations assumed to be 30 years.
3. Excludes equipment with a useful life of less than ten years; see *Table A-5* in *Technical Appendix*.

The final component of the City's fire/EMS capital facilities inventory is comprised of support facilities, which include the headquarters building, as well as training and maintenance facilities. The headquarters building has recently been sold to a private developer, and the existing headquarters will ultimately be relocated to City Hall East (the former *Sears* building). Due to uncertainties regarding the existence of support facilities beyond the year 1992, the impact fee calculations presented in this report are not based on fire/EMS capital costs attributable to support facilities. Moreover, they are not based on the City's share of the existing Atlanta-Fulton County Emergency Management Agency facility, since the net impact cost of that facility has been calculated to be less than $1.50 per functional population.

Fire/EMS Level of Service

Fire/EMS facility planning is geared toward distributing fire stations and associated fire/rescue equipment to assure adequate coverage and response time in all areas of the city. Maintenance of current fire insurance rates drives the City's facility sizing and location decisions.

The Department has projected its fire station needs to the year 2007. It has determined that three additional fire stations will be required during that time period, which will add an estimated 30,128 square feet of fire station space (see *Table 5-2*, below). With these stations in place, the Department feels that it can maintain current levels of fire protection for the city.

Table 5-2
PLANNED FIRE/EMS FACILITIES AND EQUIPMENT, 1992-2007

Facility	Year(s)	Station Area (sq. ft.)	Estimated Costs		
			Land	Building	Total
Station 4	1993-2007	12,000	$500,000	$1,500,000	$2,000,000
Station 14	1993-2007	9,064	$500,000	$1,200,000	$1,700,000
Station 33	1992	9,064	$1,000,000	$1,200,000	$2,200,000
Equipment	1993-2007	NA	NA	$650,000	$650,000
Drill Yard	1993	NA	$1,000,000	$3,000,000	$4,000,000
New Shops	1993	NA	NA	$1,500,000	$1,500,000
Burn Lab	1993	NA	NA	$1,000,000	$1,000,000
Total		30,128	$3,000,000	$10,050,000	$13,500,000

Source: D.M. Chamberlain, Jr., Fire Chief, October 13, 1992.

Since the Department serves residents, workers and visitors to the city, the most appropriate level of service measure for fire/EMS facilities is square feet of fire station building space per 1,000 functional population. *Appendix B: Functional Population* describes and calculates functional population.

Table 5-3 summarizes current and projected fire/EMS service levels. The levels of service are based on fire station space and city-wide functional population. As can be seen, the ratio of fire station building area per 1,000 functional residents is projected to decline from 502 to 477 square feet by the year 2010.

Table 5-3
CURRENT AND PROJECTED FIRE/EMS LEVELS OF SERVICE

Year	Functional Population	Fire Station Building Square Feet	Square Feet/ 1,000 Func Pop
1992	458,874	230,153	502
2010	546,138	260,281	477

Source: *Table B-8* for functional population; *Table 5-1* for existing fire station floor area.

The *Act* requires adoption of a level of service standard to serve as a basis for impact fee calculations. The City has directed the consultant team to identify levels of service that are adequate given current experience and projected trends, to minimize deficiency obligations and to create opportunities for recoupment where reasonable. Based on these policy directions and the data and analysis presented above, the consultant team recommends a level of service standard of 470 square feet of fire station space per functional resident.

While the recommended level of service is slightly lower than the service levels expected to be provided in the year 2010, it is thought to represent a reasonable standard supported by existing data and planning analyses. Moreover, the recommended standard recognizes that Fire Department requirements are likely to change in coming years to reflect changing technologies, building code improvements and public education efforts. These factors, if realized, will influence the nature and number of future incidents. The recommended level of service standard allows the Fire Department to complete its expansion plans and prevents any deficiencies.

The recommended level of service standard also offers some level of recoupment. Although existing fire/EMS facilities provide more than adequate service to the City's existing functional population, recoupment-based impact fees can be used to recover the cost of previous capital facility investments that produced excess capacity. When population growth "catches up" with that excess capacity, recoupment fees can no longer be used, although impact fees designed to offset the cost of providing expanded

capacity can then be used. Consequently, it is necessary to project when the City will need to make the transition from recoupment-based fees to more traditional development impact fees.

At the recommended standard of 470 square feet per 1,000 functional population, the existing stations will be adequate to accommodate anticipated functional population growth through the year 1998 (see *Table 5-4*). Until the existing excess capacity is consumed by growth, fire/EMS impact fees will be recouping previous investments.

Table 5-4
RECOMMENDED FIRE/EMS LEVEL OF SERVICE

Year	Sq. Ft./ 1,000 Func. Pop.	Functional Population	Sq. Ft. Needed	Needed New (Excess) Sq. Ft
1992	470	458,874	215,671	(14,482)
1998	470	486,151	228,491	(1,662)
2010	470	546,138	256,685	26,532

While recoupment impact fee revenues that will be collected until 1998 could be legally used to reimburse the general fund, it is recommended that they be used for fire/EMS capital facilities. Essentially, the only recommended difference between recoupment fees and regular fees in 1999 and beyond is that recoupment fees can be waived for qualified affordable housing or economic development projects without the requirement to reimburse the impact fee account with non-impact fee revenues. A more detailed discussion of recoupment and exemptions can be found in the level of service and exemption sections of *Chapter 1*.

Fire/EMS Revenue Credits

As detailed in *Chapter 2* (*Table 2-8*), no outstanding general obligation bonds that have been used to finance capital improvements for fire/EMS facilities. With the adoption of fire/EMS impact fees, there should not be a need for bond financing in the future. For these reasons, no revenue credit is applicable to fire/EMS impact fees.

Fire/EMS Impact Fees

Based on the analysis and recommendations of this study, the maximum impact fees that may be charged for fire/EMS facilities are shown in *Table 5-5*. The fee schedule is based on the functional population estimates for each land use type (see *Tables B-2* and *B-3* in *Appendix B: Functional Population*), the recommended level of service standard of 470 square feet per 1,000 functional residents, and the capital cost of $152 per square foot for fire stations and equipment (see *Table 5-1*).

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Table 5-5
FIRE/EMS IMPACT FEE SCHEDULE

Land Use	Unit	Func Pop per Unit	Sq. Ft./ 1,000 Func Pop	Sq. Ft. per Unit	Cost per Sq. Ft.	Cost per Unit
Single-family	Dwelling	1.60	470	0.7520	$152	$114
Multi-family	Dwelling	1.11	470	0.5217	$152	$79
Hotel/motel	Room	0.72	470	0.3384	$152	$51
Elem. school	1,000 sf	1.71	470	0.8037	$152	$122
High school	1,000 sf	1.74	470	0.8178	$152	$124
Church	1,000 sf	0.74	470	0.3478	$152	$53
Hospital	1,000 sf	1.86	470	0.8742	$152	$133
Nursing home	1,000 sf	1.36	470	0.6392	$152	$97
Office						
<50,000 sf	1000 sf	1.04	470	0.4888	$152	$74
<100,000 sf	1000 sf	0.99	470	0.4653	$152	$71
<200,000 sf	1000 sf	0.94	470	0.4418	$152	$67
<500,000 sf	1000 sf	0.90	470	0.4230	$152	$64
500,000 sf +	1000 sf	0.87	470	0.4089	$152	$62
Commercial						
<100,000 sf	1000 sf	2.78	470	1.3066	$152	$199
<200,000 sf	1000 sf	2.28	470	1.0716	$152	$163
<300,000 sf	1000 sf	2.05	470	0.9635	$152	$146
<400,000 sf	1000 sf	1.90	470	0.8930	$152	$136
<500,000 sf	1000 sf	1.81	470	0.8507	$152	$129
<600,000 sf	1000 sf	1.73	470	0.8131	$152	$124
<1,000,000 sf	1000 sf	1.57	470	0.7379	$152	$112
1,000,000 sf +	1000 sf	1.45	470	0.6815	$152	$104
Industrial						
Industry	1000 sf	0.66	470	0.3102	$152	$47
Warehouse	1000 sf	0.37	470	0.1739	$152	$26

POLICE FACILITIES

It is recommended that recoupment-based fees be used to recover the cost of past police capital facility investments. This section presents the data and analysis used in calculating those proposed (recoupment) impact fees.

Police Service Area

Police services are delivered to Atlanta residents, workers and visitors by police personnel distributed throughout the city's six police precincts and headquarters building. Although services are distributed, police operations serve the entire city with centralized management, support, back-up and personnel assignments. The entire city is considered one service area for purposes of police facility planning, even though specific parts of the city may receive higher or lower levels of police service at any given point in time. As in the case of fire/EMS facilities, the service area established for the purpose of police facility impact fee calculations includes the entire city.

Existing Police Facilities and Costs

Police capital facilities currently in place within the community are generally considered adequate to accommodate Atlanta's needs to the year 2010, albeit with periodic repairs and updates. The notable exceptions are precinct headquarters buildings for Precincts 1, 2 and 6 and a new training facility. Since the precinct headquarters facilities are expected to be financed from CDBG funds as they become available, impact fees will not be used to fund those facilities. Although the proposed new training facility will provide twice as much space for officer training than currently exists, its funding source and anticipated date of construction are not yet known. Consequently, the facility must be excluded from this impact fee analysis.

Since needed precinct facilities are expected to be funded by non-local revenues, and no funding plan or construction schedule have been prepared for the proposed training center, no growth-related police facility needs can be identified over the 1992-2010 period. Recoupment-based impact fees should, therefore, be used to recover the cost of previous excess capital investments that will accommodate new growth. The current value of existing police facilities and equipment is reported in *Table 5-6*.

Police Level of Service

Since the Police Department serves residents, workers and visitors in the city, the most appropriate level of service measure for police facilities is square feet of eligible building space per 1,000 functional population. *Appendix B: Functional Population* describes and calculates functional population.

Table 5-6
EXISTING POLICE FACILITIES

Facility	Building Area (sq. ft.)	Insured/ Depreciated Value	Percent System Improvement	Percent City Share	City Share Value
Headquarters Building (1)	300,000	$0	100%	100%	$0
Radio Shop	4,500	$50,000	100%	100%	$50,000
Training Facility	10,500	$250,000	100%	100%	$250,000
SWAT Team	1,100	$35,000	100%	100%	$35,000
Special Operations (2)	4,500	$0	100%	100%	$0
Special Task Force (2)	6,000	$0	100%	100%	$0
Zone I (2)	6,600	$0	100%	100%	$0
Zone II (2)	3,650	$0	100%	100%	$0
Zone III	1,100	$250,000	100%	100%	$250,000
Zone IV	3,300	$300,000	100%	100%	$300,000
Zone V (2)	2,200	$0	100%	100%	$0
Zone VI (2)	2,200	$0	100%	100%	$0
Prof. Standards (2)	3,000	$0	100%	100%	$0
Special Investigations (2)	12,432	$0	100%	100%	$0
Homicide (2)		$0	100%	100%	$0
Midtown Precinct (2)		$0	100%	100%	$0
Underground Precinct (2)		$0	100%	100%	$0
Mounted Patrol Stable (2)		$0	100%	100%	$0
Special Investigations (2)		$0	100%	100%	$0
Electronic Maintenance (2)		$0	100%	100%	$0
Red Dog (2)		$0	100%	100%	$0
Taxi Bureau (2)		$0	100%	100%	$0
Equipment (3)	NA	$10,214,727	100%	100%	$10,214,727
Total	361,082	$885,000			$11,099,727
Average Per Square Foot					$31

Notes:

1. Police headquarters now located in Sears Building; value not included in impact fee calculation methodology since Certificates of Participation were used to finance facility acquisition.

2. Buildings leased by Department; no capital value for impact fee calculation purposes.

3. See *Table A-7* in *Technical Appendix* for complete inventory of equipment.

Source: Atlanta Police Department, October 19, 1992.

Because police capital facilities are already in place to serve projected community needs to the year 2010, it is recommended that the level of service projected for 2010 be used as the level of service for police facility (recoupment) impact fees. As indicated in *Table 5-7*, the anticipated level of service by the year 2010 is just over 660 square feet per 1,000 functional residents.

Table 5-7
CURRENT AND PROJECTED LEVELS OF SERVICE FOR POLICE FACILITIES

Year	Existing Square Feet	Functional Population	Square Feet per 1,000 Func. Pop.
1992	361,082	458,874	787
2010	361,082	546,138	661

Police Revenue Credits

As detailed in *Chapter 2* (*Table 2-8*), there are no outstanding general obligation bonds that have been used to finance capital improvements for police facilities. Since there are no plans for police facility expansion, there should not be a need for bond financing in the future. For these reasons, no revenue credit is applicable to police impact fees.

Police Impact Fees

Based on the analysis and recommendations of this study, maximum impact fees that may be charged for police facilities are shown in *Table 5-8*. The fee schedule is based on functional population estimates for each land use type (see *Tables B-2* and *B-3* in *Appendix B: Functional Population*), a recommended level of service standard of 660 square feet per 1,000 functional residents and a cost of $31 per square foot for police capital facilities (see *Table 5-6*).

The *Act* specifically authorizes fee exemptions to support economic development activities and affordable housing objectives, provided that other revenues can be found to fund needed facilities. In the case of recoupment-based impact fees, however, facilities have already been constructed and money to provide such facilities has already been found and spent. Therefore, police impact fees can be waived for eligible projects without replacing waived fees with non-impact fee revenues. Police recoupment impact fees differ from fire/EMS recoupment fees in that no capital improvements are anticipated in the near future. While police fees are recommended for police needs, they need not be restricted to capital improvements.

Table 5-8
POLICE IMPACT FEE SCHEDULE

Land Use	Unit	Func Pop per Unit	Sq. Ft./ 1,000 Func Pop	Sq. Ft. per Unit	Cost per Sq. Ft.	Cost per Unit
Single-family	Dwelling	1.60	660	1.0560	$31	$33
Multi-family	Dwelling	1.11	660	0.7326	$31	$23
Hotel/motel	Room	0.72	660	0.4752	$31	$15
Elem. school	1,000 sf	1.71	660	1.1286	$31	$35
High school	1,000 sf	1.74	660	1.1484	$31	$36
Church	1,000 sf	0.74	660	0.4884	$31	$15
Hospital	1,000 sf	1.86	660	1.2276	$31	$38
Nursing home	1,000 sf	1.36	660	0.8976	$31	$28
Office						
<50,000 sf	1000 sf	1.04	660	0.6864	$31	$21
<100,000 sf	1000 sf	0.99	660	0.6534	$31	$20
<200,000 sf	1000 sf	0.94	660	0.6204	$31	$19
<500,000 sf	1000 sf	0.90	660	0.5940	$31	$18
500,000 sf +	1000 sf	0.87	660	0.5742	$31	$18
Commercial						
<100,000 sf	1000 sf	2.78	660	1.8348	$31	$57
<200,000 sf	1000 sf	2.28	660	1.5048	$31	$47
<300,000 sf	1000 sf	2.05	660	1.3530	$31	$42
<400,000 sf	1000 sf	1.90	660	1.2540	$31	$39
<500,000 sf	1000 sf	1.81	660	1.1946	$31	$37
<600,000 sf	1000 sf	1.73	660	1.1418	$31	$35
<1,000,000 sf	1000 sf	1.57	660	1.0362	$31	$32
1,000,000 sf +	1000 sf	1.45	660	0.9570	$31	$30
Industrial						
Industry	1000 sf	0.66	660	0.4356	$31	$14
Warehouse	1000 sf	0.37	660	0.2442	$31	$8

APPENDIX A

TECHNICAL APPENDIX

[This appendix contains tables and supporting documentation that, because of their length or special nature, were not included in the body of the report.]

Table A-1
ROADWAY LINK INVENTORY

Roadway Link Description				Dist.	Lanes		Dir	Intersect		PM Peak Hr Trips			Sig	PHT	Veh-Mile	Veh-Mile	V/C
#	Street	From	To	(mi.)	No.	Med.		Sig.	LT	Count	Date	Srce	Grp	Capacity	Capacity	Travel	Ratio
1	Northside Pky.	Cobb County Line	Mt. Paran Rd.	0.9	4	U	2	3	3	3170	1991	D	C	3171	2854	2853	1.00
2	Northside Pky.	Mt. Paran Rd.	Howell Mill Rd.	1.4	4	U	2	4	2	2170	1991	D	C	2933	4107	3038	0.74
3	Northside Pky.	Howell Mill Rd.	Northside Dr.	1.3	4	D	2	2	0	1180	1991	D	B	3305	4296	1534	0.36
4	Northside Dr.	Northside Pky.	I-75	2.5	3 rv	U	2	6	0	1930	1991	D	B	2345	5864	4825	0.82
5	W.Paces Ferry Rd.	Paces Ferry Rd.	Randall Mill Rd.	0.4	2	D	2	2	1	2926	3/91	D	D	1238	495	1170	2.36
6	W.Paces Ferry Rd.	Randall Mill Rd.	Moores Mill Rd.	1.1	2	U	2	1	1	1045	3/91	D	B	1825	2008	1150	0.57
7	W.Paces Ferry Rd	Moores Mill Rd.	E. Andrews Dr.	1.3	2	U	2	1	1	1967	1991	D	B	1825	2373	2557	1.08
8	W.Paces Ferry Rd.	E. Andrews Dr.	Peachtree Rd.	0.3	4	U	2	3	2	1967	1991	D	D	2527	758	590	0.78
9	E.Paces Ferry Rd.	Peachtree Rd.	Piedmont Rd.	0.6	4	U	2	2	2	3899	3/91	D	C	3171	1903	2339	1.23
10	Roswell Rd.	Meadowbrook Dr.	Piedmont Rd.	1.7	4	D	2	4	3	4371	1/91	D	B	3742	6362	7431	1.17
11	Roswell Rd.	Piedmont Rd.	Peachtree Rd.	1.2	4	U	2	2	1	2238	8/91	D	B	3417	4100	2686	0.66
12	P'tree-Dunwoody	City Limit	Peachtree Rd.	1.6	2	U	2	1	0	2073	1/91	D	B	1551	2482	3317	1.34
13	Roxboro Rd.	Peachtree Rd.	Dekalb Co. Line	0.9	2	U	2	3	1	1772	1/91	D	C	1373	1235	1595	1.29
14	Peachtree Rd.	Dekalb Co. Line	Roxboro Rd.	0.6	6	U	2	2	0	3180	1991	D	C	4138	2483	1908	0.77
15	Peachtree Rd.	Roxboro Rd.	Piedmont Rd.	1.1	6	D	2	8	2	4940	1991	D	D	3783	4162	5434	1.31
16	Peachtree Rd.	Piedmont Rd.	Shadowlawn Ave.	0.3	6	U	2	2	0	4650	1991	D	D	3442	1033	1395	1.35
17	Peachtree Rd.	Shadowlawn Ave.	Roswell Rd.	0.3	6	U	2	4	0	3900	1991	D	D	3442	1033	1170	1.13
18	Lenox Rd.	Peachtree Rd.	Ferncliff Rd.	0.6	4	U	2	4	4	2300	3/92	L	D	2660	1596	1380	0.86
19	Lenox Rd.	Ferncliff Rd.	West Rd.	0.8	2	U	2	2	2	2395	3/92	L	C	1525	1144	1796	1.57
20	Lenox Rd.	West Rd.	Canterbury Rd.	0.4	4	D	2	1	1	2395	3/92	A	C	3338	1335	958	0.72
21	Lenox Rd.	Canterbury Rd.	Buford Hwy.	0.2	2	U	2	2	2	2395	3/92	A	D	1275	255	479	1.88
22	Buford Hwy.	City Limit	Sidney Marcus Blvd	0.5	6	D	2	2	2	2420	1991	D	C	5125	2563	1210	0.47
23	Sidney Marcus Bl.	Buford Hwy.	Piedmont Rd.	0.6	4	D	2	2	2	*	*	*	C	3338	2003	NA	NA
24	Lindbergh Dr.	Lindridge Rd.	Cheshire Bridge Rd	0.4	2	U	2	1	1	1950	1991	D	C	1525	610	780	1.28
25	Lindbergh Dr.	Piedmont Rd.	Lindridge Rd.	0.6	4	D	2	2	2	2207	4/92	L	C	3338	2003	1324	0.66
26	Lindbergh Dr.	Peachtree Rd.	Piedmont Rd.	1.2	2	U	2	2	1	2462	4/92	L	B	1688	2026	2954	1.46
27	Piedmont Rd.	Roswell Rd.	Peachtree Rd.	1.1	4	U	2	4	3	3090	1991	D	C	3052	3357	3399	1.01
28	Piedmont Rd.	Peachtree Rd.	Cheshire Bridge Rd	2.6	6	D	2	13	1	4940	1991	D	D	3673	9549	12844	1.35
29	Piedmont Ave.	Cheshire Bridge Rd	The Prado	1.2	4	U	2	4	1	2710	3/92	C	C	2814	3377	3252	0.96
30	Piedmont Ave.	The Prado	14th St.	0.5	4	D	2	1	0	1905	3/91	D	B	3305	1652	953	0.58
31	Peachtree Rd.	Roswell Rd.	Lindbergh Dr.	1.3	6	U	2	10	0	3800	1991	D	D	3442	4475	4940	1.10
32	Peachtree Rd.	Lindbergh Dr.	Brighton Rd.	1.1	6	U	2	9	0	5000	1991	D	D	3442	3787	5500	1.45

Table A-1
ROADWAY LINK INVENTORY

Roadway Link Description				Dist.	Lanes		Dir	Intersect		PM Peak Hr Trips			Sig	PHT	Veh-Mile	Veh-Mile	V/C
#	Street	From	To	(mi.)	No.	Med.		Sig.	LT	Count	Date	Srce	Grp	Capacity	Capacity	Travel	Ratio
33	Peachtree St.	Brighton Rd.	25th St.	0.5	6(2rv)	U	2	4	0	4640	1991	D	D	3266	1633	2320	1.42
34	Peachtree St.	25th St.	W. P'tree St.	0.7	6	U	2	4	0	3587	4/91	C	D	3442	2410	2511	1.04
35	Northside Dr.	I-75	Deering Rd.	0.4	4	U	2	2	1	3360	1991	D	D	2461	984	1344	1.37
36	Northside Dr.	Deering Rd.	Bishop St.	0.3	4	D	2	1	0	3360	1991	D	C	2837	851	1008	1.18
37	Northside Dr.	Bishop St.	Hemphill Ave.	0.3	4	U	2	1	1	3360	1991	D	C	3171	951	1008	1.06
38	Northside Dr.	Hemphill Ave.	8th St.	0.5	6	U	2	2	1	2040	1991	D	C	4504	2252	1020	0.45
39	Northside Dr.	8th St.	Marietta St.	0.3	4	D	2	1	1	2040	1991	D	C	3338	835	510	0.61
40	Howell Mill Rd.	Collier Rd.	Beck St.	0.2	1/2	U	2	1	1	2237	2/91	D	D	1968	394	447	1.14
41	Howell Mill Rd.	Beck St.	Bellemeade Ave.	0.5	4	U	2	3	3	6667	3/91	D	D	2660	1330	3334	2.51
42	Howell Mill Rd.	Bellemeade Ave.	Morris St.	0.3	2	U	2	1	1	6667	1991	D	C	1525	458	2000	4.37
43	Howell Mill Rd.	Morris St.	Old Chattahoochee	0.2	1/2	U	2	0	0	6667	1991	D	A	3447	689	1333	1.93
44	Howell Mill Rd.	Old Chattahoochee	Bishop St.	0.3	2/1	U	2	0	0	1425	2/91	D	A	3447	862	356	0.41
45	Howell Mill Rd.	Bishop St.	Huff Rd.	0.3	4	U	2	1	0	1425	2/91	D	C	2695	674	356	0.53
46	Howell Mill Rd.	Huff Rd.	Marietta St.	0.6	2/1	U	2	3	1	1425	2/91	D	D	1771	1062	855	0.80
47	W. Marietta St.	Marietta Blvd.	Howell Mill Rd.	1.2	4	U	2	6	1	1152	2/91	D	D	2328	2793	1382	0.49
48	Marietta Blvd.	Tacoma Dr.	W. Marietta St.	0.8	4	U	2	1	0	1416	2/91	D	B	3140	2512	1133	0.45
49	Marietta Blvd.	Chattahoochee Av	Tacoma Dr.	1.1	4	D	2	1	0	1283	2/91	A	B	3305	3635	1411	0.39
50	Marietta Blvd.	Coronet Way	Chattahoochee Ave.	0.7	4	U	2	1	1	1283	2/91	A	B	3694	2586	898	0.35
51	Marietta Blvd.	Bolton Rd.	Coronet Way	0.7	6	U	2	1	0	1152	2/91	D	B	4704	3293	806	0.24
52	S. W. Connector	W. Marietta St.	Bankhead Hwy.	1.1	4	D	2	1	0	1283	2/91	A	B	3305	3635	1411	0.39
53	Bolton Rd.	Marietta Blvd.	James Jackson Py	1.5	2	U	2	2	1	1700	1/91	D	B	1688	2532	2550	1.01
54	Bolton Rd.	James Jackson Py	Brownstone Rd.	0.6	4	D	2	2	2	1698	1/91	D	C	3338	2003	1019	0.51
55	Bolton Rd.	Brownstone Rd.	Bankhead Hwy.	1.3	2	U	2	3	1	1370	1991	D	B	1643	2053	1713	0.83
56	James Jackson Py	Bolton Rd.	Cobb County Line	0.6	2	D	2	0	0	1220	1991	D	A	2389	1433	732	0.51
57	James Jackson Py	Northwest Dr.	Bolton Rd.	1.6	4	U	2	4	1	980	1991	D	C	2814	4503	1568	0.35
58	James Jackson Py	Bankhead Hwy.	Northwest Dr.	0.9	4	U	2	1	1	560	1991	D	B	3694	3324	504	0.15
59	Bankhead Hwy.	Fulton Ind. Blvd.	Cobb County Line	0.8	4	D	2	1	1	1480	1991	D	B	3888	3110	1184	0.38
60	Bankhead Hwy.	Harwell Rd.	Fulton Ind. Blvd.	0.4	4	U	2	5	5	2150	1991	D	D	2660	1064	860	0.81
61	Bankhead Hwy.	James Jackson Py	Harwell Rd.	1.1	2	U	2	1	0	1490	1991	D	B	1551	1706	1639	0.96
62	Bankhead Hwy.	Northside Dr.	James Jackson Py	3.9	4	U	2	10	2	2250	1991	D	C	2791	10883	8775	0.81
63	Fulton Ind. Blvd.	Bankhead Hwy.	Sandy Creek Rd.	0.7	4	U	2	0	0	1370	1991	D	A	4620	3234	959	0.30
64	Fulton Ind. Blvd.	Sandy Creek Rd.	Old Gordon Rd.	1.0	2	U	2	[illegible]	0	948	1/91	D	B	1551	1474	901	0.61

Table A-1
ROADWAY LINK INVENTORY

Roadway Link Description				Dist.	Lanes		Dir	Interect		PM Peak Hr Trips			Sig	PHT	Veh-Mile	Veh-Mile	V/C
#	Street	From	To	(mi.)	No.	Med.		Sig.	LT	Count	Date	Srce	Grp	Capacity	Capacity	Travel	Ratio
65	M L K Jr. Dr.	City Limit	I-285	1.6	4	D	2	4	4	2150	1991	D	C	3338	5341	3440	0.64
66	M L K Jr. Dr.	I-285	Hightower Rd.	1.7	4	D	2	4	4	1920	1991	D	B	3888	6610	3264	0.49
67a	M L K Jr. Dr.	Hightower Rd.	I-20	1.3	4	U	2	15	4	1420	1991	D	C	2822	3669	1846	0.50
67b	M L K Jr. Dr.	I-20	Northside Dr.	2.5	4	U	2	15	4	1420	1991	D	C	2822	7056	3550	0.50
68	Hightower Rd.	Bankhead Hwy.	Simpson St.	0.9	2	U	2	2	1	1071	1/91	D	B	1688	1519	964	0.63
69	Hightower Rd.	Simpson St.	I-20	0.4	2	U	2	0	0	2174	3/91	D	A	2275	910	870	0.96
70	Hightower Rd.	I-20	M L K Jr. Dr.	0.5	4	D	2	1	1	1280	1991	D	B	3888	1944	640	0.33
71	Northside Dr.	Marietta St.	Western Ave.	0.9	6	U	2	4	1	1660	1991	D	C	4321	3889	1494	0.38
72	Northside Dr.	Western Ave.	Larkin St.	1.4	3/2	D	2	8	8	2600	1991	D	E	3806	5329	3640	0.68
73	Northside Dr.	Larkin St.	Stewart Ave.	0.3	6	D	2	2	1	2230	1991	D	D	3943	1183	669	0.57
74	Whitehall St.	I-20	Memorial Dr.	0.8	4	U	2	3	0	1102	2/91	D	C	2695	2156	882	0.41
75	Peters St.	I-20	McDaniel St.	0.5	4	U	2	1	0	1559	2/91	D	B	3140	1570	780	0.50
76	Peters St.	McDaniel St.	Spring St.	0.7	4	U	2	3	1	583	3/91	D	C	2854	1998	408	0.20
77	Walker St.	Peters St.	Nelson St.	0.4	2/1	U	2	1	0	*	*	*	C	1996	798	NA	NA
78	Glenn St.	Murphy Ave.	Stewart Ave.	0.3	4	U	2	2	0	1146	2/91	D	D	2261	565	287	0.51
79	Gordon St.	White St.	W. Whitehall St.	1.1	4	U	2	5	1	2874	1992	C	D	2341	2575	3161	1.23
80	Cascade Rd.	Boul. Lorraine	Gordon St.	1.9	4	U	2	5	0	1580	1991	D	C	2695	5121	3002	0.59
81	Cascade Rd.	City Limit	Boul. Lorraine	2.3	2	U	2	1	0	1170	1991	D	A	1934	4448	2691	0.61
82	Lee St.	Donnelly Ave.	W. Whitehall St.	0.3	2/3	U	2	2	0	1835	2/91	C	D	2852	856	551	0.64
83	Lee St.	Campbellton Rd.	Donnelly Ave.	0.7	3/2	U	2	3	0	1870	2/91	D	C	3417	2392	1309	0.55
84	Lee St.	Womack Ave.	Campbellton Rd.	1.4	2/3	U	2	4	1	1530	1991	D	C	3568	4995	2142	0.43
85	W. Whitehall St.	Lee St.	I-20	0.7	2/3	U	2	2	0	1835	2/91	A	C	3417	2392	1285	0.54
86	Murphy Ave.	Glenn St.	I-20	0.3	4	U	2	1	0	1354	2/91	A	C	2695	809	406	0.50
87	Campbellton Rd.	Venetian Dr.	Lee St.	0.6	4	U	2	2	2	1216	1/91	D	C	3171	1903	730	0.38
88	Campbellton Rd.	I-285	Venetian Dr.	3.8	2	U	2	8	6	1005	1/91	D	B	1757	6675	3819	0.57
89	Campbellton Rd.	Daniel Rd.	I-285	0.9	4	D	2	2	2	2670	2/91	D	B	3888	3499	2403	0.69
90	Campbellton Rd.	City Limit	Daniel Rd.	1.8	2	U	2	2	0	2203	2/91	D	B	1551	2792	3965	1.42
91	Stewart Ave.	Hapeville Limit	Cleveland Ave.	0.6	2	U	2	1	1	1020	2/91	D	B	1825	1004	561	0.56
92	Stewart Ave.	Cleveland Ave.	Lakewood Fwy.	1.1	4	U	2	3	1	2310	1/91	D	C	2854	3139	2541	0.81
93	Stewart Ave.	Lakewood Fwy.	University Ave.	1.8	4	U	2	6	0	2211	1/91	D	C	2695	4717	3869	0.82
94	Stewart Ave.	University Ave.	Northside Dr.	1.9	4	U	2	6	1	1625	2/91	D	C	2775	5133	3006	0.59
95	Cleveland Ave.	City Limit	I-75	0.2	2	U	2	1	0	1785	1/91	D	D	1084	217	357	1.65

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Table A-1
ROADWAY LINK INVENTORY

Roadway Link Description				Dist.	Lanes		Dir	Intersect		PM Peak Hr Trips			Sig	PHT	Veh-Mile	Veh-Mile	V/C
#	Street	From	To	(mi.)	No.	Med.		Sig.	LT	Count	Date	Srce	Grp	Capacity	Capacity	Travel	Ratio
96	Cleveland Ave.	I-75	Stewart Ave.	0.2	4	D	2	1	1	2604	1/91	D	D	2800	560	521	0.93
97	Cleveland Ave.	Stewart Ave.	I-85	0.5	4	D	2	1	1	2093	1/91	D	B	3888	1944	1047	0.54
98	Cleveland Ave.	I-85	Browns Mill Rd.	0.8	4	U	2	4	3	1183	1/91	D	D	2560	2048	946	0.46
99	Cleveland Ave.	Browns Mill Rd.	Jonesboro Rd.	1.1	4	D	2	1	1	552	1/91	D	B	3888	4277	607	0.14
100	Crown Rd.	Sunset Ave.	I-75	0.4	4	U	2	2	2	871	1/91	D	D	2660	1064	348	0.33
101	Crown Rd.	I-75	Macon Hwy.	0.2	4	U	2	1	1	1820	1/91	D	D	2660	532	364	0.68
102	Jonesboro Rd.	Clayton Co.	I-285	0.3	4	D	2	1	1	926	1/91	D	C	3338	1001	278	0.28
103	Jonesboro Rd.	I-285	Macedonia Rd.	0.9	4	D	2	2	2	1000	3/91	D	B	3888	3499	900	0.26
104	Jonesboro Rd.	Macedonia Rd.	Sawtell Ave.	3.3	2	U	2	3	1	1013	1/91	D	B	1643	5420	3343	0.62
105	Jonesboro Rd.	Sawtell Ave.	McDonough Blvd.	1.1	2	U	2	3	1	814	1/91	D	C	1373	1510	895	0.59
106	Lakewood Ave.	Lakewood Fwy.	Jonesboro Rd.	1.0	4	U	2	4	2	1355	1/91	D	C	2933	2933	1355	0.46
107	Sawtell Ave.	Jonesboro Rd.	Southern Railway	0.4	2	U	2	2	1	660	1991	D	D	1179	472	264	0.56
108	Sawtell Ave.	Southern Railway	McDonough Blvd.	0.3	1/2	U	2	1	1	660	1991	D	C	2348	704	198	0.28
109	McDonough Blvd.	Dekalb Co. Line	Thomasville Blvd.	0.5	4	D	2	2	1	1155	1/91	D	C	3088	1544	578	0.37
110	McDonough Blvd.	Thomasville Blvd.	Boulevard	0.9	2	D	2	1	0	602	3/91	D	B	1629	1466	542	0.37
111	McDonough Blvd.	Boulevard	Capitol Ave.	1.4	2	U	2	5	3	1005	2/91	C	C	1434	2007	1407	0.70
112	Moreland Ave.	Dekalb Co. Line	Custer Ave.	1.6	4	D	2	2	1	2450	1991	D	B	3596	5754	3920	0.68
113	Moreland Ave.	Custer Ave.	Drivewood Ave.	1.3	4	U	2	3	1	2560	1991	D	B	3324	4322	3328	0.77
114	Moreland Ave.	Drivewood Ave.	Memorial Dr.	0.9	4	D	2	3	1	2480	1991	D	C	3004	2704	2232	0.83
115	Moreland Ave.	Memorial Dr.	Dekalb Ave.	0.8	4	D	2	6	2	2520	1991	D	D	2520	2016	2016	1.00
116	Moreland Ave.	Dekalb Ave.	Dekalb Co. Line	1.4	4	U	2	6	1	2470	1991	D	C	2791	3907	3458	0.89
117	Glenwood Ave.	Clifton St.	Candler Rd.	2.2	4	U	2	4	2	479	1991	D	B	3417	7516	1054	0.14
118	Candler Rd.	Memorial Dr.	Daws Rd.	0.4	4	D	2	2	0	2200	1991	D	D	2380	952	880	0.92
119	Candler Rd.	Pharr Rd.	Memorial Dr.	0.4	2	U	2	1	0	1160	1991	D	C	1296	519	464	0.89
120	Memorial Dr.	Candler Rd.	Second Ave.	1.0	3 rv	U	2	4	0	1780	1991	D	C	1996	1996	1780	0.89
121	Memorial Dr.	Second Ave.	Whitefoord Ave.	1.8	4	U	2	5	0	1740	1991	D	C	2695	4852	3132	0.65
122	Memorial Dr.	Whitefoord Ave.	Pearl St.	1.2	3 rv	U	2	6	1	1557	8/92	C	D	1722	2066	1868	0.90
123	Memorial Dr.	Pearl St.	Capitol Ave.	1.4	2/3	U	2	8	1	1403	3/91	D	E	3307	4629	1964	0.42
124	Memorial Dr.	Capitol Ave.	Peachtree St.	0.5	4	U	2	5	4	1731	4/92	C	E	2915	1457	866	0.59
125	Dekalb Ave.	Dekalb Co. Line	Kirkwood Rd.	0.8	4	U	2	1	0	1511	1991	D	B	3140	2512	1209	0.48
126	Dekalb Ave.	Kirkwood Rd.	Moreland Ave.	1.7	3 rv	U	2	5	0	1511	1991	D	C	1996	3393	2569	0.76
127	Dekalb Ave.	Moreland Ave.	Jackson St.	1.6	3 rv	U	2	2	0	7657	3/91	D	B	2345	3753	12251	3.26

Table A-1
ROADWAY LINK INVENTORY

Roadway Link Description				Dist.	Lanes		Dir	Intersect		PM Peak Hr Trips			Sig	PHT	Veh-Mile	Veh-Mile	V/C
#	Street	From	To	(mi.)	No.	Med.		Sig.	LT	Count	Date	Srce	Grp	Capacity	Capacity	Travel	Ratio
128	Boulevard	Carroll St.	Glenwood Ave.	0.3	2	U	2	1	0	2003	1/91	D	C	1296	389	601	1.55
129	Boulevard	Decatur St.	Carroll St.	0.3	2	U	2	0	0	1812	1/91	D	A	2275	683	544	0.80
130	Boulevard	Edgewood Ave.	Decatur St.	0.2	2	D	2	1	1	1555	1/91	D	D	1339	268	311	1.16
131	Hill St.	Decatur St.	Glenwood Ave.	0.5	4	U	2	5	2	*	*	*	E	2734	1367	NA	NA
132	Bell St.	Auburn Ave.	Decatur St.	0.4	2	U	2	1	0	*	*	*	C	1296	519	NA	NA
133	Ponce De Leon Av	Briarcliff Rd.	City Limit	1.1	4	U	2	4	0	3180	1991	D	C	2695	2965	3498	1.18
134	Ponce De Leon Av	Frederica St.	Briarcliff Rd.	0.4	4	U	2	2	1	2752	3/91	D	D	2461	984	1101	1.12
135	Ponce De Leon Av	Southern Railway	Frederica St.	0.6	3/2	U	2	2	0	367	1991	D	C	3417	2050	220	0.11
136	Ponce De Leon Av	Piedmont Ave.	Southern Railway	1.0	6	U	2	7	7	3018	5/92	C	E	4608	4608	3018	0.66
137	Ponce De Leon Av	Juniper St.	Piedmont Ave.	0.1	4	D	2	1	1	1790	1991	D	E	3163	316	179	0.57
138	Ponce De Leon Av	Peachtree St.	Juniper St.	0.1	4	U	2	1	1	1790	1991	D	E	3005	300	179	0.60
139	North Ave.	Piedmont Ave.	Bonaventure Ave.	1.2	6	U	2	5	1	2060	1991	D	C	4285	5141	2472	0.48
140	North Ave.	Peachtree St.	Piedmont Ave.	0.2	4	U	2	1	1	1590	1991	D	E	3005	601	318	0.53
141	North Ave.	Spring St.	Peachtree St.	0.2	6	U	2	2	0	1350	1991	D	E	3916	783	270	0.34
142	North Ave.	Northside Dr.	Spring St.	0.9	4	U	2	8	2	1896	9/91	L	E	2667	2400	1706	0.71
143	Ralph McGill Bl.	Ashley Ave.	North Ave.	0.7	2	U	2	1	0	414	5/92	C	B	1551	1086	290	0.27
144	Ralph McGill Bl.	Boulevard	Ashley Ave.	0.6	2/1	U	2	1	0	414	5/92	A	B	2345	1290	228	0.18
145	Ralph McGill Bl.	Peachtree St.	Boulevard	0.8	4	U	2	6	0	*	*	*	E	2554	2043	NA	NA
146	Capitol Ave.	University Ave.	Little St.	0.8	4	U	2	4	0	931	2/91	D	D	2261	1809	745	0.41
147	Capitol Ave.	Little St.	M L K Jr. Dr.	1.1	4	D	2	5	0	2065	3/92	C	E	2689	2957	2272	0.77
148	Ridge Ave.	Capitol Ave.	Pryor St.	0.5	2	U	2	1	0	1270	1991	D	B	1551	776	635	0.82
149	Pryor Rd.	University Ave.	Ridge Ave.	0.4	4	U	2	1	0	994	4/91	C	C	2695	1078	398	0.37
150	Pryor St.	Ridge Ave.	Central Ave.	0.4	6	U	2	1	0	651	2/91	D	C	4138	1655	260	0.16
151	Pryor St.	Central Ave.	RD Abernathy	0.4	3	NA	1	0	0	275	8/91	D	A	4395	1758	110	0.06
152	Pryor St.	RD Abernathy	Memorial Dr.	0.7	3	NA	1	7	2	396	3/91	D	E	2598	1819	277	0.15
153	Central Ave.	Pryor St.	Richardson St.	0.6	2	NA	1	1	0	*	*	*	B	1983	1190	NA	NA
154	Central Ave.	Richardson St.	Memorial Dr.	0.4	3	NA	1	2	1	815	3/92	C	E	2692	1077	326	0.30
155	RD Abernathy	Central Ave.	Capitol Ave.	0.3	6	U	2	3	2	1547	2/91	D	D	3847	1154	464	0.40
156	RD Abernathy	Stewart Ave.	Central Ave.	0.9	6	D	2	3	0	1390	2/91	D	C	4356	3921	1251	0.32
157	M L K Jr. Dr.	Northside Dr.	Walker St.	0.2	3	NA	1	1	0	782	1991	D	E	2474	495	156	0.32
158	M L K Jr. Dr.	Walker St.	Butler St.	0.8	4	NA	1	11	5	1530	1991	A	E	3313	2650	1224	0.46
159	M L K Jr. Dr.	Butler St.	Hill St.	0.4	4	U	2	3	2	2278	1991	D	E	2855	1142	911	0.80

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ROADWAY LINK INVENTORY

Roadway Link Description				Dist.	Lanes		Dir	Intersect		PM Peak Hr Trips			Sig	PHT	Veh-Mile	Veh-Mile	V/C
#	Street	From	To	(mi.)	No.	Med.		Sig.	LT	Count	Date	Srce	Grp	Capacity	Capacity	Travel	Ratio
160	Peachtree St.	W. P'tree St.	Baker St.	2.4	4	U	2	15	2	2370	2/91	D	E	2614	6274	5688	0.91
161	Fulton St.	Capitol Ave.	Pryor St.	0.4	6	U	2	4	3	*	*	*	E	4435	1774	NA	NA
162	Piedmont Ave.	14th St.	North Ave.	1.1	3	NA	1	6	0	1424	2/91	D	E	2474	2721	1566	0.58
163	Piedmont Ave.	North Ave.	M L K Jr. Dr.	1.6	4	NA	1	13	2	1646	2/91	D	E	3150	5040	2634	0.52
164	Cheshire Bridge Rd	Buford Hwy.	Lindbergh Dr.	0.5	6	U	2	4	3	*	*	*	D	3898	1949	NA	NA
165	Cheshire Bridge Rd	Lindbergh Dr.	Piedmont Rd.	1.2	4	U	2	3	1	*	*	*	C	2854	3425	NA	NA
166	14th St.	Howell Mill Rd.	Juniper St.	1.8	4	U	2	9	2	*	*	*	D	2350	4229	NA	NA
167	14th St.	Juniper St.	Piedmont Ave.	0.2	1/3	U	2	2	1	*	*	*	D	2463	493	NA	NA
168	W. Peachtree St.	Peachtree St.	16th St.	0.4	6	NA	1	3	0	2373	8/91	D	D	4045	1618	949	0.59
169	W. Peachtree St.	16th St.	10th St.	0.6	4	NA	1	4	4	1151	2/91	D	D	3173	1904	691	0.36
170	W. Peachtree St.	10th St.	Baker St.	1.4	5	NA	1	7	0	1473	3/91	D	E	3833	5367	2062	0.38
171	Spring St.	W. Peachtree St.	Intl. Blvd.	0.6	4	NA	1	6	0	1555	3/91	D	E	3067	1840	933	0.51
172	Spring St.	Intl. Blvd.	Marietta St.	0.3	4	NA	1	4	0	1854	3/91	D	E	3067	920	556	0.60
173	Spring St.	Marietta St.	Windsor St.	0.6	3	NA	1	4	2	1924	4/92	C	E	2692	1615	1154	0.71
174	Juniper St.	14th St.	10th St.	0.4	3	NA	1	4	1	1905	3/91	D	D	2270	908	762	0.84
175	Juniper St.	10th St.	Linden Ave.	0.9	4	NA	1	5	0	1905	3/91	D	E	3067	2760	1715	0.62
176	International Bl	Marietta St.	Williams St.	0.2	4	U	2	5	3	748	4/92	C	E	2825	565	150	0.26
177	International Bl	Williams St.	Piedmont Ave.	0.5	4	NA	1	5	0	385	1992	C	E	3067	1533	193	0.13
178	Edgewood Ave.	Peachtree St.	Central Ave.	0.2	4	U	2	2	0	2020	1991	D	E	2554	511	404	0.79
179	Edgewood Ave.	Central Ave.	Courtland St.	0.1	3/2	U	2	2	0	2020	1991	D	E	3235	324	202	0.62
180	Edgewood Ave.	Courtland St.	Piedmont Ave.	0.1	4/2	U	2	1	0	2020	1991	D	E	3705	370	202	0.55
181	Edgewood Ave.	Piedmont Ave.	Krog St.	1.0	4	U	2	9	0	1231	4/92	C	E	2554	2554	1231	0.48
182	Harris St.	Luckie St.	Techwood Dr.	0.1	3	NA	1	1	0	482	4/92	C	E	2474	247	48	0.19
183	Harris St.	Techwood Dr.	Williams St.	0.1	4	NA	1	1	0	482	4/92	C	E	3067	307	48	0.16
184	Harris St.	Williams St.	Spring St.	0.1	2	NA	1	1	0	482	4/92	C	E	1613	161	48	0.30
185	Harris St.	Spring St.	Peachtree St.	0.1	3	NA	1	1	0	435	1992	A	E	2474	247	44	0.18
186	Harris St.	Peachtree St.	Ivy St.	0.1	2	NA	1	1	0	435	1992	A	E	1613	161	44	0.27
187	Harris St.	Ivy St.	Piedmont Ave.	0.2	3	NA	1	2	2	388	1992	C	E	2910	582	78	0.13
188	Baker St.	Luckie St.	Techwood Dr.	0.2	2	NA	1	1	0	944	4/92	C	E	1613	323	189	0.59
189	Baker St.	Techwood Dr.	Piedmont Ave.	0.6	4	NA	1	6	0	721	1991	A	E	3067	1840	433	0.24
190	Techwood Dr.	W. Peachtree St.	Marietta St.	0.5	4	NA	1	5	1	*	*	*	E	3175	1587	NA	NA
191	Techwood Dr.	Marietta St.	Chapel St.	0.6	5	NA	1	2	0	*	*	*	C	4040	2424	NA	NA

Table A-1
ROADWAY LINK INVENTORY

Roadway Link Description				Dist.	Lanes		Dir	Intersect		PM Peak Hr Trips			Sig	PHT	Veh-Mile	Veh-Mile	V/C
#	Street	From	To	(mi.)	No.	Med.		Sig.	LT	Count	Date	Srce	Grp	Capacity	Capacity	Travel	Ratio
192	Techwood Dr.	Chapel St.	Nelson St.	0.1	3	NA	1	0	0	*	*	*	A	4395	440	NA	NA
193	Linden Ave.	Spring St.	Piedmont Ave.	0.8	2	U	2	5	0	*	*	*	E	1222	978	NA	NA
194	Peachtree St.	Baker St.	Memorial Dr.	1.2	4	U	2	12	1	1804	1991	D	E	2592	3110	2165	0.70
195	Williams St.	Intl. Blvd.	Spring St.	0.4	4	U	2	3	0	1419	5/92	C	E	2554	1022	568	0.56
196	Courtland St.	Linden Ave.	Edgewood Ave.	1.1	5	NA	1	10	1	2583	5/92	C	E	3901	4291	2841	0.66
197	Courtland St.	Edgewood Ave.	M L K Jr. Dr.	0.4	4	NA	1	2	1	1616	2/91	D	E	3337	1335	646	0.48
198	Mitchell St.	Haynes St.	Peachtree St.	1.1	3	NA	1	4	0	1950	4/92	C	C	2614	2875	2145	0.75
199	Mitchell St.	Peachtree St.	Central Ave.	0.3	2	NA	1	2	0	1950	4/92	A	E	1613	484	585	1.21
200	Mitchell St.	Central Ave.	Capitol Ave.	0.4	3	NA	1	2	0	1950	4/92	A	E	2474	989	780	0.79
201	Trinity Ave.	Spring St.	Forsyth St.	0.1	3 rv	U	2	2	1	688	2/92	D	E	2055	205	69	0.33
202	Trinity Ave.	Forsyth St.	Memorial Dr.	0.4	2	U	2	5	0	931	2/92	D	E	1222	489	372	0.76
203	Washington St.	M L K Jr. Dr.	I 75/85	0.4	4	NA	1	3	1	1616	2/92	D	D	2856	1142	646	0.57
204	Central Ave.	Memorial Dr.	M L K Jr. Dr.	0.4	3	NA	1	3	1	606	8/90	L	E	2619	1048	242	0.23
205	Central Ave.	M L K Jr. Dr.	Edgewood Ave.	0.3	4	NA	1	3	0	606	1992	A	E	3067	920	182	0.20
206	Pryor St.	Memorial Dr.	M L K Jr. Dr.	0.4	3	NA	1	3	1	635	2/91	D	E	2619	1048	254	0.24
207	Pryor St.	M L K Jr. Dr.	Edgewood Ave.	0.2	4	NA	1	2	1	928	2/91	D	E	3337	667	186	0.28
208	Marietta St.	Howell Mill Rd.	Peachtree St.	2.1	4	U	2	12	1	1748	4/92	C	E	2592	5546	3741	0.67
209	Decatur St.	Peachtree St.	Jackson St.	1.1	4	U	2	7	1	1559	4/92	C	D	2318	2550	1715	0.67
210	Rawson St.	Windsor St.	Central Ave.	0.3	3	NA	1	2	1	2064	2/91	D	E	2692	808	619	0.77
211	Windsor St.	Rawson St.	Spring St.	0.3	4	D	2	0	0	2064	2/91	D	A	4863	1459	619	0.42
North Service Area Total (excluding links with no traffic counts)																237710	
North Service Area Total (all links)															340714		
South Service Area Total (excluding links with no traffic counts)																76,373	
South Service Area Total (all links)															137513		
City-Wide Total (excluding links with no traffic counts)															452998	314083	
City-Wide Total (all links)															478217		

Notes:

Roadway Link: includes all arterials and three collectors, excludes all other collectors, local streets and interstates.

000374

Notes to *Table A-1* (continued):

Lanes: number of through lanes and whether divided median or undivided; 3-lane and 5-lane roads with continuous center turn lane classified as 2-lane divided and 4-lane divided, respectively; "rv" indicates center lane is reversible, if in parentheses indicates number of reversible lanes; two numbers with intervening slash indicates number of lanes in each direction.

Intersections: number of signalized or controlled intersections and number of intersections with left turn bays.

PM Peak Hour Trips: PM peak hour traffic volumes, with count, date of count and source: D = Georgia DOT, C = City of Atlanta, L = LRE Engineering, A = average of counts on adjacent links, * = no information or averaging method available.

Signal Group: A = less than 0.50 signalized intersection per mile, B = 0.51-2.49 signalized intersections per mile, C = 2.50-4.50 signalized intersections per mile, D = more than 4.50 signalized intersections per mile, E = more than 4.50 signalized intersections per mile and within CBD.

PHT Capacity: maximum number of peak hour trips that can be accommodated at LOS D based on lane configuration, 1-way or 2-way flow and percent of signalized intersections without left turn bays (see *Table 2-3: Maximum Peak Hour Capacities for Two-Way Arterials* and *Table 2-2: Capacity Adjustment Factors*).

Vehicle-Miles of Capacity: PHT capacity times distance (in miles) of roadway link.

Vehicle-Miles of Travel: PM peak hour trips times distance (in miles) of roadway link.

V/C Ratio: Volume-to-capacity ratio of link (PM peak hour count divided by PHT capacity).

North Service Area: includes all links located north of I-20—link numbers 1-64, 67b-69, 71-72, 74-77, 115-145, 157-160, 162-209 and 211.

South Service Area: includes all links located south of I-20—link numbers 65-67a, 70, 73, 78-114, 146-156, 161 and 210.

Table A-2
PLANNED ROADWAY IMPROVEMENT PROJECTS

CIP #	Description	Type	1992-1996 Cost ($1000) by Source					1997-2006 Cost ($1000)	Total Cost ($1000)	Percent System
			Fed/ State	Un-funded	GO Bonds	Private	Total			
SB-005	NW Atlanta Traffic Improvements	Widening	0	600	0	0	600	1713	2313	100%
SB-006	Campbellton Rd Improvements	Widening	1367	1800	0	0	3167	12000	15167	100%
SB-010	Hightower Road Widening	Widening	6500	750	0	0	7250	3600	10850	100%
SB-020	Spring Street One Way System	1-Way	2800	100	0	0	2900	0	2900	100%
SB-033	Ralph McGill Blvd Extension	Widening	3000	3250	0	0	6250	0	6250	100%
SB-042	Lakewood Av Bridge Replacement	Replace	0	1800	0	0	1800	0	1800	0%
SB-049	Bankhead Highway Widening	Widening	0	6100	0	0	6100	0	6100	100%
SB-060	Fulton Ind Blvd Widening	Widening	1000	500	0	0	1500	0	1500	100%
SB-064	Moores Mill Rd Bridge Replacement	Replace	0	0	0	0	0	2422	2422	0%
SB-065	Bohler Road Bridge Replacement	Replace	0	300	0	0	300	1800	2100	0%
SB-067	Johnson Road Bridge Replacement	Replace	0	0	0	0	0	1700	1700	0%
SB-071	Hollywood Road Bridge Replacement	Replace	0	535	0	0	535	0	535	0%
SB-074	Lindbergh-Cheshire Bridge Intersect	Turn Lns	2700	0	0	0	2700	0	2700	100%
SB-077	Roxboro Road Widening	Widening	3600	2300	0	481	6381	0	6381	100%
SB-082	Pine Street Widening	Local	0	0	0	0	0	4200	4200	0%
SB-086	Jonesboro Road Widening	Widening	2000	0	0	0	2000	0	2000	100%
SB-087	Cleveland Avenue Widening	Widening	3000	500	0	0	3500	0	3500	100%
SB-092	Southside Ind Pkwy Improvements	Local	0	0	0	0	0	0	0	0%
SB-102	Marietta Blvd Widening	Widening	0	1463	0	0	1463	0	1463	100%
SB-108	Piedmont Road Widening	Widening	2000	387	0	0	2387	0	2387	100%
SB-110	Chattahoochee Ave Widening	Local	0	0	0	0	0	2200	2200	0%
SB-115	West Bike Route Construction	Bikes	0	0	0	0	0	82	82	0%
SB-129	Westview Nhood Redevment	Sidewalk	0	0	0	0	0	900	900	0%
SB-142	Right-of-way Acquisition	ROW	0	0	2300	0	2300	0	2300	100%
SB-152	Lenox Road Widening	Widening	0	88	0	0	88	5350	5438	100%

000375

Table A-2
PLANNED ROADWAY IMPROVEMENT PROJECTS

CIP #	Description	Type	1992-1996 Cost ($1000) by Source					1997-2006 Cost ($1000)	Total Cost ($1000)	Percent System
			Fed/ State	Un-funded	GO Bonds	Private	Total			
SB-159	CD Street & Sidewalk Assmnt	Sidewalk	0	0	0	0	0	0	0	0%
SB-161	Intl Blvd Improvements	Sidewalk	0	0	0	0	0	1000	1000	0%
SB-167	Mitchell St SW Reconstruction	Replace	0	0	0	0	0	1634	1634	0%
SB-168	Peachtree St Reconstruction	Replace	0	0	0	0	0	6951	6951	0%
SB-170	Edgewood Av Reconstruction	Replace	0	0	0	0	0	1857	1857	0%
SB-171	Ellis St Reconstruction	Replace	0	0	0	0	0	809	809	0%
SB-172	Houston St Reconstruction	Replace	0	0	0	0	0	1543	1543	0%
SB-173	Walston St Reconstruction	Replace	0	0	0	0	0	1105	1105	0%
SB-174	P'tree Center Blvd Reconstruction	Replace	0	0	0	0	0	2032	2032	0%
SB-175	Harris St Reconstruction	Replace	0	0	0	0	0	1547	1547	0%
SB-176	Pryor St Park-Place Reconstruction	Replace	0	0	0	0	0	2137	2137	0%
SB-177	Ralph McGill Blvd Reconstruction	Replace	0	0	0	0	0	2347	2347	0%
SB-178	Forsyth Street Reconstruction	Replace	0	0	0	0	0	2463	2463	0%
SB-180	Baker Street Reconstruction	Replace	0	0	0	0	0	1849	1849	0%
SB-182	Auburn Av Reconstruction	Replace	0	0	0	0	0	516	516	0%
SB-183	Decatur St Reconstruction	Replace	0	0	0	0	0	2042	2042	0%
SB-184	Luckie Street Reconstruction	Replace	0	0	0	0	0	782	782	0%
SB-185	Marietta St Reconstruction	Replace	0	0	0	0	0	1188	1188	0%
SB-186	Bankhead Av Bridge	Replace	0	0	0	0	0	1653	1653	0%
SB-187	Mitchell St Viaduct Reconstruction	Replace	0	8200	0	0	8200	0	8200	0%
SB-188	Montgomery Ferry Bridge	New	0	0	0	0	0	166	166	100%
SB-193	Hill St Maintenance Facility	Support	0	600	0	0	600	0	600	0%
SB-194	Hill St Concrete Plant	Replace	0	220	0	0	220	0	220	0%
SB-196	Nelson St Bridge Reconstruction	Replace	0	0	0	0	0	3000	3000	0%
SB-197	Ponce de Leon Bridge Reconstruct	Replace	0	0	0	0	0	750	750	0%

Table A-2
PLANNED ROADWAY IMPROVEMENT PROJECTS

CIP #	Description	Type	1992-1996 Cost ($1000) by Source					1997-2006 Cost ($1000)	Total Cost ($1000)	Percent System
			Fed/ State	Un-funded	GO Bonds	Private	Total			
SB-199	Northside Bridge over P'tree Crk	New	0	0	0	0	0	5400	5400	100%
SB-200	Spring St Viaduct Construction	Replace	0	11300	0	0	11300	0	11300	0%
SB-201	Forsyth St Viaduct Reconstruction	Replace	0	0	2100	0	2100	0	2100	0%
SB-203	Courtland St Viaduct Reconstruction	Replace	0	0	0	0	0	0	0	0%
SB-206	Wall St Viaduct Reconstruction	Replace	0	0	0	0	0	1800	1800	0%
SB-207	Peachtree St Viaduct Reconstruction	Replace	0	5260	300	0	5560	0	5560	0%
SB-211	Truck/Equipment Wash Facility	Support	0	300	0	0	300	0	300	0%
SB-212	Howell Mill Road Widening	Widening	0	800	0	0	800	4200	5000	100%
SB-214	Lenox Rd MARTA Street Imprvmts	Local	0	600	0	0	600	0	600	0%
SB-218	Glenwood Land-Port Connector	New	0	1000	0	0	1000	0	1000	100%
SB-220	Sidney Marcus Blvd Extension	New	0	0	0	0	0	1600	1600	100%
SB-221	Glenwood/Moreland Intersection Imp	Align	0	200	0	0	200	0	200	0%
SB-222	Ashby/MLK Intersection Imp	Replace	0	250	0	0	250	0	250	0%
SB-230	Memorial Dr/Boulevard Imp	Turn Lns	0	0	0	0	0	200	200	100%
SB-231	Moreland @ Memorial/Arkwright	Turn Lns	0	0	0	0	0	300	300	100%
SB-232	Moreland/Glenwood	Align	0	0	0	0	0	200	200	0%
SB-233	Piedmont/E Paces Ferry	Intersect	0	0	0	0	0	500	500	100%
SB-234	Piedmont/Pharr/P'tree Dr	Intersect	0	0	0	0	0	500	500	100%
SB-235	Piedmont/E Wesley/Darlington	Intersect	0	0	0	0	0	150	150	100%
SB-236	Glenwood/Hill/I-20 Ramp	Align	0	0	0	0	0	100	100	0%
SB-237	Peachtree Hills/Lindbergh Dr	Intersect	0	0	0	0	0	50	50	100%
SB-238	MLK Street Reconstruction	Replace	0	0	0	0	0	1000	1000	0%
SB-239	14th St Widening	Widening	0	3000	0	0	3000	0	3000	100%
SB-240	12th St Widening	Local	0	0	0	0	0	10000	10000	0%
SB-241	Harris St Extension Widening	Widening	0	0	0	0	0	500	500	100%

Table A-2
PLANNED ROADWAY IMPROVEMENT PROJECTS

CIP #	Description	Type	1992-1996 Cost ($1000) by Source					1997-2006 Cost ($1000)	Total Cost ($1000)	Percent System
			Fed/ State	Un-funded	GO Bonds	Private	Total			
SB-242	8th St Widening	Local	0	0	0	0	0	1000	1000	0%
SB-243	Memorial Dr Widening	Widening	0	0	0	0	0	10000	10000	100%
SB-244	DeKalb Av Widening	Widening	0	0	0	0	0	18000	18000	100%
SB-245	11th St Widening	Local	0	0	0	0	0	3000	3000	0%
SB-246	13th St Widening	Local	0	0	0	0	0	1000	1000	0%
SB-247	10th St Widening	Local	0	0	0	0	0	1000	1000	0%
SB-248	7th St Widening	Local	0	0	0	0	0	3000	3000	0%
SB-249	Northside Pkwy Widening	Widening	0	0	0	0	0	1800	1800	100%
SB-252	Buckhead Loop Area Circ System	Local	0	0	0	0	0	10000	10000	0%
SB-253	Baker St Extension	New	0	0	0	0	0	2000	2000	100%
SB-254	Stone-Hogan Extension	Local	0	0	0	0	0	1500	1500	0%
SB-255	Greenbriar Pkwy Connector	Local	0	0	0	0	0	800	800	0%
SB-260	General Bridge Improvements	Replace	0	0	3000	0	3000	0	3000	0%
TE-001	Computer Traffic Control Expansion	Signals	0	6000	0	0	6000	0	6000	100%
TE-002	Installation of Traffic Signals	Signals	0	0	600	0	1600	1300	1900	100%
TE-004	Traffic Signal Modernization	Signals	0	0	7540	0	7540	15500	23040	100%
TE-006	Street Light Modernization	Replace	0	800	0	0	800	400	1200	0%
TE-056	City-Wide Traffic Operations	Local	0	0	0	400	400	200	600	0%
TE-063	CBD Traffic Signal Modernization	Signals	1000	300	0	0	1300	0	1300	100%
TE-075	Downtown Interstate Signal Modern	Signals	0	0	0	0	0	0	0	100%
Totals—All Improvements			28967	59303	15840	881	104991	170338	275329	
Totals—System Improvements Only			28967	28938	10440	481	68826	84829	153655	

Source: City of Atlanta, *1992 Capital Improvements Program*, June 1992.

Table A-3
PARKS INVENTORY

Class	Park Name/Location	Census Tract	NPU	Service Area	Acres
BLOCK	CHANNING DRIVE PLAYL	90.00	C	NS	0.6
BLOCK	LORING HEIGHTS PARK	89.00	E	NS	1.9
BLOCK	JOHN HOWELL PARK	15.00	F	NS	2.8
BLOCK	INVERNESS PARK		F	NS	0.3
BLOCK	UNDERWOOD HILLS PARK	89.00	D	NS	10.0
BLOCK	ELLSWORTH	90.00	C	NS	1.0
BLOCK	ANSLEY PARKS - YONAH	4.00	E	NS	1.9
BLOCK	SPRING VALLEY PARK	90.00	C	NS	3.0
BLOCK	NOBLE PARK		F	NS	0.4
BLOCK	PINEGROVE PARK	89.00	C	NS	1.7
BLOCK	SUNKEN GARDEN PARK	1.00	F	NS	2.8
BLOCK	SPRINGLAKE DRIVE & N	90.00	C	NS	5.2
BLOCK	CULPEPPER PLAYLOT	89.00	D	NS	0.5
BLOCK	PERSHING POINT	5.00	E	NS	0.3
BLOCK	EUBANKS (THE PRADO)	4.00	E	NS	2.0
BLOCK	ARDMORE PARK	91.00	C	NS	1.0
BLOCK	SIDNEY MARCUS PARK	2.00	F	NS	1.8
BLOCK	MAYSON PARK	100.00	B	NS	3.1
BLOCK	BUCKHEAD PARK	96.00	B	NS	0.7
BLOCK	SUSSEX PARK	1.00	F	NS	4.5
BLOCK	SMITH PARK	92.00	E	NS	0.5
BLOCK	VERMONT ROAD PARK	100.00	B	NS	2.0
COMM	FRANKIE ALLEN PARK	96.00	B	NS	21.3
COMM	-SUNNYBROOK PARK	96.00	B	NS	2.4
COMM	-ALEXANDER PARK	93.00	B	NS	11.6
COMM	-GARDEN HILLS PARK	96.00	B	NS	3.6
CONSERV	WILDWOOD PARK	4.00	F	NS	1.0
CONSERV	SIBLEY PARK	95.00	C	NS	1.6
CONSERV	EUBANKS (THE PRADO)	4.00	E	NS	2.0
CONSERV	SPRING VALLEY PARK	90.00	C	NS	3.0
NATURE	DANIEL JOHNSON & HER	201.00	F	NS	31.6
N'HOOD	ORME PARK	2.00	F	NS	6.6
N'HOOD	BROOKVIEW PARK	90.00	C	NS	6.8
N'HOOD	ANSLEY PARKS - WINN	4.00	E	NS	10.3
N'HOOD	MORNINGSIDE RECREATI	1.00	F	NS	0.0
N'HOOD	SIBLEY PARK	95.00	B	NS	6.8
N'HOOD	FRANKIE ALLEN PARK	96.00	B	NS	21.3
N'HOOD	TANYARD CREEK	91.00	C	NS	14.5
N'HOOD	UNDERWOOD HILLS PARK	88.00	D	NS	10.7

Table A-3
PARKS INVENTORY

Class	Park Name/Location	Census Tract	NPU	Service Area	Acres
N'HOOD	ANSLEY PARKS	5.00	E	NS	23.3
N'HOOD	PEACHTREE HILLS PARK	93.00	B	NS	7.5
N'HOOD	CHATTAHOOCHEE PARK	88.00	D	NS	4.5
N'HOOD	SHADY VALLEY PARK	94.01	B	NS	11.1
N'HOOD	LENOX WILDWOOD PARK	1.00	F	NS	7.9
N'HOOD	ANSLEY PARKS - ANSLE	5.00	E	NS	6.1
N'HOOD	ANSLEY PARKS - McCLA	5.00	E	NS	5.0
N'HOOD	-DELLWOOD	202.00	N	NS	0.0
N'HOOD	-OAK GROVE	202.00	N	NS	0.0
N'HOOD	-SHADYSIDE	202.00	N	NS	0.0
N'HOOD	DRUID HILLS - VIRGIL	202.00	N	NS	0.0
N'HOOD	DRUID HILLS PARKS &	202.00	N	NS	4.6
N'HOOD	DRUID HILLS - SPRING	202.00	N	NS	0.0
REGION	ATLANTA MEMORIAL PAR	90.00	C	NS	199.0
REGION	CHASTAIN MEMORIAL PA	99.00	A	NS	320.0
REGION	PIEDMONT PARK	4.00	E	NS	180.0
SPECIAL	HOME PARK	6.00	E	NS	1.7
SPECIAL	DRUID HILLS - SHADYSIDE			NS	0.0
SPECIAL	CHATTAHOOCHEE RIVER	98.00	A	NS	40.0
SPECIAL	DRUID HILLS - OAKGROVE			NS	0.0
SPECIAL	VIRGILEE			NS	0.0
Total - Northside Service Area					1,013.8
BLOCK	PARKWAY-ANGIER PLAYL	17.00	M	SS	0.5
BLOCK	MANIGAULT STREET PLA	31.00	N	SS	0.1
BLOCK	GIBSON-KIRKWOOD	31.00	N	SS	1.0
BLOCK	KIMPSON PARK		Y	SS	0.2
BLOCK	MEAD PLAYLOT	53.00	W	SS	0.5
BLOCK	WOODLAND PARK	69.00	W	SS	0.2
BLOCK	TECHWOOD PLAYLOT	21.00	M	SS	1.8
BLOCK	TULL WATERS PARK	70.00	Z	SS	3.9
BLOCK	CABBAGETOWN PARK	31.00	N	SS	0.4
BLOCK	PRYOR-TUCKER PLAYLOT	70.00	Z	SS	0.3
BLOCK	GOLDSBORO PARK	204.00	N	SS	2.5
BLOCK	WELCH STREET	57.00	V	SS	0.5
BLOCK	ORMOND STREET PLAYLO	53.00	W	SS	0.5
BLOCK	LANG-CARSON PARK	31.00	N	SS	1.8
BLOCK	GILLIAM PARK	206.00	O	SS	2.6
BLOCK	HARDY IVY PARK	19.00	M	SS	1.0
BLOCK	WINDSOR STREET PLAYL	44.00	V	SS	0.6

Table A-3
PARKS INVENTORY

Class	Park Name/Location	Census Tract	NPU	Service Area	Acres
BLOCK	RENAISSANCE PARK	18.00	M	SS	5.4
BLOCK	PARKWAY-MERRITTS PLA	17.00	M	SS	0.5
BLOCK	REBEL VALLEY PLAYLOT	70.00	Z	SS	1.1
BLOCK	PEOPLESTOWN BLOCK PA	56.00	V	SS	1.5
BLOCK	HURT PARK	27.00	M	SS	2.5
BLOCK	TIFT-BONNIE BREA PLAYLOT		V	SS	0.2
BLOCK	SYLVAN CIRCLE PLAYLO	75.00	X	SS	1.0
BLOCK	IVERSON STREET	204.00	N	SS	1.0
BLOCK	PARKWAY-WABASH PLAYL	17.00	M	SS	0.6
COMM	CANDLER PARK	203.00	N	SS	55.3
COMM	PERKERSON PARK	65.00	X	SS	19.9
COMM	SOUTH BEND PARK	70.00	Y	SS	76.6
COMM	DREW PARK	208.00	O	SS	23.3
N'HOOD	ADAIR PARK II	58.00	V	SS	7.4
N'HOOD	ADAIR PARK I	58.00	V	SS	6.3
N'HOOD	DANIEL L. STANTON PA	55.01	V	SS	7.7
N'HOOD	AVERY PARK	75.00	X	SS	11.0
N'HOOD	BROWNWOOD PARK	209.00	W	SS	13.2
N'HOOD	M. L. K. NAT.	29.00	M	SS	2.2
N'HOOD	BASS PARK	30.00	N	SS	0.5
N'HOOD	PHOENIX PARK III	49.95	V	SS	2.0
N'HOOD	THOMASVILLE PARK	68.02	V	SS	9.8
N'HOOD	LAKE CLAIRE	203.00	N	SS	4.1
N'HOOD	SPRINGDALE PARK	30.00	N	SS	4.6
N'HOOD	WOODRUFF PARK		M	SS	6.0
N'HOOD	BESSIE BRANHAM PARK	208.00	O	SS	6.5
N'HOOD	EMMA MILLICAN PARK	65.00	X	SS	6.0
N'HOOD	EAST LAKE PARK (Zaba	208.00	O	SS	10.3
N'HOOD	EMPIRE PARK	73.00	Z	SS	11.8
N'HOOD	COAN PARK	205.00	O	SS	14.4
N'HOOD	SOUTH ATLANTA PARK	55.02	Y	SS	10.0
N'HOOD	W.H.T.WALKER	209.00	O	SS	6.8
N'HOOD	BENTEEN PARK	69.00	W	SS	9.8
N'HOOD	JOYLAND PARK	67.00	Y	SS	9.9
N'HOOD	CHOSEWOOD PARK	64.00	Y	SS	5.8
N'HOOD	RAWSON-WASHINGTON PA	48.00	V	SS	4.4
N'HOOD	CLEVELAND AVENUE PAR	70.00	Z	SS	5.9
N'HOOD	BEDFORD PINE PARK	17.00	M	SS	4.3
N'HOOD	J.D. SIMS PARK	17.00	M	SS	1.0

Table A-3
PARKS INVENTORY

Class	Park Name/Location	Census Tract	NPU	Service Area	Acres
N'HOOD	FULTON & GLENWOOD	17.00	V	SS	0.0
N'HOOD	PITTMAN PARK	63.00	V	SS	14.1
N'HOOD	MORGAN BOULEVARD	17.00	M	SS	78.5
N'HOOD	PHOENIX PARK II	55.01	V	SS	7.3
N'HOOD	PHOENIX PARK I (DUNB	44.00	V	SS	8.6
N'HOOD	HARPER PARK	72.00	Z	SS	15.0
N'HOOD	BUTLER PARK	28.00	M	SS	3.4
REGION	GRANT PARK	53.00	W	SS	127.0
REGION	JOHN A. WHITE PARK	80.00	S	SS	107.0
REGION	SOUTHSIDE PARK	70.00	Z	SS	164.9
REGION	BROWNS MILL GOLF COURSE		Z	SS	158.5
REGION	FREEDOM/E.MORELAND PARK		M	SS	250.0
SPECIAL	FOUR CORNERS			SS	0.0
SPECIAL	M.L. KING (North)			SS	0.0
SPECIAL	DEKALB MEMORIAL PARK	205.00	O	SS	0.0
SPECIAL	PERRY HOMES CENTER		M	SS	0.0
SPECIAL	THOMASVILLE			SS	0.0
SPECIAL	E LAKE MEADOWS CENTER		O	SS	0.0
SPECIAL	CORONET WAY			SS	0.0
SPECIAL	LEILA VALLEY CENTER		Z	SS	0.0
SPECIAL	WABASH			SS	0.0
SPECIAL	SE ATLANTA CENTER			SS	0.0
SPECIAL	ANGIER PARK			SS	0.0
SPECIAL	MILLIGAN			SS	0.0
SPECIAL	TECHWOOD HOMES COMM		M	SS	0.0
SPECIAL	M.L.KING (South)			SS	0.0
SPECIAL	CARVER HOMES CENTER		Y	SS	0.0
SPECIAL	BRIDGEPORT			SS	0.0
SPECIAL	ENGLEWOOD MANOR CENTER		Y	SS	0.0
SPECIAL	J.D. SIMS COMM CENTER			SS	0.0
Southside Service Area					1,323.3
BLOCK	ROSE CIRCLE PARK	62.00	T	WS	2.7
BLOCK	TREMONT PLAYLOT	83.02	J	WS	0.9
BLOCK	PERRY BOULEVARD	87.02	G	WS	0.5
BLOCK	ASHBY CIRCLE PLAYLOT	24.00	K	WS	0.9
BLOCK	WEST END PARK	42.95	T	WS	2.0
BLOCK	VERBENA STREET PLAYL	83.02	J	WS	0.9
BLOCK	MONTREAT AVENUE PARK	61.00	S	WS	2.6
BLOCK	ASHBY GARDENS PARK	24.00	L	WS	1.2

Table A-3
PARKS INVENTORY

Class	Park Name/Location	Census Tract	NPU	Service Area	Acres
BLOCK	J. F. KENNEDY PARK	25.00	K	WS	1.0
BLOCK	FRANK STREET PLAYLOT	39.00	T	WS	0.1
BLOCK	ARLINGTON CIRCLE PLA	86.01	J	WS	0.9
BLOCK	HOWELL PARK	42.95	T	WS	2.1
BLOCK	ABNER PLACE	87.02	G	WS	0.9
COMM	GROVE PARK	87.01	J	WS	15.0
COMM	WILSON MILL PARK	78.03	H	WS	19.5
COMM	ANDERSON PARK	83.02	J	WS	56.7
COMM	COLLIER DRIVE PARK	82.02	H	WS	16.0
COMM	MELVIN DRIVE PARK	78.02	P	WS	48.9
COMM	MADDOX PARK	85.00	K	WS	38.0
COMM	BEN HILL PARK	77.02	P	WS	10.9
COMM	PEYTON FOREST PARK	81.02	I	WS	15.1
COMM	HARWELL HEIGHTS PARK	82.01	I	WS	23.4
COMM	GUN CLUB PARK	87.01	G	WS	42.3
COMM	MOZLEY PARK	40.00	K	WS	28.8
COMM	CENTER HILL PARK	86.01	J	WS	16.7
COMM	WASHINGTON PARK	24.00	K	WS	19.8
COMM	ADAMSVILLE GYM & PAR	78.04	H	WS	8.0
CONSERV	DALE CREEK PARK	82.01	I	WS	3.2
CONSERV	BEECHER PARK	80.00	I	WS	5.8
NATURE	CASCADE SPRINGS NATU	77.01	I	WS	103.0
NATURE	FAIRBURN ROAD NATURE	77.02	P	WS	40.3
NATURE	OUTDOOR ACTIVITY CEN	61.00	S	WS	26.0
N'HOOD	ADAMSVILLE PARK	78.04	H	WS	8.0
N'HOOD	STONE HOGAN PARK	77.02	R	WS	10.5
N'HOOD	LINCOLN HOMES	87.02	G	WS	2.3
N'HOOD	OAKLAND CITY PARK	66.02	S	WS	14.4
N'HOOD	ROCKDALE PARK (UNDER	87.01	G	WS	21.2
N'HOOD	DEAN RUSK PARK	42.95	T	WS	6.7
N'HOOD	DEERWOOD PARK	77.02	P	WS	17.3
N'HOOD	KNIGHT PARK	7.00	K	WS	4.0
N'HOOD	SALLE PARK	61.00	S	WS	8.5
N'HOOD	A. D. WILLIAMS (CARE	86.01	G	WS	11.0
N'HOOD	UNIVERSITY PARK	38.00	T	WS	4.3
N'HOOD	TUCSON TRAIL PARK	103.00	P	WS	10.9
N'HOOD	BEN HILL PARK	77.01	P	WS	10.9
N'HOOD	ENGLISH PARK	86.02	G	WS	9.0
N'HOOD	WEST MANOR PARK	79.00	I	WS	11.2

Table A-3
PARKS INVENTORY

Class	Park Name/Location	Census Tract	NPU	Service Area	Acres
REGION	ADAMS PARK	76.02	R	WS	158.7
SPECIAL	EAGAN HOMES		L	WS	0.0
SPECIAL	ENOTA PLACE			WS	0.0
SPECIAL	KIMBERLY ROAD CENTER		P	WS	0.0
SPECIAL	BOWEN HOMES CENTER		G	WS	0.0
SPECIAL	HOLLYWOOD CRTS CENTER		G	WS	0.0
SPECIAL	BANKHEAD COURTS CENTER		H	WS	0.0
SPECIAL	MELVIN DRIVE NAT.PRES.			WS	0.0
SPECIAL	HERNDON HOMES CENTR		L	WS	0.0
SPECIAL	ENOTA PLACE			WS	0.0
SPECIAL	BANKHEAD COURTS (AHA)		H	WS	0.0
Total - Westside Service Area					863.0
City-Wide Total					3,200.1

Note: Adjusted park acreages reflect some parks that are split between census tracts.

Source: City of Atlanta, Department of Parks, Recreation and Cultural Affairs, 10-28-92.

Table A-4
NEIGHBORHOOD AND COMMUNITY RECREATION CENTERS

Park/Location	NPU	Service Area	Building Sq. Ft.
Chastain Park	A	NS	16,000
Morningside Park	F	NS	3,000
Peachtree Hills Park	B	NS	6,500
Brownwood Park	W	SS	3,621
Drew Park	O	SS	16,965
South Bend Park	Y	SS	11,073
Thomasville Park	Z	SS	19,940
Bass Recreation Center	N	SS	6,290
Bessie Branham Park	O	SS	3,270
Four Corners Park	V	SS	2,000
J.D. Sims Park	M	SS	4,000
Kimpson Park	Y	SS	1,190
Coan Park	O	SS	14,194
Pittman Park	V	SS	21,642
Bedford Pine Park	M	SS	15,577
Daniel Stanton Park	V	SS	7,278
East Lake Park	O	SS	4,844
Perkerson Park	X	SS	4,038
Joyland Park	Y	SS	7,611
Lang-Carson Park	O	SS	14,718
Grant Park	W	SS	18,747
Collier Park	H	WS	3,000
Anderson Park	J	WS	13,338
Oakland City Park	S	WS	3,000
English Park	G	WS	4,697
Ben Hill Park	P	WS	6,500
Grove Park	J	WS	25,000
A.D. Williams Park	G	WS	5,360
Adamsville Gym Park	H	WS	2,500
Adams Park	R	WS	20,000
Mozley Park	K	WS	5,284
West Manor Park	I	WS	5,500
Total Building Square Feet			296,677

Note: only centers with complete information inventoried.

Source: City of Atlanta, Department of Parks, Recreation and Cultural Affairs.

Table A-5
INVENTORY OF PARK FACILITIES

Class	Park Name	Service Area	Acres	Lit Ball Fields	Unlit Ball Fields	Basket Ball Courts	Lit Football Soccer	Unlit Football Soccer	Multi-Use Courts	Multi-Use Fields	Lit Tennis Courts	Unlit Tennis Courts
COMM	ALEXANDER PARK	NS	11.60									
COMM	FRANKIE ALLEN PARK	NS	21.30	2						1	4	
COMM	GARDEN HILLS PARK	NS	3.60		1							
COMM	SUNNYBROOK PARK	NS	2.40									
COMM	CANDLER PARK	SS	55.30		1	1		1			2	2
COMM	DREW PARK	SS	23.30			3						1
COMM	PERKERSON PARK	SS	19.90			1			1			
COMM	SOUTH BEND PARK	SS	76.60		2						1	
COMM	ADAMSVILLE GYM/PARK	WS	8.00									
COMM	ANDERSON PARK	WS	56.70	1	1		1	1		1	3	
COMM	BEN HILL PARK	WS	10.90	3							2	
COMM	CENTER HILL PARK	WS	16.70	1		2						1
COMM	COLLIER DRIVE PARK	WS	16.00	1		2						2
COMM	GROVE PARK	WS	15.00	1			1			1		2
COMM	GUN CLUB PARK	WS	42.30		2					1		1
COMM	HARWELL HEIGHTS PARK	WS	23.40		1	1						3
COMM	MADDOX PARK	WS	38.00	1								3
COMM	MELVIN DRIVE PARK	WS	48.90			1					2	
COMM	MOZLEY PARK	WS	28.80	2		1			2		2	
COMM	PEYTON FOREST PARK	WS	15.10		1	3						2
COMM	WASHINGTON PARK	WS	19.80	2							8	
COMM	WILSON MILL PARK	WS	19.50	1	1	2		1		1		2
NHOOD	ANSLEY PARK	NS	6.10									
NHOOD	BROOKVIEW PARK	NS	6.80		1			1				
NHOOD	CHATTAHOOCHEE PARK	NS	4.50			1						
NHOOD	FRANKIE ALLEN PARK	NS	21.30									
NHOOD	LAKE CLAIRE PARK	NS	4.10							1		1
NHOOD	LENOX WILDWOOD PARK	NS	7.90									2
NHOOD	McCLATCHEY PARK	NS	5.00								2	
NHOOD	MORNINGSIDE REC. CTR	NS	0.25						1			
NHOOD	ORME PARK	NS	6.60									
NHOOD	PEACHTREE HILLS PARK	NS	7.50	1			1					3
NHOOD	SHADY VALLEY PARK	NS	11.10		1				1			3
NHOOD	SIBLEY PARK	NS	6.80									
NHOOD	SPRINGDALE PARK	NS	4.60									

Table A-5
INVENTORY OF PARK FACILITIES

Class	Park Name	Service Area	Acres	Lit Ball Fields	Unlit Ball Fields	Basket Ball Courts	Lit Football Soccer	Unlit Football Soccer	Multi-Use Courts	Multi-Use Fields	Lit Tennis Courts	Unlit Tennis Courts
NHOOD	SPRINGDALE PARK	NS	0.00									
NHOOD	TANYARD CREEK	NS	14.50									
NHOOD	UNDERWOOD HILLS PARK	NS	10.70	1		1					1	
NHOOD	WINN PARK	NS	10.30							1		
NHOOD	ADAIR PARK I	SS	6.30			1					2	
NHOOD	ADAIR PARK II	SS	7.40		1	1			1		2	
NHOOD	AVERY PARK	SS	11.00									
NHOOD	BASS PARK	SS	0.50			1						
NHOOD	BEDFORD PINE PARK	SS	4.30		2	2					2	
NHOOD	BENTEEN PARK	SS	9.80		1	1				1		1
NHOOD	BESSIE BRANHAM PARK	SS	6.50	1		2			1	1		
NHOOD	BROWNWOOD PARK	SS	13.20									
NHOOD	BUTLER PARK	SS	3.40		1	1					1	
NHOOD	CHOSEWOOD PARK	SS	5.80			1			1			1
NHOOD	CLEVELAND AV PARK	SS	5.90									
NHOOD	COAN PARK	SS	14.40		1	2				3	4	
NHOOD	DANIEL L. STANTON PARK	SS	7.70									
NHOOD	DEAN RUSK PARK	SS	6.70		1			1		1		
NHOOD	DELLWOOD	SS	0.00									
NHOOD	EAST LAKE PARK (ZABAN)	SS	10.30	1	1	1	1			2	1	
NHOOD	EMMA MILLICAN PARK	SS	6.00									
NHOOD	EMPIRE PARK	SS	11.80									
NHOOD	FULTON/GLENWOOD PRK	SS	0.50									
NHOOD	HARPER PARK	SS	15.00									
NHOOD	JOYLAND PARK	SS	9.90			1					4	
NHOOD	J.D. SIMS PARK	SS	1.00			1						
NHOOD	MORGAN BOULEVARD	SS	0.40			1						
NHOOD	M. L. K. NATATORIUM	SS	2.20									
NHOOD	OAK GROVE	SS	0.00									
NHOOD	PHOENIX PRK I (DUNBAR)	SS	8.60		1							2
NHOOD	PHOENIX PARK II	SS	7.30			2						2
NHOOD	PHOENIX PARK III	SS	2.00									
NHOOD	PITTMAN PARK	SS	14.10			2					3	
NHOOD	RAWSON-WASHINGTN PK	SS	4.40		1	2			1			1
NHOOD	SHADYSIDE	SS	0.00									

Table A-5
INVENTORY OF PARK FACILITIES

Class	Park Name	Service Area	Acres	Lit Ball Fields	Unlit Ball Fields	Basket Ball Courts	Lit Football Soccer	Unlit Football Soccer	Multi-Use Courts	Multi-Use Fields	Lit Tennis Courts	Unlit Tennis Courts
NHOOD	SOUTH ATLANTA PARK	SS	10.00			1					1	
NHOOD	THOMASVILLE PARK	SS	9.80			1						2
NHOOD	UNIVERSITY PARK	SS	4.30									
NHOOD	VIRGILEE	SS	0.00									
NHOOD	WOODRUFF PARK	SS	6.00									
NHOOD	W.H.T.WALKER PARK	SS	6.80									
NHOOD	ADAMSVILLE PARK	WS	8.00									
NHOOD	A. D. WILLIAMS PARK	WS	11.00	1	1	1						
NHOOD	BEN HILL PARK	WS	10.90									
NHOOD	BRIDGEPORT PARK	WS	2.30									
NHOOD	DEERWOOD PARK	WS	17.30		1	1						2
NHOOD	ENGLISH PARK	WS	9.00	1	1	1						
NHOOD	KNIGHT PARK	WS	4.00			1					1	
NHOOD	OAKLAND CITY PARK	WS	14.40	1		1	1				2	
NHOOD	ROCKDALE PARK	WS	21.20	1								
NHOOD	SALLE PARK	WS	8.50									
NHOOD	STONE HOGAN PARK	WS	10.50			1						
NHOOD	TUCSON TRAIL PARK	WS	10.90		1							
NHOOD	WEST MANOR PARK	WS	11.20	1								2
TOTAL PARKS, ACRES, FACILITIES		89	1073.65	24	26	49	5	5	9	15	50	41
AVERAGE PER PARK			12.06	0.27	0.29	0.55	0.06	0.06	0.10	0.17	0.56	0.46
AVERAGE PER ACRE				0.022	0.024	0.046	0.005	0.005	0.008	0.014	0.047	0.038

Source: City of Atlanta, Department of Parks, Recreation and Cultural Affairs.

Table A-6
FIRE/EMS EQUIPMENT

Equip No.	Year	Cost	ENR Index	Current Replacement Value	Useful Life	Depreciated Value 1992	City Share of Cost
9061	1972	$47,534	2.8106	$133,599	20	$0	100%
9079	1972	$47,543	2.8106	$133,624	20	$0	100%
9062	1972	$68,564	2.8106	$192,706	20	$0	100%
9055	1973	$68,564	2.6000	$178,266	20	$8,913	100%
9012	1973	$111,849	2.6000	$290,807	20	$14,540	100%
9075	1973	$47,480	2.6000	$123,448	20	$6,172	100%
9115	1974	$73,285	2.4391	$178,749	20	$17,875	100%
9076	1975	$80,504	2.2274	$179,315	15	$0	100%
9054	1975	$53,748	2.2274	$119,718	20	$17,958	100%
9052	1977	$74,703	1.9127	$142,884	20	$35,721	100%
9090	1977	$74,703	1.9127	$142,884	20	$35,721	100%
9068	1978	$77,875	1.7749	$138,220	15	$9,215	100%
9110	1978	$104,515	1.7749	$185,504	15	$12,367	100%
9083	1978	$77,875	1.7749	$138,220	20	$41,466	100%
9084	1978	$112,320	1.7749	$199,357	20	$59,807	100%
9016	1979	$350,000	1.6407	$574,245	15	$76,566	100%
9010	1979	$350,000	1.6407	$574,245	15	$76,566	100%
9013	1979	$350,000	1.6407	$574,245	15	$76,566	100%
9132	1980	$83,703	1.5221	$127,404	15	$25,481	100%
9131	1980	$83,703	1.5221	$127,404	20	$50,962	100%
9154	1981	$497,000	1.3938	$692,719	15	$184,725	100%
17047	1981	$515,179	1.3938	$718,056	15	$191,482	100%
9143	1981	$248,000	1.3938	$345,662	15	$92,177	100%
9146	1981	$248,000	1.3938	$345,662	15	$92,177	100%
9145	1981	$248,000	1.3938	$345,662	15	$92,177	100%
9144	1981	$248,000	1.3938	$345,662	15	$92,177	100%
9157	1982	$163,975	1.2881	$211,216	20	$105,608	100%
9148	1982	$95,891	1.2881	$123,517	15	$41,172	100%
9159	1982	$122,721	1.2881	$158,077	15	$52,692	100%
9153	1982	$188,789	1.2881	$243,179	20	$121,590	100%
9151	1982	$99,825	1.2881	$128,585	15	$42,862	100%
9150	1982	$99,825	1.2881	$128,585	15	$42,862	100%

Table A-6
FIRE/EMS EQUIPMENT

Equip No.	Year	Cost	ENR Index	Current Replacement Value	Useful Life	Depreciated Value 1992	City Share of Cost
9148	1982	$95,891	1.2881	$123,517	20	$61,759	100%
9168	1983	$123,873	1.2118	$150,109	12	$37,527	100%
9171	1983	$123,873	1.2118	$150,109	15	$60,044	100%
9170	1983	$123,873	1.2118	$150,109	15	$60,044	100%
9169	1983	$123,873	1.2118	$150,109	15	$60,044	100%
9167	1983	$123,873	1.2118	$150,109	15	$60,044	100%
9175	1984	$314,404	1.1884	$373,638	15	$174,364	100%
9174	1984	$314,404	1.1884	$373,638	15	$174,364	100%
9173	1984	$314,404	1.1884	$373,638	20	$224,183	100%
9453	1985	$133,591	1.1745	$156,903	15	$83,682	100%
9452	1985	$133,591	1.1745	$156,903	15	$83,682	100%
9454	1985	$130,881	1.1745	$153,720	20	$99,918	100%
9224	1985	$336,514	1.1745	$395,236	15	$210,793	100%
13321	1987	$155,954	1.1182	$174,388	15	$116,259	100%
13872	1987	$331,906	1.1182	$371,137	15	$247,425	100%
13320	1987	$155,954	1.1182	$174,388	15	$116,259	100%
13871	1987	$331,906	1.1182	$371,137	15	$247,425	100%
13319	1987	$155,954	1.1182	$174,388	15	$116,259	100%
13318	1987	$155,954	1.1182	$174,388	15	$116,259	100%
14703	1988	$411,560	1.0903	$448,724	15	$329,064	100%
14704	1988	$411,560	1.0903	$448,724	15	$329,064	100%
14702	1988	$411,560	1.0903	$448,724	15	$329,064	100%
14796	1989	$422,529	1.0676	$451,092	16	$366,512	100%
15762	1990	$169,378	1.0412	$176,356	15	$152,842	100%
15855	1990	$422,529	1.0412	$439,937	15	$381,279	100%
15856	1990	$169,378	1.0412	$176,356	15	$152,842	100%
15761	1990	$169,378	1.0412	$176,356	15	$152,842	100%
16409	1990	$402,502	1.0412	$419,085	15	$363,207	100%
15763	1990	$169,378	1.0412	$176,356	15	$152,842	100%
16410	1990	$402,502	1.0412	$419,085	15	$363,207	100%
15760	1990	$169,378	1.0412	$176,356	15	$152,842	100%
15764	1990	$169,378	1.0412	$176,356	15	$152,842	100%

Table A-6
FIRE/EMS EQUIPMENT

Equip No.	Year	Cost	ENR Index	Current Replacement Value	Useful Life	Depreciated Value 1992	City Share of Cost
15759	1990	$169,378	1.0412	$176,356	15	$152,842	100%
15758	1990	$169,378	1.0412	$176,356	15	$152,842	100%
16650	1991	$179,404	1.0190	$182,813	15	$170,625	100%
17271	1991	$402,502	1.0190	$410,150	15	$382,807	100%
17272	1991	$402,502	1.0190	$410,150	15	$382,807	100%
16688	1991	$179,404	1.0190	$182,813	15	$170,625	100%
16649	1991	$179,404	1.0190	$182,813	15	$170,625	100%
17270	1991	$402,502	1.0190	$410,150	15	$382,807	100%
16648	1991	$179,404	1.0190	$182,813	15	$170,625	100%
16697	1991	$264,888	1.0190	$269,921	15	$251,926	100%
17527	1992	$192,269	1.0000	$192,269	15	$192,269	100%
17528	1992	$192,269	1.0000	$192,269	15	$192,269	100%
17529	1992	$192,269	1.0000	$192,269	15	$192,269	100%
18164	1992	$192,269	1.0000	$192,269	15	$192,269	100%
Totals		$15,993,198		$20,025,908		$10,603,987	
Pieces of Equipment Per Station						2.36	
Average Value Per Piece						$256,742	
Average Equipment Cost Per Station						$605,911	

Note: for description of ENR index, see *Appendix D*.

Source: D.M. Chamberlain, Jr., Fire Chief, City of Atlanta, October 13, 1992.

Table A-7
POLICE EQUIPMENT INVENTORY

Equipment	Year	Pieces	Total Cost	Use-ful Life	ENR Index	1992 Value	Percent Deprecí-ated	Recoup-ment Value
Helicopter Bell	1973	1	$25,000	20	2.6000	$65,000	95.00%	$3,250
HT220 Handi	1975	2	$1,296	20	2.2274	$2,887	85.00%	$433
Microwave Tower	1975	10	$7,000,000	25	2.2274	$15,591,800	68.00%	$4,989,376
Radio Charger	1975	1	$630	15	2.2274	$1,403	100.00%	$0
Radio Unit Motor	1975	1	$648	15	2.2274	$1,443	100.00%	$0
200 Ft Antenna	1976	1	$5,000	20	2.0521	$10,260	80.00%	$2,052
Batt Charger	1976	1	$3,360	20	2.0521	$6,895	80.00%	$1,379
A.B. Dick Copier	1976	1	$1,206	15	2.0521	$2,475	100.00%	$0
Bomb Trailer	1976	1	$2,068	20	2.0521	$4,244	80.00%	$849
Cushman Mtr Acc.	1976	1	$3,700	20	2.0521	$7,593	80.00%	$1,519
Freg Devia Monita	1976	1	$5,515	20	2.0521	$11,317	80.00%	$2,263
GE Auto Radio	1976	19	$11,096	20	2.0521	$22,770	80.00%	$4,554
GE Radio	1976	5	$2,715	20	2.0521	$5,571	80.00%	$1,114
GEMOMT 76TCS66	1976	7	$3,528	20	2.0521	$7,240	80.00%	$1,448
Generator 30 kw	1976	1	$7,500	20	2.0521	$15,391	80.00%	$3,078
Generator Hewitt	1976	1	$2,263	20	2.0521	$4,644	80.00%	$929
Golden X-Ray (65)	1976	1	$2,068	20	2.0521	$4,244	80.00%	$849
Handi Talki Multi	1976	44	$20,240	20	2.0521	$41,535	80.00%	$8,307
Handi-Talkie	1976	16	$19,040	20	2.0521	$39,072	80.00%	$7,814
Handi-Talkie	1976	38	$47,766	20	2.0521	$98,021	80.00%	$19,604
Handi-Talkie	1976	213	$245,376	20	2.0521	$503,536	80.00%	$100,707
Handi-Talkie	1976	4	$2,960	20	2.0521	$6,074	80.00%	$1,215
Handi-Talkie H3	1976	54	$67,878	20	2.0521	$139,292	80.00%	$27,858
Handi-Talkie Z-2	1976	5	$4,800	20	2.0521	$9,850	80.00%	$1,970
Linde Frze Mach.	1976	1	$2,068	20	2.0521	$4,244	80.00%	$849
Metro Page 2 term	1976	1	$13,280	20	2.0521	$27,252	80.00%	$5,450
MOT	1976	38	$18,924	20	2.0521	$38,834	80.00%	$7,767
Motorcycle Radio	1976	19	$34,200	20	2.0521	$70,182	80.00%	$14,036
Motorola	1976	7	$11,669	20	2.0521	$23,946	80.00%	$4,789
Motorola Handi	1976	14	$16,520	20	2.0521	$33,901	80.00%	$6,780
Motorola Handi	1976	8	$9,200	20	2.0521	$18,879	80.00%	$3,776
Motorola Radio	1976	18	$7,128	20	2.0521	$14,627	80.00%	$2,925

Table A-7
POLICE EQUIPMENT INVENTORY

Equipment	Year	Pieces	Total Cost	Use-ful Life	ENR Index	1992 Value	Percent Depreci-ated	Recoup-ment Value
Motorola Radio	1976	5	$2,370	20	2.0521	$4,863	80.00%	$973
Motorola T73MHT	1976	46	$24,150	20	2.0521	$49,558	80.00%	$9,912
Picker X-Ray Proc.	1976	1	$2,068	20	2.0521	$4,244	80.00%	$849
Radio 2-Channel	1976	2	$1,992	20	2.0521	$4,088	80.00%	$818
Radio 450 MHZ	1976	24	$27,840	20	2.0521	$57,130	80.00%	$11,426
Spectrum Analyzer	1976	1	$3,994	20	2.0521	$8,196	80.00%	$1,639
Tool Box Assorted	1976	1	$2,068	20	2.0521	$4,244	80.00%	$849
Transmitter Det.	1976	1	$1,500	20	2.0521	$3,078	80.00%	$616
Helicopter Bell	1977	1	$16,661	10	1.9127	$31,867	100.00%	$0
Mobile Basestation	1977	4	$3,136	20	1.9127	$5,998	75.00%	$1,500
Mobile Radio	1977	7	$7,868	10	1.9127	$15,049	100.00%	$0
Mobile Radio 45w	1977	10	$13,280	20	1.9127	$25,401	75.00%	$6,350
Mobile Radio 45w	1977	10	$13,150	20	1.9127	$25,152	75.00%	$6,288
Diesel Generator	1978	1	$12,499	20	1.7749	$22,184	70.00%	$6,655
Portable Radio	1978	53	$59,148	20	1.7749	$104,982	70.00%	$31,495
Portable Radio	1978	14	$10,444	15	1.7749	$18,537	93.33%	$1,236
Portable Radio	1978	8	$9,720	20	1.7749	$17,252	70.00%	$5,176
Portable Radio	1978	2	$3,730	15	1.7749	$6,620	93.33%	$442
Hand Held 5 Watt	1979	4	$2,100	20	1.6407	$3,445	65.00%	$1,206
Mobile Radio	1979	27	$31,050	20	1.6407	$50,944	65.00%	$17,830
Handi Z-2 Talkie	1980	10	$8,180	20	1.5221	$12,451	60.00%	$4,980
Mobile Radio	1980	20	$15,780	10	1.5221	$24,019	100.00%	$0
Observation Booth	1980	5	$22,500	20	1.5221	$34,247	60.00%	$13,699
Photo Copier	1980	1	$40,000	20	1.5221	$60,884	60.00%	$24,354
Portable Radios	1980	45	$134,550	10	1.5221	$204,799	100.00%	$0
12 Channel UHF	1981	23	$38,502	20	1.3938	$53,664	55.00%	$24,149
Mble Data Term.	1981	32	$137,376	10	1.3938	$191,475	100.00%	$0
Motorola Page Boy	1981	10	$3,180	10	1.3938	$4,432	100.00%	$0
MT500 VHF	1981	1	$860	20	1.3938	$1,199	55.00%	$540
MT506 VHF Handi	1981	8	$6,880	15	1.3938	$9,589	73.33%	$2,557
Synto	1981	18	$32,904	15	1.3938	$45,862	73.33%	$12,231
VHF 8 Chnl Handi	1981	50	$67,150	15	1.3938	$93,594	73.33%	$24,962

Table A-7
POLICE EQUIPMENT INVENTORY

Equipment	Year	Pieces	Total Cost	Useful Life	ENR Index	1992 Value	Percent Depreciated	Recoupment Value
A.B. Dick Offset	1982	1	$2,860	15	1.2881	$3,684	66.67%	$1,228
Centra Comm.	1982	2	$73,420	15	1.2881	$94,572	66.67%	$31,521
Charger	1982	9	$4,129	15	1.2881	$5,319	66.67%	$1,773
Handi-Talkie	1982	12	$15,8[illegible]6	10	1.2881	$20,373	100.00%	$0
MT500 Handi	1982	99	$113,058	20	1.2881	$145,630	50.00%	$72,815
MT500 HandiTalki	1982	1	$1,142	10	1.2881	$1,471	100.00%	$0
UHF Handi-Talkie	1982	8	$9,912	10	1.2881	$12,768	100.00%	$0
16mm TV Prjtor	1983	1	$1,729	10	1.2118	$2,095	90.00%	$209
Expo Radio	1983	2	$2,790	15	1.2118	$3,381	60.00%	$1,352
Panasonic Color	1983	1	$1,855	10	1.2118	$2,248	90.00%	$225
Panasonic VHF	1983	1	$1,260	10	1.2118	$1,527	90.00%	$153
Speed Detection	1983	1	$1,300	15	1.2118	$1,575	60.00%	$630
Cellular Phone	1984	1	$2,530	15	1.1884	$3,007	53.33%	$1,403
Comm. Moni.	1984	1	$14,789	20	1.1884	$17,575	40.00%	$10,545
Expansion Shelf	1984	24	$8,640	15	1.1884	$10,268	53.33%	$4,792
Kenwd TK 7015 V	1984	10	$4,450	15	1.1884	$5,288	53.33%	$2,468
Kenwd TK 7015 V	1984	10	$5,000	15	1.1884	$5,942	53.33%	$2,773
MaMyac Lens	1984	4		15	1.1884	$0	53.33%	$0
MT500 Portable	1984	34	$37,706	20	1.1884	$44,810	40.00%	$26,886
MT500 VHF	1984	1	$779	20	1.1884	$926	40.00%	$556
MT500 VHF Ptble	1984	5	$3,895	15	1.1884	$4,629	53.33%	$2,160
MT500 VHF Ptble	1984	31	$24,149	15	1.1884	$28,699	53.33%	$13,394
Nigna Vis. Goggles	1984	1	$6,700	10	1.1884	$7,962	80.00%	$1,592
Projector	1984	3	$2,250	15	1.1884	$2,674	53.33%	$1,248
Radar Unit	1984	3	$4,050	10	1.1884	$4,813	80.00%	$963
Radar Unit Radio	1984	2	$2,700	10	1.1884	$3,209	80.00%	$642
Sea 175F Mobile T	1984	5	$5,230	20	1.1884	$6,215	40.00%	$3,729
Start-up Shelf	1984	8	$3,064	15	1.1884	$3,641	53.33%	$1,699
Walk Thr Mtl Det.	1984	1	$4,169	10	1.1884	$4,954	80.00%	$991
Comm. Console	1985	1	$39,432	20	1.1745	$46,313	35.00%	$30,103
Handi Talkie Radio	1985	4	$7,000	20	1.1745	$8,222	35.00%	$5,344
Kenwood Mobile	1985	1	$500	15	1.1745	$587	46.67%	$313

Table A-7
POLICE EQUIPMENT INVENTORY

Equipment	Year	Pieces	Total Cost	Use-ful Life	ENR Index	1992 Value	Percent Deprecl-ated	Recoup-ment Value
Mamiyac Camera	1985	5	$2,180	15	1.1745	$2,560	46.67%	$1,365
MT500 Radio	1985	20	$25,260	20	1.1745	$29,668	35.00%	$19,284
MT500 VHF	1985	6	$7,974	20	1.1745	$9,365	35.00%	$6,087
MT500 VHF Radio	1985	37	$49,173	20	1.1745	$57,754	35.00%	$37,540
Spectra Compa.	1985	1	$1,449	15	1.1745	$1,702	46.67%	$908
Spectratalcom	1985	2	$16,154	20	1.1745	$18,973	35.00%	$12,332
20 Channel Recdr.	1986	1	$20,491	10	1.1471	$23,505	60.00%	$9,402
Beseiu Minolta	1986	1	$2,530	20	1.1471	$2,902	30.00%	$2,031
DVP Portable VHF	1986	1	$10,977	10	1.1471	$12,592	60.00%	$5,037
Mamiyac Camera	1986	3	$2,280	15	1.1471	$2,615	40.00%	$1,569
Mobrok 2-Wy Rad	1986	4	$6,600	15	1.1471	$7,571	40.00%	$4,543
Motorola VHF Rad	1986	20	$23,440	15	1.1471	$26,888	40.00%	$16,133
Motorola VHF Rad	1986	53	$87,450	20	1.1471	$100,314	30.00%	$70,220
Motorla VHF Rcd.	1986	5	$15,330	10	1.1471	$17,585	60.00%	$7,034
MR8 784 Vltmeter	1986	1	$5,636	10	1.1471	$6,465	60.00%	$2,586
Multi Line Dist.	1986	1	$29,111	10	1.1471	$33,393	60.00%	$13,357
Radar Unit	1986	3	$3,705	10	1.1471	$4,250	60.00%	$1,700
Silent Comm.	1986	1	$303	10	1.1471	$348	60.00%	$139
Silent Comm.	1986	1	$331	10	1.1471	$380	60.00%	$152
VHF Transmitter	1986	2	$19,108	10	1.1471	$21,919	60.00%	$8,768
Wave Analyzer	1986	1	$2,868	15	1.1471	$3,290	40.00%	$1,974
100 Sq. Ft. Quartz	1987	1	$5,800	20	1.1182	$6,486	25.00%	$4,865
Camdex Auto	1987	1	$9,400	15	1.1182	$10,511	33.33%	$7,008
Carbine Rifles	1987	5	$2,780	10	1.1182	$3,109	50.00%	$1,555
Fluor Scope	1987	1	$23,838	10	1.1182	$26,656	50.00%	$13,328
HelicopterRanger	1987	1	$285,000	20	1.1182	$318,687	25.00%	$239,015
Messenger/Pager	1987	1	$2,464	15	1.1182	$2,755	33.33%	$1,837
Micro Upright OM	1987	2	$19,000	20	1.1182	$21,246	25.00%	$15,935
Oscilloscope Mode	1987	1	$4,680	20	1.1182	$5,233	25.00%	$3,925
Satellite Alarm	1987	1	$14,630	10	1.1182	$16,359	50.00%	$8,180
Starset Heater	1987	1	$12,689	20	1.1182	$14,189	25.00%	$10,642
VHF Handi Talkie	1987	20	$13,500	10	1.1182	$15,096	50.00%	$7,548

Table A-7
POLICE EQUIPMENT INVENTORY

Equipment	Year	Pieces	Total Cost	Useful Life	ENR Index	1992 Value	Percent Depreciated	Recoupment Value
Bomb Blast Suit	1988	1	$10,500	15	1.0903	$11,448	26.67%	$8,395
Channel Control M	1988	1	$49,050	10	1.0903	$53,479	40.00%	$32,087
Comm. System	1988	1	$4,985	15	1.0903	$5,435	26.67%	$3,985
Illuminated Sign	1988	1	$1,200	15	1.0903	$1,308	26.67%	$959
Motorcycle Radio	1988	9	$10,035	20	1.0903	$10,941	20.00%	$8,753
Multi-Unit STX	1988	15	$9,975	15	1.0903	$10,876	26.67%	$7,975
Omni Transcriber	1988	1	$569	15	1.0903	$620	26.67%	$455
Portable Radio	1988	7	$15,232	20	1.0903	$16,607	20.00%	$13,286
Portable Radio	1988	92	$154,192	20	1.0903	$168,116	20.00%	$134,493
Recorder	1988	1	$2,595	15	1.0903	$2,829	26.67%	$2,075
Satellite Receiver	1988	2	$4,520	15	1.0903	$4,928	26.67%	$3,614
Smartset CTL	1988	4	$20,424	15	1.0903	$22,268	26.67%	$16,329
Stx Sharpnet Port.	1988	39	$120,003	10	1.0903	$130,839	40.00%	$78,503
UHF Mobile Radio	1988	77	$43,967	20	1.0903	$47,937	20.00%	$38,350
VHF Mobile Radio	1988	1	$3,108	15	1.0903	$3,389	26.67%	$2,485
12 Channel Radio	1989	100	$120,100	20	1.0676	$128,219	15.00%	$108,986
9mm Pistols	1989	68	$20,808	10	1.0676	$22,215	30.00%	$15,551
Antenna Dishes	1989	12	$50,988	20	1.0676	$54,435	15.00%	$46,270
Battery System	1989	1	$3,537	15	1.0676	$3,776	20.00%	$3,021
Battery System	1989	1	$1,808	15	1.0676	$1,930	20.00%	$1,544
Battery System	1989	1	$2,594	15	1.0676	$2,769	20.00%	$2,215
Battery System	1989	1	$1,572	15	1.0676	$1,678	20.00%	$1,342
Charger Sys 24	1989	1	$3,108	15	1.0676	$3,318	20.00%	$2,654
Charger Sys 25	1989	3	$6,912	15	1.0676	$7,379	20.00%	$5,903
Charger Sys 35	1989	1	$2,862	15	1.0676	$3,055	20.00%	$2,444
Charger Sys 75	1989	1	$3,648	15	1.0676	$3,895	20.00%	$3,116
Electric Shredder	1989	1	$300	15	1.0676	$320	20.00%	$256
Generator	1989	2	$2,068	20	1.0676	$2,208	15.00%	$1,877
Mble Data Term	1989	70	$226,660	10	1.0676	$241,982	30.00%	$169,387
Mobile Radio	1989	2	$2,240	10	1.0676	$2,391	30.00%	$1,674
580 Prism Lens	1990	1	$670	15	1.0412	$698	13.33%	$605
9mm Magazines	1990		$4,863	10	1.0412	$5,063	20.00%	$4,050

Table A-7
POLICE EQUIPMENT INVENTORY

Equipment	Year	Pieces	Total Cost	Use-ful Life	ENR Index	1992 Value	Percent Depreci-ated	Recoup-ment Value
9mm Pistol	1990	224	$68,768	10	1.0412	$71,601	20.00%	$57,281
9mm Pistols	1990	1,226	$397,444	10	1.0412	$413,819	20.00%	$331,055
Chairs	1990		$6,791	10	1.0412	$7,071	20.00%	$5,657
Currency Counter	1990	1	$981	10	1.0412	$1,021	20.00%	$817
Evidence Camera	1990	1	$790	15	1.0412	$823	13.33%	$713
Microfilm Camera	1990	1	$15,755	15	1.0412	$16,404	13.33%	$14,217
Portable Radio	1990	45	$27,630	10	1.0412	$28,768	20.00%	$23,014
Radio Charger	1990	26	$7,878	10	1.0412	$8,203	20.00%	$6,562
Reader Printer	1990	1	$13,680	10	1.0412	$14,244	20.00%	$11,395
Shelving	1990	1	$2,490	10	1.0412	$2,593	20.00%	$2,074
2 Horse Trailers	1991	1	$2,761	10	1.0190	$2,813	10.00%	$2,532
4 Horse Trailers	1991	1	$3,659	10	1.0190	$3,729	10.00%	$3,356
Barricade Trailer	1991	1	$3,350	20	1.0190	$3,414	5.00%	$3,243
Camera	1991	1	$586	10	1.0190	$597	10.00%	$537
Camera	1991	1	$1,092	15	1.0190	$1,113	6.67%	$1,039
Camera Body	1991	2	$700	15	1.0190	$713	6.67%	$665
Chugai Lens	1991	1	$1,124	15	1.0190	$1,145	6.67%	$1,069
Hand Radar Unit	1991	1	$1,687	10	1.0190	$1,719	10.00%	$1,547
Hand Held Radio	1991	8	$13,496	10	1.0190	$13,752	10.00%	$12,377
Lens	1991	1	$535	10	1.0190	$545	10.00%	$491
Lens 50x w/bilt	1991	2	$648	15	1.0190	$660	6.67%	$616
Mobile Radio	1991	6	$7,068	10	1.0190	$7,202	10.00%	$6,482
Paper Shredder	1991	1	$1,491	15	1.0190	$1,519	6.67%	$1,418
Pelco Pan & Tilt	1991	1	$1,669	15	1.0190	$1,701	6.67%	$1,588
Photo Processor	1991	1	$80,862	15	1.0190	$82,398	6.67%	$76,902
Portable Radio	1991	5	$2,905	10	1.0190	$2,960	10.00%	$2,664
Portable Radios	1991	122	$919,547	10	1.0190	$937,018	10.00%	$843,316
Projection Lens	1991	3	$1,027	15	1.0190	$1,047	6.67%	$977
Projection Lens	1991	2	$606	15	1.0190	$618	6.67%	$577
Projector w/access	1991	1	$7,049	15	1.0190	$7,183	6.67%	$6,704
Radar Unit	1991	6	$10,122	15	1.0190	$10,314	6.67%	$9,626
Repeater Station	1991	1	$3,116	15	1.0190	$3,175	6.67%	$2,963

Table A-7
POLICE EQUIPMENT INVENTORY

Equipment	Year	Pieces	Total Cost	Useful Life	ENR Index	1992 Value	Percent Depreciated	Recoupment Value
Shotgun Racks	1991		$10,184	15	1.0190	$10,377	6.67%	$9,685
X-Ray Machine	1991	1	$3,200	15	1.0190	$3,261	6.67%	$3,043
Ballistic Shield	1992	2	$1,518	10	1.0000	$1,518	0.00%	$1,518
Desk w/Credenza	1992	2	$1,300	15	1.0000	$1,300	0.00%	$1,300
Moxtra Mobile	1992	5	$5,890	10	1.0000	$5,890	0.00%	$5,890
Photo Copier	1992	1	$90,000	20	1.0000	$90,000	0.00%	$90,000
Spectra Bunk	1992	2		10	1.0000	$0	0.00%	$0
CJIS Purchase	1993	1	$1,750,000	10	1.0000	$1,750,000	0.00%	$1,750,000
TOTALS		3,698	$13,862,199			$23,850,791		$10,214,72

Notes: For description of ENR index, see *Appendix D*; all equipment paid for 100 percent by City of Atlanta. The City also incurs $154,200 annually in rental costs for facilities, and will pay out $979,000 in rental for specialized equipment. These capital costs are not converted to present value capitalized equivalents which means the above figures represent conservative cost estimates.

Source: William Fauntleroy, Atlanta Police Department, October 14, 1992.

APPENDIX B

FUNCTIONAL POPULATION

The parks and recreation and public safety impact fee studies presented in this report share a common methodology for calculating levels of service and for estimating the service demands of different land use types. The common methodology is known as "functional population," and it is described and analyzed in this appendix.

Functional population is analogous to the concept of "full-time equivalent" employees. It represents the number of "full-time equivalent" people present in the City or in a service area (for the purpose of measuring level of service) or at the site of a land use (for the purpose of determining the impact of a particular development). Functional population will thus serve two distinct purposes in the parks and public safety impact fee studies: to measure the level of service on an area-wide basis, and to estimate demands for facilities generated by a particular land use.

For each purpose, functional population will be measured in a different way. To determine the level of service on an area-wide basis, functional population multipliers will be developed for population and employment. Using these multipliers, the level of service can be monitored and capital needs projected using estimates and projections regularly prepared by the City. On the other hand, physical characteristics of development such as the number and type of dwelling units or the amount of building floor area are more appropriate for estimating the impacts of a particular land use on demands for service. Functional population estimates per unit of development will therefore be calculated to determine development impacts.

In most communities it is reasonable to assume that total population and total functional population are the same. If this equality holds, the level of service can be expressed in terms of facilities per 1,000 persons, while the demand resulting from a new land use is calculated in terms of functional population. In a central city like Atlanta, however, with its daily inflow of workers and shoppers from outside the City, functional population is likely to dramatically exceed residential population. Consequently, levels of service for park and public safety facilities should be based on functional population, rather than on residential population, to equitably spread the overall burden of facility demand.

Residential Functional Population

The residential component of functional population is considerably simpler than the nonresidential component, so it is addressed first. It is assumed that people spend two-thirds of each 24-hour day at their place of residence. If a person did no more than sleep at home, that person would spend eight hours a day, or one-third of the time, at home. The third of the day spent away from home accounts for working, shopping and other away-from-home activities.

For the purposes of measuring a city-wide or area level of service, the residential component of functional population can be calculated simply by applying the factor of 0.67 to the total population of the City or of a service area. Thus, for the City as a whole, the existing and projected residential functional population can be calculated as shown in *Table B-1*.

Table B-1
RESIDENTIAL FUNCTIONAL POPULATION, 1990-2010

Factor	1990	2000	2010
Population	437,078	448,759	480,386
Occupancy Factor	0.67	0.67	0.67
Functional Population	292,848	300,669	321,859

Source: For derivation and sources of population estimates, see *Tables B-5, B-6* and *B-7*.

Determining the functional population of different types of housing units for the purposes of measuring demands for new facilities is relatively straightforward. The average number of household residents per unit for single-family, multi-family and mobile home units were derived from 1990 U.S. Census data. Applying the occupancy factor yields the following functional population estimates per dwelling unit.

Table B-2
RESIDENTIAL FUNCTIONAL POPULATION BY HOUSING TYPE

Housing Type	Household Residents per Unit	Functional Population	
		Occupancy Factor	Functional Population
Single-family	2.40	0.67	1.60
Multi-family	1.67	0.67	1.11

Source: Household residents per unit represents household population divided by total (occupied and vacant) units from City of Atlanta Bureau of Planning, *Table 4C: Structure Type, April 1, 1990*; census tracts 101.01, 102.01 and 103 excluded because they are largely outside City limits.

Nonresidential Functional Population

The functional population methodology for nonresidential uses is based on national trip generation data compiled by the Institute of Transportation Engineers (ITE). The rates in the ITE *Trip Generation* manual are divided by two to avoid over-counting. For example, a round trip from home to store would be counted as two trip ends for the dwelling unit (leaving and returning) and two trip ends for the store (arrival and departure), for a total of four one-way trips. By dividing the trip rates in half, only two one-way trips are counted, one of them assigned to the dwelling unit and one to the store.

Total functional population is derived by separately calculating and summing the functional population present at a land use during the five-day work week and during the weekend. Employees are assumed to spend eight hours a day at their place of employment. Dividing the number of weekday trips per 1,000 square feet (or other unit of measurement) by the number of trips per employee gives us the number of employees per 1,000 square feet. Multiplying the number of employees times eight hours gives an estimate of the number of hours spent at a land use by employees on an average weekday.

Nationally, the average occupancy of a vehicle is estimated to be 1.34 persons. Multiplying this times the number of weekday trips provides an estimate of the number of persons going to a land use each day. Subtracting the number of weekday employees provides an estimate of the daily number of visitors at a land use. For each land use, an assumption is made on the number of hours a visitor spends during a trip to the land use (i.e., a typical movie lasts 90 minutes). The assumed hours per visit is multiplied by the number of daily visitors to estimate weekday visitor hours spent at a land use. The functional population for the five-day workweek is calculated by multiplying the hours spent by employee and visitors during a weekday times five, and then dividing by the number of hours in a week (168).

The Saturday and Sunday trip rates per 1,000 square feet (or other unit) are averaged to estimate an average daily weekend trip rate. The number of hours spent by persons at a land use during a typical weekend day is estimated by multiplying the total hours spent by employees and visitors during an average weekday by the ratio of the weekend to weekday trip rates. This is then multiplied by 2 days and divided by the number of hours in a week to yield the weekend functional population. The weekend functional population is added to the workweek functional population to get total functional population.

Since the number of employees per unit of land use has been derived, the functional population per employee can be calculated simply by dividing the functional population by number of employees. The formulas used to derive the functional population estimates are summarized in *Figure B-1*.

Figure B-1
FUNCTIONAL POPULATION FORMULA

Functional population/unit = workweek functional population + weekend functional population

Functional population/employee = functional population/unit ÷ weekday employees/unit

Where:

Weekday ADT/unit = one-way average daily trips (total trip ends ÷ 2)

Weekday employees/unit = weekday ADT/unit ÷ weekday ADT/employee

Weekday visitors/unit = weekday ADT/unit x 1.34 avg. vehicle occupancy - employees/unit

Weekend ADT/unit = average of Saturday and Sunday ADT/unit

Weekday employee hours = employees/unit x 8 hrs/day

Weekday visitor hours = visitors/unit x hrs/visit

Workweek functional population = (weekday employee + visitor hours) x 5 days ÷ 168 hours/week

Weekend functional population = weekend ADT + weekday ADT x (weekday employee + visitor hours) x 2 days ÷ 168 hours/week

The level of service for park and public safety facilities will be expressed in terms of the ratio of facilities to functional population, either city-wide or by service area. For the residential component, as noted above, the only data needed is a total population estimate. The types of nonresidential development, however, are much more varied and information on the physical characteristics of existing development at any point in time (i.e., building floor area by type of land use) is much more difficult to assemble. Fortunately, however, the City and the Atlanta Regional Commission regularly prepare estimates and projections of employment by four major categories: commercial, retail, industrial and miscellaneous. Functional population multipliers can be calculated for these employment categories in order to estimate the nonresidential component of functional population.

Using the above formula, information on trip generation rates from the ITE Manual, and conservative assumptions about the amount of time spent by visitors at a land use, functional population estimates per unit of development (usually 1,000 square feet of gross floor area) and per employee can be calculated. *Table B-3* presents the results of these calculations for a range of general land use types.

The employment multipliers will be used to translate employment estimates and projections into functional population estimates for the purpose of determining the level of service for parks and public safety facilities. The multipliers per unit of land use will be used in the impact fee schedules.

Table B-3
NONRESIDENTIAL FUNCTIONAL POPULATION PER UNIT AND PER EMPLOYEE BY LAND USE

ITE Code	Land Use	Unit	Wkday ADT/ Unit	Wkday ADT/ Emp	Wkend ADT/ Unit	Wkday Emp/ Unit	Wkday Visitors/ Unit	Visitor Hrs/ Trip	Functional Pop. per	
									Unit	Emp.
110	Light Industry	1000 sf	3.485	1.508	0.499	2.31	2.36	1.00	0.66	0.29
150	Warehouse	1000 sf	2.440	1.946	0.223	1.25	2.02	1.00	0.37	0.30
	Avg. Industrial	1000 sf							0.52	0.30
710	General Office (1)									
710	<20,000 sf	1000 sf	10.391	NA	0.495	3.29	10.63	1.00	1.12	0.34
710	<50,000 sf	1000 sf	8.309	NA	0.413	3.29	7.84	1.00	1.04	0.32
710	<100,000 sf	1000 sf	7.016	NA	0.380	3.29	6.11	1.00	0.99	0.30
710	<200,000 sf	1000 sf	5.924	NA	0.361	3.29	4.65	1.00	0.94	0.29
710	<500,000 sf	1000 sf	4.737	NA	0.344	3.29	3.06	1.00	0.90	0.27
710	500,000 sf +	1000 sf	4.000	NA	0.338	3.29	2.07	1.00	0.87	0.26
	Avg. Office	1000 sf							0.98	0.30
820	Shopping Center (2)									
820	<50,000 sf	1000 sf	45.826	NA	59.180	2.00	59.41	1.00	3.40	1.70
820	<100,000 sf	1000 sf	35.336	NA	45.730	2.00	45.35	1.00	2.78	1.39
820	<200,000 sf	1000 sf	27.248	NA	35.340	2.00	34.51	1.00	2.28	1.14
820	<300,000 sf	1000 sf	23.405	NA	30.390	2.00	29.36	1.00	2.05	1.03
820	<400,000 sf	1000 sf	21.011	NA	27.305	2.00	26.15	1.00	1.90	0.95
820	<500,000 sf	1000 sf	19.325	NA	25.130	2.00	23.90	1.00	1.81	0.91
820	<600,000 sf	1000 sf	18.174	NA	23.480	2.00	22.35	1.00	1.73	0.87
820	<1,000,000 sf	1000 sf	16.044	NA	19.415	2.00	19.50	1.00	1.57	0.79
820	1,000,000 sf +	1000 sf	14.533	NA	16.305	2.00	17.47	1.00	1.45	0.73
	Avg. Commercial	1000 sf							2.11	1.06
320	Hotel/Motel (3)	room	5.10	6.41	4.06	0.80	1.50	8.00	0.72	NA
520	Elementary School (6)	1,000 sf	5.36	6.70	NA	0.80	6.38	8.00	1.71	NA
530	High School (6)	1,000 sf	5.45	8.40	NA	0.65	6.65	8.00	1.74	NA
560	Church	1,000 sf	4.66	NA	11.58	0.00	6.24	2.00	0.74	NA
610	Hospital (4)	1,000 sf	8.39	2.59	5.72	3.25	8.00	1.00	1.86	NA
620	Nursing Home (5)	1,000 sf	2.60	2.02	2.26	1.29	2.19	1.00	1.36	NA

Notes:

1. Based on largest size in range; final category based on 1,000,000 square foot office building.

2. Based on largest size in range; final category based on 1,500,000 square foot shopping center; employees/1,000 square feet assumed.

3. Visitors = guests.

4. 1.0 functional population added to account for hospitalized patients, assuming 70 percent occupancy of beds; beds/1000 sf = weekday ADT per 1000 sf ÷ weekday ADT per bed = 1.43; 1.43 beds per 1000 sf x 0.7 occupancy = 1.0 functional population.

5. 1.5 functional population added to account for nursing home residents, assuming 75 percent occupancy of beds; beds/1000 sf = weekday PM PHT per 1000 sf ÷ weekday PM PHT per bed = 2.0; 2.0 beds per 1000 sf x 0.75 occupancy = 1.5 functional population.

6. Visitors = students.

Source: ITE, *Trip Generation*, 5th Edition, 1991; calculations based on formula in *Figure B-1*.

Total Functional Population

The functional population of an area is the sum of the residential and nonresidential components. Total functional population can be estimated using population and employment estimates and the multipliers presented in the previous two sections.

In order to facilitate the analysis of service areas within the city, functional population has been computed by 1980 census tracts for the years 1990, 2000 and 2010 (see *Tables B-5*, *B-6* and *B-7*). Since reliable current population and employment estimates are not available, 1992 functional population by census tract was approximated by using the projected 1990-2000 average annual increase in functional population for each tract (see *Table B-8*).

City-wide 1990 functional population and projected growth in functional population is compared with existing and projected trends in population and employment in *Table B-4*. While population is only projected to increase by about ten percent over the next two decades, employment is projected to increase by about 45 percent. The city's functional population, which reflects both population and employment growth, is projected to increase by 21 percent.

Somewhat surprisingly, the estimates of the city's current functional population are only 3 percent higher than current residential population. However, the ratio of functional to resident population will tend to increase over time, since employment is projected to grow much faster than population. By the year 2010, functional population is projected to be 14 percent higher than resident population.

Table B-4
POPULATION, EMPLOYMENT AND FUNCTIONAL POPULATION, 1992-2010

Factor	1990	2010	% Change
Resident Population	437,078	480,386	+9.9%
Employment	398,815	578,891	+45.2%
Functional Population	449,773	546,138	+21.4%
Ratio Functional/Resident Population	1.03	1.14	+11%

Source: See *Tables B-5* and *B-7*.

Table B-5
FUNCTIONAL POPULATION BY CENSUS TRACT, 1990

1980 Tract	1990 Pop.	1990 Employment					1990 Func. Pop.
		Comm.	Retail	Ind.	Misc.	Total	
1.00	3990	294	544	46	10	894	3355
2.00	4775	910	1059	411	443	2823	4851
4.00	1130	11377	455	2896	124	14852	5558
5.00	2551	5794	367	1451	93	7705	4299
6.00	1397	2075	319	843	323	3560	2246
7.00	3141	991	56	1223	215	2485	2892
8.00	2102	503	69	426	72	1070	1781
10.95	6010	9494	888	914	267	11563	8171
11.00	1565	2581	421	220	211	3433	2399
12.00	3665	12469	1313	209	107	14098	7683
13.00	3627	570	1855	77	59	2561	4608
14.00	1875	163	272	132	37	604	1644
15.00	4411	303	611	8	28	950	3704
16.00	1064	148	222	81	54	505	1033
17.00	2938	5331	165	342	8	5846	3847
18.00	3334	3253	181	56	36	3526	3429
19.00	770	22450	1694	3111	396	27651	10099
20.00	1834	114	73	0	0	187	1341
21.00	3208	1155	255	4434	225	6069	4164
22.00	2423	225	14	651	67	957	1921
23.00	3486	196	12	0	597	805	2587
24.00	3247	387	18	93	0	498	2338
25.00	3767	837	42	0	0	879	2820
26.00	1696	198	55	7	0	260	1256
27.00	267	33532	4020	4674	790	43016	16139
28.00	2133	6722	330	170	88	7310	3873
29.00	1571	557	27	186	41	811	1317
30.00	1711	236	101	798	61	1196	1582
31.00	2152	117	25	126	105	373	1573
32.00	1554	512	14	246	8	780	1286
33.00	2653	5793	56	240	211	6300	3711
35.00	1419	23335	2885	616	198	27034	11254
36.00	1503	76	49	415	37	577	1217

Table B-5
FUNCTIONAL POPULATION BY CENSUS TRACT, 1990

1980 Tract	1990 Pop.	1990 Employment					1990 Func. Pop.
		Comm.	Retail	Ind.	Misc.	Total	
37.00	773	79	0	0	65	144	561
38.00	4039	2136	62	24	0	2222	3420
39.00	2779	686	73	0	4	763	2146
40.00	2808	281	20	0	13	314	1990
41.00	2626	412	135	222	0	769	2092
42.95	3103	1030	569	163	5	1767	3042
43.00	1929	1108	46	242	154	1550	1792
44.00	2886	538	29	543	22	1132	2296
46.95	1395	1288	196	99	103	1686	1590
48.00	1415	441	4	0	0	445	1085
49.95	2096	334	35	181	25	575	1603
50.00	2067	689	55	577	107	1428	1855
52.00	3965	126	206	841	71	1244	3187
53.00	3593	622	8	223	180	1033	2723
55.01	2830	185	38	25	1	249	2000
55.02	4253	667	36	231	34	968	3168
56.00	1648	463	15	31	31	540	1277
57.00	1446	230	16	527	97	870	1242
58.00	1864	95	23	714	63	895	1535
60.00	4934	122	301	0	41	464	3674
61.00	5502	175	3	0	5	183	3743
62.00	1860	321	72	700	2	1095	1629
63.00	2816	292	66	335	0	693	2145
64.00	2611	587	78	1785	0	2450	2543
65.00	4859	1435	14	178	33	1660	3765
66.01	2288	505	273	1216	39	2033	2350
66.02	1511	53	39	0	0	92	1069
67.00	5031	891	72	406	34	1403	3847
68.01	811	542	0	0	22	564	712
68.02	1562	6	0	0	0	6	1049
69.00	3533	1146	256	48	9	1459	2999
70.00	9145	2506	68	84	117	2775	7011
71.00	4875	124	0	87	0	211	3329

Table B-5
FUNCTIONAL POPULATION BY CENSUS TRACT, 1990

1980 Tract	1990 Pop.	1990 Employment					1990 Func. Pop.
		Comm.	Retail	Ind.	Misc.	Total	
72.00	3816	5704	414	901	32	7051	4987
73.00	7190	1106	309	1377	9	2801	5892
74.00	2903	1193	920	43	30	2186	3300
75.00	3866	457	537	100	0	1094	3326
76.01	7808	4542	263	0	7	4812	6874
76.02	3042	169	148	7	4	328	2249
77.01	9358	580	281	0	13	874	6746
77.02	7472	741	1552	97	270	2660	6984
78.02	5660	172	7	0	3	182	3852
78.03	9411	4113	933	11605	789	17440	12246
78.04	8780	209	222	13	6	450	6187
79.00	4749	290	37	0	5	332	3310
80.00	6950	472	196	0	28	696	5015
81.01	1414	11	0	0	4	15	952
81.02	7393	928	298	12	9	1247	5554
82.01	6780	121	116	78	29	344	4734
82.02	4994	1091	5	15	386	1497	3799
83.01	4161	249	14	0	0	263	2878
83.02	3805	397	1	0	0	398	2669
84.00	5869	550	88	0	15	653	4195
85.00	5964	409	103	59	24	595	4253
86.01	6723	220	232	24	23	499	4830
86.02	3760	1100	383	606	77	2166	3460
87.01	3068	183	11	0	0	194	2123
87.02	4728	1425	24	303	63	1815	3731
88.00	3359	1881	308	2336	513	5038	3996
89.00	10363	3718	2143	8820	1751	16432	13501
90.00	3368	466	334	291	35	1126	2849
91.00	6783	8994	1610	1068	134	11806	9310
92.00	3332	4943	1516	1483	551	8493	5932
93.00	4578	298	710	195	6	1209	3969
94.00	6678	3076	967	251	49	4343	6512
95.00	8162	3781	960	156	73	4970	7690

Table B-5
FUNCTIONAL POPULATION BY CENSUS TRACT, 1990

1980 Tract	1990 Pop.	1990 Employment					1990 Func. Pop.
		Comm.	Retail	Ind.	Misc.	Total	
96.00	7754	14380	8159	1307	495	24341	18698
97.00	3307	1772	29	74	122	1997	2837
98.00	6852	6014	727	1723	184	8648	7738
99.00	3860	965	500	70	109	1644	3459
100.00	6581	10741	1934	641	451	13767	10009
101.01	133	0	0	0	0	0	89
102.01	1104	801	150	80	18	1049	1169
103.00	1678	379	149	866	44	1438	1669
201.00	1279	73	8	174	134	389	980
202.00	2154	405	15	3	5	428	1583
203.00	3373	560	36	34	49	679	2491
204.00	2254	724	55	22	40	841	1804
205.00	4321	1357	17	322	4	1700	3418
206.00	1956	547	0	276	83	906	1583
207.00	3292	248	30	24	0	302	2319
208.00	10752	502	101	1	7	611	7464
209.00	8319	847	230	77	52	1206	6111
Total	437078	266717	49057	70118	12923	398815	449773

Notes: Employment categories used by Atlanta Regional Commission grouped as follows: commercial = transportation, communication and utilities, finance, insurance and real estate, service and government; industrial = manufacturing and wholesale; miscellaneous = construction and miscellaneous. Employment estimates for tracts partially outside the City adjusted by James Duncan and Associates as follows: no employment counted if 1990 population estimate for the City was less than ten percent of 1990 population estimate prepared by Atlanta Regional Commission in 1987 for the full tract; otherwise, employment was adjusted by the ratio of 1990 population of City portion to population of the full tract. Functional population calculated as the sum of population and employment weighted with the following multipliers: population—0.67; commercial, industrial and miscellaneous employment—0.30; retail employment—1.06. For source of functional population multipliers, see *Figure B-1* and *Table B-3*.

Source: 1990 population estimates by census tract for the City of Atlanta prepared by Atlanta Regional Commission and provided by Bureau of Planning, December 1991; 1990 employment estimates by census tract prepared by Atlanta Regional Commission, 1991.

Table B-6
FUNCTIONAL POPULATION BY CENSUS TRACT, 2000

1980 Census Tract	2000 Pop.	2000 Employment					2000 Func. Pop.
		Comm.	Retail	Ind.	Misc.	Total	
1.00	4295	313	362	45	28	748	3378
2.00	4798	754	836	118	293	2001	4451
4.00	1946	14919	994	4893	681	21487	8506
5.00	2537	6930	563	349	281	8123	4565
6.00	1239	2527	259	541	181	3508	2079
7.00	2649	1160	133	2413	27	3733	2996
8.00	1862	722	35	493	99	1349	1679
10.95	5845	10096	954	1745	447	13242	8614
11.00	2163	5152	481	3193	351	9177	4568
12.00	3730	18440	2121	1349	376	22286	10797
13.00	3849	1893	2325	59	154	4431	5675
14.00	1439	184	397	87	75	743	1489
15.00	5060	423	1025	8	61	1517	4624
16.00	997	187	274	415	45	921	1153
17.00	3166	3980	202	196	63	4441	3607
18.00	6293	4171	257	304	162	4894	5880
19.00	2739	36035	2044	2917	1020	42016	15993
20.00	1626	88	64	39	0	191	1195
21.00	2648	2709	331	3414	409	6863	4084
22.00	2046	243	47	885	57	1232	1776
23.00	3022	209	36	602	0	847	2306
24.00	3010	418	46	147	0	611	2235
25.00	4830	883	57	0	0	940	3561
26.00	1614	288	69	59	10	426	1261
27.00	719	33836	3508	4944	1064	43352	16154
28.00	1888	8094	707	505	261	9567	4672
29.00	1599	571	41	149	33	794	1340
30.00	1727	240	47	847	81	1215	1557
31.00	2094	73	67	129	49	318	1549
32.00	1508	590	20	224	165	999	1325
33.00	2704	5420	143	259	97	5919	3696
35.00	1506	24517	4803	371	526	30217	13724

Table B-6
FUNCTIONAL POPULATION BY CENSUS TRACT, 2000

1980 Census Tract	2000 Pop.	2000 Employment					2000 Func. Pop.
		Comm.	Retail	Ind.	Misc.	Total	
36.00	1238	69	35	217	35	356	962
37.00	977	38	0	0	0	38	666
38.00	4752	2217	79	19	0	2315	3939
39.00	2564	777	107	0	28	912	2073
40.00	2613	82	33	0	29	144	1819
41.00	2431	297	244	163	13	717	2030
42.95	3167	1109	800	260	32	2201	3390
43.00	2397	936	139	363	80	1518	2167
44.00	2383	444	198	383	69	1094	2076
46.95	1525	1819	741	345	91	2996	2484
48.00	1774	547	0	0	0	547	1353
49.95	1778	245	81	298	30	654	1449
50.00	2003	469	43	1116	95	1723	1892
52.00	3502	108	489	673	26	1296	3106
53.00	3085	397	10	119	73	599	2254
55.01	2550	514	47	23	0	584	1920
55.02	3707	758	93	313	58	1222	2921
56.00	1743	245	38	255	72	610	1380
57.00	1280	303	65	574	99	1041	1220
58.00	1602	208	43	1106	51	1408	1528
60.00	4402	59	257	63	66	445	3278
61.00	5217	119	17	0	0	136	3549
62.00	1705	75	301	200	63	639	1562
63.00	2503	1974	138	362	57	2531	2541
64.00	2313	963	112	3585	130	4790	3072
65.00	4482	738	56	421	49	1264	3425
66.01	2205	443	88	1652	81	2264	2223
66.02	1385	63	19	0	0	82	967
67.00	4570	897	99	440	228	1664	3636
68.01	2262	693	0	43	0	736	1737
68.02	1896	0	0	0	0	0	1270
69.00	3232	805	397	26	91	1319	2862

Table B-6
FUNCTIONAL POPULATION BY CENSUS TRACT, 2000

1980 Census Tract	2000 Pop.	2000 Employment					2000 Func. Pop.
		Comm.	Retail	Ind.	Misc.	Total	
70.00	9067	2834	38	26	204	3102	7034
71.00	4599	358	19	28	0	405	3217
72.00	2191	6409	495	2279	207	9390	4661
73.00	6858	1020	526	1607	58	3211	5958
74.00	3242	1011	477	49	72	1609	3017
75.00	3869	484	705	212	0	1401	3548
76.01	7747	4812	272	0	152	5236	6968
76.02	2935	143	264	9	12	428	2295
77.01	8744	1056	727	0	145	1928	6989
77.02	8740	1139	1752	453	259	3603	8268
78.02	6101	183	100	0	82	365	4274
78.03	9897	7133	1182	15030	963	24308	14822
78.04	8256	1264	360	35	18	1677	6309
79.00	5337	329	90	11	116	546	3808
80.00	6420	549	66	0	31	646	4545
81.01	1343	11	0	0	0	11	903
81.02	7530	822	320	6	32	1180	5642
82.01	6825	188	184	237	35	644	4906
82.02	4925	1190	174	160	446	1970	4023
83.01	3689	247	31	0	0	278	2579
83.02	3382	177	5	0	0	182	2324
84.00	5255	521	146	14	0	681	3836
85.00	5419	274	96	48	28	446	3838
86.01	6345	179	379	30	71	659	4737
86.02	3646	1139	295	865	243	2542	3430
87.01	4201	207	11	108	64	390	2940
87.02	4651	1234	45	650	123	2052	3766
88.00	3771	1925	192	2931	701	5749	4398
89.00	14932	6281	1901	8331	1531	18044	16862
90.00	3178	270	335	117	0	722	2600
91.00	7701	8545	1443	645	195	10828	9505
92.00	3586	3803	1963	1768	850	8384	6410

Table B-6
FUNCTIONAL POPULATION BY CENSUS TRACT, 2000

1980 Census Tract	2000 Pop.	2000 Employment					2000 Func. Pop.
		Comm.	Retail	Ind.	Misc.	Total	
93.00	4881	632	616	209	79	1536	4199
94.00	10719	4134	1020	408	375	5937	9738
95.00	8117	8131	1303	824	516	10774	9660
96.00	8092	24939	9154	1560	834	36487	23325
97.00	3604	1322	32	111	139	1604	2921
98.00	8177	4417	697	2509	444	8067	8429
99.00	4313	1140	509	213	166	2028	3885
100.00	7390	20293	1798	993	752	23836	13468
101.01	147	0	0	0	0	0	98
102.01	1285	1091	466	232	94	1883	1780
103.00	2363	274	137	1424	102	1937	2268
201.00	1274	70	68	0	141	279	989
202.00	2350	316	21	0	13	350	1696
203.00	3378	246	20	66	19	351	2384
204.00	2176	656	99	24	32	811	1777
205.00	3921	1215	20	377	67	1679	3146
206.00	1903	734	8	302	73	1117	1616
207.00	3070	275	104	246	0	625	2324
208.00	9757	483	124	0	19	626	6819
209.00	7069	569	125	74	25	793	5069
Total	448759	331150	58931	89939	19270	499290	495243

Notes: Miscellaneous employment consists of construction and miscellaneous categories used by Atlanta Regional Commission. 2000 population and employment estimates for tracts partially outside the City adjusted by James Duncan and Associates as follows: no employment counted if 1990 population estimate for the City was less than ten percent of 1990 population estimate prepared by Atlanta Regional Commission in 1987 for the full tract; in otherwise, employment, and in all cases, population, adjusted by ratio of 1990 population of City portion to population of the full tract. Functional population calculated as the sum of population and employment weighted with the following multipliers: population—0.67; commercial, industrial and miscellaneous employment—0.30; retail employment—1.06. For source of functional population multipliers, see *Figure B-1* and *Table B-3*.

Source: 2000 population and employment estimates prepared by Atlanta Regional Commission and provided by Bureau of Planning, 1987.

Table B-7
FUNCTIONAL POPULATION BY CENSUS TRACT, 2010

1980 Census Tract	2010 Pop.	2010 Employment					2010 Func. Pop.
		Comm.	Retail	Ind.	Misc.	Total	
1.00	4536	321	370	49	54	794	3558
2.00	4909	783	863	138	312	2096	4574
4.00	2459	18525	1229	5591	724	26069	10403
5.00	2548	8282	597	454	389	9722	5077
6.00	1239	2739	300	563	197	3799	2198
7.00	3451	1228	133	2430	29	3820	3559
8.00	1865	733	35	505	108	1381	1691
10.95	5853	10551	997	1710	456	13714	8794
11.00	2665	8230	591	3909	433	13163	6184
12.00	4392	22770	2443	1940	418	27571	13071
13.00	4020	2170	2398	62	169	4799	5955
14.00	1515	211	432	76	65	784	1579
15.00	5325	453	1121	7	73	1654	4916
16.00	991	210	302	425	49	986	1189
17.00	3269	4185	220	179	87	4671	3759
18.00	8257	4806	354	365	221	5746	7525
19.00	3635	39345	2313	2860	865	45383	17808
20.00	1729	90	68	39	0	197	1269
21.00	2751	3787	357	3395	490	8029	4523
22.00	1981	432	58	903	65	1458	1808
23.00	2883	453	47	632	0	1132	2307
24.00	3027	523	65	150	6	744	2301
25.00	5791	995	121	0	14	1130	4311
26.00	1858	827	103	86	33	1049	1638
27.00	851	38590	3973	5040	1107	48710	18202
28.00	1867	8526	751	520	278	10075	4844
29.00	1655	602	46	152	41	841	1396
30.00	1751	289	86	856	91	1322	1635
31.00	2064	86	67	113	57	323	1531
32.00	1484	698	23	243	188	1152	1357
33.00	2632	5654	222	249	109	6234	3802
35.00	2805	27871	5452	476	804	34603	16403

Table B-7
FUNCTIONAL POPULATION BY CENSUS TRACT, 2010

1980 Census Tract	2010 Pop.	2010 Employment					2010 Func. Pop.
		Comm.	Retail	Ind.	Misc.	Total	
93.00	5306	1028	792	196	78	2094	4785
94.00	14314	8301	1653	596	491	11041	14159
95.00	8555	12126	1669	1310	489	15594	11679
96.00	8579	31361	10066	1689	784	43900	26568
97.00	3706	1397	44	111	156	1708	3029
98.00	8561	4987	847	2519	517	8870	9041
99.00	4540	1319	540	241	184	2284	4138
100.00	7419	23728	1936	1081	703	27448	14677
101.01	148	0	0	0	0	0	99
102.01	1337	1270	381	229	60	1940	1768
103.00	4593	439	264	1955	137	2795	4116
201.00	1279	73	69	0	137	279	993
202.00	2449	327	27	0	27	381	1776
203.00	3390	251	22	74	23	370	2399
204.00	2208	670	108	24	38	840	1813
205.00	3877	1225	26	390	95	1736	3139
206.00	1945	740	12	318	89	1159	1660
207.00	3015	285	115	252	0	652	2303
208.00	9788	525	132	0	26	683	6863
209.00	6982	619	130	77	37	863	5036
Total	480386	390661	66587	99705	21938	578891	546138

Notes: Miscellaneous employment consists of construction and miscellaneous categories used by Atlanta Regional Commission. 2010 population and employment estimates for tracts partially outside the City adjusted by James Duncan and Associates as follows: no employment counted if 1990 population estimate for the City was less than ten percent of 1990 population estimate prepared by Atlanta Regional Commission in 1987 for the full tract; in otherwise, employment, and in all cases, population, adjusted by ratio of 1990 population of City portion to population of the full tract. Functional population calculated as the sum of population and employment weighted with the following multipliers: population—0.67; commercial, industrial and miscellaneous employment—0.30; retail employment—1.06. For source of functional population multipliers, see *Figure B-1* and *Table B-3*.

Source: 2010 population and employment estimates prepared by Atlanta Regional Commission and provided by Bureau of Planning, 1987.

Table B-8
FUNCTIONAL POPULATION BY CENSUS TRACT, 1990-2010

1980 Census Tract	Functional Population			
	1990	1992	2000	2010
1.00	3355	3360	3378	3558
2.00	4851	4771	4451	4574
4.00	5558	6148	8506	10403
5.00	4299	4352	4565	5077
6.00	2246	2213	2079	2198
7.00	2892	2913	2996	3559
8.00	1781	1761	1679	1691
10.95	8171	8260	8614	8794
11.00	2399	2833	4568	6[illegible]
12.00	7683	8306	10797	13071
13.00	4608	4821	5675	5955
14.00	1644	1613	1489	1579
15.00	3704	3888	4624	4916
16.00	1033	1057	1153	1189
17.00	3847	3799	3607	3759
18.00	3429	3919	5880	7525
19.00	10099	11278	15993	17808
20.00	1341	1312	1195	1269
21.00	4164	4148	4084	4523
22.00	1921	1892	1776	1808
23.00	2587	2531	2306	2307
24.00	2338	2317	2235	2301
25.00	2820	2968	3561	4311
26.00	1256	1257	1261	1638
27.00	16139	16142	16154	18202
28.00	3873	4033	4672	4844
29.00	1317	1322	1340	1396
30.00	1582	1577	1557	1635
31.00	1573	1568	1549	1531
32.00	1286	1294	1325	1357
33.00	3711	3708	3696	3802
35.00	11254	11748	13724	16403

Table B-8
FUNCTIONAL POPULATION BY CENSUS TRACT, 1990-2010

1980 Census Tract	Functional Population			
	1990	1992	2000	2010
36.00	1217	1166	962	1012
37.00	561	582	666	653
38.00	3420	3524	3939	4324
39.00	2146	2131	2073	2107
40.00	1990	1956	1819	1815
41.00	2092	2080	2030	2029
42.95	3042	3112	3390	4065
43.00	1792	1867	2167	2293
44.00	2296	2252	2076	2085
46.95	1590	1769	2484	2617
48.00	1085	1139	1353	1303
49.95	1603	1572	1449	1450
50.00	1855	1862	1892	1994
52.00	3187	3171	3106	3117
53.00	2723	2629	2254	2233
55.01	2000	1984	1920	1895
55.02	3168	3119	2921	2942
56.00	1277	1298	1380	1405
57.00	1242	1238	1220	1229
58.00	1535	1534	1528	1664
60.00	3674	3595	3278	3185
61.00	3743	3704	3549	3565
62.00	1629	1616	1562	1581
63.00	2145	2224	2541	2646
64.00	2543	2649	3072	3195
65.00	3765	3697	3425	3509
66.01	2350	2325	2223	2267
66.02	1069	1049	967	951
67.00	3847	3805	3636	3875
68.01	712	917	1737	1743
68.02	1049	1093	1270	1287
69.00	2999	2972	2862	2835

Table B-8
FUNCTIONAL POPULATION BY CENSUS TRACT, 1990-2010

1980 Census Tract	Functional Population			
	1990	1992	2000	2010
70.00	7011	7016	7034	7172
71.00	3329	3307	3217	3193
72.00	4987	4922	4661	5067
73.00	5892	5905	5958	6137
74.00	3300	3243	3017	3143
75.00	3326	3370	3548	3591
76.01	6874	6893	6968	7064
76.02	2249	2258	2295	2379
77.01	6746	6795	6989	8819
77.02	6984	7241	8268	11527
78.02	3852	3936	4274	6243
78.03	12246	12761	14822	16200
78.04	6187	6211	6309	6756
79.00	3310	3410	3808	4903
80.00	5015	4921	4545	4585
81.01	952	942	903	887
81.02	5554	5572	5642	6404
82.01	4734	4768	4906	5593
82.02	3799	3844	4023	4143
83.01	2878	2818	2579	2569
83.02	2669	2600	2324	2335
84.00	4195	4123	3836	3967
85.00	4253	4170	3838	3783
86.01	4830	4811	4737	4787
86.02	3460	3454	3430	3824
87.01	2123	2286	2940	2937
87.02	3731	3738	3766	3969
88.00	3996	4076	4398	4539
89.00	13501	14173	16862	18068
90.00	2849	2799	2600	2644
91.00	9310	9349	9505	10104
92.00	5932	6028	6410	6727

APPENDIX D
COST INDEX

Table D-1
CURRENT COST INDEX

Year	ENR Index	ENR Index Factor
1971	1581	3.1164
1972	1753	2.8106
1973	1895	2.6000
1974	2020	2.4391
1975	2212	2.2274
1976	2401	2.0521
1977	2576	1.9127
1978	2776	1.7749
1979	3003	1.6407
1980	3237	1.5221
1981	3535	1.3938
1982	3825	1.2881
1983	4066	1.2118
1984	4146	1.1884
1985	4195	1.1745
1986	4295	1.1471
1987	4406	1.1182
1988	4519	1.0903
1989	4615	1.0676
1990	4732	1.0412
1991	4832	1.0197
1992	4927	1.0000

Note: ENR Index is a general construction cost index based on a hypothetical unit of construction requiring 6 bbl. of portland cement, 1,088 M bd. ft. of 2" x 4" lumber, 2,500 lb. of structural steel, 68.38 hours of skilled labor and 200 hours of common labor; ENR Index Factor represents the number of 1992 construction units that could be purchased with the cost in that year of one construction unit.

Source: *Engineering News-Record*, monthly.