

Public Works and Public Utilities

Counties in the state of Georgia appropriate considerable funds for public works projects. Those individuals responsible for public works projects are guided by policy decisions regarding these expenditures, and the implementation of these projects requires considerable time and a basic understanding of the public works, civil engineering, and associated activities.

This chapter describes typical public works facilities, activities, and associated services that are financed and owned by Georgia counties. Each of these public works programs fulfills a community need by promoting health, protecting life and property, aiding economic development, and protecting the environment. This list is not considered to be all-inclusive but instead represents a significant number of responsibilities typically observed in the public works setting in counties throughout the state of Georgia, including the following:

- Project oversight and delivery
- Road construction and maintenance
- Transportation and traffic engineering
- Road lighting
- Transit
- Airports
- Transportation and environmental regulation
- Water
- Environmental protection

- Sanitary sewer
- Sanitation/solid waste
- Cable TV
- Building codes
- Vehicle/equipment purchase and maintenance

The discussion in this chapter is applicable to Georgia and federal laws, standard construction and maintenance practices, and other practical management concerns for each public works item listed.

PROJECT DELIVERY

The oversight and method of delivering construction and public works services are key priorities of county officials. Additional contracting and construction delivery methods are covered in Chapter 8.

Engineering

For the supervision of any public works project, qualified engineering services are a primary concern. A professional engineer can protect the public from excessive costs and from unsafe construction and maintenance practices that fail to meet minimum standards. Georgia law defines a professional engineer as one who is qualified and who is properly certified.¹

Georgia law further defines professional engineering practice as it applies to public works construction and maintenance to include

any professional service, such as consultation, investigation, evaluation, planning, designing, or responsible supervision of construction or operation, in connection with any public or private utilities, structures, buildings, machines, equipment, processes, works, or projects, wherein the public welfare or the safeguarding of life, health, or property is concerned or involved, when such professional service requires the application of engineering principles and data and training in the application of mathematical and physical sciences.²

Except for construction (including alterations) that costs less than \$100,000, Georgia law prohibits counties from engaging in public works design, construction, or supervision unless such activity is under the direct authority of a registered professional engineer or architect.³

Engineering activities are often separated into two types: one requiring the services of consulting engineers, the other using in-house staff engineers.

Specialized Projects Designed by Consulting Engineers

These projects include water treatment plants, sewage treatment plants, and major road and drainage construction. They are usually built by private contractors whose work can be supervised by either the consulting engineers who designed the project or program management consultants working on behalf of and as staff extension for public works operations. Typically, program management consultants can provide a greater measure of protection of the local government's resources because they are not involved with the actual design of the public works project.

Selecting a consulting engineer should be done carefully. With larger public works projects, a request for qualifications occurs prior to submitting costs proposals. A request for qualifications usually includes past experience on similar projects, qualifications of personnel assigned to the project, ability to meet deadlines, and other related issues. Once the qualified firms are selected, local authorities can either request a cost proposal that contains both the cost and the technical approach to solving the problem for the local authority or a separate technical and cost proposal. This latter approach of separate and distinct proposals is authorized in the federal Brooks Architect-Engineers Act, commonly referred to as the Brooks law.⁴ This law establishes the procedures for the procurement of engineering services by federal agencies and certain federally funded projects. Generally speaking, selecting engineering consultants based on their technical merit and expertise followed by separate negotiations for cost based on the highest ranked technical firm is the preferred approach for procuring engineering services. This is known as Qualifications-Based Selection.

Compensating a consultant for engineering services may take the form of lump sum, cost plus fixed fee, percentage of construction costs, or multiple of payroll costs. Regardless of the type of payment chosen, careful attention should be given to any additional services that may involve further costs, such as design changes, soil tests, resident inspection, planning survey, and duplicate copies of drawings.⁵

Activities and General Projects Administered by In-House Engineers

These activities include contract administration associated with consulting engineers; public works supervision; compliance with mandated federal,

state, and local regulations associated with public works; and engineering feasibility studies and design for minor public works projects.

Coordinating and controlling the numerous construction and maintenance activities associated with public works entails keeping three categories of maps and records. These records can be maintained in a geographic information system as a managerial control function.⁶ The categories are as follows:

1. An official map depicting public rights-of-way and property lines.
2. Detail-supporting maps and records that tie into the official map. Data in these detailed maps include bridges and bridge pier details, subsurface utilities, utility poles, streetlights, pavement surfaces, curbs and gutters, storm drains, topographic elevations, traffic control devices, parking restrictions, pedestrian crosswalks, bridges, and railroad crossings, among others.
3. “As-built” drawings that reflect changes in public works construction and maintenance, such as relocation of water and sewer lines, alterations to water treatment plants and sewage lift stations and treatment plants, and modifications to buildings owned by the county.

PRIVATIZATION AND FINANCING

Privatization of water and sewer operations, government facilities maintenance, and public works operations such as vehicle maintenance and mowing of right-of-ways may be the best choice when localities must address issues related to costs, efficiency, and public perception of government services. Contract services, unit price contracts, and on-demand contract services are among the options for privatization.

Public-private partnerships will become increasingly more important as both large and small governments throughout the state continue to balance operation costs with meeting ever-changing state and federal regulations.

TRANSPORTATION: ROAD CONSTRUCTION AND MAINTENANCE

The Georgia Code of Public Transportation governs county roads.⁷ This code forbids construction or maintenance of private roads by a county,⁸ specifies property acquisition procedures for public road purposes,⁹

and requires notification to the Georgia Department of Transportation (DOT or GDOT) within three months after a county road is added or abandoned.¹⁰ This code empowers counties to contract with other governments; use authorized federal and state funds; and acquire, manage, receive, and make payment for all personal property (e.g., equipment, machinery, and vehicles) used in operating the county road system.¹¹ Counties may employ personnel and contract with additional persons whose services may be required for construction and maintenance of public roads.¹² Counties are also permitted to enter into contracts with private companies to finance, construct, maintain, improve, own, or operate private toll roads or bridges.¹³

A county may regulate the use of those public roads on its county road system that are located outside the corporate limits of a municipality.¹⁴ In regulating these roads, counties may require that proposed installation and maintenance of utilities be accompanied by written request.¹⁵ Also, with GDOT permission, counties may set vehicle parking requirements and place parking meters on any public road on the state highway system that is outside the corporate limits of any municipality.¹⁶

With further respect to county road systems, counties can purchase supplies through the state and require contractors who work on county roads to post indemnity bonds or other security for any damages resulting from a contractor's failure to complete the work on time.¹⁷ Counties may provide for surveys, maps, and specifications as are necessary in supervising and maintaining county roads that are in both the unincorporated and incorporated areas of the county.¹⁸ Counties are empowered to contract for public road maintenance or construction.¹⁹ All contracts are required to be let by public bids, except when a county is specifically permitted by law to negotiate contracts. For example, counties may negotiate contracts involving expenditures of \$20,000 or less.²⁰ (For details, see Chapter 8.)

This code further regulates counties with regard to

- control of advertising, erection of informational and directional signals, regulation of limited access roads, and regulation of roads under a county's exclusive jurisdiction;²¹
- relocation of public utilities and railroad grade crossings and payment for these costs;²²
- junkyards that are within 1,000 feet of the rights-of-way of interstate or federal aid primary highways;²³ and

- acquisition of property, scenic easements, air space, and rights of access for present or future public road or transportation purposes.²⁴

Potential for Financial Benefits

Compliance with this code and taking other prudent steps can result in some noteworthy economic benefits for counties. For example, costly damage to county roads can be curtailed by reporting suspected overweight vehicle violations on county roads to the Georgia Department of Public Safety (DPS). The DPS is authorized to enforce load limitations on all public roads in Georgia.²⁵ Revenues from ensuing fines and forfeitures are distributed between the state and the county where the violation occurred.²⁶

As a means of regulating the maintenance and use of public roads, a county can control vehicle parking and place parking meters (a source of revenue) on its county road system, except on extensions of the county road system into municipalities. It also may place parking meters on state highway system roads outside municipal corporate limits when authorized by DOT.²⁷

Counties may limit liability concerns and expenses by building roads to nationally recognized standards such as those published by the American Association State Highway Transportation Officials and the “Greenbook” Committee of Public Works Standards, Inc.

Funding, Regulating, and Maintaining Roads

In constructing roads, the governing authority’s policy should consider financial alternatives. Because road construction and right-of-way costs may command a large portion of the county budget, the board may need to spread out these proposed expenditures over several years. This process requires the use of a long-range capital improvements program that permits funding from the following sources:

- Current revenues
- State grants to counties
- State contracts from DOT
- Local option sales tax (LOST)
- Regional local option sales tax
- Special purpose local option sales tax (SPLOST)
- General obligation bonds

- Assessments on adjoining property owners
- Homestead option sales tax (HOST)
- Impact fees
- Public/private partnerships
- Georgia Transportation Infrastructure Bank loans

Two activities in particular are necessary in protecting a county's investment in its paved roads:

- *Regulatory enforcement.* To prevent damage to road surfaces by overweight vehicles, counties should adopt an ordinance that specifies maximum gross vehicular weights on designated streets.
- *Preventive maintenance.* To protect road surfaces and subsurfaces from deterioration due to excessive moisture, a county must promptly patch potholes and effectively seal "alligator cracks."

In order to prevent excessive moisture, all gutters, inlets, catch basins, and storm drainpipes should be kept clear of debris. In urban sections, a regular schedule for street sweeping, leaf collection, and catch basin or outlet cleaning will require expenditures in personnel and equipment; however, this can prevent far heavier outlays in costly resurfacing projects.

Surveys should be performed on a periodic basis in order to adequately define the condition of a county's roadways. A variety of condition survey techniques exist to assist local governments with the maintenance and rehabilitation necessary to maintain their roadway infrastructure and with adequately addressing funding necessary to perform this work. Typically, the Georgia DOT requires that local governments provide a condition survey of local asphalt resurfacing needs for eligibility of state funding for the local road assistance program.

An inventory of roadway striping is also critical to providing a safe roadway for the motoring public. A periodic inventory of existing striping conditions will also help protect the local government from potential litigation.

Right-of-Way Maintenance

It is generally the responsibility of the county public works department to maintain the public right-of-way on the county roads in both the unincorporated and the incorporated areas of the county. The responsibility for maintenance of state rights-of-way is generally the responsibility of

the DOT unless a contractual relationship exists between the local government and the DOT. Right-of-way maintenance usually consists of, but is not limited to, (1) removal of shrubbery, trees, and other obstructions for safe operation of the public use of the road; (2) removal of brush and trees that could cause restrictions to sight distance, particularly horizontal and vertical sight distance at intersections; (3) mowing of grass within the right-of-way; and (4) maintenance of a roadway shoulder to ensure that the shoulder elevation matches the roadway elevation in order to avoid drop-offs on the edge of pavement and other irregularities in the shoulder that may result in vehicular accidents.

Proper traffic control during maintenance of the right-of-way is critical during these operations. The Manual for Uniform Traffic Control Devices must be utilized during right-of-way maintenance operations.

Roadway Rehabilitation Techniques

Patch-and-Repair

A number of construction techniques exist for the rehabilitation and repair of public roads. The normally accepted practice by most local governments is to remove those areas that are in need of repair and replace the deteriorated areas with full depth asphalt or a combination of asphalt and underlying graded aggregate base. If a county's public works crews can accomplish this work, the cost usually is minimal except for the time and the cost of materials. The need to contract out patch-and-repair operations can result in significant costs to the local government.

Resurfacing

In those cases where the patch-and-repair operation is extensive or where the cost of patch-and-repair exceeds the cost of resurfacing, the county should assess whether removal of the existing road, through methods defined as reclaiming, is appropriate. Additionally, depending on the condition survey of the roadway, several interim repair measures such as crack sealing (normally done as a preventive measure several years prior to resurfacing) or a single or double surface treatment on the existing roadway surface prior to asphalt resurfacing are available as alternatives to resurfacing.

Reclaiming

Reclaiming is a method by which the existing underlying stone base (if one exists) is removed with the asphalt pavement and the combined material is reclaimed in place and recompact and utilized as a base course for a new asphaltic concrete pavement surface. This reclaiming

operation, although three to four times the cost of a typical asphalt overlay project, will result in a roadway with a lifespan substantially greater than a patch-and-repair or a resurfacing project. Depending on weather, traffic loading conditions, and construction methods and materials, a reclaimed roadway typically has a lifespan of two to three times that of a typical resurfacing project. Moreover, the time, monetary costs, and, in highly urbanized areas, effects of traffic control associated with resurfacing every five to seven years may justify a local government's decision to use the reclamation approach.

TRANSPORTATION AND TRAFFIC ENGINEERING

Vehicular and pedestrian flow on streets is regulated under the Georgia Uniform Rules of the Road.²⁸ These regulations are also enforceable on privately owned shopping center parking lots or similar areas used by the public as through streets or connector streets.²⁹

In their broad scope, the Uniform Rules of the Road regulate the use of traffic signs, signals, and markings;³⁰ driving on the right side of the roadway, overtaking, and passing;³¹ the right of way of approaching vehicles;³² the rights and duties of pedestrians;³³ turning starting, and signaling;³⁴ stopping at railroad crossings and entering highways from private drives, alleys, and buildings;³⁵ school buses;³⁶ speed restrictions;³⁷ stopping, standing, and parking;³⁸ backing, driving on sidewalk, driving on mountain highway, crossing a fire hose, littering, "laying drags";³⁹ duties in an accident;⁴⁰ and the use of bicycles, play vehicles, motorcycles, motorized carts, and mopeds.⁴¹ They also define and specify penalties for serious traffic offenses.⁴²

These rules apply throughout Georgia.⁴³ Counties are given powers to adopt regulations that are supplemental to the Uniform Rules of the Road.⁴⁴ They also may adopt by ordinance any or all of these rules by reference; publishing or posting the provisions in full is not required.⁴⁵ The adopting ordinance must use the same or similar wording as that appearing in Figure 12-1.⁴⁶

In managing traffic control, a comprehensive transportation and roadway thoroughfare plan is needed that includes the following elements:

1. Road plan. Evaluates roads in meeting objectives. Assigns roads to categories (i.e., arterials, collectors, or local roads).
2. Land-use plan and zoning maps. Determines traffic needs in accommodating land-use patterns. Maps roads to meet traffic flow according to uses (e.g., residential, business, industrial, schools, playgrounds, and hospitals).

Figure 12-1. *Model Ordinance: Georgia Rules of the Road*

County of _____

Ordinance number _____

An ordinance adopting the Georgia Uniform Rules of the Road, Code Sections [_____ to _____ (except for Code Sections _____)] of Chapter 6 of Title 40 of the Official Code of Georgia Annotated, to regulate traffic upon the public streets of the County of _____ and repealing ordinance number _____ and all other ordinances and sections of ordinances in conflict herewith.

It is ordained by _____ as follows:

Section 1. Adoption by reference. Pursuant to Chapter 6 of Title 40 of the Official Code of Georgia Annotated, Code Sections 40-6-372 through 40-6-376, Code Sections [_____ to _____ (except for Code Sections _____)] of that chapter known as the Uniform Rules of the Road and the definitions contained in Code Section 40-1-1 are hereby adopted as and for the traffic regulations of this County with the effect as if recited herein.

Section 2. Penalties. Unless another penalty is expressly provided by law, every person convicted of a violation of any provision of this ordinance shall be punished by a fine of not more than _____ dollars or by imprisonment for not more than _____ days or by both such fine and imprisonment.

Section 3. Repeal. The (existing ordinances covering the same matters as embraced in this ordinance) are hereby repealed and all ordinances or parts of ordinances inconsistent with the provisions of this ordinance are hereby repealed.

Section 4. Effective date. This ordinance shall take effect from and after the _____ day of _____, 20 _____.

O.C.G.A. §40-6-374

3. Subdivision street plans. Examines subdivision proposals for potential impact from through traffic and other safety hazards. Assigns street speed limits. Reviews curvatures, cul-de-sacs, T intersections, distances between intersections. Encourages minimum number of intersections at one location.
4. Origin-destination study. Collects information for forecasting increases in traffic volume.
5. Sight distance analysis.⁴⁷ Evaluates obstruction removal necessary to aid motorist vision at designated intersections under varying approach speeds (e.g., at an intersection on a hill).
6. Traffic warrant analysis.⁴⁸ Investigates traffic conditions at a location to determine if a signal installation is warranted. Data collection includes the number, type, and speed of vehicles from each approach; pedestrian volume; accident experience; and geometric conditions.

Comprehensive Transportation Studies

Most urbanized areas in Georgia are faced with the need to make transportation improvements. Transportation improvements facilitate economic vitality, quality of life, and transportation safety by identifying needs in the short, intermediate, and long term. The Comprehensive Transportation Plan typically provides recommendations for transportation improvements that address countywide, intercounty, and regional travel needs. Various modes of transportation are also typically addressed, including roadway, transit, bicycle, and pedestrian facilities. The transportation plan is submitted when urbanized counties seek to obtain state and federal funding, and it provides technical documentation for addressing air quality concerns as required under the Clean Air Act.⁴⁹ Factors typically considered in the development of Comprehensive Transportation Plans include coordination of all transportation improvement plans with the local government's current and future land-use and zoning plans; travel demand forecasting models for the development of analyzing transportation alternatives; coordination with studies of transportation plans of adjoining jurisdictions; development of a countywide thoroughfare plan with roadway functional classifications; identification of current and future transportation deficiencies, trends in patterns of development, and the effects on the transportation network; and the development of conceptual cost estimates for construction of transportation projects.

Roadway Modeling

Transportation modeling is a necessary element in the development of transportation thoroughfare plans. The assessment of future travel demands and patterns can be done through computer modeling. Modeling programs typically reflect current travel patterns and anticipate future population, employment, and travel growth.

Traffic-Calming Devices

The technique known as traffic calming is quickly becoming an accepted traffic control measure for addressing a wide range of citizen concerns within residential neighborhoods. Traffic calming includes slowing traffic speeds; reducing cut-through traffic and traffic-related noise; improving the aesthetics of the street; and increasing safety for pedestrians, bicyclists, and vehicles, with the ultimate goal of improving the overall quality of life within a neighborhood. Traffic circles, chicanes, chokers, narrowing roads, changes in road texture, direction changes, and a variety of other mid-block design changes can alter the movement of vehicles on residential streets. It is critical that the use of traffic-calming measures be coordinated with the DOT because it has had policies that prohibited state funding on roads that incorporated certain types of traffic-calming devices.

A number of professional organizations, such as the Institute of Transportation Engineers, have developed technical specifications and guidelines for traffic-calming devices. Governments that have instituted such traffic control measures are another source of information.

Asset Management and Traffic Signs, Striping, and Other Roadway Inventory Attributes

The development of a database for a county's public works infrastructure, such as signs, striping, and work orders initiated and completed within the road right-of-way, is critical for budgeting, scheduling, and protecting the local government in the event of litigation. Numerous types of software exist for the creation of this database. Integration of this inventory of public works infrastructure can be accomplished with minimal training of public works staff. In addition, maintaining an accurate and up-to-date inventory of public works infrastructure is an important step toward properly managing county assets.

Road Lighting

County road-lighting policies should consider crime control, highway safety, business convenience, and beautification. Policies should establish priorities, particularly when funding for road lighting is limited. Essential

roadway-lighting standards can be adopted regarding minimum levels of illumination, maximum permissible ratios of average to minimum illumination, and minimum mounting heights. Roadways are classified by traffic use and access. Areas may be commercial, residential, or some combination of these.⁵⁰

Policymakers may also need to consider the efficiency of lighting units and the amount of vertical and lateral light they will emit. Assistance may be found in *American National Standard Practice for Roadway Lighting*, as developed by the Illuminating Engineering Society, and in *Lighting Handbook*.⁵¹ In selecting lighting, the costs must be weighed against the benefits of alternative electrical light sources. Maintenance of a road-lighting program is also important. Reflectors need to be washed regularly, trees trimmed, lamps replaced, and damaged, rotted, or rusting poles replaced.⁵²

Transit

Counties may contract with transit agencies for transit services or facilities within the county or between that county and any area in which the transit agency already provides such services or facilities. However, if transit services are to be subsidized by fees, taxes, or assessments levied in a special service district, the voters of the county must approve the contract. The governing authority of an affected county must adopt a transit service plan.⁵³

Airports

Among the more than 100 airports in Georgia, some are the responsibility either jointly or fully of one or more counties. Usually managed by a fixed-base operator (FBO), most small airports are only marginally profitable at best. For this reason, the governing authority may not expect to operate an airport solely from airport revenues.

Liability prevention and the development of standard management practices have been cited by Georgia FBOs/airport managers as critical areas for improving profits and achieving greater stability.⁵⁴ In deciding on lease arrangements with FBOs/airport managers, governing authorities should be prepared to deal with the various concerns. In terms of liability prevention, these include noise, selling of new and used parts, bailor-bailee relationships, renting of airplanes to incompetent pilots, negligent instruction, and defective rental aircraft. In terms of management practices, such concerns include safety procedures, accident notification, fire regulations, emergency weather procedures, fuel facilities inspection and maintenance, and testing of fuel storage for water and foreign matter.

Airport mowing, public works projects, passenger and visitor services, and revenue charges are other issues that FBOs must address when they serve as airport operators. Information on these concerns is available in the *Small Airport Management Handbook*.⁵⁵

TRANSPORTATION AND ENVIRONMENTAL REGULATIONS

The construction and maintenance of county roads and bridges will likely involve activities, equipment, and materials that can significantly impact air and water quality as well as produce significant noise levels. As a result, county construction and maintenance activities are likely to be subject to state and federal environmental laws and regulations, including the Clean Water Act,⁵⁶ the Clean Air Act,⁵⁷ the National Environmental Policy Act,⁵⁸ the Resource Conservation and Recovery Act (RCRA),⁵⁹ the Endangered Species Act,⁶⁰ the Rivers and Harbors Act,⁶¹ the Toxic Substances Control Act,⁶² and noise abatement regulations. For more information on environmental laws and regulations that affect counties, see Chapter 10.

New construction often involves clearing land prior to the beginning of the actual construction activity. Land-clearing activities such as the removal of vegetation and existing structures can affect the structural makeup of the soil, increase soil erosion and sedimentation, and cause flooding, which may affect downstream property owners and aquatic resources, particularly wetlands and floodplains. Sensitivity to downstream impacts is vitally important in road construction activities, and great care must be taken to ensure that such impacts are eliminated or minimized. These land-disturbing activities must observe the best management practices established in the Erosion and Sedimentation Act of 1975.⁶³ Other potential impacts as a result of construction activities include air emissions, noise, vibrations from construction equipment, and dust and/or odors from construction traffic.

The 1970 Clean Air Act established a regulatory structure that required states to meet air quality standards and transportation plans in order to conform to state strategies to meet those air quality standards. Air pollution must then be reduced by certain attainment dates or deadlines. The act defines two types of stationary air pollution sources: existing and new. New sources are subject to one set of technology-based requirements; existing sources are subject to a more lenient approach to resolving an air quality violation.

Additional amendments to the Federal Highway Funding Program resulted in complementary environmental requirements identified as the

Intermodal Surface Transportation Efficiency Act (ISTEA). Within the ISTEA program, metropolitan planning organizations (with populations greater than 200,000) must adopt 20-year transportation plans and Transportation Improvement Programs (TIP) consisting of projects funded or approved by the Federal Highway Administration or the Federal Transit Administration. The transportation improvement plan must result in emissions that conform to the State Implementation Plan for Air Quality (SIP) budget for mobile source emissions. ISTEA's metropolitan planning requirements prohibit federal approval, funding, or implementation of transportation projects that do not conform to the SIP.

The ISTEA program not only strengthened metropolitan planning organizations' authority to conduct transportation planning and allocate federal funds but also created separate categories of projects and programs eligible for federal funding under the Congestion Mitigation and Air Quality program for the express purpose of supporting improvements in air quality. ISTEA also encouraged multimodal planning, requiring a set of management systems for intermodal facilities, bridges, pavement, public transportation, safety, and congestion.⁶⁴ The influence of the Clean Air Act and ISTEA amendments shifted the emphasis in metropolitan transportation planning toward projects that improve air quality and away from those that impair it.

WATER

In a county that distributes water, supply must be adequate to satisfy needed peak hourly flows for both domestic purposes and required fire flows. For domestic uses, the water supply must meet state health standards regarding clarity, softness, palatability, and purity. In order to meet required fire flows, additional water must be provided in amounts above the quantities needed for peak domestic demand. This required fire flow amount must be in elevated storage in case of electrical malfunctioning.

The policy of the county governing authority should assure that these two separate purposes—domestic needs and fire flows—are satisfied in evaluating the water supply in terms of its source, pumping capacity, and elevated storage reservoirs. The water supply may come from a surface supply (a river or lake) or from an underground supply (wells). Calculations for determining the total water supply are usually prepared by consulting engineers. Regardless of the source of the water supply, policy should be dedicated to meeting long-range capital needs and assuring an adequate supply of water to satisfy both domestic needs and required fire flows. One consequence of poor planning for the water

needs of the county may be higher insurance premiums in a community as a result of a low fire defense rating by the Insurance Services Office because of inadequate water supply.

A good water distribution system provides adequate quantity and pressure. Adequate quantity refers not only to the amount of water available, but also to the need to have a supply from two different directions using a series of “loops” to all points in the system. Adequate pressure requires the use of elevated storage tanks or standpipes to equalize pressure in the system and to provide for maintaining pressure in case of pump failure. In counties that have dispersed clusters of urban subdivisions, it may be necessary to operate more than one water system.

Charging for Water

The general practice in most counties is to charge consumers regardless of type—residential, commercial, or industrial—for the actual amount of water used during a specific period.⁶⁵ Meter reading and billing are ordinarily done under a cycle plan whereby meters are read either monthly or bimonthly. Meters are divided into divisions or zones, and all meters in a single zone are read and billed according to that zone. In this way, the billing clerk avoids a peak load of preparing bills in a short time span. Unit prices are specified per 100 or 1,000 cubic feet or gallons of metered water used. If the cost per unit of water delivered is lower as quantities increase, the unit price for the water decreases. Prices change according to several “blocks” or steps in the rate schedule.

If customers use unusually large volumes of water, requiring larger treatment systems or larger distribution systems, the unit price may rise to offset increased costs. Two examples of demand-charge customers are (1) industries that process large volumes of water and (2) customers in sparsely developed areas that are distant from previously planned main extensions and elevated storage tanks. Conservation billing—consumers paying more based upon consumption—is a growing practice.

Management Policy

The following suggestions provide policy guidance in managing the county water system:

- Water pricing should be adjusted at least annually in order to keep pace with inflation as well as to offset any expected increased costs in capital improvements in the water system. Because sanitary sewer rates are usually a percentage of the water bill, the water pricing ultimately determines the funds

available for sewer operation and capital plans. Incremental annual or semiannual increases in water and sewer rates are usually more acceptable to the public than large increases every two or three years.

- Persons supervising the operation of public water supply systems and wastewater treatment plants must be certified by the State Board of Examiners for Certification of Water and Wastewater Treatment Plant Operators and Laboratory Analysts.⁶⁶ There are several classifications of water supply systems and several certification classes established by the Environmental Protection Division (EPD) of the Georgia Department of Natural Resources.⁶⁷
- Water quality test results should be summarized quarterly and explained to the governing authority. Plant operators are required to perform laboratory tests on water from their system at specified intervals and to send water samples to the EPD for analysis.⁶⁸ Water quality should be protected by periodic inspections at customer locations, especially commercial establishments. Particular attention should be given to ensure that improper cross-connections and backflows are prevented from contaminating the entire distribution system.
- Unaccounted water losses should be identified and reduced.
- Policies should be reviewed if they result in water subsidies to any group at the expense of paying customers. The county should have a policy governing the extension of water mains, particularly with respect to who will pay for them.⁶⁹ The county should extend service to developers and industry only when they are willing to pay for the extension. Provisions can be made for rebating some or all of the extension cost to developers and industry as customers are added to new lines. The extension policy should also cover the size of the line. In this case, the county would want to consider requirements for customer usage and fire protection. Water mains should be sized to meet domestic needs and to support required fire flows. Although it is less expensive to install smaller domestic lines, eventually they will probably need to be replaced to provide adequate hydrant service and improve the fire insurance rating.
- Each water system customer should be individually metered so that payment will be on the basis of amount actually used.

There should be no “flat-rate” or “nonmetered” customers. The amount of water used by flat-rate customers and the consequent revenue lost is almost always significantly higher than expected and usually warrants the expense of installing and reading meters.

- Water meters should be tested or meter heads replaced regularly to ensure proper operation. Counties should adopt a rotation schedule to periodically test and identify malfunctioning meters. Obviously, the continued existence of many defective meters can cause considerable revenue loss to the county.
- Meters should be read frequently. While many water systems read meters every 30 days, reading and billing might be performed every 60 days. A 60-day billing period would provide more time for meter reading and would reduce by half the number of water bills to be mailed each year.

SANITARY SEWER

In a modern county sanitary sewer system, liquid wastes are collected in a network of drains from two basic types of sewers: sanitary and storm sewers. Sanitary sewers collect contaminated, putrescible liquid from the plumbing systems of buildings and carry it to a sewage treatment plant or other suitable place for disposal. Storm sewers collect rainwater and carry it to natural water courses or bodies of water in such a way as to prevent flooding.⁷⁰ Because of space limitations and the extreme importance of sanitary sewers (and because, in many cases, storm sewers and sanitary sewers are combined), this section does not discuss enclosed storm sewer systems.

Where physically possible, sanitary sewer systems depend upon gravity to move the sewage through the lines. For this reason, the location of sewer lines must be carefully planned to follow the topography of the land and to ensure that sewage flows downhill toward the treatment plant. If this is not possible, pumping stations must be installed, where necessary, to lift the sewage and force it up and over a grade for additional gravity flowage.

Sanitary Sewer Treatment Methods

Once sewage has been collected and piped to a place of disposal, it must be given primary, secondary, and sometimes tertiary, treatment.⁷¹ With primary treatment, raw sewage undergoes digestion by bacterial action

and is pumped through a series of screens that remove successively smaller particles of insoluble solid matter. When the screening process is completed, the remaining sewage is pumped into a sedimentation tank, where additional solid waste is allowed to settle to the bottom of the tank. This solid matter, called sludge, is periodically removed from the tank and used for fertilizer, burned, dumped in a landfill, or disposed of in some other manner. As a final step in primary treatment, the liquid waste is treated with chlorine gas for a minimum period of time to destroy disease-causing bacteria and to make it less offensive. The chlorinated liquid is then discharged into a stream or river.

Secondary treatment adds a step in which bacteria in the sewage are further utilized to decompose organic matter. After passing through a sedimentation tank, as in primary treatment, the liquid waste is pumped into another facility. There, it is either trickled slowly through a bed of stones or exposed to “activated sludge.” In the trickling-filter process, liquid waste passes slowly over layers of stone that become covered with bacteria that decompose organic matter remaining in the sewage. In the activated sludge process, sewage is pumped into an aeration tank, where—through exposure to oxygen and sludge containing a high bacteria count—it is further decomposed. As in primary treatment, the last stage in secondary treatment is to chlorinate the remaining liquid waste before pumping it into a stream or river.

In addition to primary and secondary treatment, more advanced techniques have been suggested and/or tried, including the following:

- Coagulation-sedimentation—to increase the removal of solids and to remove phosphate
- Absorption—to remove more organic matter than can be eliminated in secondary treatment
- Electrodialysis—to remove salts and then restore, or even improve, the salt content of the water

These techniques, when used in succession, return the county’s water to a quality appropriate for any reuse by keeping rivers clean. State and federal regulations mandate minimum wastewater treatment practices for county sewage treatment systems. These regulations are administered by the EPD.⁷²

In managing the county sanitary sewer system, several alternative customer billing approaches are available, including

- flat rate,
- number of fixtures,

- flat rate according to water bill,
- percentage of water bill,
- flat minimum rate plus percentage of water bill,
- percentage of average winter water bill, and
- proration based on water consumption.⁷³

It has been noted that a “good argument can be made in favor of basing the sewer service charge on the quantity of water used or some variable indicating water or consumption, such as size of water meter. This approach at least recognizes the fact that a large proportion of the water delivered to the customer is later returned to the sewer.”⁷⁴

Suggestions for overseeing sanitary sewer activities include the following:

1. Periodically evaluate the nature and condition of the present sewer system regarding treatment plant capacity and major repairs to the plant or to the collection system that may be needed.
2. Consider all planning for residential, commercial, and industrial expansion or redevelopment that may reveal future needs for additional sewer capacity.
3. Explore financial implications of sewerage plans.
4. Phase any untreated sewage into an expansion program as feasible. Consult EPD officials before proceeding with major expansions.
5. Monitor industrial wastes to the sewerage system to assure adequate pretreatment processes.
6. Reconcile the sewerage system with plumbing regulations of the county.
7. Clarify county policy on sewer connections as to who can do the work and under what conditions.
8. Make provisions for disposing of roof drain, septic tank outlet, car wash, laundry, and air-conditioning water.

Combined Sewer and Sanitary Sewer Overflows

The Federal Clean Water Act requires local governments to rehabilitate combined sewer overflows (CSOs) and sanitary sewer overflows (SSOs), which will require an enormous investment, particularly in urban areas within the state of Georgia that have an aging sewer infrastructure. Both

types of sewage collection and treatment systems in older communities can release raw sewage into our streams and rivers.

Combined sewer overflows result from a design technique used for the construction of municipal sewers many years ago. Sewer collection lines were frequently designed to handle both sanitary sewer and storm water runoff from streets, roofs, and buildings. These combined systems were usually built prior to municipal, state, or federal requirements for sanitary sewer treatment. When wastewater treatment plants were constructed, the plants and their collector sewers were provided with bypasses to prevent them from being overwhelmed with large volumes of mixed sanitary sewer and storm water during periods of rainfall. Combined sewer overflows are the discharge of mixtures of storm water and untreated sewage from these combined systems.

In order to gain further control over CSO discharges and to eliminate and reduce them, the federal EPA, working through the state EPD, requires systems with CSOs to implement the following nine minimum controls:⁷⁵

1. Implement proper operation and maintenance programs for the sewer system and the combined sewer overflows.
2. Maximize use of the collection system for storage of combined storm water and sewage before later treatment.
3. Review and modify industrial wastewater pretreatment requirements to ensure that adverse CSO impacts are minimized.
4. Maximize flow to the wastewater treatment plant for treatment.
5. Prohibit CSO discharges during dry weather.
6. Control solid and floatable materials in CSOs.
7. Implement pollution prevention measures.
8. Provide adequate notification to the public about CSO occurrences and impacts.
9. Monitor and characterize CSO impacts and the effectiveness of CSO controls.

Sanitary Sewer Overflows

Sanitary sewer overflows occur when sewer collection lines that are designed to handle only sanitary sewage become overcharged with storm water entering the system from a variety of external sources. These sewer lines then either back up and discharge from manholes or other outlets into homeowners' basements or through designed diversion structures

that are intended to limit the amount of flow into large interceptor sewers. These discharges are SSOs.

Sources of the storm water entering the sanitary sewer systems include inflow and infiltration. Inflow comes from such design defects as low manholes and other features below grade so that they serve as a conduit for storm water into the sanitary sewer system. Other sources of inflow include breaks or gaps in collectors that admit stream flows and hookups of residential roof drains and foundation drains into the sanitary sewer system. Infiltration comes from the deterioration of collectors and house sewer laterals (the homeowner portion of the system that conveys wastewater to the municipal collector), allowing storm water to enter the lines.

Technical solutions to CSOs and SSOs and alternatives could include

- reducing the amount of inflow and infiltration from house laterals and other private sources such as roof and foundation drains;
- reducing the amount of storm water in separate sanitary sewers through substantial repair, replacement of municipal collectors, and better municipal maintenance programs that schedule inspections and replacement of deteriorated lines and cleanouts of obstructions;
- conveying more or all of the mixed storm water and wastewater to the wastewater treatment plant and providing additional treatment capacity for this volume; and
- constructing storage tanks and retention basins in individual local governments to contain wet water volumes that can be treated later during lower flow periods.⁷⁶

Alternative Wastewater Systems

A number of alternatives exist to on-site, individual septic tank systems or centralized wastewater systems. Such systems are described as community-based septic tank systems. These decentralized systems essentially redirect effluent to a centralized large-scale holding tank and leach field. Advanced on-site systems must be designed for a particular set of environmental parameters. Where restrictive soils exist, recirculating sand filters can be used in combination with absorption systems to enhance pathogen reduction and lower absorption area requirements, for example. Discharge of any wastewater system greater than 10,000 gallons per day

requires an EPD permit. Such decentralized systems must consider the following factors:

- Management and maintenance of community-based systems should be accomplished through a homeowners association or by annual fees. The association fees are then used to perform annual or more frequent cleanout of the systems and inspection of such systems.
- The removal of effluent must be sufficiently removed through a biological system to ensure that communal drain fields function properly.
- A proper design, with particular attention given to installation, is critical to the success of community-based systems.

The benefits of such systems are as follows:

- A community-based septic tank system will generally increase the value of the lots similar to that of a subdivision development with sanitary sewers.
- Removal of on-site septic tank systems will allow for saving of more trees on each individual lot.
- Long-term cost for sewer will be reduced as a result of connections to a community-based septic tank system. (Extension of sewer lines throughout a subdivision would not be necessary. Direct connection to a community-based system would reduce costs to a local government.)
- Environmentally, a community-based system can be more easily maintained and managed as opposed to individual septic tank systems, which may not be properly inspected or maintained by homeowners.

PRIVATIZATION OF WATER, WASTEWATER, AND STORM WATER SYSTEMS

Public-private partnerships in the areas of water, wastewater, and storm water may take the form of privatization; contract operation, maintenance, and management; or contract management.

Privatization

Privatization can take the form of (1) purchase of an existing facility, (2) creation of a new facility (from the initial planning to the design of the

infrastructure) and long-term operation, (3) expansion or enhancement of an existing facility, or (4) long-term lease of treatment works.

Contract Operations, Maintenance, and Management

A contractor generally performs contract operations, maintenance, and management services under a negotiated agreement to provide necessary government services. The contractor is responsible for the routine operation, maintenance, and management of the treatment facilities while the ownership remains with the government. The contractor normally guarantees performance of the facilities while complying with all regulations. The contractor is generally responsible for all routine costs associated with the operations of the facilities. Large capital expenditures for expansion and upgrade remain the responsibility of the local government.

Within a contract management partnership, the government retains ownership of the facility and is responsible for purchasing supplies and equipment and regulatory compliance. The private sector is a partner with the local government and assumes all personnel and management responsibility. Public-private partnerships for storm water projects are just beginning to be examined in Georgia, but the need for such partnerships will become increasingly more important over the next decade.

Funding Storm Water Systems

The financing of storm water projects is generally relegated as a line item within the general fund of local governments, often competing with other funding needs (e.g., fire, sheriff) within a community. With the increased emphasis on environmental issues (and associated mandates) in the United States, storm water and related water quality issues will require dedicated funding sources.

A storm water utility is an example of dedicated funding that more than 40 city and county governments in Georgia have initiated, and more are coming on line each year. A fee is assessed to the property owners of land within a county setting based on their amount of impervious surface (or their storm water contribution), and this fee is used exclusively to address storm water and associated water quality concerns. Other funding opportunities include impact fees, EPA Clean Water Act Section 319 and community development block grant funds, and increasing millage rates and other fees.

SANITATION

Managing Solid Waste

Management of the county's solid waste is a significant responsibility of county government. Under the Georgia Comprehensive Solid Waste Management Act, counties are required to adopt solid waste management plans and to update these plans every 10 years.⁷⁷ The adopted solid waste management plan must demonstrate 10 years of solid waste collection capability and disposal capacity. It must also include a strategy to reduce the per capita disposal rate within the county. The plan must also include a "land limitation" element that governs the siting of new solid waste-handling facilities within the county. This land limitation element, if written and implemented properly, is a powerful tool in managing where and how both public and private solid waste-handling facilities are sited and operated. The Department of Community Affairs (DCA) reviews and approves solid waste management plans and collects other solid waste management information from local governments annually. The EPD implements the regulatory provisions of local plans.

Collection of Solid Waste (Refuse), Recyclables, and/or Yard Trimmings

While landfilling remains the most widely used solid waste disposal method, many county sanitation systems throughout the state have made or are making the transition from "waste" management to "resource" management. Citizens are increasingly demanding separate collection services for solid waste, recyclables, and yard trimmings so that these materials may be put to beneficial use. A growing trend, primarily in the commercial sector, is to separate organics collection for composting and/or biofuel production.

A county may choose from among six basic arrangements for the collection of refuse, recyclables, and/or yard trimmings:

1. Provide the service using county employees and equipment
2. Contract, with private haulers or another local government, for collection services for the entire unincorporated county or parts of the county
3. Establish a franchise for collection services for the entire unincorporated county or parts of the county
4. License private collectors who provide collection services directly with homeowners and/or commercial property owners

5. Adopt an ordinance governing refuse, recycling, and/or yard trimmings collection services within the county
6. Open competition enabling private haulers to provide collection services directly to homeowners and/or commercial property owners without any oversight.

Counties may use a combination of these methods. For example, county crews may collect from bins that are set out along the road in rural areas and license private haulers to collect from densely populated subdivision residents, businesses, and industrial firms. Alternatively, they may elect to use their own crews to collect yard trimmings and recyclables and contract out the collection of refuse.

In order to capture the economic benefit of the collected materials, refuse, recyclables, and yard trimmings need to be kept separate. In most cases, keeping materials segregated from refuse results in a higher economic value of the individual materials collected. If recyclables are “source separated” during collection (e.g., each material is separated from the other), they can be processed and sold directly to end-market users of those materials. However, a source-separated recycling collection system typically costs more, has less participation, and has lower recycling recovery rates than does a single-stream/comingled recycling collection system. Trying to capture recyclables or energy from recyclables mixed together with refuse typically has the highest cost and results in the lowest recovery rate of any collection program.

There are five commonly used methods for the collection of solid waste, recyclables, and/or yard trimmings:

1. Roadside or curbside service. On a regular schedule (typically either weekly or twice a week for refuse, sometimes less frequently for recyclables and yard trimmings), residents carry and set out at the “curb” their refuse, recyclables, and/or yard trimmings contained in separate containers, where they are picked up by a county crew or private collection hauler. Residents return the containers to their original location stored on their property. This service can be provided using either an automated collection vehicle with one driver and an automated “sidearm” to collect and empty the containers or a rear load packer truck typically with a two- to three-person collection crew. Yard trimmings, especially storm debris, are often collected using a grapple or claw bucket and dump trucks.

2. **Backdoor service.** Collection crews collect refuse, recyclables, and/or yard trimmings in large containers, baskets, or disposable paper or plastic sacks from the “backdoor” of a residence and carry them to a collection vehicle and return the container to the location where they found it. Many counties either provide or require a private hauler to provide this service to elderly or disabled residents.
3. **Convenience centers.** Refuse, recyclables, and/or yard trimmings are delivered to either a staffed or unstaffed location or locations in the county by residents or businesses. Unstaffed locations typically consist of a series of “green” container boxes that are serviced by county crews, but more typically private waste haulers take the refuse to a solid waste transfer station or landfill. Most unstaffed locations do not collect recyclables or yard trimmings in separate containers. Staffed convenience centers have set hours of operation, typically accept both refuse and recyclables, and are secured during nonoperating hours in order to prevent illegal dumping and use by nonresidents. Residents and businesses typically are required to separate their recyclables into separate roll-off containers for each recyclable accepted; however, many counties are starting to take advantage of single-stream recycling collection whereby all the recyclables are mixed together into one collection container and collected either by a county crew or private hauler and delivered to a material recovery facility for processing and delivery to an end market or an industrial user of the recyclable materials. Collected yard trimmings are either ground and managed on site and delivered to a composting facility and/or an inert or construction and demolition landfill.
4. **Vacuum collection.** Used for yard trimmings collection only. Leaves are raked to the curb and collected by a county collection crew using a vacuum collection vehicle. The collected materials are delivered to a composting facility, inert landfill, or construction and demolition landfill. This service typically is only provided in densely populated areas of a county.
5. **Special events.** On a periodic basis, counties may host a special event to collect hard-to-dispose-of items, including tires; bulky items like couches, mattresses, and other furniture sometimes referred to as “brown goods”; electronic items; computers and

televisions; appliances or “white goods”; or household hazardous waste. These events either are held at county facilities or involve hiring a private contractor to provide the collection containers (e.g., roll-off box, tractor trailer, or van truck, depending upon the materials being collected).

Management of Collected Solid Waste (Refuse), Recyclables, and/or Yard Trimmings

Most areas in the state use a combination of sanitary landfill, incinerator, and/or recycling, composting, and/or bioconversion facility to manage the discarded resources collected within their county. Open dumps, which attract insects and rodents, are highly undesirable and illegal. Many public agencies have abandoned the incineration process because of air pollution and the high cost of approved incineration methods. The majority of counties in the state now use a sanitary landfill, where refuse is compacted and covered with a layer of dirt on a daily basis. Due to the increased environmental regulatory costs of constructing and operating a lined sanitary landfill, such landfills have become larger and more regional in nature. Approximately two-thirds of the disposable waste in Georgia is disposed of in one-third of the landfills in the state, which are privately owned and operated.

Minimizing transportation costs to these regional landfills has given rise to the siting and operation of solid waste transfer stations. Solid waste transfer stations typically are roofed structures, often three-sided buildings, where solid waste haulers, individuals, and businesses deliver collected waste. The waste is then loaded onto semi-trailers or placed into trash compactors for delivery to a sanitary landfill. Solid waste transfer stations do not require a solid waste-handling permit from the EPD; the siting and operational management are governed primarily by local zoning regulations and provisions included in a county solid waste management plan.

Recycling

Community recycling initiatives can support Georgia-based manufacturers and extend landfill life by reducing the amount of the waste stream.⁷⁸ Recycling stations or centers are alternatives to landfill disposal. These centers typically accept recyclables such as newspaper, magazines, cardboard, plastic, scrap metal, and glass that are kept separate from each other. The centers typically have a baler to process the collected materials so they can be cost effectively shipped to markets/manufacturers that use the materials by recycling them into new products. These centers

are typically operated by local governments or nonprofits that also have the responsibility for finding a market for these materials.

A Material Recovery Facility (MRF) is another type of recycling center. At a MRF, recyclables that are collected “single stream” (i.e., collected comingled in one container or vehicle) are accepted and processed. At a MRF, materials are separated by type, processed, and delivered to end users or markets. Depending upon recyclable commodity market conditions, counties and private haulers can expect to get paid a nominal amount for the materials delivered to a MRF or be able to deliver the materials and drop them off free of charge.

Recycling has a major impact upon the environment and Georgia’s economy. Recycling conserves the state’s natural resources, reduces the volume of waste disposed of in landfills, and results in less energy and water consumption when the materials are used to make new products. Recycling also supports the markets—the industries in Georgia that need these materials for their operations. Georgia has strong markets for all the recyclables collected in a curbside recycling program. For example, the state has 16 paper mills, 9 of which rely exclusively on recycled fiber for their operations; one-third of all plastic beverage containers recycled in North America are recycled into carpet in north Georgia; aluminum cans are being recycled and readied for use in less than 30 days in Greensboro; and three Georgia manufacturers use recycled glass in their operations. Recycling these materials in Georgia means these materials are available locally, reducing the cost and environmental emissions associated with transporting these materials to markets in the state.

Composting/Bioconversion

Counties are required to impose restrictions on the disposal of yard trimmings.⁷⁹ Under current law, counties are required to have yard trimmings collected separately from refuse and to keep the collected yard trimmings from being disposed of at lined landfills and preferably be put to beneficial use. Another method of reducing the solid waste stream is composting, a process of aerobic biological decomposition of organic materials to produce a stable and usable organic topsoil that does not require disposal. Resources used to create the final compost product originate from the roughly 60 percent of the municipal solid waste stream that is organic material (e.g., food waste, scrap paper, yard and lawn clippings). The primary activities associated with composting are (1) collections/receiving wastes for composting, (2) processing of waste, and (3) marketing. A local government can collect or receive waste for composting from a variety

of sources, such as active yard waste collection programs, vacuuming of leaves, and organics-only collection.

Another source of compostable materials is biosolids—sewage sludge, the solid, semisolid, or liquid residue generated during the treatment of domestic sewage in a wastewater treatment plant. Given the federal guidelines and restrictions on the land application of biosolids, composting may be a viable option for managing this resource.⁸⁰

Composting of household organic materials is not regulated by any major federal statute, although Georgia does have composting standards and regulations if the composting operation involves processing any organic materials beyond yard trimmings.

The processing or decomposition stage of composting involves both a physical and biological process. In order to accelerate the decomposition process and minimize odors, composters typically shred or grind the organic materials they accept into smaller particle sizes and frequently rotate or “turn” the composting materials. Composters must also carefully balance the carbon-nitrogen mix of the materials they accept in order to successfully stimulate the biological process of decomposing organic materials into a stable, usable soil amendment.

Bioconversion is another growing trend for managing organics in the waste stream. Bioconversion is the conversion of the organic waste stream to energy through a biological process or agents such as certain microorganisms or enzymes.

Charges for Solid Waste Disposal

Solid waste management services may be financed through the county general fund, an enterprise fund supported by a special assessment, a user fee collected by the county or private contractor, or the creation of a special service district. A special assessment and user fee are typically preferred over using the general fund, given that there is not necessarily a correlation between the value of someone’s property and the amount of trash they generate. A special assessment may be assessed using a number of factors and collected as a line item on property tax bills, or a user-fee bill may be sent monthly or quarterly by either the county or a private contractor to individual residents or commercial waste generators. If a particular service such as residential collection is provided only to a particularly densely populated area, the county may create a special service district to finance this effort.⁸¹ The special service district can give relief to urbanized residents in unincorporated parts of the county while avoiding

the imposition of charges to rural landowners of large tracts of land who may not need this service. Similarly, a service district can consist of the entire unincorporated area of the county, with municipalities providing disposal services using municipal revenues.

The flat minimum rate was previously the most popular fee plan in most counties. In an effort to reduce the waste stream, however, some counties have instituted a “pay-as-you-throw” system, with fees based on the amount or volume of solid waste collected. Under this program, households are charged a higher rate for larger trash containers (e.g., a 95 gallon cart versus a 35 gallon cart). Because recycling containers and services are typically provided without an itemized fee, a pay-as-you-throw program supports recycling efforts by charging a higher rate for the collection of larger trash containers. This practice is consistent with commercial accounts, which usually are charged on the basis of quantity and frequency of collection services.

CABLE TELEVISION

Many counties have franchise agreements with cable television providers. A franchise agreement is a contract between the county and the cable provider in which the county allows the cable provider to locate its cables and equipment in the public rights-of-way of the unincorporated area of the county in exchange for a franchise fee.⁸² A county may charge up to 5 percent of the cable company’s gross revenues⁸³ as a franchise fee.⁸⁴ Unlike cities, the only service for which counties may collect a franchise fee is cable service.⁸⁵

Cable franchise agreements may no longer contain build-out requirements for any cable providers.⁸⁶ Cable providers can expand or shrink their service area as long as they do not discriminate based on the income of the subscribers in an area.⁸⁷ Any discrimination claims will be brought to the local government and addressed through nonbinding mediation or the courts.⁸⁸

Cable providers are required to follow any county ordinances and regulations regarding excavation, permitting, bonding, indemnification, and placement and maintenance of facilities in the public right-of-way that are applicable to all users of the right-of-way, regardless of the type of franchise agreement held by the cable provider.⁸⁹

Since 2008, cable providers have had the option of obtaining a franchise agreement from the county or the state.⁹⁰

Local Franchise Agreements

If the cable provider chooses to have a local franchise, it can negotiate a franchise agreement with the county or adopt the terms of any other franchise agreement that the county may have with another provider.⁹¹ If the cable provider chooses to negotiate a franchise agreement, the rate of the franchise fee and the frequency with which it may be changed is subject to the terms of the franchise agreement.

In negotiating a franchise agreement, the county may require public, educational, and governmental (PEG) channels.⁹² However, cable providers have the option of terminating their existing local franchise agreements in order to obtain a state franchise.⁹³ In doing so, the cable provider must continue to provide PEG access support according to the terms of the local franchise as if the local franchise had not been terminated early.⁹⁴

Federal law and the Federal Communications Commission (FCC) establish regulation of cable providers. Counties “regulate” subscriber rates for “basic services tier” cable channels (e.g., local broadcast stations and PEG channels) and customer service of cable service by ensuring that the rates and the customer service meet the requirements of federal law.⁹⁵

State Franchise Agreements

If a cable provider decides to obtain a franchise through the state, the county may object to the franchise if the board of commissioners reasonably believes that the cable provider does not have financial and technical capability to provide cable or video service or is not authorized to do business in Georgia.⁹⁶ If the state franchise is granted, the county must also set the franchise fee rate (up to 5 percent) and notify the secretary of state and the cable provider.⁹⁷ The county may change the franchise fee on a state franchise once every two years.⁹⁸ Even with a state franchise agreement, counties may audit a cable provider once per year.⁹⁹

Under the state franchise, counties are limited to a maximum of two or three public access or PEG channels, depending on their unincorporated population.¹⁰⁰ If a county cannot meet the utilization requirements, it can place its PEG content on a shared channel controlled by the cable provider.

The governor’s Office of Consumer Affairs is responsible for establishing a uniform set of rules for counties and cable service providers to resolve subscriber complaints.¹⁰¹ Under the state franchise, counties may enforce federal customer service standards until 50 percent of the potential subscribers within the unincorporated county are offered cable

service by two or more service providers holding a state or local franchise. After this threshold is met, the county may adopt a resolution to discontinue receiving complaints regarding billing and customer service from citizens.¹⁰²

BUILDING CONSTRUCTION AND BUILDING CODES

County public works departments may also be associated with the construction or renovation of county buildings such as courthouses, administrative buildings, and fire stations as well as older buildings and the demolition of other structures. When contractors are hired, such projects may be subject to the Georgia Public Works Construction Law.¹⁰³ Whether performed with county labor or by a private contractor, as with the construction and maintenance of roads, these activities may be subject to numerous state and federal environmental regulations. If the building is within the city limits, the project will be subject to city building codes and inspections.¹⁰⁴ Land-disturbing activities may require permits from state and federal agencies, for example. The waste generated through building construction activities can be hazardous or nonhazardous, and disposal of such waste is generally regulated under a variety of federal, state, and local laws. If hazardous construction wastes are generated, federal RCRA Hazardous Waste Regulations¹⁰⁵ are applied.

Of particular concern is the presence of asbestos in county-owned buildings. Decades ago, asbestos was often used for insulation and as a fire retardant. All renovation or demolition activities involving asbestos materials are regulated under the Clean Air Act, and local governments are required to contact the federal EPA prior to any renovation or demolition. Removal and disposal of asbestos must be performed by accredited, trained personnel utilizing appropriate equipment. It is also important to note that lead-based paint is typically found in the interiors and on the exteriors of buildings constructed prior to 1978. During demolition and renovation activities, federal guidelines must be followed with regard to the removal and disposal of such paint.

Building codes are a set of rules adopted by the state that specify the minimum acceptable level of safety for constructing buildings and other structures. They are designed to protect health, safety, and property during construction and occupancy of a building or structure.

The State of Georgia has adopted eight “mandatory” building codes:

1. Georgia State Minimum Standard Building Code (International Building Code with Georgia State Amendments)
2. Georgia State Minimum Standard One and Two Family Dwelling Code (International Residential Code for One- and Two-Family Dwellings with Georgia State Amendments)
3. Georgia State Minimum Standard Fire Code (International Fire Code with Georgia State Amendments)
4. Georgia State Minimum Standard Plumbing Code (International Plumbing Code with Georgia State Amendments)
5. Georgia State Minimum Standard Mechanical Code (International Mechanical Code with Georgia State Amendments)
6. Georgia State Minimum Standard Gas Code (International Fuel Gas Code with Georgia State Amendments)
7. Georgia State Minimum Standard Electrical Code (National Electrical Code with Georgia State Amendments)
8. Georgia State Minimum Standard Energy Code (International Energy Conservation Code with Georgia State Supplements and Amendments).¹⁰⁶

While counties have the option of enforcing some or all of these codes in the unincorporated areas, builders are required to comply with them.

The state has also adopted two “permissive” codes: the International Property Maintenance Code and the International Existing Building Code.¹⁰⁷ Counties have the option of adopting and enforcing these two codes. Counties desiring to enforce these codes may do so by adopting a resolution or ordinance providing procedures necessary to administer the codes.

DCA is charged with developing and updating building codes. A copy of the adopting ordinance or resolution must be forwarded to DCA.¹⁰⁸

A county may amend any of these codes to meet local conditions, provided that the requirements are not made less stringent and they are based on local climatic, geologic, topographic, or public safety factors.¹⁰⁹ The amended codes must be submitted to DCA for review. The final decision remains with the county.¹¹⁰

In addition to these codes, the Georgia State Fire Code, as adopted by the Georgia Safety Fire Commissioner, remains mandatory throughout the state.¹¹¹ That office determines the construction standards for

manufactured homes (i.e., mobile homes).¹¹² Although state minimum standards do not exist for historic preservation, high-rise construction, or architectural design standards, counties may adopt related building codes or ordinances for enforcement purposes. Review by DCA is required to ensure that the restrictive nature of state-mandated codes is not diluted.¹¹³

Once codes are adopted, they are enforced through a system of permits and inspection. Anyone planning construction or alterations covered by county codes must first submit a set of plans and specifications to the building inspector. If these plans meet county code standards and zoning requirements (if any), a building permit is issued. The permit allows construction to proceed on the condition that the approved plans are followed. Periodic inspections are made by the building inspector. If the county is unable to review the plans within 30 business days of receiving a written application for permitting or if the county is unable to provide an inspection within 2 business days of receiving a request for inspection, the builder may hire a private professional provider (i.e., an engineer or architect) to review the plans or perform the inspection.¹¹⁴

If a city constructs a building or structure in the unincorporated area of a county that has adopted building codes, the city is subject to the same permit and inspection process as any other builder. Conversely, if a county constructs a building or structure in a city that has adopted building codes, the county is subject to the city's permit and inspection process.¹¹⁵

Personnel requirements for code enforcement vary with the size of the county, the volume of building activity, and the kinds of codes being enforced. In larger counties, code enforcement may require a department with several full-time staff members.

Counties are required to post a notice stating whether their building inspectors are qualified through certification by the International Code Council.¹¹⁶ If the county does not have certified inspectors, a builder has the option of retaining, at his or her own expense, a person who is certified by the council.¹¹⁷

Counties may choose to contract with a municipality or adjoining county that has a code enforcement department or enter into an intergovernmental agreement establishing a joint code enforcement system.

Code enforcement should be organized so that the inspector's performance is reviewed only by an official directly concerned with enforcing county codes.¹¹⁸ Criteria for successful code enforcement have been defined as follows:¹¹⁹

- All code enforcement should be in one agency.
- Code enforcement should be the sole function of that agency.
- The code enforcement agency should have department status.
- The code enforcement administrator should be responsible directly and exclusively to the person serving as chief administrative officer of the county.

Counties are allowed to charge inspection fees; permit fees are regulatory fees designed to help defray code enforcement costs.¹²⁰ The Southern Building Code Congress International and the International Code Council publish building valuation data on which some local governments base their permit fees. However, counties must take care to ensure that the cost of the regulatory fees does not exceed the cost of inspection.¹²¹

VEHICLE/EQUIPMENT PURCHASE AND MAINTENANCE

County vehicles may be purchased within either the fleet maintenance division of the public works operation and/or the finance department of a local government setting. Purchasing normally includes the acquisition of vehicles, equipment, and materials. Purchasing activity is directly regulated by environmental laws only with regard to the purchasing of clean fuel vehicles for local governments that have large vehicle fleets. Under the Clean Air Act, local governments that purchase new vehicles for fleets of a certain size are required to purchase a specified percentage of clean fuel vehicles during each year in order to satisfy pollutant emissions reduction goals in a nonattainment area.

Public works departments within local governments are generally responsible for operating, maintaining, and purchasing motor vehicles and equipment to perform government services. The types of vehicles can range from fire trucks, heavy construction equipment, administrative staff vehicles, and vehicles and equipment used by the sheriff/police department and other officials within a variety of departments within the local government. Equipment needed in order to maintain these vehicles can cover a broad spectrum, from generators to normal mechanics' tools to pumps and boilers. Public works fleet operations generally include vehicle repair shops, fueling stations, purchasing operations, and paint and body shops.

Within vehicle repair shops, several activities have the potential to impact the environment and are regulated under U.S. environmental laws

and regulations. Changing fluids (e.g., oil, antifreeze), cleaning parts, maintaining batteries, repairing air conditioners, washing vehicles and shop floors, repairing and replacing exhaust systems, painting vehicle bodies, and storing materials are all subject to regulation under federal environmental laws such as the RCRA, the National Pollutant Discharge Elimination System, and others. For a fuller explanation of state and federal environmental laws, see Chapter 10.

Vehicle fueling stations are also often associated with public works operations and, generally speaking, are located within a vehicle fleet maintenance operation within the public works department. Vehicle fueling stations provide fuel to government vehicles and include activities such as fuel storage, fuel dispensing, and disposal of unusable fuel. Moreover, they provide alternative fuel options such as compressed natural gas and methanol. Fuels can be stored in underground or above-ground storage tanks and are connected by piping to the fuel-dispensing unit. Operation and maintenance of these tanks are generally regulated under either the federal Clean Water Act, which requires development and implementation of spill prevention plans and secondary containment for aboveground tanks, and/or the provisions of the underground storage tank section of the RCRA.¹²² Fuel-dispensing units used in public works vehicle fueling stations are similar or identical to those used at retail service stations. Because these dispensing units may potentially emit organic vapors into the atmosphere, they may be subject to regulation under the Clean Air Act. These laws also contain requirements for handling, storage, and disposal of unusable fuel. In the event of spills, the repair shop is required to report such spills to the local hazardous waste-reporting agencies within the local government setting or state agency.

NOTES

1. OFFICIAL CODE OF GEORGIA ANNOTATED (O.C.G.A.) §43-15-2(10).
2. O.C.G.A. §43-15-2(11).
3. O.C.G.A. §43-15-24.
4. 40 UNITED STATES CODE ANNOTATED (U.S.C.A.) §1101 et seq.
5. Charles K. Coe, *Getting the Most from Professional Services: Consulting Engineer* (Athens: Institute of Government, University of Georgia, 1978).
6. A geographic information system enables the collection of technical data from maps, surveys, aerial photography, and text that can be inserted into a computer program for planning and monitoring proposed construction throughout the area.
7. O.C.G.A. tit. 32.

8. O.C.G.A. §32-1-8.
9. O.C.G.A. tit. 32, ch. 3.
10. O.C.G.A. §32-4-41(4).
11. O.C.G.A. §32-4-42.
12. *Ibid.*
13. O.C.G.A. §36-60-21.
14. O.C.G.A. §§32-4-42, 32-6-2(2).
15. O.C.G.A. §32-4-42(6).
16. O.C.G.A. §32-6-2.
17. O.C.G.A. §§32-4-42(6), 32-4-69.
18. O.C.G.A. §32-4-42(4).
19. O.C.G.A. §32-4-42(1).
20. O.C.G.A. §§32-4-63, 32-4-64.
21. O.C.G.A. tit. 32, ch. 6, arts. 1, 3, 4, 5.
22. O.C.G.A. tit. 32, ch. 6, art. 6.
23. O.C.G.A. tit. 32, ch. 6, art. 8.
24. O.C.G.A. §32-3-1 et seq.
25. O.C.G.A. tit. 32, ch. 6, art. 2.
26. O.C.G.A. §32-6-27(d).
27. O.C.G.A. §32-6-2.
28. O.C.G.A. tit. 40, ch. 6.
29. O.C.G.A. §40-6-3.
30. O.C.G.A. tit. 40, ch. 6, art. 2.
31. O.C.G.A. tit. 40, ch. 6, art. 3.
32. O.C.G.A. tit. 40, ch. 6, art. 4.
33. O.C.G.A. tit. 40, ch. 6, art. 5.
34. O.C.G.A. tit. 40, ch. 6, art. 6.
35. O.C.G.A. tit. 40, ch. 6, art. 7.
36. O.C.G.A. tit. 40, ch. 6, art. 8.
37. O.C.G.A. tit. 40, ch. 6, art. 9.
38. O.C.G.A. tit. 40, ch. 6, art. 10.
39. O.C.G.A. tit. 40, ch. 6, arts. 7, 11.
40. O.C.G.A. tit. 40, ch. 6, art. 12.
41. O.C.G.A. tit. 40, ch. 6, art. 13.
42. O.C.G.A. tit. 40, ch. 6, art. 15.
43. O.C.G.A. §40-6-370.
44. O.C.G.A. §40-6-371.
45. O.C.G.A. §40-6-372.
46. O.C.G.A. §40-6-374.
47. American Association of State Highway and Transportation Officials, *A Policy on Geometric Design of Highways and Streets, 1990* (Washington, DC: AASHTO, 1990). For a general overview of this topic, see chapter 3, “Elements of Design.” A more detailed, technical application to assist in making decisions on sight distance problems is found in chapter 9, “At-Grade Intersections.”

48. Federal Highway Administration, *Manual on Uniform Traffic Control Devices for Streets and Highways* (Washington, DC: U.S. Government Printing Office, 1988), 4C-14C-12.
49. 42 U.S.C.A. §7401 et seq.
50. American Standards Association, *American National Standard Practice for Roadway Lighting* (New York: Illuminating Engineering Society, 1983).
51. Ibid.
52. International City Management Association, *Urban Public Works Administration* (Washington, DC: ICMA, 1976), 366–83.
53. O.C.G.A. §32-9-11.
54. Jerry A. Singer, “Survival Techniques for FBO/Airport Managers,” in *Small Airport Management Handbook* (Athens: Carl Vinson Institute of Government, University of Georgia, 1985).
55. Ibid.
56. 33 U.S.C.A. §1251 et seq.
57. 42 U.S.C.A. §7401 et seq.
58. 42 U.S.C.A. §4321.
59. 42 U.S.C.A. §6901.
60. 16 U.S.C.A. §1531.
61. See 33 U.S.C.A. §407 et seq.
62. 15 U.S.C.A. §2601 et seq.
63. O.C.G.A. §12-7-6.
64. Intermodal Surface Transportation Efficiency Act of 1991, Pub. L. 102-240.
65. Georgia Municipal Association, *A Study of Municipal Water and Sewer Utility Rates in Georgia* (Atlanta: GMA, 1971).
66. O.C.G.A. §§43-51-1, 43-51-6; OFFICIAL COMPILATION RULES AND REGULATIONS OF THE STATE OF GEORGIA (GA. COMP. R. & REGS.), ch. 750.
67. O.C.G.A. §43-51-10.
68. GA. COMP. R. & REGS., ch. 391-3-5.
69. O.C.G.A. tit. 36, ch. 71.
70. International City Managers’ Association, *Municipal Public Works Administration*, 5th ed. (Chicago: ICMA, 1957), 289.
71. This discussion of treatment processes is drawn from Arnold W. Reitze Jr., *Environmental Law*, 2nd ed., vol. 1 (Washington, DC: North American International, 1972), 4–17.
72. O.C.G.A. tit. 12, ch. 5, art. 2; GA. COMP. R. & REGS., ch. 391-3-6.
73. Georgia Municipal Association, *A Study of Municipal Water and Sewer Utility Rates in Georgia* (Atlanta: GMA, 1971), 20. Pursuant to the FTC’s Red Flag Rules, counties must also protect customers from identity theft. See *ACCG Identity Theft Prevention Program* (June 2010). www.accg.org/library/ACCG_Sample_Identity_Theft_Prevention_Program.pdf.
74. Ibid.
75. Combined Sewer Overflow Control Policy, 59 Federal Register 18688 (April 19, 1994).
76. U.S. Environmental Protection Agency, Seminar Publication: National Conference on Sanitary Sewer Overflows (SSOs), April 24–26, 1995, EPA/25/R-96/0007 (Washington, DC: EPA, September 1996).

77. O.C.G.A. tit. 12, ch 8.
78. Examples of programs directed at landfill waste stream reduction include residential participation in separation of recycling products from household waste collection; recycling of recoverable materials such as used motor oil, batteries, and tires; roadside litter prevention and patrols; composting; and Christmas tree chipping. Information on these and other programs aimed at landfill waste reduction can be obtained from the Georgia Department of Community Affairs, Office of Environmental Management (www.dca.state.ga.us/development/EnvironmentalManagement/index.asp) and from Keep Georgia Beautiful (www.KeepGeorgiaBeautiful.org).
79. O.C.G.A. §§12-8-21(g), 12-8-40.2.
80. 40 CODE OF FEDERAL REGULATIONS (C.F.R.) part 503.
81. O.C.G.A. §36-70-24.
82. O.C.G.A. §36-76-2(6).
83. O.C.G.A. §36-76-2(8).
84. 47 U.S.C.A. §542(b); O.C.G.A. §§36-18-2, 36-76-6.
85. See O.C.G.A. §§36-18-1 et seq., 36-76-1 et seq.; *DeKalb County v. Georgia Power Company*, 249 Ga. 704 (1982); *DeKalb County v. Atlanta Gas Light Company*, 230 Ga. 65 (1973); *DeKalb County v. Atlanta Gas Light Company*, 228 Ga. 512 (1972).
86. O.C.G.A. §36-76-10.
87. O.C.G.A. §36-76-11(a).
88. O.C.G.A. §36-76-11(c).
89. O.C.G.A. §36-76-10(4).
90. O.C.G.A. §36-76-3(a).
91. *Ibid.*
92. 47 U.S.C.A. §531
93. O.C.G.A. §36-76-4(g)(2).
94. O.C.G.A. §36-76-4(g)(4).
95. 47 U.S.C.A. §541 et seq.; 47 C.F.R. 76.309(c), 76.922.
96. O.C.G.A. §36-76-4(f).
97. O.C.G.A. §36-76-6(a)(2).
98. O.C.G.A. §36-76-6(a)(3).
99. O.C.G.A. §36-76-6(c).
100. O.C.G.A. §36-76-8.
101. O.C.G.A. §36-76-7(c)(1).
102. O.C.G.A. §36-76-7(c)(2).
103. O.C.G.A. §36-10-1 et seq.
104. *City of Decatur v. DeKalb County*, 256 Ga. App. 46 (2002).
105. 40 C.F.R. Part 260.
106. O.C.G.A. §§8-2-20(9)(B)(i)(I)–(VIII), 8-2-25(a).
107. O.C.G.A. §§8-2-20(9)(B)(i)(IX)–(XI), 8-2-25(b).
108. O.C.G.A. §8-2-25. Once the state receives a copy of the county adopting ordinance or resolution of any of these six optional codes, subsequent amendments can be forwarded for the purpose of keeping the county informed about the code changes.

109. O.C.G.A. §8-2-25(c)(1).
110. O.C.G.A. §8-2-25.
111. O.C.G.A. §§8-2-20(9)(D), 25-2-13.
112. O.C.G.A. tit. 8, ch. 2, art. 2, pt. 2.
113. O.C.G.A. §8-2-25.
114. O.C.G.A. §8-2-26(g)(1).
115. City of Decatur v. DeKalb County, 256 Ga. App. 46 (2002).
116. O.C.G.A. §8-2-26.1(b).
117. O.C.G.A. §8-2-26.1(c).
118. Richard L. Sanderson, *Code and Code Administration* (Chicago: Building Officials Conference of America Inc., 1969).
119. *Ibid.*, 110.
120. O.C.G.A. §8-2-26(a)(4).
121. O.C.G.A. §48-13-9; Greater Atlanta Homebuilders Association v. DeKalb County, Georgia, case no. 1:00-CV-1290-GET, U.S. District Court, Northern District of Georgia, *aff'd without opinion*, 37 Fed. Appx. (May 30, 2002); Homebuilders Association of Savannah Inc. v. Chatham County, 276 Ga. 243 (2003).
122. 42 U.S.C.A. §6901 et seq.