



Infrastructure in Sussex County, Delaware: Where, When & How?

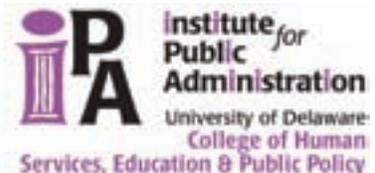
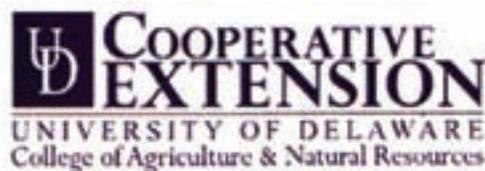
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About this Report

This report stems from a desire to know more about vital infrastructure in Sussex County, Delaware. Where is the current infrastructure located? How much capacity is present? How many more users can that capacity accommodate? What came out of those questions were not answers but many more questions regarding not only what currently exists, but how it came to be and what the future holds.

To begin, the research team requested information from Sussex County providers regarding the provision of three key utility infrastructure systems—water, wastewater, and electricity—in an attempt to understand the existing system. Unfortunately, very few of the team's requests were fulfilled. Many of the water and wastewater utilities are so small or reside within such a complex hierarchy that comprehensive maps are not available and those that are available can rarely be obtained in digital format. Concerns over commercial competitiveness and security also presented problems. A majority of the information requested for this report has been classified as confidential due to the heightened security measures implemented after Sept. 11, 2001. Other information is considered confidential for purposes of maintaining competitiveness among the industry leaders (see *Appendix A. Current Sussex County Infrastructure Provision* for details on information obtained or the reasons that were given for denial of the request).

The second course of action through which the team attempted to understand the infrastructure situation in Sussex County was to review the rules and regulations that govern the actions of physical infrastructure and utility service providers. The team found that these rules and regulations commonly dictate certain standards for infrastructure installation or pricing, but very few contained requirements, or even discussions, of the timing and location for new services (see *Appendix B. Legislation and Guidance* for a summary of the references reviewed). This leaves many of the decisions regarding future expansion to the supplying utility, and, due to security issues, the protocols used to make those decisions are not publicly available, so they could not be included in this overview.

As obstacles arose this project slowly changed direction and, in its current form, this report attempts to take merely the first step towards completion of the research team's initial goal. **This document is a place to begin: a discussion of how infrastructure is supplied, how this impacts consumers, and how the systems differ from utility to utility.** A brief overview of the rules and regulations that govern this system of provision and a look at what is on the horizon are also included to provide a basis for evaluating which components of the current system work and which could be improved.¹ **This document should be useful, not only to students of planning and community issues, but to anyone living in Sussex County who has a desire to understand more about their community and how it may change over time.**

Thank you to all those who helped access the desired information; your support and generosity is greatly appreciated.

¹ Due to the complexity of each system, this report addresses only three of the key utility infrastructures; natural gas, transportation, public facilities and services, as well as IT systems will need to be addressed separately in order to fully understand the system of infrastructure provision for Sussex County.

Introduction to Infrastructure

Infrastructure:

The fundamental elements that provide the framework supporting an entire structure; commonly refers to the physical system that distributes the services used in communities, such as water mains, electric lines, or roadways. The design and organization of a system's infrastructure determines how it functions and how flexible it is to meet future requirements.

The United States is facing an infrastructure crisis. An estimated \$1.6 trillion is needed over a five-year period to bring the nation's infrastructure to a good condition, and this goes beyond being stuck in traffic. Some infrastructure issues—such as water and waste-disposal issues—are about the health and safety of the American people. Here are just a few of the concerns we face as a nation:

- “Each day, six billion gallons of clean, treated drinking water disappears, mostly due to old, leaky pipes and mains. That's enough water to serve the population of a state the size of California” (ASCE).
- The industry needs to invest \$10 billion a year over the next five years to ensure the reliability of the national power grid” (ASCE).
- Combined sewer overflows and sanitary sewer overflows release 850 billion of gallons of raw sewage annually into rivers, streams, lakes and oceans” (ASCE).

Each area of the country has its own set of issues to address, Delaware included. According to the American Society of Civil Engineers' Infrastructure Report Card for the year 2000, **Delaware's Infrastructure grade is “D+” and requires a total investment of \$560 Million to be brought up to an acceptable level of service.** While a substantial amount of money is needed to address existing infrastructure systems, this number may skyrocket if we continue to build beyond those systems' means; allowing the pace of development to outstrip the pace of infrastructure planning and repair is a sure way to end up over budget and over capacity. The following sections outline how the pace of water, wastewater, and electric infrastructure provision is governed, how it can impact the common homeowner, and potential steps towards improving the nation's infrastructure crisis beginning in our own communities.

GOVERNING WATER

Water Withdrawal:

Water removed from the ground or diverted from a surface-water source for use (USGS, 2000).

GPD:

Gallons Per Day; an average person uses about 100 gpd at home (USGS, 2005).

In Delaware, water distribution, otherwise known as *allocation*, is administrated by the Delaware Department of Natural Resources and Environmental Control (DNREC,) under the authority of Delaware Code Title 7, § 6010. According to DNREC,

“Water withdrawals [greater than 50,000 gpd] are permitted under the *Regulations Governing the Allocation of Water*, March, 1987...As long as adequate supply is available for the proposed demand, and no harmful effect is anticipated, a water allocation will be granted. This permit precludes a future allocation to another user if it would cause a harmful diversion of water from the permit holder. Likewise, all permit holders who affect another person’s supply are obligated to restore that supply...” (DNREC, 2007).

Withdrawals less than 50,000 gpd are assigned based upon *Delaware Regulations Governing the Construction and Use of Wells* but still require registration and permitting.

What does all this mean for the everyday person?

Today permitting is standard and chances are, if your home was built in the past 25 years and has a well, it has a permit. Many of the wells that supply individual homes or irrigation systems, however, were constructed before these regulations came into effect and have yet to officially lay claim to any of the water DNREC has determined as accessible for permit. There are certainly complicated and comprehensive reasons as to why these permits are important, but it is important to recognize that the historic use of a pool of water does not provide a legal right to continue that use. All users governed by the regulations, including private and individual wells, must report their use and claim their respective permit to ensure that they will continue to have water in the amount and at the time that they desire.

GOVERNING WASTEWATER

Effluent:

An outflow or discharge of liquid waste, as from a sewage system, factory, or nuclear plant (American Heritage Science Dictionary, 2005).

On-site Wastewater-Treatment System:

DNREC calls these “conventional or alternative, wastewater-treatment and -disposal systems installed or proposed to be installed on land of the owner or on other land to which the owner has the legal right to install the system” (Doc. No. 40-08-05/04/07/01). Basically, this term refers to “small” wastewater-treatment plants with local effluent disposal, such as septic systems or cesspools.

In Delaware, overview of the siting, design, and installation of on-site wastewater-treatment and -disposal systems is administrated by the Delaware Department of Natural Resources and Environmental Control (DNREC) under the authority of Delaware Code Title 7, § 6010. Systems that discharge effluent off-site, such as commercial sewage-treatment plants, are typically governed by the federal National Pollutant Discharge Elimination System (NPDES); the U.S. Environmental Protection Agency (EPA) has delegated this administration to DNREC as well.

Permits for these systems are based upon *The Regulations Governing the Design, Installation and Operation of On-site Wastewater Treatment and Disposal Systems* and *Guidance and Regulations Governing Land Treatment of Wastes*. Section 402 of the federal *Clean Water Act*,

as amended, and the Delaware Code of Law, Title 7, Part VII, Chapter 60, “Environmental Control,” provide the authority for Delaware’s NPDES permits.

Some jurisdictions have provisions that *require* new development (and some existing development, with system extension) to connect to central sewers where they are available. This helps protect groundwater resources from contamination, since on-site systems are prone to failure without proper maintenance. The following sections outline these provisions.

What does all this mean for the everyday person?

Properly maintained, septic systems are a great solution for sparse rural development, but in more dense suburban environments failed septic systems can spread harmful germs that can contaminate our waterways and even the wells that provide the public water supply. Permitting helps the state know where all of the systems are and how long they have been in place, so that if a problem arises they can address it quickly. Today, permitting is standard, and, chances are, if your home was built in the recent past and has an on-site waste-disposal system, it has a permit. Most urban homes are connected to central sewer and are billed for this service as either part of their water bill or separately from the treatment entity. Homeowners need to consider several questions to enhance their safety. Do you know where your waste goes? How about your neighbors’ waste? Staying aware of this information can help protect your investments and your health.

GOVERNING ELECTRICITY

Transmission lines:

An interconnected group of lines and associated equipment for the movement or transfer of electric energy between points of supply and points at which it is transformed for delivery to customers or is delivered to other electric systems (Kentucky PSC, 2004).

Distribution lines:

The portion of the electrical grid between a transmission line substation and a customer’s metered private electrical system; this is how electricity gets from the large lines that run along roadways to the point where it enters our homes (U.S. DOE).

Siting:

The process of choosing a location for a facility (EPA).

Since state restructuring in 1999, the distribution services of investor-owned utilities have remained under the regulatory control of Delaware’s Public Service Commission (PSC). While the commission provides rules a utility must follow in providing service and selecting rates that it may charge for those services, the PSC does *not* have authority over the siting of transmission and distribution lines.

In Delaware, the siting of electric lines is left mostly to agreements between private property owners and the providing utility; developers must either lay lines themselves and hook into an existing utility’s infrastructure or apply to and pay a provider to lay lines for the new development. Permits for electric lines are based upon local building codes.

In rare cases that affect the pricing of electric transmission or placement of interstate transmission lines, the Federal Energy Regulatory Commission (FERC) can become involved in the provision of electric infrastructure. When lines cross public or environmentally sensitive lands, DNREC is also involved in the permitting process.

What does all this mean for the everyday person?

Under the current structure, electric lines follow growth; lines are almost never laid until customers are available, and the cost for system upgrades that supply the new growth is paid for by the developer. Even in cases where infrastructure improvement or extension is required to supply an existing property, the cost of extension rarely places a financial burden upon the existing community, since there is strict governance as to when and how this cost can be reflected in rate increases.

Comparing Utility Governance: Impacts on Current Residents and Growing Communities

Since there are alternatives to connecting to a central water and sewer system—such as private well and septic systems—it is not required that this infrastructure is available prior to improvement of a piece of land in order to profit from that improvement. New subdivisions located even a short distance from an existing urban core may decide to provide distributed supply systems to minimize the initial cost of the new development, but this can present long-term problems. As septic systems fail, private wells go dry, or it becomes necessary to treat drinking water in a certain fashion due to water quality, the local provider will likely be required to extend central water and sewer to accommodate the distant development. System extension is more expensive after improvement of the land than initial provision of infrastructure would have been. Costs can be prohibitive for individual homeowners, so a percentage may be passed on to all users through taxes or rate hikes.

Electric supply on the other hand, almost always arrives as growth does; this infrastructure arrives *concurrently* with new development or the improvement of land. Since it would be very difficult to sell a home or commercial building without electric supply, by default this utility is required for new development. The rules governing the distribution of cost for electric infrastructure are also more restrictive than the rules that govern the prices of water and sewer supply. Such rules are designed to protect existing users from excessive rate increases due to costs required to supply new users.

The cost of providing infrastructure increases considerably when property is already developed; many utility lines are run underground and are placed during excavation and construction of the home. If a home must be retrofit for these utilities in later years, existing structures, concrete and landscaping must be torn up and replaced to appropriately locate the new infrastructure. Due to this additional cost, the maxim of spending the time and money to do it right the first time is essential. In an attempt to strengthen the effectiveness of how infrastructure is provided, some public agencies have begun to propose a growing trend in land use and infrastructure funding—*concurrency*.

Requiring concurrency in infrastructure means that certain utilities and infrastructures must be present at an adopted level of service before or at the same time as the development that will use them. This means that if someone desires to build on a lot where the funding for infrastructure is not planned for another five years, they must wait until it is available. This process helps protect citizens from overburdened systems and from the cost of expanding service in an untimely manner. Concurrency does not stop development; it seeks rather to ensure that development occurs in an orderly and timely fashion, without negatively impacting existing users. Some systems allow developers to have infrastructure extended more quickly if they pay any additional cost for altering the timing and location of expansion.

While the existing system of electric supply works from the opposite direction of concurrency (regulating cost that governs the timing of development and the concurrent infrastructure), it is clear that existing users are protected from the impacts of growth more in this system than in the systems that currently govern most water and sewer supply infrastructure.

A number of jurisdictions have begun to require concurrency for certain facilities or services, particularly those that are already strained, to protect the existing community. Concurrency may be required through a provision in a comprehensive plan, as a component of development review or building-permit approval, or may be simply suggestive by incorporating evaluation of infrastructure availability into the protocol of a permitting agency. There are a number of legal considerations that must be addressed before passing any concurrency requirement, but this practice has been tested and approved in multiple courts as an acceptable way to manage land use and address the impacts of growth.

Insight Into Legislation and Guidance

The provision of infrastructure is not only governed by growth and the companies that supply our utilities, but by a number of laws and protocols at each level of government. Here is a quick overview of the types of guidance that can be found at each of these levels and the various ways in which the development of infrastructure may be addressed. Please see *Appendix B. Legislation and Guidance* for a more complete list of applicable regulations.

- *Ordinances* and *Federal Acts*, in general, are law and may be viewed as fairly static in their application. These may direct action, set criteria, provide funding mechanisms, or address any number of other issues; compliance is mandatory.
- *Goals* and *Objectives* describe the intent or desired qualities of a community or organization regarding a certain issue but do not usually direct action.
- *Policies* are meant to implement *Goals* and *Objectives*; these provisions state what should be done, how, where, and when, to achieve the desired outcome.

Goals, *Objectives*, and *Policies* are typically designed to provide guidance for decision-making or action that commonly occurs in a community. These are not usually legally binding by themselves but may direct the creation of ordinances to accomplish any desired legal requirements.

Most of these provisions fulfill the requirement of assisting decision-makers, but they do a poor job of providing peace of mind to the community at large. Many of the provisions referenced here are insufficient to provide citizens reasonable expectations of how system development and expansion will occur. This leaves determination of the location and sequence of infrastructure provision entirely to the providing entity and can create uncertainty for property owners in the area.

It is in a community's best interest to determine how they want their community to mature and find ways to provide guidance for the corporations and utility providers that work within the community. Once the priorities of a community have been incorporated into that community's appropriate guiding documents, the public should be able to reasonably expect that those priorities will be reflected as development progresses, providing a more stable and predictable physical environment. Clearly stating community priorities within these documents may also cause more brief and pleasant negotiations with potential service providers by providing them with information on the qualities with which their proposals must comply for acceptance.

FEDERAL LEGISLATION

The Federal Government typically addresses overarching issues like health and safety standards that apply to the entire nation or interstate issues such as transmission line location or hydroelectric dams.

Clean Water Act (CWA)

This act governs water pollution in the U.S. and gave the EPA authority to implement pollution-control programs. The act required the creation of standards for surface-water quality, and "made it unlawful for any person to discharge any pollutant from a point source into navigable waters, unless a permit was obtained under its provisions" (EPA). Through the authority of this act, the EPA has assigned responsibility for the *National Pollutant Discharge Elimination System* (NPDES), the permitting system set up by the CWA, in the state of Delaware to DNREC. This act potentially impacts both water and wastewater utilities.

Safe Drinking Water Act (SDWA)

SDWA authorizes the EPA to set national health-based standards for drinking water to protect against both naturally occurring and man-made contaminants that may be found in drinking water. The EPA, states, and water systems then work together to make sure that these standards are met. In Delaware, the Department of Health and Social Services' Division of Public Health and DNREC work together.

Federal Power Act of 1920 & Energy Policy Act of 2005

These acts are enforced predominantly by the Federal Energy Regulatory Commission (FERC). The Federal Power Act governs coordination of hydroelectric projects, licensing of power plants, and regulation of interstate electricity transmission. The Energy Policy Act attempts to provide solutions to America's growing energy problems by providing tax incentives and loan guarantees for energy production of various types and encouraging the use of renewable resources.

STATE OF DELAWARE: LAW AND GUIDANCE

When government funding is provided to develop infrastructure, there are good reasons to have a coherent and cohesive policy on how that funding is obtained and allocated. Given the percentage of funding that comes from the state, it's no surprise that Delaware is in the process of developing such policy. "Delaware state government provides social services, prisons, roads, transit, the largest police force in the state, approximately 70% of school funding, 50% of library construction funding and 60% of paramedic funding" (Livable Delaware, 2004: 9).

Required by Governor Minner's *Livable Delaware Agenda*, the *Strategies for State Policies and Spending* document is used to guide state agency operating and capital budget requests. "In part, the State Strategies are meant to act as a guide for adequate infrastructure provision throughout Delaware while minimizing the burden on the State's taxpayers. Thus, the three general strategies are:

1. Towns, counties and the state are collectively involved in the infrastructure planning process;
2. Existing infrastructure should be utilized before new infrastructure is constructed; and,
3. When it is necessary to expand new infrastructure, it should be expanded in a logical manner that aims to serve first those areas closest to existing services" (Livable Delaware, 2004: iii).

To support these strategies, the State has identified and mapped locations assigning them to Investment Levels 1 through 4 and specified allocation criteria for each level. Many of the related **state ordinances** support, or provide the authority to support, these strategies. The following ordinance provides further detail.

Title 29, Chapter 91.2, *Development Of State Impact Fees*, provides the intent to:

- (1) Ensure that adequate public facilities are available to serve new growth and development....
- (4) Ensure that new growth and development is required to pay no more than its proportionate share of the cost of public facilities needed to serve new growth and development and to prevent duplicate and ad hoc development exactions (§ 9121).

This ordinance also directs the development of impact fees (§ 9123), allows for the creation of county impact fees for "services for which the county will bear increased costs of development" (§ 9124), and protects farm residences from the burden of impact fees from unrelated development (§ 9125).

SUSSEX COUNTY: LAW AND GUIDANCE

In addition to national and state legislation, infrastructure is governed by the rules and regulations of each county in which it provides services. The Sussex County Comprehensive Plan and county ordinances provide guidance as to how infrastructure should be supplied.

County Comprehensive Plan, Land Use Element, Guidelines for Infrastructure

Town Centers are...adjacent to municipalities where public water and wastewater systems are available. Future development should provide for the extension of these services, where feasible....

Developing Areas...can be served with public wastewater systems by extending services from the existing municipalities.... [A new system may be required] to serve the remaining areas where high-density development occurs or where development impacts sensitive environments.... [Classification continues for additional districts and areas].

County Comprehensive Plan, Water and Wastewater Element

Establish an intergovernmental planning program to coordinate, support, and promote the expansion of existing municipal water and wastewater systems and commence planning for their extension into appropriate Growth Areas.

Regulate existing private wastewater systems. Growth should be directed toward public systems and the use of private systems discouraged....

County Ordinances, Chapter 110 Water and Sewers

§ 110-3. *Use of privies, privy vaults, septic tanks and cesspools.*

Where public sewers are provided in an area served by a Sussex County sanitary sewer district, it shall be unlawful to construct or maintain any privy, privy vault, septic tank, cesspool or other facility intended or used for the disposal of sewage.

§ 110-42. *Connection required.*

The owners of all houses, buildings or properties used for human occupancy, employment, recreation or other purposes situated in an area served by a Sussex County water district ... in which there is now located or may in the future be located a public water main of Sussex County are hereby required, at their expense, to install a suitable water supply system and to connect such system directly with the proper public water main in accordance with the provisions of this Part 1, within 60 days after the date of official notice to do so.

MUNICIPALITY: GUIDANCE

Local jurisdictions can also exercise control over the timing and strategy of infrastructure provision. The level of municipal control in Delaware varies greatly, from barely mentioned to protective enough to provide predictability. Each town or city should consider what type of governance serves its purposes best. Typically, municipal ordinances implement the policies the comprehensive plan directs and, as a result, are similar in composition.

Town of Georgetown Comprehensive Plan, 2.5 Utilities and Services

...the use of existing infrastructure should be maximized and investment in new services realized at least possible expenses... Georgetown should utilize provisions that make new development reflect the associated costs necessary to extend or upgrade existing infrastructure such as water and sewer lines or required pumping stations. New development should essentially pay for itself.

- *Water and Sewer Availability:* Town water and sewer services are available on the outskirts of the existing town limit lines. It is recommended that extensions may be made at the cost of the developer on a case-by-case basis. The developer should be subject to Impact Fees for the new construction....

City of Rehoboth Beach Comprehensive Development Plan, Water

While current water supply and current water quality is not a constraint on the growth of the city, the new and growing land uses around the city's well heads pose future problems for the aquifer from which the city's water is drawn. The protection of these wells is of paramount importance...The City will require ongoing consultation with the state and the county about proposed development that may affect the integrity of its wells and water supply and the development of effective means of protection, e.g., annexation, purchase, added groundwater-protection measures, etc. (Sec. 4.3).

Future needs will be analyzed and the necessary facility improvements will be included in a Five-Year Capital improvement Plan for Water and Sewer, Roads and Walks, and Utilities (Sec. 4.321).

Town of Milton Comprehensive Plan Update

In the long-term, the Town is gearing up to provide the infrastructure required to support the anticipated development.... In an effort to allow annexation and development to occur in the short term in order to provide town services in the long term, the Town looks to implement two measures to ensure that development and infrastructure keep pace with each other.

1. *Adequate Public Facilities Ordinance* – Such an ordinance would apply to all lands, currently in town and annexed in the future, and would be triggered when land is subdivided. At the time of subdivision, the adequacy of sewer and water infrastructure would need to be demonstrated. If such availability is unable to be demonstrated, the application would be denied, or phased in a way that it could be accommodated.
2. *Annexation Agreements* – These are agreements that the Town of Milton would enter into with landowners at the time of annexation that would address the short-term infrastructure limitations. Such agreements would include a cap on the annual number of building permits and arrangements for the landowner to help fund the necessary sewer and water infrastructure upgrades.

On the Horizon

The body of laws and regulations that govern our lives is ever changing, and it is important to stay aware of upcoming possibilities. Below are some of the current proposals that may change or support the current system of infrastructure provision.

A majority of the currently proposed federal legislation relates to federal funding or financing of infrastructure; therefore, it has not been included here. For a brief listing please see *Appendix B. Legislation and Guidance*. This is the second step and is only relevant after the decision to

extend or expand a system has already been made. Most of the governance of how and when infrastructure is provided may be found at a local level. A number of bills currently in the Delaware state legislature may have some impact on the way infrastructure is provided or funded.

House Bill 239: An act to amend Title 29 of the Delaware Code relating to growth management, public services, facilities, and infrastructure.

Synopsis: This bill centralizes growth management and planning in the Office of State Planning Coordination and creates specific minimum standards for determining the adequacy of public facilities and services for water, health care, transportation, stormwater management, schools, and wastewater transmission, treatment, and disposal (Delaware General Assembly).

The bill was introduced June 21, 2007, and has been assigned to the House Transportation/Land Use and Infrastructure Committee.

House Bill 244: An act to amend Titles 9, 22 and 29 of the Delaware Code relating to the transfer of development rights and the creation of special development districts.

Synopsis: This bill provides two major components for better land use planning and development in Delaware.... These two components working together should address several problems. They will help save open space by encouraging the transfer of development rights and by providing for higher density where development does occur. They will also provide more funding for the construction of needed infrastructure so that this burden does not fall entirely on existing property owners (Delaware General Assembly).

This bill was introduced June 26, 2007, and as of June 28, 2007, the House Transportation/Land Use and Infrastructure Committee had released the bill with three favorable and three on its merits.

House Bill 311: An act to amend Title 7 of the Delaware Code establishing a new Chapter 71 and Chapter 72, enabling Sussex County to create tax-increment-financing districts, utilize tax-increment financing to fund costs related to development and redevelopment, create special-development districts, and utilize special development–district financing to fund costs related to development and redevelopment.

Synopsis: This bill enables Sussex County to take advantage of the opportunity to have development and redevelopment infrastructure impact costs financed through the establishment of tax-increment-financing districts (TIF) and the use of tax-increment financings and the establishment of special-development districts (SDD) and the use of special development–district financings. TIFs and SDDs can be used effectively to encourage development and redevelopment by steering growth to desired areas... (Delaware General Assembly).

This bill was introduced February 06, 2008, and has been assigned to the Housing & Community Affairs Committee of the House.

Senate Bill 170: An act to amend Chapter 1 of Title 26 of the Delaware Code related to the calculation of a water utility's rate base for rate-making purposes and to allow for the pass through of certain costs through an interim rate adjustment.

This bill was introduced June 26, 2007, and as of June 30, 2007, had passed the Senate Agriculture Committee with one favorable and four on its merits.

Conclusion

Through the course of this report, it has become clear how little information is publicly available about the creation and maintenance of the infrastructure that services our daily lives and the impacts it may have on Delaware's southern residents.

Due to issues of security and confidentiality, as well as a lack of resources in smaller jurisdictions, we have limited information regarding 1) the location and capacity of existing infrastructure, 2) the availability of capacity for new residents, 3) planned improvements and extensions of existing systems, and 4) the location and capacity of new systems.

In times of heightened security, the measures taken to protect this information may make sense, but the lack of information presents a challenge to those planning to meet the future demands of a growing community. Many of the guiding documents examined here express a desire to protect the economic and environmental resources of the area, but how can we ensure that infrastructure is sufficient both for new and existing residents while protecting those resources, when we must rely upon the service providers to determine how creation and maintenance occurs? How do we know whether there will be enough capacity to meet growing demands, when a majority of the information required to make that determination is not available? In these types of situations, resource protection and community development measures are necessarily reactive, which tend to be inefficient ways to address these issues.

Based upon review of the available guidance, many jurisdictions seem either unwilling or unable to regulate the distribution of utilities and infrastructure when they are not directly provided by that jurisdiction. Water and wastewater are commonly provided by counties or municipalities and are commonly discussed—both in terms of the timing and capacity of provision, but rarely does this include discussion of the relationship between these utilities and the communities they serve. In the absence of forthcoming information, it may be in a community's best interest to properly state what it will and will not allow, in order to ensure residents the best results. While no solution will prevent all rate increases or required system upgrades, some may take surprise out of the equation, allowing residents and local governments to better prepare and coordinate in times of stress or growth. The creation of state or local regulations that help bridge the gap between the needs for community planning and the needs of the providers is just one of many possible solutions. It has been shown to work in other communities and so may serve as a good place to start evaluating how infrastructure will play a role in the future of Delaware's communities.

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Appendix A. Current Sussex County Infrastructure Provision

This section includes information regarding the data available, as of 2008, for the current—and where possible, planned—capacity of residentially oriented infrastructure for Sussex County, Del. Due to the heightened security restrictions following September 11, 2001, and to the desire to retain certain competitive advantages, some information requested for this report was considered sensitive or classified material and could not be obtained. In these cases, a summary of the request response has been included. Those agencies and municipalities not included in this list did not respond to our requests for information.

For fairness sake, and to protect the privacy of those who did supply the information we requested, the details of that information have not been included here.

Private Providers

Tidewater Utilities, Inc. was able to provide GIS shapefiles of their current water supply facilities for the State of Delaware, but was unable to provide planned facilities due to competitive reservations.

The *Delaware Electric Coop* was able to provide graphic images of their service area, as well as the facilities and capacities within those areas.

Following formal requests, *Chesapeake Utilities*, *Delmarva Power*, and *Artesian Water Company* were either unable or unwilling to provide information regarding their infrastructure provision due to due to issues of security and competitive reservation.

Government and Municipal Providers

Sussex County provides sanitary sewer service for the following areas: Angola Neck, Bay View and Sea Country Estates, Bethany Beach, Blades, Cedar Neck Expansion, Dagsboro and Frankford, Dewey Beach, Ellendale, Fenwick Island, Henlopen Acres, Holts Landing, Johnson's Corner, Long Neck, Miller Creek, North Bethany Expansion, North Millville Expansion, Oak Orchard, Ocean View Expansion, South Bethany, South Ocean View, West Rehoboth Expansion. Current maps, capacity, and planned project information are available from the County website.

The *Town of Blades* was able to provide a zoning map and a hand-drawn map of the municipal utility's infrastructure. Information regarding their sanitary sewer district is available from Sussex County, who provides the service.

City of Lewes was able to provide information regarding general location and capacity of their facilities.

Town of Georgetown was able to provide information as well as location details for their facilities, with a good portion of the requested information available on their website.

The *Town of Bridgeville* was unable to provide the information that we requested.

Town of Laurel - Town has no up-to-date cartographic data regarding the location and extent of facilities; they are currently working with IPA's Planning Services Group to develop a contract to create this data with funding from a state Livable Delaware grant.

For security reasons, the following jurisdictions have provided only the information available in their comprehensive plan: *Town of Greenwood*, *Town of Millsboro*, and *Town of Milton*.

Appendix B. Legislation and Guidance

FEDERAL GOVERNANCE

This section includes legislation and guidance from the Federal government, regarding the provision and/or funding of infrastructure related to residential development.

Clean Water Act (CWA)

This act governs water pollution in the U.S and gave the EPA authority to implement pollution control programs. The act required the creation of standards for surface water quality, and “made it unlawful for any person to discharge any pollutant from a point source into navigable waters, unless a permit was obtained under its provisions (EPA).” Through the authority of this act, the EPA has assigned responsibility for the *National Pollutant Discharge Elimination System* (NPDES), the permitting system set up by the CWA, in the State of Delaware to DNREC. This act potentially impacts both water and wastewater utilities.

Safe Drinking Water Act (SDWA)

SDWA authorizes the EPA to set national health-based standards for drinking water to protect against both naturally occurring and man-made contaminants that may be found in drinking water. US EPA, states, and water systems then work together to make sure that these standards are met. In Delaware, the Department of Health and Social Services, Division of Public Health (DHSS) and DNREC work together

Federal Power Act of 1920 & Energy Policy Act of 2005

These acts are implemented predominantly by the Federal Energy Regulatory Commission (FERC). The Federal Power Act governs coordination of hydroelectric projects, licensing of power plants, and regulation of interstate electricity transmission. The Energy Policy Act attempts to provide solutions to America’s growing energy problems by providing tax incentives and loan guarantees for energy production of various types and encouraging the use of renewable resources.

Federal Governance on the Horizon (Status is as of March, 2008)

- *Water Security Act of 2007*, S.1968: A bill to provide for security at public water systems and publicly owned treatment works. Status: referred to the Committee on Environment and Public Works.
- *Water Quality Financing Act of 2007*, H.R.720: To amend the Federal Water Pollution Control Act to authorize appropriations for State water pollution control revolving funds, and for other purposes. Status: referred to the Committee on Environment and Public Works.
- *National Infrastructure Improvement Act of 2007*, S.775: A bill to establish a National Commission on the Infrastructure of the United States. Status: referred to the Subcommittee on Water Resources and Environment.
- *National Infrastructure Development Act of 2007*, H.R.3896: To facilitate efficient investments and financing of infrastructure projects and new job creation through the

establishment of a National Infrastructure Development Corporation, and for other purposes. Status: referred to the Subcommittee on Water Resources and Environment.

STATE GOVERNANCE

“Delaware State government provides social services, prisons, roads, transit, the largest police force in the state, approximately 70% of school funding, 50% of library construction funding and 60% of paramedic funding (Livable Delaware, 2004: 9).”

This section includes legislation and guidance from the State of Delaware, regarding the provision and/or funding of infrastructure related to residential development. It is important to note that, while the provision exists for requiring new development to pay for associated infrastructure, there is no provision that requires new development to wait until the associated infrastructure and facilities are in place.

Livable Delaware: The Strategies for State Policies and Spending

“In part, the State Strategies are meant to act as a guide for adequate infrastructure provision throughout Delaware while minimizing the burden on the State’s taxpayers. Thus, the three general strategies are:

1. Towns, counties and the state are collectively involved in the infrastructure planning process;
2. Existing infrastructure should be utilized before new infrastructure is constructed; and,
3. When it is necessary to expand new infrastructure, it should be expanded in a logical manner that aims to serve first those areas closest to existing services (iii).”

To support these strategies, the State has identified and mapped locations as belonging to Investment Levels 1 through 4 (see map in Section 3).

1. Government is to “Direct maximum assistance to upgrades, reconstruction, treatment improvements, and system expansions within Investment *Level 1* Areas (emphasis added, 35).
2. In *Level 2* areas, government is to “Base investments on available infrastructure to accommodate orderly growth (39).”
3. *Level 3* recognizes “that state infrastructure investments may be appropriate where state and local governments agree that such actions are necessary to address unforeseen circumstances involving public health, safety, or welfare (45).”
4. *Level 4* areas are considered “out-of-play,” or areas that are yet inappropriate for most investment associated with development.

A Matrix of Strategies for State Policies and Spending in Investment Levels is available here: http://stateplanning.delaware.gov/strategies/document_04/10_appendices.pdf

State Ordinances

Duties of electric distribution companies

Laws of Delaware, Chapter 73, §1008 *Duties of electric distribution companies*—formerly Senate Bill number 48, as amended by Senate Amendment number 2—provides that:

“Each electric distribution company shall maintain its facilities and provide products and services which are safe, efficient, sufficient, adequate, and reliable. Each electric distribution company shall implement procedures to require all electric suppliers to deliver energy to the electric distribution company at locations and in amounts which are adequate to meet each supplier's obligations to its customers.”

Sanitary and Water Districts

Title 9, Chapter 65, *Sanitary and Water Districts*, provides for the establishment, powers and duties of these districts within Sussex County, Del.

Through these districts, the County is provided the power to “construct and maintain main sewers or water mains and sewage or water treatment works (§ 6508),” to “construct or maintain submains or laterals as agent for municipalities when officially requested (§ 6509),” and to adjust property owners’ assessments for those costs already incurred by the property owner when those sewers or water systems were constructed (§ 6510.)

The power to issue bonds for the subject construction (§ 6511) is also provided through this ordinance, as is the power to collect annual assessments “sufficient to provide funds required to reimburse the County for sums to be expended for retiring the bonds which have been issued, for the payment of the interest due on the bonds, for maintaining or improving the sewerage or water system and for paying the necessary general expenses of the sanitary sewer or water district (§ 6513).”

Finally, this ordinance provides the power to order connection to sanitary sewer where service and capacity is available, where it is deemed “necessary to the preservation of public health...(§ 6517)” and governs the location of sewage treatment and disposal facilities (§ 6521).

Sewers and Water

Title 9, Chapter 67, *Sewers and Water*, provides similar powers and duties directly to the County.

Municipal Electric Companies

Title 22, Chapter 13, *Municipal Electric Companies* authorizes establishment of municipally owned or operated electric utilities and governs the powers and duties of the subject utilities.

Title 22, Chapter 18, *Special Development Districts*, provides for the creation of, levying of taxes and issuance of bonds in order to finance the cost of:

“the design, construction, establishment, extension, alteration or acquisition of adequate storm drainage systems, sewers, water systems, roads, bridges, culverts, tunnels, streets, sidewalks, lighting, parking, parks and recreation facilities, libraries, schools, transit facilities, solid waste facilities and other infrastructure improvements as necessary, whether situated within the special development district or outside the special development district if the infrastructure improvement provides service or benefit to the property within the special development district, for the development and utilization of the land, each with respect to any defined geographic region within the municipality; and

(2) To pay costs associated with tax increment financing undertaken with respect to TIF Districts pursuant to Chapter 17 of this title. (74 Del. Laws, c. 145, § 2.)”

Public Service Commission Jurisdiction and Powers

Title 26, Chapter 1.2, *Public Service Commission Jurisdiction and Powers*, provides that, “The Commission shall, upon notice and after hearing, establish boundaries throughout the State within which public utilities providing retail electric service shall have the obligation and authority to provide retail electric service... (§ 201)”

Included is the requirement that “In acting further under this section, the Commission shall consider among other pertinent factors, which of 2 or more public utilities:

...(3) Can install and/or upgrade its facilities to furnish service to a designated area with the smaller amount of additional investment; and

(4) Is demonstrably capable of providing adequate and reliable service to a designated area within a reasonable period of time and in a feasible manner...

(e) If the Commission, after notice and hearing, shall determine that service being furnished or proposed to be furnished by a public utility subject to its jurisdiction to a customer or prospective customer within its service territory is substantially inadequate and is not likely to be made adequate, or otherwise exceeds the capacity of that public utility to provide adequate service within a reasonable time, the Commission may authorize another public utility to provide service to such customer...(§ 203B)”

This chapter also provides the conditions under which the Commission shall issue a certificate of public convenience and necessity (§ 203C), the elective ability of an Electric cooperative to be exempt from regulation (§ 223), and the regulations that govern these exempt groups (§ 224).

Development of State Impact Fees

Title 29, Chapter 91.2, *Development of State Impact Fees*, provides the intent to:

- (1) Ensure that adequate public facilities are available to serve new growth and development;
- (2) Promote orderly growth and development by establishing uniform standards by which municipalities and counties may require that new growth and development pay a proportionate share of the cost of new public facilities needed to serve new growth and development;
- (3) Establish standards for the determination of impact fees for state facilities and services; and
- (4) Ensure that new growth and development is required to pay no more than its proportionate share of the cost of public facilities needed to serve new growth and development and to prevent duplicate and ad hoc development exactions (§ 9121).

This ordinance also directs the development of impact fees (§ 9123), allows for the creation of County impact fees for “services for which the county will bear increased costs of development” (§ 9124), and protects farm residences from the burden of impact fees from unrelated development (§ 9125).

Pre-application Reviews

Title 29, Chapter 92.2, *Pre-application Reviews*, provides that:

“(b) In special circumstances, the Office of State Planning Coordination *may waive the pre-application requirements* of this chapter. Where such waiver is granted, the Office of State Planning Coordination shall provide a written explanation of the causes for the waiver to the relevant local jurisdiction and the applicant. These circumstances may include, but are not limited to, local governments that impose a more stringent review of projects enumerated in § 9203(a) of this title than required by this chapter, or *for projects which will provide an extraordinary benefit to the State and the local jurisdiction through economic development, job creation, educational opportunities, public services or facilities, agricultural preservation or protection and enhancement of the natural environment* (emphasis added, § 9205).”

State Administrative Code, Relevant Sections

1351 - Underground Storage Tank Systems

- 1400 - Board of Electrical Examiners
- 1800 - Board of Plumbing, Heating, Ventilation, Air Conditioning and Refrigeration Examiners
- 4455 - Delaware Regulations Governing a Detailed Plumbing Code
- 4462 - Public Drinking Water Systems
- 4463 - Public Drinking Water Systems (Operators)
- 7201 - Regulations Governing the Control Of Water Pollution

COUNTY GOVERNANCE

This section includes legislation and guidance from Sussex County, Del., regarding the provision and/or funding of infrastructure related to residential development.

Sussex County Comprehensive Plan

Unless otherwise noted, the text of this section is taken directly from the Sussex County 2003 Comprehensive Plan.

Land Use Element, Guidelines for Infrastructure

Town Centers are...adjacent to municipalities where public water and wastewater systems are available. Future development should provide for the extension of these services, where feasible...[streets] should be planned as extensions of existing streets...(12)”

Developing Areas...can be served with public wastewater systems by extending services from the existing municipalities...[a new system may be required] to serve the remaining areas where high-density development occurs or where development impacts sensitive environments...poorly planned development will severely reduce [Route 13] traffic capacity and create safety hazards. A corridor preservation study is underway to alleviate current problems...(13)”

In the **Environmentally Sensitive Developing Areas**...Extension of the central wastewater systems in this area to serve failing on-site systems and new development will protect the Inland Bays from excessive amounts of nutrients...Where central sewer service is not available, new developments using on-site systems should have a minimum lot size of one-half acre, where permitted by DNREC...Expansion of [privately owned companies] plus a potential County water system is desirable..... Transportation improvements, which may include mass transit, intersection improvements, additional traffic lanes and controlled access, will be required to accommodate future growth (15).

Rural Community Districts...will continue to use on-site water and wastewater systems except where there is a threat to public health. Centralized community septic systems are encouraged...(16)

Public water and wastewater systems are not planned for **Low Density or Ag-Lands Preservation Foundation Areas**. “Development will use on-site septic or wastewater

disposal systems...(19-20)” Transportation improvements will focus on evacuation safety and be evaluated by individual area.

Natural Resource Protection Area (Conservation District)...Public central wastewater facilities exist or are planned for much of the area around the Inland Bays. These facilities are intended to protect water quality in the area and not to encourage development (21).

Public and Private Resource District Guidelines for Infrastructure...The preservation parcels of this District will utilize on-site water and wastewater systems for any administrative, visitor and maintenance facilities...The existing roadway network will adequately serve limited recreation and other uses... The active recreation and other use parcels primarily contiguous with the Growth Area will often require public or centralized on-site water and wastewater systems. This is especially true for beachfront recreational facilities (22).

Water and Wastewater Element

Establish an intergovernmental planning program to coordinate, support and promote the expansion of existing Municipal water and wastewater systems and commence planning for their extension into appropriate Growth Areas.

Regulate existing private wastewater systems. Growth should be directed toward public systems and the use of private systems discouraged...

Continue the expansion of County Wastewater Treatment Facilities to serve the coastal and inland bays area. (44).

Housing Element

Promote mixed-use cluster development where public water and wastewater systems are provided... Provide housing opportunities in and adjacent to incorporated towns with existing public infrastructure to allow for multi-family developments (59-60).

Community-Design Element

Utilize both traditional and conventional design concepts to promote mixed-use cluster developments or villages where public water and wastewater systems are provided...(65)

Utilize existing municipalities and Rural Communities to guide future development patterns. Adjacent future development should be consistent with the existing character of each area.

- Encourage a variety of housing types at densities dependent on the availability of adequate public infrastructure and services... (66)

County Comprehensive Plan Changes on the Horizon

Sussex County is currently undergoing a 5-year Comprehensive Plans Update process and is expected to adopt the new version by April 30, 2008. The updated text is expected to contain new material devoted to outlining Sussex County’s Growth and Preservation Strategy,

including a goal to “Direct development to areas with or near community services...” In addition, the “The Future Land Use Plan included in this Comprehensive Plan Update was drafted to specifically coordinate with the existing and future service capabilities of each of the County’s 18 sewer planning areas” (Sussex County Government, 21 Feb 2008). Improved population growth projections, public involvement process, and source water protection sections are also included in the proposed update. This update should strengthen the County’s understanding of the situation at hand and provide them a better mechanism to address those issues, as approved by the public citizens of the County.

Public adoption hearings are scheduled for April 3 and 22 of 2008; more information may be obtained from: www.sussexcountyde.gov

Sussex County Ordinances

Unless otherwise noted, the text of this section is taken directly from the subject ordinance.

Chapter 52, Building Construction

Basic building Standards are not included in this section but may be assumed to be similar to most other jurisdictions, as the International Building Code (IBC) is incorporated through reference and substituted for Chapter 52, Building Construction, with few exceptions and exemptions (author commentary).

Chapter 71, Housing Standards

§ 71-15. Plumbing facilities and fixtures.

...P. Supply. The water supply systems shall be installed and maintained to provide, at all times, a supply of water to plumbing fixtures, devices and appurtenances in sufficient volume and at pressures adequate to enable them to function satisfactorily...

R. Connections. Every sink, lavatory, bathtub or shower, drinking fountain, water closet or other facility shall be properly connected to either a public sewer system or to an approved private sewage disposal system.

§ 71-17. Electrical facilities.

A. Outlets required. Where there is electric service available to a structure, every habitable room of a dwelling unit and every guest room shall contain at least two separate and remote outlets, one of which may be a ceiling- or wall-type electric light fixture...

Chapter 110 Water and Sewers

§ 110-3. Use of privies, privy vaults, septic tanks and cesspools.

Where public sewers are provided in an area served by a Sussex County sanitary sewer district, it shall be unlawful to construct or maintain any privy, privy vault, septic tank, cesspool or other facility intended or used for the disposal of sewage.

§ 110-4. Connection to public sewer required.

A. The owners of all houses, buildings or properties used for human occupancy, employment, recreation or other purposes situated within an area served by a Sussex County sanitary sewer district or a Sussex County water and sanitary sewer district...in which there is now located or may in the future be located a public sanitary or combined sewer of the county are hereby required at their expense to install suitable toilet facilities therein and to connect such facilities directly with the proper public sewer in accordance with the provisions of this Part 1 within 60 days after the date of official notice...

B. At such time as a public sewer becomes available to a property served by a private sewage disposal system in an area served by a Sussex County sanitary sewer district or Sussex County water and sanitary sewer district, a direct connection shall be made to the public sewer, and any septic tanks, cesspools and similar private sewage disposal facilities shall be abandoned and filled with suitable material.

§ 110-42. Connection required.

The owners of all houses, buildings or properties used for human occupancy, employment, recreation or other purposes situated in an area served by a Sussex County water district ... in which there is now located or may in the future be located a public water main of Sussex County are hereby required, at their expense, to install a suitable water supply system and to connect such system directly with the proper public water main in accordance with the provisions of this Part 1, within 60 days after the date of official notice to do so.

§ 110-111. Authority of County Engineer.

The County Engineer may grant connections to scattered parcels at the equivalent dwelling unit (EDU) density of the abutting property, but in no instance at an EDU density exceeding 18 EDU's per acre.

§ 110-112. Conditions for grant of connections.

The connection for scattered parcels may be granted by the County Engineer only upon a study and a written determination by him that the proposed connection will not overload the capacity of existing sewer facilities, taking into account the full development capacity of the other parcels within the area encompassed by this Part 4.

Chapter 115, Zoning

§ 115-25. Height, area and bulk requirements. [Amended 11-7-1989 by Ord. No. 632; 10-31-1995 by Ord. No. 1062; 7-15-1997 by Ord. No. 1157; 8-3-2004 by Ord. No. 1709]

...(7) Any development using the option in Subsection B(2) [Cluster Development] shall have central water and wastewater systems operated and maintained by companies authorized by the State of Delaware to perform such services. Wastewater collection and treatment systems must be designed in accordance with the requirements of Sussex County

ordinances and conform to the requirements for a central sewer system as defined in § 115-194A of the Sussex County Zoning Ordinance.

§ 115-28. Purpose.

The purpose of this district [MR – Medium-Density Residential District] is to provide for medium-density residential development in areas which are or which are expected to become generally urban in character, but where sanitary sewers and public water supplies may or may not be available at the time of construction...

§ 115-44. Purpose.

The purpose of these districts [HR-1 and HR-2 High-Density Residential Districts] is to permit variety in housing types and provide for residential densities appropriate for areas which are or will be served by public sanitary sewer and water systems and which are well-located with respect to major thoroughfares, shopping facilities and centers of employment.

§ 115-132. Purpose.

In order to encourage planned vacation, retirement and general residential park developments which are compatible with the surrounding area and are economically feasible and to achieve the goals of the Comprehensive Plan, the Vacation-Retirement-Residential-Park District (VRP District) is hereby established.

... E. Central sewer and water supply facilities and electric connections shall be provided.

§ 115-172. Special requirements.

The following special requirements shall be conditions to approval and development of the indicated conditional uses: ...

G. Trailer park or mobile home park, provided that...

(10) Proper provision shall be made for public water supply, sanitary sewers, electric connections, fire protection, laundry, toilet and bathing facilities...

H. Park or campground for mobile campers, tents, camp trailers, touring vans and the like, provided that...

(5) Proper provisions shall be made for public water supply, toilets and bathing facilities and electric connections...

§ 115-194.3. ES-1 Environmentally Sensitive Development District Overlay Zone (ESDDOZ). [Added 12-9-2003 by Ord. No. 1645]

C. Permitted uses and densities.

(1) Uses permitted in the Environmentally Sensitive Development District Overlay Zone will be those uses permitted in the underlying zoning category as established by the Sussex County Zoning Ordinance.

(2) Uses prohibited in the underlying zone are also prohibited in the overlay zone.

(3) The maximum density shall be the allowable density of the underlying zoning district for developments using a central water and wastewater collection and treatment system. "Central sewer system" means centralized treatment and disposal facilities as defined in § 115-194A. Within this Overlay District, clustering of single-family detached lots to a minimum lot size of 7,500 square feet is permitted in all residential zoning districts using a central water and sewer system. For dwelling units using on-site individual wastewater disposal systems, the allowable density shall be based on a minimum lot size of 3/4 of an acre. The applicant has the option of clustering the lots to a minimum lot size of 1/2 acre where soil conditions are suitable as determined by DNREC, provided, however, that the number of lots or dwelling units permitted shall not exceed the number permitted in the underlying district.

LOCALITY GOVERNANCE

This section includes legislation and guidance from towns or municipalities within Sussex County, Del., regarding the provision and/or funding of infrastructure related to residential development.

Locality Comprehensive Plans

TOWN OF GEORGETOWN

Unless otherwise noted, the text of this section is taken directly from the Town of Georgetown's February 2002 Comprehensive Plan.

Georgetown provides sewage treatment to most of the town, and for some areas in the County... The Town currently operates two sewage treatment facilities. (31).

The Town of Georgetown provides municipal water service to homes and businesses located within its boundaries... Georgetown operates six wells for its source of water Supply...[its] water allocation is very close to its annual permit limit of 300 mg...(33)

Conectiv and the Delaware Electric Co-op provide electrical power. Power is generated at the Conectiv plant in Millsboro. All residents in and surrounding the town limits negotiate direct service with Conectiv as the only provider of electrical power in Georgetown. Conectiv supports and maintains a sub station within the town limits, located on East Market Street (34).

2.5 Utilities and Services

...the use of existing infrastructure should be maximized and investment in new services realized at least possible expenses... Georgetown should utilize provisions that make new development reflect the associated costs necessary to extend or upgrade existing infrastructure such as water and sewer lines or required pumping stations. New development should essentially pay for itself.

- *Water and Sewer Availability:* Town water and sewer services are available on the outskirts of the existing town limit lines. It is recommended that extensions may be made at the cost of the developer on a case-by-case basis. The developer should be subject to Impact Fees for the new construction.
- *Impact Study:* New developments or projects equivalent to 12 EDU.s or higher will require an impact study...it is recommended that an impact study be completed on water as well...
- The Town should undertake a study of the existing sanitary sewer system to determine any deficiencies or excess capacity...[to] evaluate whether upgrades or enhancements need to be made in the existing system to accommodate expected growth...
- ...it is recommended that the Town begin discussions with DNREC concerning its need to increase its allocation permit limits. This will be essential in order to accommodate anticipated residential and economic growth (55-6).

3.1.7 Utilities [Downtown Georgetown]

Current Conditions:

- Entire area is served by water and sewer
- Entire area has a stormwater collection system
- Overhead electric, cable, and telephone utilities

Desired Conditions:

- Relocation of overhead utilities underground
- Improved street lighting to encourage pedestrian traffic
- Curbing in areas where it currently does not exist to improve stormwater management and the appearance of the planning area (67-8).

3.2.7 Utilities [Town Residential Area]

Current Conditions:

- Entire area (developed and undeveloped) is served by water and sewer and older lines are in good condition
- Stormwater collection system is provided throughout the entire district, however it is inadequate in some areas
- Overhead and underground utilities in the older neighborhoods. All utilities underground in new subdivisions

Desired Conditions:

- Town should evaluate all utility conditions at the time road/street construction is being planned
- All utilities located underground in new subdivisions
- Curbing and appropriate storm drains should be installed in areas with poor drainage

- Evaluate street lighting to ensure proper coverage of lighting (70-1).

3.3.7 Utilities [North Race Street/Railroad Area]

Current Conditions:

- The area is served by existing older utilities in good working condition. There are no serious deficiencies at this time

Desired Conditions:

- The utilities should be maintained as needed
- Opportunities to upgrade utilities should be explored in conjunction with street repair work. Where possible, sewer and water lines should be relocated underground (73).

Continued for additional planning communities...

“New development should be built at locations that increase efficiency of service delivery and minimize infrastructure costs (Land Use Plan, 96).”

“The impact of the development on town services and utilities must be evaluated. These impacts *may* include sewer; water; fire service; police service; administrative costs; long-term maintenance of infrastructure; impact of the development on town facilities; and other criteria to be defined by the Council and the Town Manager (Annexation Plan, 101).”

CITY OF LEWES

Unless otherwise noted, the text of this section is taken directly from the City of Lewes 2005 Comprehensive Plan.

Drinking Water

Drinking water in Lewes is distributed by the Board of Public Works via the City of Lewes Power and Water Plant...Water is pumped from a city-owned well field (five production wells) located near Cape Henlopen High School, just outside city limits...BPW recently applied for and received an expanded Certificate of Public Convenience and Necessity (CPCN) to serve a larger area with drinking water...Lewes appears to have plenty of drinking water to meet demand for the foreseeable future (24).

Sewer/Wastewater

The City of Lewes Wastewater Treatment Facility...pump[s] wastewater from the community to the treatment plant. The pumps are powered by electricity, and some of them are also equipped with back-up generators...Treated wastewater is currently released into the Lewes and Rehoboth Canal, most of which flows into the Delaware Bay...

BPW provides sewer service only to properties within the city limits, except the Cape Henlopen High School, University of Delaware housing, First Baptist Church, P. Rodney Cunningham strip mall, and five properties within Highland Acres. Plenty of sewer capacity exists for new development outside of town through Sussex County and private developers...Sussex County currently serves a portion of the lands outside the city limits

and has allocated capacity to serve up to four residential units per acre with some commercial development (24-5).

Electricity

BPW purchases all electric power from Conectiv. However, the city-owned Lewes Power Plant generates power using two diesel generators as part of a contract with Conectiv to operate during peak usage times or for emergencies. The distribution system currently has three substations within the city limits, but these will be reduced to two. The entire distribution system is currently being upgraded from 4,160 to 12,000 volts, and the carrying capacity of the system is being upgraded from 20 to 45 megawatts...(25)

... consider annexing parcels already receiving city services or Utilities (49).

Provision of City Services to Annexed Areas: If all of the identified land was annexed, there are already approximately 550 existing homes, businesses or recorded lots that would require some level of city services. Lewes would prefer that Areas 2 and 3A not be further developed...If these remaining lands were developed...All of these homes could be provided with drinking water under BPW's current capacity, but additional sewer capacity may be needed to serve this unwanted development (50-1).

High Priority –

...Coordinate with Sussex County to determine additional wastewater capacity needs and service areas for the annexation areas (84).

Medium Priority –

...Continue the use of impact/connection fees and adopt a system of automatic indexing for inflation (85).

Town of Millsboro

Unless otherwise noted, the text of this section is taken directly from the Town of Millsboro 2004 Comprehensive Plan

The Town accepts in principle the state strategies with modifications already stated, and the Plan recommends additional growth in the Millsboro area to be within the town's corporate limits with connections to public water and wastewater treatment (24).

The Town of Millsboro recommends that future development be concentrated within the town boundaries and immediate areas to be annexed and served by town services.

Growth...

4. Encourage development within the town limits of Millsboro, where it can be served by existing and planned infrastructure. The plan further recommends that Sussex County discourage medium and high-density residential, commercial and industrial development within the immediate area of Millsboro. Municipal water and sewer would better serve this type of development (25).

[The Future Land Use Plan] reinforces existing patterns of development and is compatible with the layout of water and wastewater infrastructure. The plan recommends that annexation occur in an orderly fashion and that the decision be contingent on the availability of infrastructure and town services to prevent satellite development (25).

The Plan makes the following recommendations:

...6. Establish annexation agreements that provide funds for capital expenses for improvements in infrastructure and town services and that sets aside land for public uses (26).

In the area west of town, development has occurred outside of the boundaries of town...The Town of Millsboro recognizes this development trend, and the Plan recommends that Millsboro provide an orderly development process that will incorporate a portion of this development activity within town limits and served by town services. This will also provide the basis for extending public services in the direction of existing and proposed development with the possible connection to these town public services in the future (26).

Properties along SR 20 to the northwest of town and on US 113 north of town have potential for development...The Plan further recommends that the Town seek Certificates of Public Convenience and Necessity (CPCN) for water and wastewater for properties along SR 20 and US 113 as appropriate (28).

The Plan also recommends that land be set aside for public facilities when appropriate...The town may require the dedication or reservation of the land for public facilities be made in lieu of the lands required for recreation and open space activities (31).

Water

The Town of Millsboro provides municipal water and wastewater service to homes and businesses located within its boundaries...A review of DNREC files indicates that Millsboro operates three wells for its source of water supply...Millsboro has agreed to provide the Town of Dagsboro up to 90,000 gallons per day when that town's planned public water is completed. Accordingly, Millsboro plans to submit an application to DNREC for an increased groundwater allocation to serve the needs of both towns....The town appears to have adequate source water quantity available for increasing its allocation... However there may be an issue of quality and treatment capacity... The Town therefore intends to prepare a comprehensive Master water plan update. (33-4).

Recommended Actions...

2. Amend the Master Water Plan to include the proposed interconnection to the Town of Dagsboro and to address the increased rate of growth. Expand the town's water supply, treatment and storage capacity in order to provide bulk water service to Dagsboro and to meet increased demand associated with future annexations. Enlarge the water distribution in planned increments to serve future annexations. Initiate an application process with

DNREC to increase the allocation of water to supply the residents and businesses of Millsboro and Dagsboro.

3. Prepare and implement an annexation fee system to equitably distribute the cost of infrastructure expansion and upgrades among those creating the need.

4. Initiate allocation process with the DNREC to increase permit for withdrawing water to be used for supplying drinking water to the residents and businesses of Millsboro (36).

Sewer/Wastewater

A recent study of the Millsboro water and wastewater services indicates that expansion of service to the north, east, west, and south of town may be necessary to serve areas threatened by failing septic systems. The Delaware Wastewater Facilities Advisory Council (WFAC) in a 1997 survey identified two un-sewered communities adjacent to the town (35).

According to Millsboro 2003 Wastewater Master Plan, town officials are of the opinion that growth is most likely to occur west of US 113 and possibly to the south. According to the recently updated Strategies for State Policies and Spending and the Livable Delaware initiative, both the state and county should support, both politically and fiscally, infrastructure investments in those same areas...Minor upgrades aside, Millsboro currently has sufficient and safe drinking water and adequate wastewater treatment (35).

Recommended Actions

1. Amend the Wastewater Facilities Master Plan to address the accelerating growth rate...Implement the amended plans to comply with the TMDL regulation and to accommodate growth. Expand the wastewater collection and transmission system in planned increments to serve future annexations...

3. Prepare and implement an annexation fee system to equitably distribute the cost of infrastructure expansion and upgrades among those creating the need (36).

Electricity

The town's sources of electrical supply are Conectiv and the Delaware Electric Cooperative (33).

Town of Milton

Unless otherwise noted, the text of this section is taken directly from the Town of Milton 2003 Comprehensive Plan Update.

...stresses the principle that future development in the county should occur to the fullest extent possible in or adjacent to existing municipalities, areas that the Plan defines as town center and development districts. These areas were created around municipalities because infrastructure exists in these areas...Within this area, the Town of Milton would like to coordinate with Sussex County on land use decisions, especially within the town's

potential expansion area. Lands east of Town along Route 16, which are not feasible for annexation because of large agricultural districts, are also within the County's growth area. Since the activities on these lands will directly impact the town in terms of traffic and other infrastructure demands, the Town would like to coordinate with the County on and proposals here as well (32).

The Town provides municipal water and sewer services as well as fire and police protection... The Public Works Department, which oversees the water and sewer systems, and maintains the Town streets, has offices at the Sewage Treatment Plant on Front Street (39).

Where there is interest on the part of one or more property owners for annexation...the study, which should include consultation with Town engineering consultants and others as appropriate, the Committee should determine...

2. Whether it is feasible to extend existing or planned Town roadways, street lighting, water and sewer lines, or other municipal facilities or services, to the property and to do so at a reasonable cost which can be repaid by the development over a reasonable period of time.
3. Whether from a fiscal impact point of view the development will be able to pay the Town annual property taxes and/or service fees sufficient to cover the costs of municipal services and/or facilities which the Town will be required to provide (58).

The Town's sewer system has an operating capacity of 350,000 gallons per day, and could be expanded to 450,000 gallons per day with minor upgrades. While the system is currently operating at about half of its capacity, build-out of the currently vacant lands within the Town boundaries would push the existing infrastructure to or beyond its capacity. In order to accommodate annexation, the Town will likely need to build a new sewage treatment plant. As this plan nears completion, the Town is beginning work on a planning study for its sewer and water infrastructure, which will address these issues. Improvements to the Town's sewer infrastructure will be made following this study.

In the long-term, the Town is gearing up to provide the infrastructure required to support the anticipated development that would come with annexation. In the short-term, the Town is confined by the limitations of its existing infrastructure. The development pressure exists in the area surrounding Milton, and the Town is not in a position to turn away developers who would otherwise build in the County, still putting a strain on the Town's services, such as roads and police. In an effort to allow annexation and development to occur in the short-term in order to provide town services in the long-term, the Town looks to implement two measures to ensure that development and infrastructure keep pace with each other.

1. *Adequate Public Facilities Ordinance* – Such an ordinance would apply to all lands, currently in Town and annexed in the future, and would be triggered when land is subdivided. At the time of subdivision, the adequacy of sewer and water infrastructure would need to be demonstrated. If such availability is unable to be

demonstrated, the application would be denied, or phased in a way that it could be accommodated.

2. *Annexation Agreements* – These are agreements that the Town of Milton would enter into with landowners at the time of annexation that would address the short-term infrastructure limitations. Such agreements would include a cap on the annual number of building permits and arrangements for the landowner to help fund the necessary sewer and water infrastructure upgrades.

C. UTILITY EXTENSIONS

Upon adoption of the Comprehensive Plan, the town should commission a comprehensive study of its water and sewer facilities. Decisions on extending utilities to areas to be annexed should be made on a case-by-case-basis. Once the Comprehensive Plan is adopted, the Town will need to move forward with the water and wastewater facilities study. This study should consider alternatives to stream discharge of wastewater (59).

The previously mentioned adequate public facilities ordinance and annexation agreements should help to manage new growth, both through subdivision and annexation, until such a time that the sewer infrastructure is upgraded to keep pace with development pressures (60).

Water

Milton's town-owned municipal water and sewer systems serve properties within the incorporated limits plus a small number of users outside the limits...The Town's water system consists of four wells...Each of the four wells is equipped with a submersible pump which discharges directly to the water distribution system...serving all developed areas within the corporate limits (41).

...the Milton water system is continuing to operate at roughly 30 percent of its capacity and has the ability to support additional development. At a peak flow of 150 gallons per capita per day the system can supply a population of almost 7,400 or over 2,000 new homes... Water to developments in surrounding unincorporated areas is provided by individual private wells (42-3).

When capital investments required for [the water] system improvement do not financially or indirectly benefit existing customers, it is unfair to finance these types of improvements through rate increases. Therefore, it is recommended that system expansion be funded through impact fees, for which the Town already has provisions, and/or system development charges. System development charges can include costs to upgrade existing facilities to meet expansion demands and costs to build new facilities. Many of the improvements will not have to be made until developers present final plans. Developers will then make system improvements when lines are extended through their developments (43).

Sewer/Wastewater

The Broadkill River is impaired for nitrogen, phosphorous, dissolved oxygen, and bacteria...a pollution control strategy will be developed that...will likely deal with both

point sources, such as wastewater treatment facilities, and non-point sources, such as runoff from urban and agricultural uses. The Town of Milton should work with DNREC in developing the TMDL and subsequent pollution control strategies, since they will likely have an impact on the Town's wastewater treatment plant and urban land uses (18).

The Town is served by a single sanitary-sewage-treatment plant...adjacent to the Broadkill River on Front Street...Sanitary and storm sewers are separated. The treated effluent is discharged into the Broadkill River at the treatment plant location... In general, the Milton sewage system is currently operating at 50% of its design capacity... The Town is presently updating its wastewater facilities master plan. The plant has capacity for an additional 700 to 800 houses. Build-out of the units already in some phase of the development process (page 10) will require capacity is expanded. (44).

When capital investments required for [the wastewater] system improvement do not financially or indirectly benefit existing customers, it is unfair to finance these types of improvements through rate increases. Therefore, it is recommended that system expansion be funded through impact fees, for which the Town already has provisions, and/or system development charges. System development charges can include costs to upgrade existing facilities to meet expansion demands and costs to build new facilities. Many of the improvements will not have to be made until developers present final plans. Developers will then make system improvements when lines are extended through their developments...One of the most difficult tasks in planning for growth in the Town is determining when and where the growth will occur.

Sewage treatment in surrounding unincorporated areas is through use of septic tanks and tile drain fields...Some property owners have requested annexation by the Town in order to have the benefit of the municipal sewage system and avoid the mounding of their septic fields, which can be both costly and unsightly (45).

The overall goal for public facilities is to provide high-quality public services to enhance the lives of the citizens of Milton, including parks and recreation facilities, public schools, civic facilities and public utilities. Policies and projects include...

2. Require engineering review of all subdivision and annexation plans prior to approval.
3. Develop an adequate public facilities ordinance that ensures that sewer infrastructure is available to land at the time of subdivision (53, 55).

The availability of town services, such as police, water and sewer, is an important factor in the growth of Milton. As the Town grows through annexation and build-out of existing lands, these services will need to grow along with the town. At this point in time in Milton, sewer is the most limited of these services.

Electricity

The study area receives electrical service from Conectiv and Delaware Electric Cooperative (41).

City of Rehoboth Beach

Unless otherwise noted, the text of this section is taken directly from the Rehoboth Beach 2003 Comprehensive Development Plan.

Wastewater treatment plants serve approximately 28% of the County's population and are an important source of nutrient problems...More than 18,000 onsite sewage disposal systems are permitted in the drainage basin of the Inland Bays and discharge as much as 480,000 pounds of nitrogen and 250,000 pounds of phosphorus to soils annually with much of the nitrogen entering the groundwater. One hundred percent of the region's drinking water and irrigation water comes from groundwater. Bacterial loadings have led to the partial closure of shellfish harvesting waters in all three bays and development has resulted in the loss and alteration of sensitive habitat and an increase in storm water runoff pollution (Sec. 2.3)

The City provides careful access to the water...supplies the public facilities necessary for users of the water, and works collaboratively with State and federal agencies to ensure their maintenance. The guiding principles are preservation of the natural processes at work along the ocean, beach, canal, inland bays, and lakes and continuation of the neighborly appeal of Rehoboth's water areas (Sec. 3.2, A Vision for Water Resources).

The City will...collaborate with State and Federal agencies to ensure the quality of the ocean and surrounding waterways. This is particularly important with regard to storm drain discharge (Sec. 4.1).

... it is essential that the County and the City enter into an "intergovernmental cooperative agreement" that accomplishes the following purposes for an "Area of Concern" that corresponds with the Inland Bays Watershed defined by the State of Delaware...If such an agreement is reached between the City and County or between several coastal communities and the County, the resulting cooperative plan should include the following elements...

Designated growth areas where...

- Services are provided or planned for such development.
- Designated potential future growth areas where development is planned for at densities to accompany the orderly extension of services....
- Designated rural resource areas where...
 - development at densities compatible with rural resource uses that are or may be permitted and
 - publicly financed infrastructure services are not provided or planned unless the participating governments agree for health or safety reasons (Sec. 8.13).

Sewer/Wastewater

The main sources of nutrients in the watershed are septic systems, sewage treatment plants, stormwater runoff, and agricultural operations with nonpoint sources being the

greater source of nutrient contribution...it appears that over the past 20 years nutrient enrichment has slowed. In part, this can be attributed to increased tidal flushing as a result of the stabilization of the Indian River Inlet. Upgrades to sewage treatment plants, expansion of central sewers and the removal of septic systems, and use of best management practices on agricultural lands also reduced nutrient loadings...Rehoboth Beach supports the recommendations of the Delaware Inland Bays Comprehensive Conservation and Management Plan...specifically, Rehoboth Beach will strive to improve the quality of its wastewater discharges and stormwater discharge and runoff to meet the nitrogen and phosphorus reduction targets, establish protective buffers around its lakes and waterways, and require that development within its boundaries be sensitive to environmental considerations (Sec. 4.2)

Unless Rehoboth Beach radically changes its land use composition or substantially extends its sewer district, the overall population capacity of the City is not constrained by its current wastewater treatment capability...(Sec. 4.3)

Future needs will be analyzed and the necessary facility improvements will be included in a 5-Year Capital improvement Plan for Water and Sewer, Roads and Walks, and Utilities (Sec. 4.322).

Water

While current water supply and current water quality is not a constraint on the growth of the City, the new and growing land uses around the City's well heads pose future problems for the aquifer from which the City's water is drawn. The protection of these wells is of paramount importance...The City will require ongoing consultation with the State and the County about proposed development that may affect the integrity of its wells and water supply and the development of effective means of protection e.g. annexation, purchase, added groundwater protection measures, etc (Sec. 4.3).

Future needs will be analyzed and the necessary facility improvements will be included in a 5-Year Capital improvement Plan for Water and Sewer, Roads and Walks, and Utilities (Sec. 4.321).

Electricity

The ambiance of Rehoboth Beach...is detracted from by the power lines and poles that wind through the City. Additionally, utility poles and electrical service boxes infringe upon sidewalks and not only impede safe pedestrian and bicycle movement but create a safety hazard. Furthermore, because of its coastal location, Rehoboth Beach is subjected to frequent high winds and ice storms that cause both service interruptions and safety hazards due to downed utility lines. The plan for revitalizing the length of Rehoboth Avenue includes undergrounding the utilities. Other opportunities for undergrounding, pole relocation, or running wires behind buildings will be investigated (Sec. 5.1).

Locality Ordinances

Due to the extensive nature of local ordinances they have not been included here, but they are expected to be in the same vein as the intent expressed in the section above (Locality

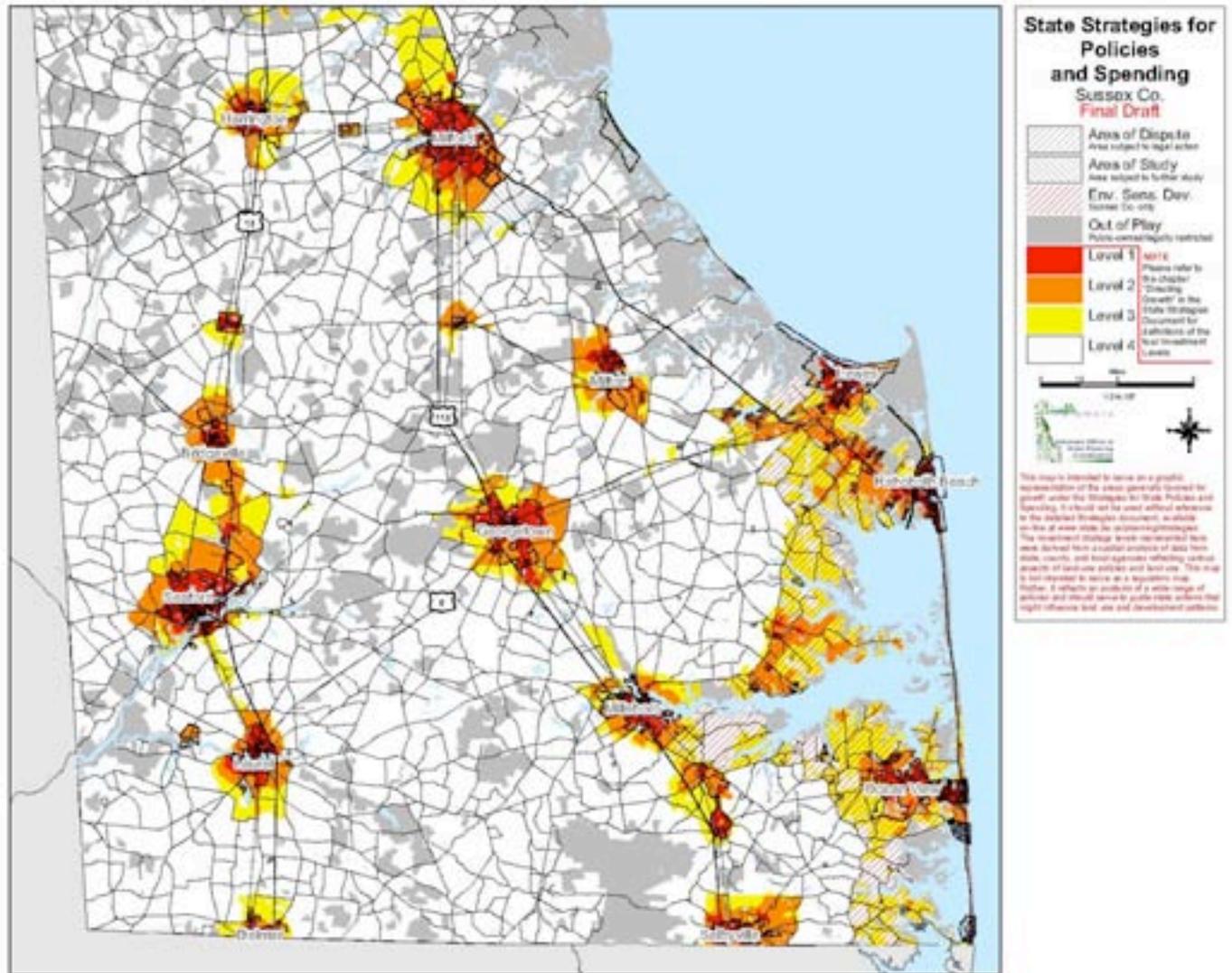
Comprehensive Plans.) Given the presence of a Comprehensive Plan, ordinances typically implement the direction of the jurisdiction's plan and will have amendments directed as the direction of the plan changes.

For further detail please view:

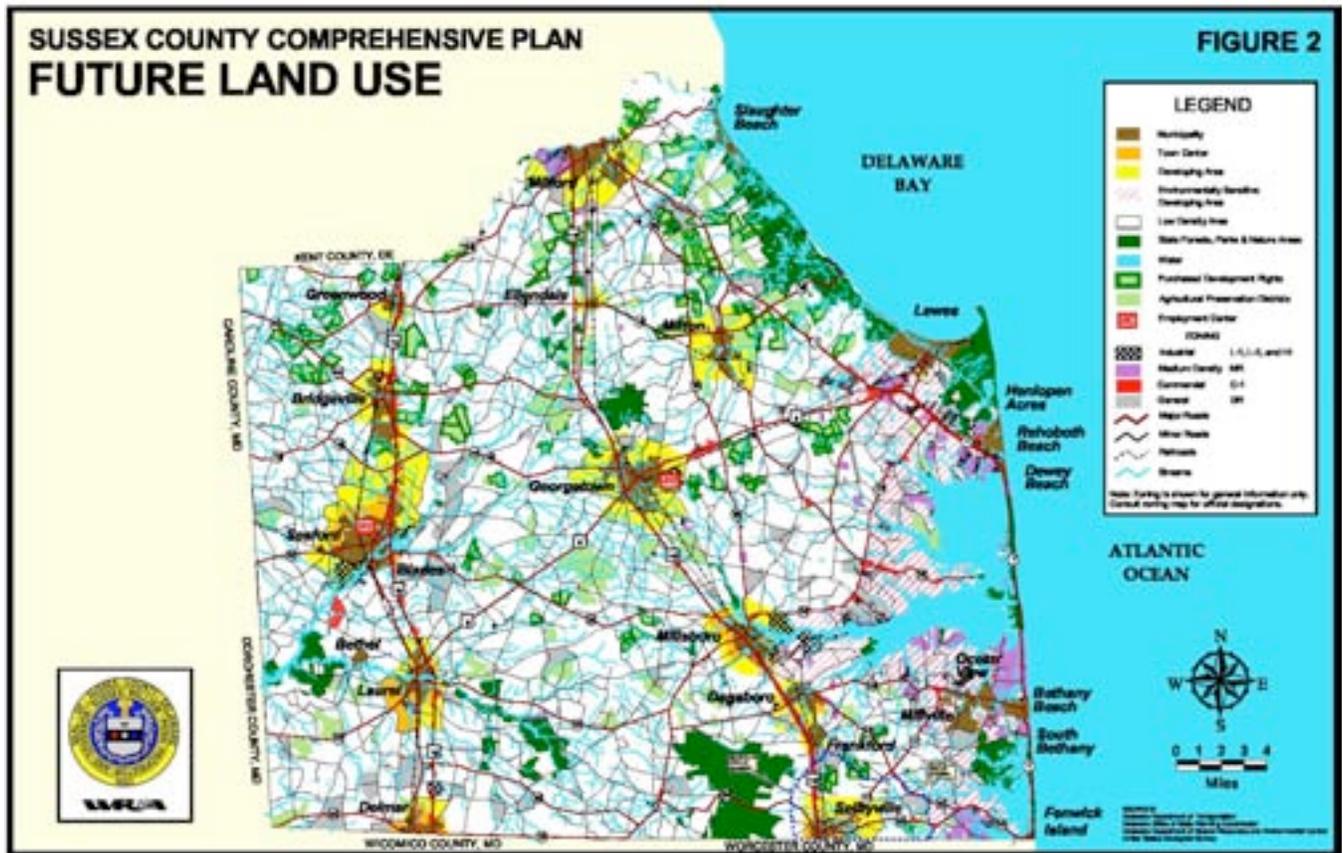
- The Code of the City of Rehoboth Beach, Delaware at: http://www.e-codes.generalcode.com/codebook_frameset.asp?ep=fs&t=ws&cb=0659_A
- Milton's Town Code at:
<http://www.ci.milton.de.us/documents/results.cfm?documentTypeID=13>
- The Code of the Town of Millsboro at: http://www.e-codes.generalcode.com/codebook_frameset.asp?ep=fs&t=ws&cb=1671_A
- The Code of the Town of Georgetown at: http://www.e-codes.generalcode.com/codebook_frameset.asp?t=ws&cb=1544_A
- The Code Book for City of Lewes at : http://www.e-codes.generalcode.com/codebook_frameset.asp?t=ws&cb=0715_A

Appendix C. Maps

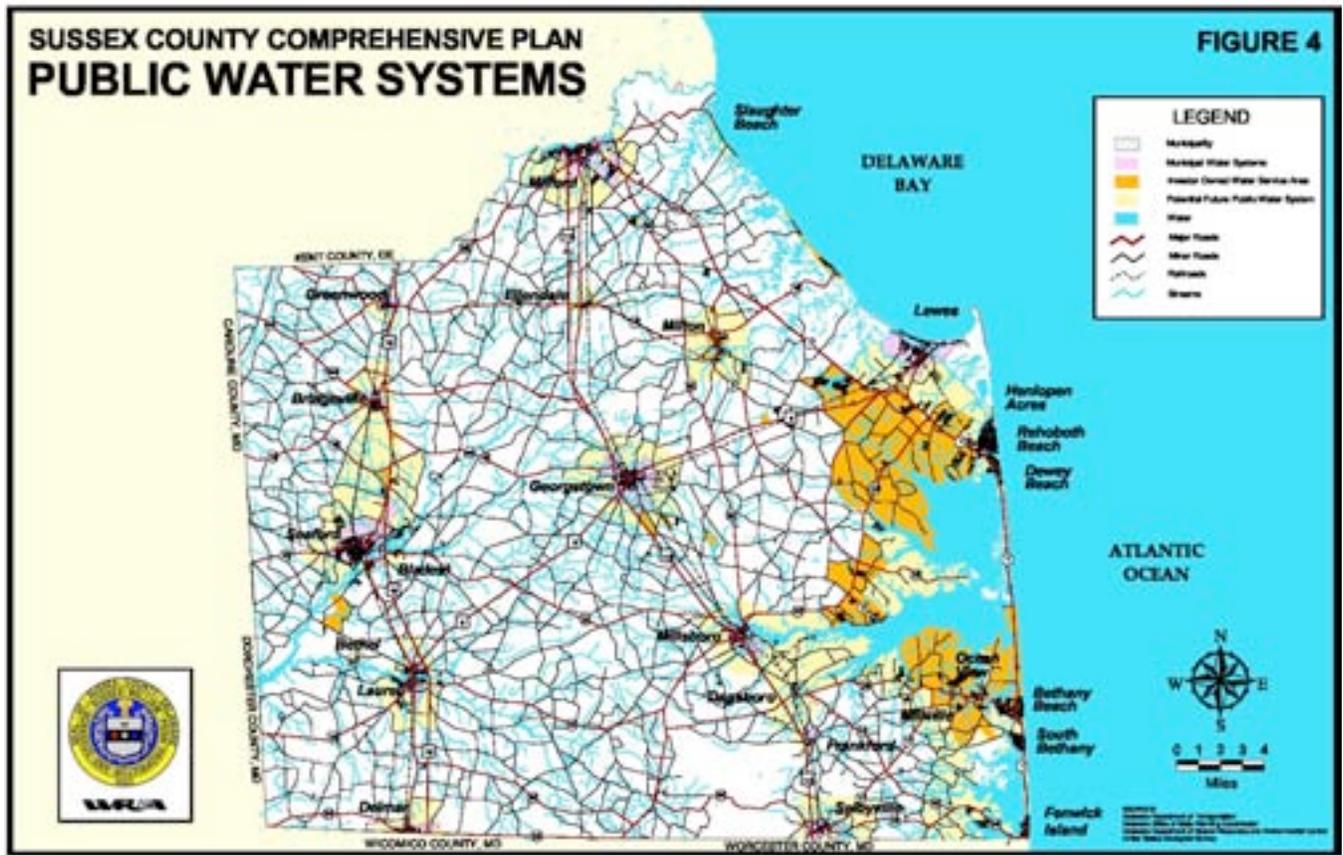
State Strategies for Policies and Spending (2004)



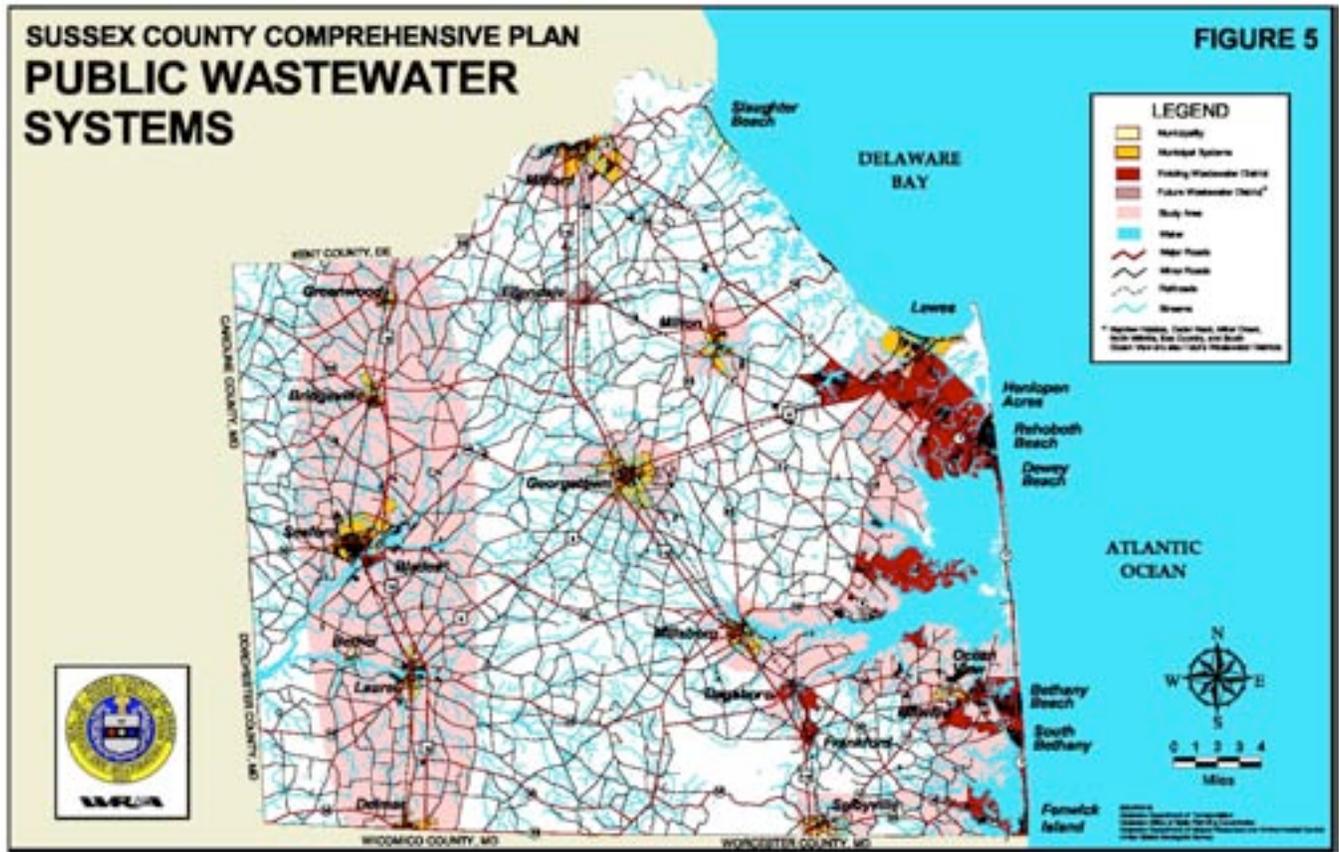
Sussex County Future Land Use Map (2003)



Sussex County Public Water Systems



Sussex County Public Wastewater Systems





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