Project Details

- Comprehensive survey of the status of Delaware’s wastewater facilities.
- Survey developed and sent to all municipalities providing sewer service.
- Meetings held to review survey results with all participants.
- Survey results were reviewed and assessed to determine existing conditions, trends and needs.
Project Objectives

- To assess the state’s existing wastewater facilities.
- To identify the wastewater needs of Delaware’s municipalities through the planning period.
- To determine funding requirements for needed infrastructure improvements.
Development of Findings

- Data developed from information provided by the municipalities through surveys and meetings.
- Data and costs were provided by the municipal engineer, or consulting engineers.
- Reviewed compatibility of service areas expansions with the land use plans.
- Reviewed anticipated costs associated with reported infrastructure upgrades or expansions.
- Developed Needs Assessment for each municipality and aggregated to the County level.
Research Limitations

- The validity of the assessment is dependent on the accuracy of the survey responses.
  - Range from full-scale wastewater facilities plans to no responses by two communities.

- Some municipalities are in the preliminary stages of investigating alternatives for their wastewater infrastructure needs.

  - These unknowns may have a significant impact on the overall cost of the anticipated needs.
As of 2005, 23 municipalities provide wastewater services to approximately 84% of the total state population.

Communities without service include:
- Bethel, Hartly, Houston, Slaughter Beach, Viola and Woodside.

The reported capacity of treatment facilities is 207 mgd.
- 57% percent increase from 132 mgd in 1995.
## Statewide Assessment

<table>
<thead>
<tr>
<th>County</th>
<th>Pop\textsuperscript{n} Served</th>
<th>Total Pop\textsuperscript{n} Served (%)</th>
<th>Average Annual Flow (mgd)</th>
<th>Design Capacity (mgd)</th>
<th>Maximum Flow (mgd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Castle County</td>
<td>499,500</td>
<td>95%</td>
<td>90.2</td>
<td>173.2</td>
<td>275.4</td>
</tr>
<tr>
<td>Kent County</td>
<td>102,548</td>
<td>73%</td>
<td>12.7</td>
<td>15.6</td>
<td>18.9</td>
</tr>
<tr>
<td>Sussex County</td>
<td>107,987</td>
<td>61%</td>
<td>11.3</td>
<td>18.2</td>
<td>19.9</td>
</tr>
<tr>
<td><strong>State Total</strong></td>
<td><strong>710,035</strong></td>
<td><strong>84%</strong></td>
<td><strong>114.4</strong></td>
<td><strong>206.9</strong></td>
<td><strong>295.3</strong></td>
</tr>
</tbody>
</table>
Statewide Needs & Costs

- Majority of needs are:
  - For new and/or expanded and improved treatment facilities.
  - To eliminate CSOs in the City of Wilmington.
  - I&I is common major problem statewide.
Statewide Needs & Costs

- Statewide cost of necessary unfunded improvements is approximately $390 million.
- Sussex County identified the greatest need at $164 million.
Statewide Observations

- In southern New Castle County, Kent and Sussex Counties:
  - Majority of the improvements and expansions are related to the significant increase in residential and commercial development, and septic elimination.

- In northern New Castle County:
  - Population growth is expected to grow slowly or be stable.
  - Replacement of aging collection and conveyance systems.
  - Reduction of combined sewer overflows (CSOs).

- Majority of municipal facilities:
  - TMDL requirements have had very significant impacts
  - Many major capital improvement projects are associated with meeting TMDL requirements.
  - Some of the proposed treatment methods and facilities are extremely expensive which will greatly increase the cost of providing wastewater service.
Statewide Recommendations

- The majority of municipal utilities are assessing impact fees and requiring developers to financially assist with:
  - Upgrade the collection/conveyance infrastructure.
  - Upgrade treatment capacity to serve new development.
  - Provide sewer service to non-served areas through development process.

- Investigate the true impact of development on the entire wastewater system:
  - Including the collection and conveyance system, not just treatment plant capacity.

- Complete investigations to determine the condition of existing collection and conveyance systems:
  - For aging municipal utilities.
New Castle County Observations

Driving Factors:

- Northern area is well established and has little room for growth.
- The needs are centered on repair, rehabilitation and replacement of failing and overloaded infrastructure.
New Castle County Observations

Flow vs. Capacity

- Treatment facilities are adequately sized to meet the average daily flow rates.

- Design flow rates are significantly exceeded during peak flow periods.

![Bar chart showing average daily flow and maximum flow percentages for different locations.](chart.png)
New Castle County Observations

- **Inflow & Infiltration:**
  - Significant I&I at pumping stations and treatment plants.

- **Combined Sanitary & Storm Sewers**
  - Wilmington and New Castle County facilities
  - Wilmington most extensive:
    - 170 miles combined.
    - No plans to separate.
    - Enhanced long-term control plan to achieve high-level of CSO control.
The total cost of needed improvements is approximately $147 million.

- For new and/or expanded and improved wastewater treatment facilities in southern New Castle County.

- To control CSO in the City of Wilmington.
Kent County Observations

Driving Factors:

- Steady growth in population and new households.
  - Need for new collection and conveyance systems

- Septic elimination plan
  - Provide service to 13 un-sewered communities

- I&I remediation

- TDML compliance

- Improve water quality

- Rehabilitate existing problem areas
Kent County Observations

Flow vs. Capacity:

- Kent Co. Treatment Plant provides all of the public treatment capacity in the county. (except for Harrington)

- Kent County and Harrington treatment facilities are experiencing average daily flow rates that are approaching their capacity.
Kent County Observations

Inflow & Infiltration:

- Each municipality surveyed experiences problems with I&I except the Town of Clayton.

- Clayton indicated that they previously identified and corrected their problems.

- Each municipality has studied its I&I problems and identified potential corrective measures, except for Town of Smyrna and the City of Milford.
Kent County Needs & Costs

- The total cost of needed improvements is approximately $79 million.

- The majority of need is associated with:
  - Improvements to the conveyance system,
  - Improvements to the treatment facility at Frederica
  - Providing public sewer to communities not presently sewered.
Sussex County Observations

Driving Factors:

- Population growth in Sussex County has increased significantly in past years and is projected to continue into the future.

- This steady growth has resulted in the need for facility expansions and upgrades for the majority of County municipalities.

- Development of vacant parcels within incorporated areas and annexations areas has expanded the service areas.
Flow vs. Capacity:

Due to the dramatic increase in development within the County, all municipal utilities are planning for substantial increases in wastewater capacity and infrastructure improvements.
Sussex County Observations

Inflow & Infiltration:

- I&I is a problem with most municipal facilities
- Rain events cause peak flow rates at many treatment plants
  - Bridgeville, Georgetown, Laurel, Milton, Rehoboth, Lewes, Seaford, South Coastal
- The extent of I&I has not been quantified.
- Sussex Co. municipalities were the most impacted by the new TMDL requirements.
  - have to upgrade their existing treatment and disposal facilities.
Sussex County Needs & Costs

- The total cost of needed improvements in Sussex County is approximately $163.7 million.
  - Identified the greatest need in the State

- The majority of need is associated with:
  - New and/or expanded and improved treatment facilities.
  - Studies to determine the extent of the problem and the cost to correct I&I problems.
  - Improvements to meet TDML standards,
Summary of Findings

- Municipalities need to make major investments to upgrade treatment wastewater facilities in order to comply with Total Maximum Daily Load (TMDL) water quality standards.

- Expansion of wastewater systems is primarily due to the rapid pace of development in the state south of the C&D Canal in all 3 counties.
Summary of Findings

- Funding should be allocated to municipal utilities for I&I studies.
  - The minimum cost to investigate and develop rehabilitation costs begin at $100,000 to $150,000 for small sized systems.

- The unknown costs of correcting I&I could be substantial.

- Many municipal utilities are using or planning to use impact fees and developer contribution to fund infrastructure improvements.
Summary of Anticipated Costs

- Projected costs of meeting reported unfunded wastewater needs are as follows:
  - New Castle County $147 million
  - Kent County $79 million
  - Sussex County $164 million

Statewide total $390 million