

Purpose

This chapter provides recommendations for how Dublin can guarantee the reliable delivery of potable water and sound management and treatment of wastewater and stormwater to ensure public health and safety and support its other development objectives.

09 UTILITIES

Principles relating to utilities established as part of previous Community Plan updates are still valid today. The City of Dublin models and analyzes existing utility infrastructure to determine available capacity and capacity limitations. The City strives to provide services in a safe, efficient, and fiscally responsible manner.

As the City continues to age, infrastructure installed in the early stages of Dublin's growth will require more preventative maintenance and improvements. Funding will be necessary for this maintenance effort to uphold the level of services currently provided.

*Goal and Objectives for
Utilities*

TO PROVIDE HIGH QUALITY UTILITY SERVICES IN A SAFE, EFFICIENT, AND FISCALLY RESPONSIBLE MANNER.

- Provide for the safe and efficient delivery of high quality potable water to the community for consumption and fire protection.
- Implement waterline extensions to growth areas consistent with the Community Plan.
- Provide for the safe and efficient collection of wastewater generated by the community.
- Continue efforts to remove infiltration and inflow sources within the existing sanitary sewer collection system.
- Implement sanitary sewer extensions to growth areas consistent with the Community Plan.
- Provide for the safe and efficient collection of stormwater and continue to maintain and improve the water quality of the City of Dublin's tributaries and the Scioto River corridor.
- Continue implementation of the Dublin Stormwater Master Plan to provide adequate stormwater management in tributary areas consistent with the recommendations of the Community Plan.
- Design stormwater management facilities to blend with surrounding development as an attractive amenity and landscape feature.

The goal and objectives for Dublin's utilities are further expanded in this chapter through community-wide conclusions and recommendations.



Most Sustainable.

By ensuring the continued safe and efficient delivery of public utility services and preservation of natural watercourses through effective stormwater management, Dublin can advance its goal of being the most sustainable City.



Most Connected.

With strategic and fiscally responsible capital improvements planning and programming, Dublin can extend utility infrastructure to new growth areas in support of its goal of being the most connected City.



Most Resilient.







Through continued maintenance of public water distribution, wastewater collection and stormwater management infrastructure, Dublin can be a community resilient to change and growth.

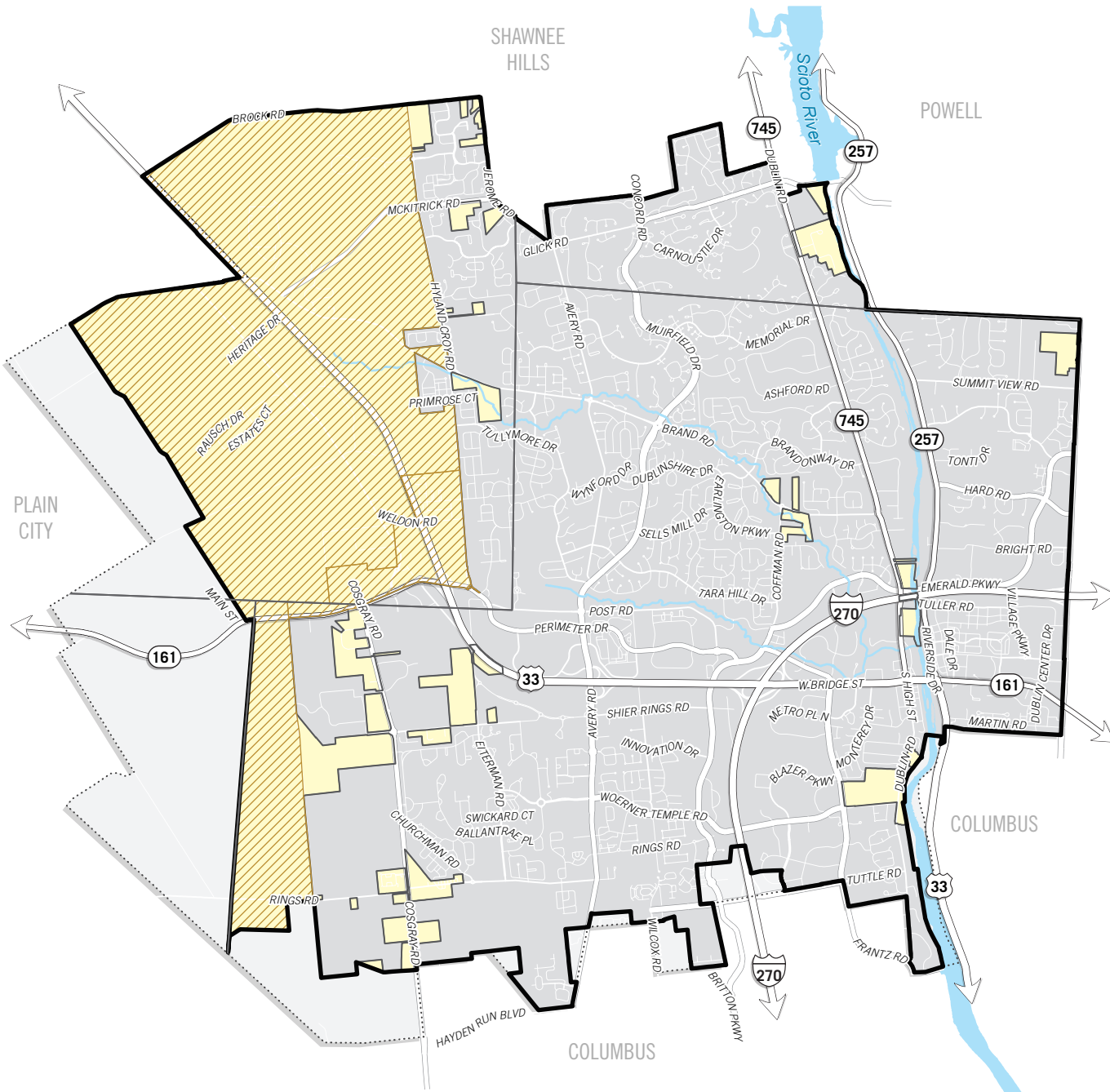
MUNICIPAL SERVICE AGREEMENTS

The City of Dublin does not own or operate water or wastewater treatment facilities, instead supplying these basic public services through arrangements with other jurisdictions. The City of Dublin provides water and sanitary sewer service primarily through contracts with the City of Columbus, as Central Ohio's regional service provider. These agreements are comprehensive in nature and ensure that the City of Dublin has the ability to provide water and sanitary sewer service as the community grows. Limited areas of the City of Dublin are also provided with sanitary sewer service through agreements with Delaware County, and Dublin has an additional agreement regarding conveyance of wastewater for the Village of Shawnee Hills. The City of Marysville also provides water and wastewater utility service within portions of Dublin's planning area.

The water and sanitary sewer service area for the City of Dublin has been delineated, as indicated on the Dublin Water and Sewer Service Area map, defining specific geographic areas in which service is provided by the City of Columbus. The Dublin water and sanitary sewer service area includes expansion areas that may be annexed and served by Dublin.

Dublin Water and Sewer Service Area

-  Dublin Water and Sewer Service Area
-  Revenue Sharing Area
-  City of Dublin
-  Planning Area Boundary
-  Dublin Expansion Area
-  County Boundaries





CITY OF COLUMBUS 208 FACILITIES PLAN BOUNDARY

The Ohio Environmental Protection Agency (EPA) oversees the State Water Quality Management Plan (208 Plan) as required by Section 303 of the Clean Water Act. As part of the 208 Plan, the City of Columbus was required to develop a facilities plan for their systems to be included in the overall state plan. The plan includes definition of the existing water and sanitary sewer service area and a 20-year projection of service area. As part of the 208 Plan, the City of Columbus agrees to provide service within the indicated 208 Plan boundary. The Ohio EPA requires an agreement between governmental jurisdictions if service involves more than one jurisdiction. Under the Clean Water Act and Ohio Revised Code, the Ohio EPA cannot issue a Permit-to-Install (PTI), National Pollutant Discharge Elimination System (NPDES) permit, or Water Pollution Control Loan Fund (WPCLF) monies for wastewater projects in conflict with a 208 Plan. Revisions to this boundary are required to be submitted and approved by the Ohio EPA for inclusion in the 208 Plan. This plan is a collaborative effort between Ohio's Water Quality Management Planning (WQMP) Agencies and the Ohio EPA to provide guidance to those having the authority to develop and implement wastewater treatment projects within Ohio's communities.

EXISTING AGREEMENTS

City of Columbus – Water Service Agreement

The City of Dublin and City of Columbus entered into a new water service agreement on November 27, 2023, which replaces the previous agreement that was approved on April 13, 1993, supplemented on January 16, 2007, and modified on November 13, 2009. The water service agreement provides the City of Dublin access to drinking water for the area delineated on the Dublin Water and Sewer Service Area map through the City of Columbus water treatment and distribution system until the contract's expiration in 2048. Dublin is permitted to construct water distribution infrastructure and connect to City of Columbus infrastructure for the purpose of providing or improving water supply to Dublin. The City of Columbus is responsible for routine maintenance and operation of the water distribution system within Dublin. The cost related to excessive maintenance, as defined by a formula within the contract, is the responsibility of the City of Dublin. The maintenance of fire hydrants, booster stations, water storage facilities and vault structures for pressure reducing valves are also the responsibility of the City of Dublin. The water service agreement effectively provides the City of Dublin with a reliable source of drinking water.

City of Columbus – Sanitary Sewer Service Agreement

The City of Dublin and City of Columbus entered into a new sanitary sewer service agreement on November 27, 2023, which replaces the previous agreement that was approved on April 13, 1993, and modified on November 13, 2009. The sanitary sewer service agreement provides the City of Dublin the ability to dispose of wastewater from the area delineated on the Dublin Water and Sewer Service Area map through the City of Columbus wastewater collection and treatment system until the contract's expiration in 2048. Similar to water distribution provisions, the agreement between the City of Dublin and the City of Columbus allows Dublin to construct sanitary sewers necessary to serve developing areas of the City. The operation and maintenance of the sanitary sewer collection system within the City of Dublin is the responsibility of the City of Dublin. The sanitary sewer service agreement effectively provides for reliable wastewater disposal.

City of Columbus – Economic Development Agreement

The City of Dublin and City of Columbus entered into a new economic development agreement on November 27, 2023, which replaces the previous agreement that was approved on August 20, 2009. The economic development agreement establishes the terms and conditions under which the 5,575-acre area located to the west of Dublin's existing corporate boundary will become exclusive Dublin Expansion Area. The terms and conditions relate largely to the sharing of the net income tax revenues that may result from the development of this area. The 5,575-acre area is delineated as Revenue Sharing Area as depicted on the Dublin Water and Sewer Service Area map.

The economic development agreement facilitates the orderly development of this area by:

- Allowing the annexation of properties adjacent to, and part of, areas planned for substantial economic development investments.
- Providing the opportunity for greater influence over the development of properties not previously within Dublin's influence.
- Leveraging other investments in Dublin's infrastructure adjacent to the area.

The key components of the economic development agreement are as follows:

- If annexation is requested by a property owner, the land will be annexed into Dublin.
- Dublin will pay to Columbus an Equity Share for each annexation.

- Dublin and Columbus will share in the net income tax revenues.
- Dublin will provide utility services to the area.
- Dublin will fund the necessary capital investments and other governmental services in the area.
- Non-compete clause.

The initial term of the economic development agreement terminates in 2073, unless otherwise terminated prior to that date.

City of Marysville

Portions of Dublin's Expansion Area as defined in the Columbus water and sanitary sewer agreements currently obtain water and sanitary sewer service through the City of Marysville. The area served is primarily located along the Industrial Parkway corridor through infrastructure originally installed under the jurisdiction of Union County. Union County and the City of Marysville entered into an Asset Purchase Agreement on December 19, 2005, that transferred the operation and maintenance of the systems to the City of Marysville with defined areas of future municipal growth and additional areas of exclusive service provision within surrounding townships. The closing date in accordance with the Agreement was January 31, 2006, and thereafter the Agreement became effective. While the City of Marysville is obligated to maintain service to existing county and Marysville customers, coordination of services outside Marysville's expected growth area and aging infrastructure provides opportunity for regional dialogue and cooperation as development progresses in the Dublin Expansion Area.

Shawnee Hills – Sanitary Sewer Agreement

On April 24, 2000, the City of Dublin entered into an agreement with the Village of Shawnee Hills located north of Dublin along the Scioto River to provide Village access to sanitary sewer service (approximately 284-acres). Today, Dublin provides access to the City's sanitary sewer system in order to transport sewage and other wastes from Shawnee Hills to the City of Columbus system for treatment and disposal.

As part of that agreement, the Village made a one-time payment for access to transport up to 120,000 gallons per day (gpd). Excess flows will result in additional payments based upon the level of flow. The Shawnee Hills agreement will last until 2040, unless written notice is provided by either party at least five years in advance of the termination date. If notification does not occur, the agreement will remain in effect for successive three-year periods.

The Shawnee Hills agreement was amended on November 14, 2003 to consider sanitary sewer provision to the South Heidelberg Property (Bogey Inn site). As part of the approved contract amendments, the site is served by Shawnee Hills and is subject to Village regulations regarding sanitary sewer services. Flows from this site are not included in the 120,000 gpd contract cap, and the site has been annexed to the City and is subject to Dublin zoning regulations.

Delaware County – Sanitary Sewer Agreement

On August 22, 1994, the City of Dublin entered into an agreement with Delaware County to provide sanitary sewer treatment for approximately 210-acres located along Summit View Road. For designated areas north of Summit View Road, the City collects wastewater and discharges it to Delaware County for treatment and disposition. The fully developed contracted area includes the Wedgewood Hills, Campden Lakes and Wedgewood Glen subdivisions. These projects were developed in accordance with the agreement at prescribed densities of 1.25 units per acre. Dublin performed inspections on the installation of the sanitary sewer system and is required to maintain infrastructure. Capacity fees and use charges are paid to Delaware County.

This agreement included service agreements for Shawnee Hills with Delaware County; however, a subsequent 2000 agreement with the Village of Shawnee Hills and Columbus fulfills the requirements to provide the safe transportation of sanitary sewer flows as prescribed in the 1994 agreement. Delaware County is responsible to inspect and maintain the sanitary sewer collection system in these areas, and capacity fees and use charges in Shawnee Hills are paid to the City of Columbus.

Ohio Environmental Protection Agency – Director’s Final Findings and Orders

On November 17, 2008, City Council approved Resolution 83-08, which authorized the City Manager to enter into an agreement with the Ohio EPA regarding the Director’s Final Findings and Orders (DFFO) related to sanitary sewer system discharge and clear water infiltration and inflow. The Ohio EPA issued the final version of the DFFO on February 11, 2009.

The DFFO requires that the communities discharge their wastewater into the Columbus system plan and implement practices to assist in minimizing illegal discharges and mitigating excessive clear water infiltration and inflow from the Columbus system.

The required implementation includes:

- Public Notification Program
- Sanitary Sewer Overflow (SSO) Emergency Response Plan
- Sewer System Evaluation Study (SSES)
- Capacity, Management, Operations and Maintenance (CMOM) Program

All of the requirements listed above have been met. The SSES is an on-going project and is on an approved 15-year schedule.

CONCLUSIONS AND RECOMMENDATIONS

As a governmental agency, the City of Dublin strives to provide its residents and businesses with the safe and efficient distribution of potable water for consumption and fire protection and adequate collection of wastewater. Dublin’s existing service agreements help provide a high quality of life and level of service within the community. As Dublin continues to grow and further development occurs in the U.S. 33 Corridor Area and Northwest/Glacier Ridge Area, the presence of overlapping service areas provides an opportunity for coordinated water and sanitary sewer provision that can result in greater efficiency and benefit to the entire region. All potential options for water and sanitary sewer provision should be considered as growing development affects the capacities and operational function of the planning area; policies relating to these growth issues should be examined with future development.

While the City has traditionally provided water and sanitary sewer service to areas only within municipal boundaries, the consideration for extending services outside the City should also be evaluated as a means to achieve economic development goals and other quality of life objectives. Existing or future service agreements should be considered within the context of long-term maintenance and infrastructure viability for all remaining portions within the service area.

WATER INFRASTRUCTURE

EXISTING CONDITIONS

The City of Columbus water supply is supported by both surface and ground water sources, and is the primary source of drinking water for the City of Dublin. The City of Columbus currently maintains three in-stream reservoirs; the Griggs, O’Shaughnessy, and Hoover Reservoirs have a combined storage capacity of 27 billion gallons, providing water for much of Franklin County. Several up-ground water reservoirs were constructed in Delaware County which provide an additional 9 billion gallons of raw water storage capacity. The City of Columbus maintains three water plants, with plans for a fourth underway; the Dublin Road, Hap Cremean, and Parsons Avenue Water Plants draw from various raw water sources to provide an average of 145 million gallons of clean water per day to the greater Columbus area. The Fourth Water Plant is planned to be constructed by 2028, and will be located along the Scioto River in southern Delaware County, on the southeast corner of Home and Dublin Roads. The new plant will provide an additional 50 million gallons of treated water per day to the Columbus system. The continued efforts to maintain adequate sources of drinking water will enable the City of Dublin to support additional growth.

The City of Dublin’s current corporate area is approximately 22,000-acres, or 34.1 square miles, in size. In 2022, the water distribution system supplying the City of Dublin provided an average of nearly 4.3 million gallons of water per day. The distribution system consists of over 260 miles of water pipes ranging in size from 2-inch to 24-inch in

diameter, with over 3,500 public fire hydrants, and over 6,000 water valves. The City of Dublin water distribution system includes six water storage towers that control system hydraulics, and provide necessary pressure and fire flow during times of peak demand. The existing storage towers and their capacities are as follows:

- Avery Road Storage Tower (2 million gallons)
- Darree Fields Storage Tower (2 million gallons)
- Dublin Road Storage Tower (½ million gallons)
- Rings Road Storage Tower (2 million gallons)
- Summit View Storage Tower (2 million gallons)
- Tartan West Storage Tower (½ million gallons)

The system has a combined storage capacity of over 9 million gallons. Four booster stations (Brand Road, Hyland-Croy Road, Post Road, and Rings Road) supply the system’s water storage, and control hydraulics across four pressure districts (Henderson, Hyland-Croy, Post, and Smoky Row).

As part of the 2013 City of Dublin Community Plan, a dynamic water model was developed that provided insight into the operations of the system at that time. The model evaluated the water distribution system and its response to varying demand levels throughout daily and seasonal changes. Performance of the water system was measured by both the operating pressures in the system during differing demand events and the potential fire flows available in the system. In general, the system is desired to maintain an operating pressure of 35 psi during normal daily demands and a minimum of 20 psi during fire-flow scenarios. A minimum of 1,000 gpm of fire flows are required in the system with a target set to 2,500 gpm as the preferred system performance at 20 psi during maximum daily demand conditions. During the 2013 analysis, several existing performance deficiencies from the defined minimums and goals were noted. Recommended improvements to mitigate those deficiencies were also identified. The Findings and Recommendations from 2013 Analysis table identifies the denoted deficiencies, recommended improvements, and current status of the improvements, as many have been implemented since 2013:

Findings and Recommendations from 2013 Analysis

Existing Deficiency	Recommended Improvement	Improvement Status
Muirfield Villages and areas generally bounded by Avery Road to the west and Brandon Park to the south experience fire flows less than 2,500 gpm at a residual pressure of 20 psi under existing conditions.	Construction of new 0.5 MG elevated water storage tank along Dublin Road.	Completed in 2013
	12-inch water main from the Hyland-Croy Tank to Manly Road.	Completed in 2010
Other smaller areas not capable of delivering desired fire flows can also be found in the areas of Ballantrae Loop near the Southwest Area and Tuller Ridge Drive in the Sawmill/ State Route 161 Area.	Construct a new 2 MG elevated water tank in Darree Fields Park, construction of new transmission mains along Cosgray Road to Ballantrae.	Tank constructed in 2010 and waterlines constructed in 2011.

In addition to identifying the existing deficiencies in the system, the hydraulic model was used to predict future deficiencies that may arise through implementation of the 2013 Community Plan. Predicted deficiencies that should be monitored as the demands increase include:

- The Muirfield Area in the location of Rothesay Drive and Gairloch Court will gradually develop pressures that are below the required 20 psi standard. The larger Muirfield area will develop pressures that are below the desired minimum pressure of 35 psi. Portions of the Muirfield area affected by lower than desired available fire flows under existing conditions will also gradually increase in size. Modeling shows that this lower than desired pressure will remain confined to the Muirfield area.
- Portions of the Southwest Area near the Ballantrae subdivision, particularly near Ballantrae Loop, will also exhibit signs of lower than desired pressure. Without additional improvements, this identified area will also eventually experience pressures lower than the required 20 psi. This area of lower pressure will gradually expand to include much of the Southwest Area, including south to Rings Road and Tuttle Crossing Boulevard. Other portions of the region along State Route 161, Post Road and Emerald Parkway will also develop pressures that are less than the desired minimum pressure of 35 psi.
- Areas east of the Scioto River, particularly those bounded by Riverside Drive to the west, Hard Road to the north and Bright Road to the south that currently exhibit lower than desired pressures will remain the same. However, the total available fire flow will continue to decrease in the area.

The initial review and assessment of the water system's ability to support the land uses defined through the *Envision Dublin* effort did not utilize the previously developed hydraulic model but rather focused on a review of current system usage and future demand projections. This simple approach would allow for a determination of the potential overall impact on the system and provide insight as to where more detailed analysis of the infrastructure would be needed. For example, should overall demand projections be similar to those previously defined, then subsequent analyses will not need to focus on supply from the City of Columbus system, but rather focus more on localized improvements in the City's distribution network. Conversely, should the projections show a significant increase in demands, discussions with Columbus regarding supply availability should be prioritized over localized infrastructure review. Ultimately, after finalization of the *Envision Dublin* Plan, the City's model should be updated to reflect the changes in system operation that have occurred in the last decade and be utilized as a tool for continued assessment of the system.

During this evaluation, billing data for all water users in the City of Dublin was obtained from the City of Columbus for the years 2003 through 2022. This was requested to verify how demands have grown since the prior 2013 evaluation. This data shows that the total Average Daily Demand for the City of Dublin has remained generally flat for the last two decades, despite development and expansion having continued to occur. This phenomenon has been observed in other locations and is typically attributed to increased water conservation education and measures being in place. This data is limited to the Average Daily Demand, and may not be reflective of current Maximum Daily Demand volumes, which is the critical event for supply and distribution, which may have increased over the same time period.



ANALYSIS OF FUTURE PROJECTIONS

A high-level spreadsheet analysis was performed to evaluate City-wide water demands, project future demands, and compare them to previous future projections. This effort was conducted to ascertain the potential increase in water demand that could be realized were the City to adopt either of the land use scenarios. The land use scenarios propose varying residential and employment populations throughout different areas of the City. Corresponding population densities were derived from the land use scenarios, and regional standard water usage assumptions were applied to determine water demands across the City.

The analysis projects the Average Daily Demand (ADD) and Maximum Daily Demand (MDD) for each land use scenario. The ADD represents the average total water usage per day over the course of a year. The MDD is the water volume representing the one day a year with the highest total demand. Both of these values are presented in units of million gallons per day (MGD). Water distribution systems are typically designed around the Maximum Daily Demand. Higher, short-term peak hourly flows can influence the design of local infrastructure; however, peak flows are typically offset by localized storage. Peak hourly flows were not projected or considered in this analysis.

Projected Water Demand Summary table below summarizes the results of the analysis for the Current Land Use Scenario and the Future Land Use Plan.

It is recognized that the Current Land Use Scenario is intended to be consistent with the future full-build scenario considered with the 2013 analysis. However, as indicated by the table, water demand projections with the Current Land Use Scenario are slightly below the 2013 projections (decreased by 19%). This is likely due to differing methodology and assumptions between the two analyses, but generally confirms the consistency between the two efforts. The Future Land Use Plan indicates an increase of 19% of the total system demands.



Projected Water Demand Summary

Projected Demand Description	Average Daily Demand (MGD)	Max. Daily Demand (MGD)*	% Change from 2013 Model
Actual Columbus Billing Data (2022)	4.3	6.2	-
Future Full-Build Water Model (2013)	14.0	20.4	-
2050 Current Land Use Scenario (2023)	11.4	16.6	-19%
2050 Future Land Use Plan (2023)	16.7	24.4	+19%

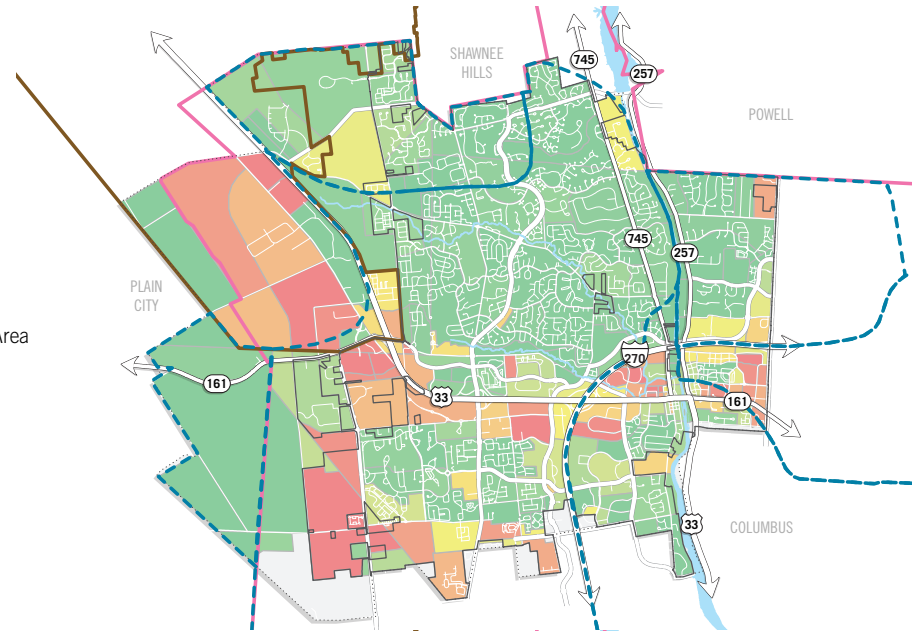
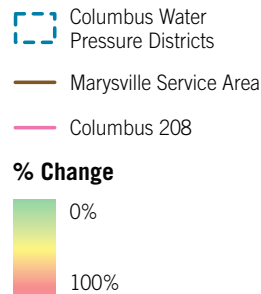
*Max. Daily Demand calculated based on previously determined Avg. to Max. Multiplier of 1.46.

The Future Land Use Plan reflects a moderate increase in projected water demands when compared to the 2013 projections, suggesting the most recent master planning may still be sufficient for the City of Dublin moving forward in regards to citywide water demands. While total demands of the system when comparing the Current Land Use Scenario to the 2013 analysis reflect a reduction, the spatial allocation of the demands are critical to understand as it relates to the ability of local infrastructure to support the future land use. Likewise, though the Preferred Future Land Use Plan may reflect a modest increase in expected demands across the overall system, specific locations would experience a greater concentration of these demands. The Current Land Use Water Demand % Change map and Future Land Use Water Demand % Change map show that these projected demands are concentrated in the central and western/southwestern portions of the City, where existing local infrastructure may not be able to support them.

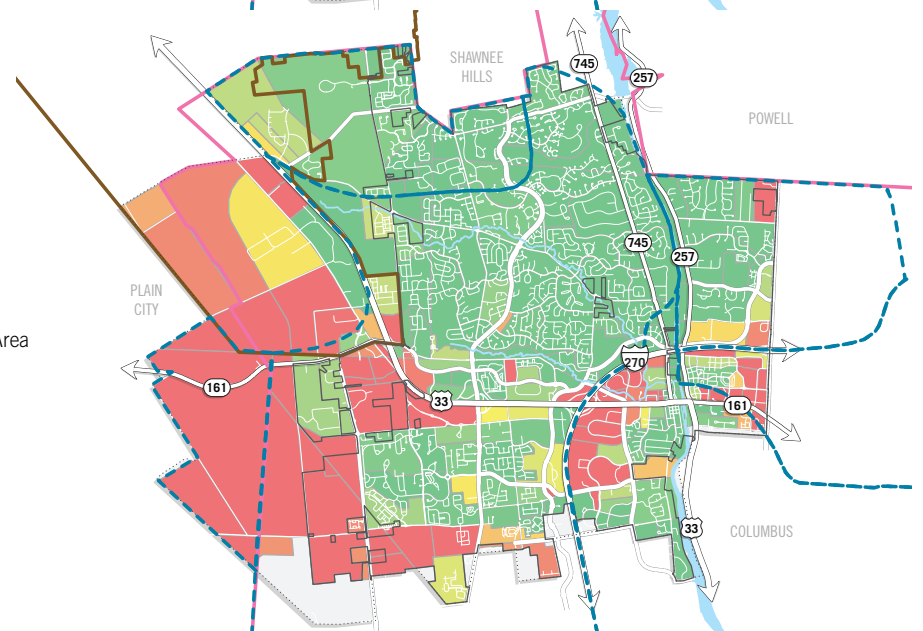
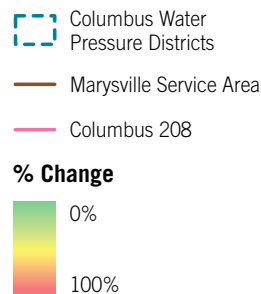
The Future Land Use Water Demand % Change map displays the intensity of the projected changes in demand around the City, based on the Future Land Use Plan, with areas in green representing areas of low change, and those in yellow, orange, and red representing areas of higher change. The areas of change are framed by City of Columbus water pressure district boundaries.



CURRENT LAND USE WATER DEMAND % CHANGE



FUTURE LAND USE WATER DEMAND % CHANGE



CONCLUSIONS AND RECOMMENDATIONS

The Future Land Use Plan will generate a modest increase in overall water demands with localized areas of more intense demands, as compared to the 2013 projections and the Current Land Use Scenario. Compared to present day demands, however, both scenarios represent significant growth in demands that the existing water infrastructure may not be suited to handle. There are several observations that can be made:

- The demands in the Post pressure district, north of State Route 161, do not reflect much change.
- The demands in the Post pressure district, south of State Route 161, reflect significant increases in demand under the Future Land Use Plan. As such, critical infrastructure serving the Post pressure district should be a priority focus of future evaluations.
- The Future Land Use Plan reflects demand increases inside of I-270, impacting areas in both the Henderson and Cleveland pressure districts. These areas, while smaller and more condensed, should also be subject to further evaluation.
- There appears to be limited demand increases in the Hyland-Croy and Smoky Row pressure districts suggesting these areas be lower priorities for future evaluations.
- The Future Land Use Plan reflects a significant expansion in area and increase in demand in the area between Cosgray Road and extending West to Iams Road. Development of this area would require significant expansion of the Post pressure district.

These observations should help direct focus on the next, more detailed step, which would be evaluation of specific infrastructure (booster stations, storage tanks, piping, etc.) to support the Future Land Use Plan.

It is recommended that the City update their water model to evaluate current and future system operations. An update to the City's 2013 water model and further analysis would be required to confirm that the implemented improvements from the last decade have had the desired results or to ascertain if new operational challenges have arisen. An updated model reflecting existing conditions would be necessary to identify present-day deficiencies and to recommend potential future improvements. The City of Dublin will also need to ascertain the ability of the City of Columbus system to meet any increases in demand associated with the Future Land Use Plan. This determination will need to be made by the City of Columbus and thus coordination should occur as soon as feasible.

Technology Industry and Large-Water Users

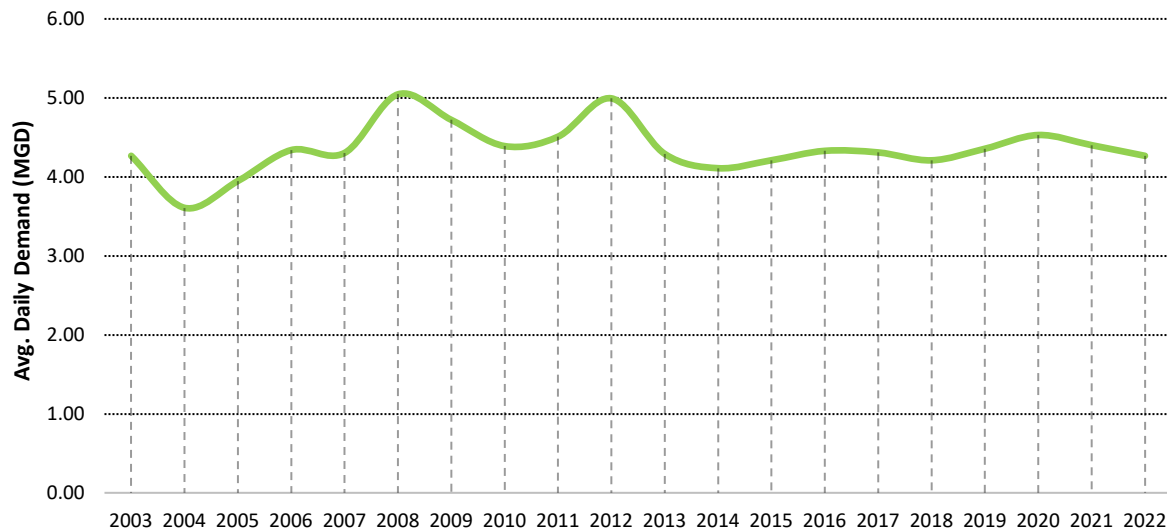
Current development trends in central Ohio have given rise to a significant number of technology-based facilities. These range from data and web services centers to technology-based manufacturing plants. Water supply is often a key consideration in attracting and facilitating these developments. It is understood that areas of future development in Dublin may focus on the technology sector. Planning for these facilities from a water supply perspective on a land use basis has limited value since their demands can vary so widely dependent upon the technology they employ and the overall size of the site. Specific considerations include:

- **Seasons** - Data centers typically fluctuate in water demand seasonally, as the changing temperatures impact the amount of water needed to provide adequate cooling.
- **Technology** - Data centers are evolving to be more water-efficient, either through less heat-intensive processes, or through the use of alternative means of cooling, such as air cooling or closed loop systems. Future development of large water users may end up needing less water than anticipated.
- **Collaboration** - Opportunities may be present when large water users are next to other large water users, as they are able to collaborate on and share the infrastructure needed to serve them, possibly utilizing progressive solutions such as "purple," or recycled/reclaimed, water infrastructure.
- **Storage** - Some technology developments use large amounts of water, based on their usage patterns, over short time periods, which can be very impactful to system operation. However, if their usage could be spread over longer time periods, the impact becomes much less. Water providers can help meet the needs of the developments without significant impacts to the overall system by mitigating these short, intense usage periods by utilizing water storage.
- **Size** - Often technology developments require large land footprints and thus the corresponding demand of water on a per acre basis may not be greater than traditional land uses.

If large water users, such as data centers or technology industries, are developing in the City of Dublin, then special planning beyond general land use projections is required to determine if these users will have access to the necessary water supply.

There is no succinct or readily available answer as to where, what kind, or how many large water users the City is capable of supporting. Zoning by itself is not indicative of the local water infrastructure being sufficient for future development, nor is the presence of existing large water users. Such determinations should be studied thoroughly on a case-by-case basis and will need to consider specific infrastructure in proximity to the site as well as supply limitations.

City of Dublin Average Daily Water Use



Billing Data and Existing Conditions

As mentioned previously, City of Columbus billing data for the City of Dublin water users reflect no long-term change in annual average daily water demand over the last two decades. This data indicates that water demand projections following current standards are likely conservative. Improvements to the water distribution system will likely be necessary to meet future demands, especially in areas of intense, concentrated growth; however, overall demands may not be changing as quickly as previously projected. As such, the City should continue to track and monitor water consumption on an annual basis to best balance economic growth with responsible management of the domestic water supply.

City of Dublin Average Daily Water Use table below shows the Average Daily Demand from City of Columbus billing data for the City of Dublin for each year from 2003 to 2022.





SANITARY SEWER INFRASTRUCTURE

EXISTING CONDITIONS

The City of Dublin's current corporate area is approximately 22,000-acres, or 34.1 square miles, in size. The City of Dublin's wastewater (sanitary sewer) service is provided through municipal service agreements with surrounding communities. The City of Columbus is the primary provider of wastewater service, while Delaware County provides wastewater service for approximately 210-acres located north of Summit View Road.

The City of Dublin sanitary sewer collection system consists of more than 230 miles of sanitary sewers and over 5,500 sanitary manholes. This sanitary sewer collection system is owned, operated, and maintained by the City of Dublin. All of the wastewater from the City of Dublin drains to the City of Columbus sanitary sewer system for treatment and disposal except for that which goes to Delaware County.

The sanitary sewer collection system for the City of Dublin consists of nine major sanitary trunk sewers. The nine major trunk sewers divide the system into nine sanitary sewer tributary areas. The major trunk sewers are as follows:

- Cosgray Sanitary Trunk Sewer
- Cramer North Sanitary Trunk Sewer
- Cramer South Sanitary Trunk Sewer
- Deer Run Sanitary Trunk Sewer
- Hayden Run Sanitary Trunk Sewer
- Llewellyn Farms Sanitary Trunk Sewer
- North Fork Indian Run Sanitary Trunk Sewer
- Riverside Sanitary Trunk Sewer
- South Fork Indian Run Sanitary Trunk Sewer

The Riverside Sanitary Trunk Sewer serves those areas of Dublin on the east side of the Scioto River and drains into the City of Columbus sanitary sewer collection system through the Upper Scioto East Interceptor Sewer. The remaining eight trunk sewers serve those areas of Dublin on the west side of the Scioto River and drain into the City of Columbus sanitary sewer collection system through the Upper Scioto West Interceptor Sewer. The Wyandotte Woods sanitary sewer pump station along with approximately 3,500-feet of sanitary sewer force main complement the system to provide service to areas in the Riverside Sanitary Sewer Tributary Areas where gravity sewer is not feasible. This pump station is located along the east side of Riverside Drive between Wyandotte Woods Boulevard and Summit View Road.

ANALYSIS OF FUTURE PROJECTIONS

Two land use scenarios were evaluated as part of this analysis: the Current Land Use Scenario, and the Future Land Use Plan. The scenarios present two varying degrees of projected population growth and city expansion. These scenarios were used as the basis for developing the sanitary sewer flow projections. Each scenario was analyzed using City of Columbus design criteria to determine the peak sanitary sewer flows that would be expected from each development scenario.

For each sanitary tributary area, a spreadsheet was created and populated with sanitary sewer information and the future populations as proposed by the land use scenarios. The scenarios were developed to project the future populations of different areas throughout the City. These proposed populations were then used to estimate future sanitary sewer flows.

Population densities were derived from the land use scenarios and applied to the planning areas to determine projected sanitary sewer flows. Population densities varied depending on land use type such as suburban, mixed-use, commercial, industrial, etc. Population densities are presented in units of people per acre, or “ppa”. The sanitary sewer flows can be estimated using a standard average daily sanitary flow value. For the City of Columbus sanitary sewer design criteria, a standard value of 130 gallons per day per capita was used.

The average sanitary flow by itself is not used in the design of sanitary sewer infrastructure. A peak sanitary sewer flow is used and is a short-term high flow event in the sewers that occurs based on time of day, season, and other system factors. The City of Columbus Sanitary Sewer Design Manual states a peaking factor of 3.5 should be used for the design of new sanitary sewer infrastructure.

Lastly, infiltration and inflow, referred to as I/I, must be considered when designing sanitary sewer infrastructure and projecting future flows. I/I represents sources of clean water that enter the system through cracks, leaks, deficiencies, or other direct connections to the sanitary sewer collection system. Infiltration and inflow typically occurs during periods of wet weather. City of Columbus sanitary sewer design criteria use an I/I value of 0.003 cubic feet per second (cfs) per acre. Thus, the larger the tributary area, the more I/I that must be included in the sanitary sewer flow calculations.

It is important to note this analysis is preliminary in nature, based on a high-level analysis of the region, and thus does not suggest sanitary sewer availability at any specific location. Further studies would be required to determine local sanitary sewer availability and to identify necessary improvements. The evaluation is limited to the City of Dublin sanitary sewer collection system and does not evaluate the downstream impacts of the estimated projected flows.

For this analysis, in order to remain within capacity throughout each section of the City of Dublin’s sanitary trunk sewers, an iterative approach was taken in which areas were removed until the percent full value at any point was lowered to or below 100% full when possible. If capacity was found to be over 100% and an area could not be removed, alternatives were recommended. The proposed development may cause capacity issues downstream in the Columbus system that are not evaluated by this analysis. To service remaining planning areas that were unable to be serviced by the existing sewer infrastructure, sanitary sewer improvements would be necessary; improvements may include pump station and force mains, discharging downstream where capacity is available, or improving sanitary sewer capacity by pipe upsizing existing pipes or constructing parallel sanitary sewer lines. Evaluation and approval from the City of Columbus would be required for any proposed sanitary sewer extension.

The following map delineates the overall sanitary sewer-sheds corresponding to the sanitary sewer infrastructure capacity analysis of the Future Land Use Plan.

OVERALL SEWERSHEDS

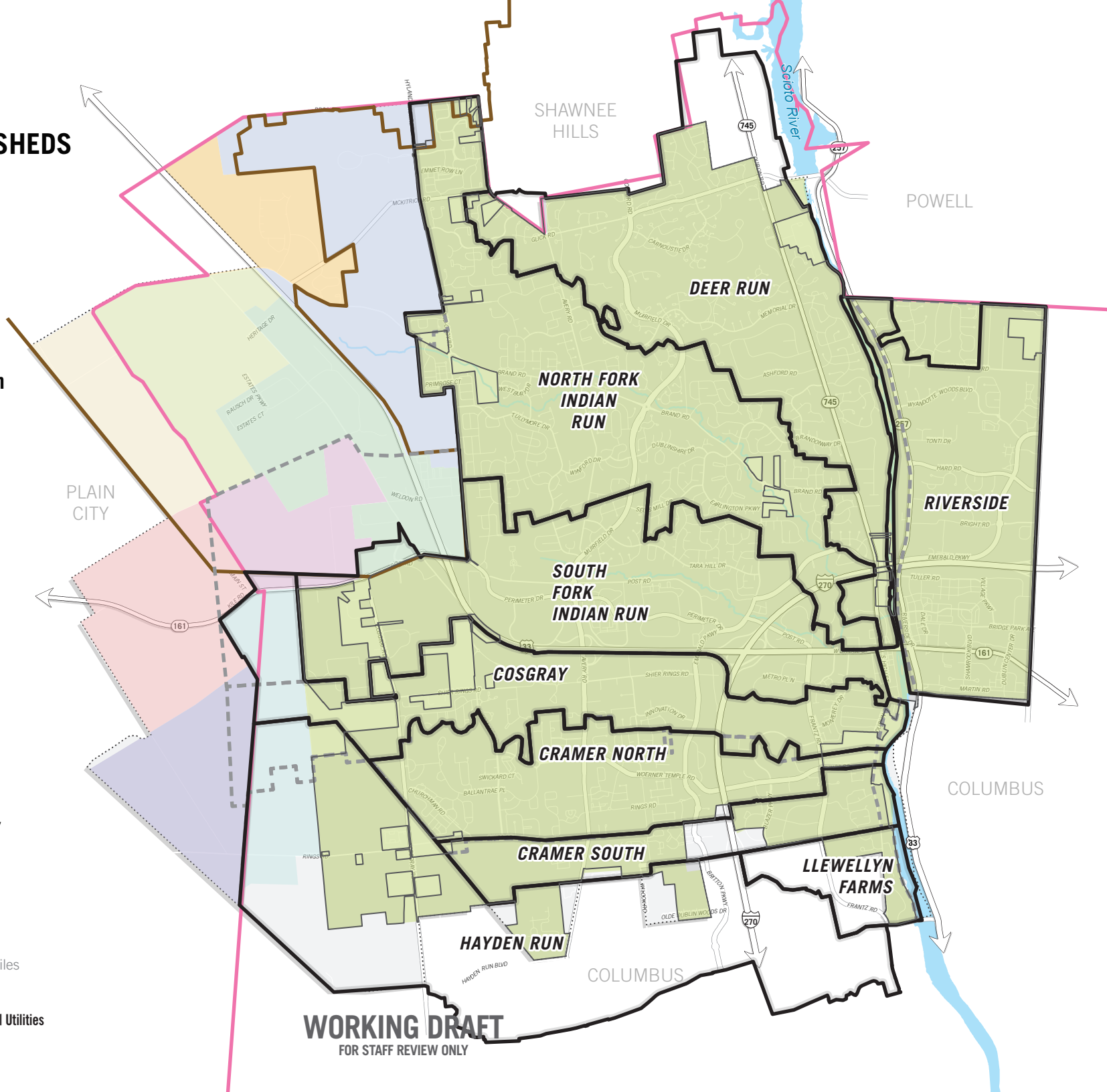
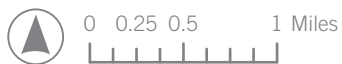
- Columbus 208
- Marysville Service Area
- Proposed Sewershed
- Existing Sewershed

Dublin Planning Growth Analysis Areas

- Base
- A
- B
- C
- D
- E
- F
- G
- H
- I

Context Layers

- City of Dublin
- Planning Area Boundary
- River



Deer Run Sanitary Sewershed

The Deer Run sewershed currently serves approximately 3,350-acres of developed land within the City of Dublin. The existing development within Deer Run produces a peak flow of approximately 18.3 MGD. The main trunk sewer is currently experiencing capacity issues. A previous study was completed titled, “Final OEPA Summary of the Deer Run Sewer Shed: Sanitary Sewer Evaluation Survey Findings and Implementation Schedule,” dated January 23, 2017. Several infrastructure improvements were identified to relieve capacity restrictions in the Deer Run sewershed. These improvements are summarized in the Deer Run Sanitary Sewer Improvements table below.

For the purpose of this study, no additional tributary area was added to this sewer. Post-improvement flow monitoring and modeling evaluation efforts should be completed to determine if additional area can be serviced by this sewer. See Deer Run Sewershed map for a visual of the proposed tributary area.



Deer Run Sanitary Sewer Improvements

Priority	Recommended Improvement	Description	Project Status
1	Deer Run Wet Weather Relief Pump Station	Design flow for existing conditions with the Deer Run Relief Sewer is 5.25 cfs (2,360 gpm). Pump station is wet weather relief only. After all future improvements and build-out conditions, design flow increases to 6.25 cfs (2,800 gpm).	Under construction. Completion in Spring 2024.
2	Glick Road Relief Sewer	Relief sewer from Carnoustie Dr/Glick Rd (MH#2219) to the Proposed Deer Run Pump Station. Pipe to be oversized for storage capacity with a 6" outlet and overflow weir structure. Estimated diameter is 30", but dependent on detailed design alignment and depths.	Under design. Per the adopted 2024-2028 Capital Improvements Program, construction is programmed for 2025, pending site acquisitions if necessary.
3	Riverview Relief Sewer	Increase capacity for 36" trunk sewer along Riverview Dr by constructing a 30" parallel relief sewer.	Under design. Per the adopted 2024-2028 Capital Improvements Program, construction of the N. Riverview Street relief sewer is programmed for 2025, pending site acquisitions if necessary. Construction of the S. Riverview Street relief sewer is programmed for 2028, pending site acquisitions if necessary.
4	Avery Rd Relief Sewer	Relief sewer from Avery Rd (MH#1656) to the new relief sewer for MacEwan Ct. Pipe to be oversized for storage capacity with a 6" outlet and overflow weir structure. Estimated diameter is 36", but dependent on detailed design alignment and depths.	Per the adopted 2024-2028 Capital Improvements Program, design is programmed for 2025, with construction programmed for 2026, pending site acquisitions if necessary.
5	Muirfield GC Relief Sewer	Parallel 12" Relief sewer from MH#2216 to the Proposed Deer Run Pump Station.	Not programmed in the adopted 2024-2028 Capital Improvements Program.

North Fork Indian Run Sanitary Sewershed

The North Fork Indian Run sewershed currently serves approximately 3,468-acres of developed land within the City of Dublin. The existing development within North Fork produces a peak flow of approximately 10.8 MGD. The main trunk sewer is currently experiencing capacity issues. A previous study was completed titled, “Sanitary Sewer Capacity Study for North & South Fork Indian Run Sewershed,” dated September 30, 2019. Several project infrastructure improvements were identified to relieve capacity restrictions in the North Fork Indian Run sewershed. These improvements are summarized in the North Fork Indian Run Sanitary Sewer Improvements table below.

North Fork Indian Run Sanitary Sewer Improvements

Recommended Improvement	Project Status
Increase System Capacity – Install 5,000 LF of 18” Pipe from MH#2151 to MH#2492	Not programmed in the adopted 2024-2028 Capital Improvements Program.
Increase System Capacity with Storage Utilization – Install 2,000 LF of 18” Pipe and 3,000 LF of 36” Pipe with Outlet Control Structure from MH#2151 to MH#2492	Not programmed in the adopted 2024-2028 Capital Improvements Program.
Implement Private Property I/I Reduction Program – Achieve 40% I/I Reduction in area tributary to MH #900 and MH #2843	Not programmed in the adopted 2024-2028 Capital Improvements Program.

For the purpose of this study, no additional tributary area was proposed for this sanitary sewer. Post-improvement flow monitoring and modeling evaluation efforts should be completed to determine if additional area can be serviced by this sanitary sewer. See following Sewersheds map for a visual of the tributary area.

South Fork Indian Run Sanitary Sewershed

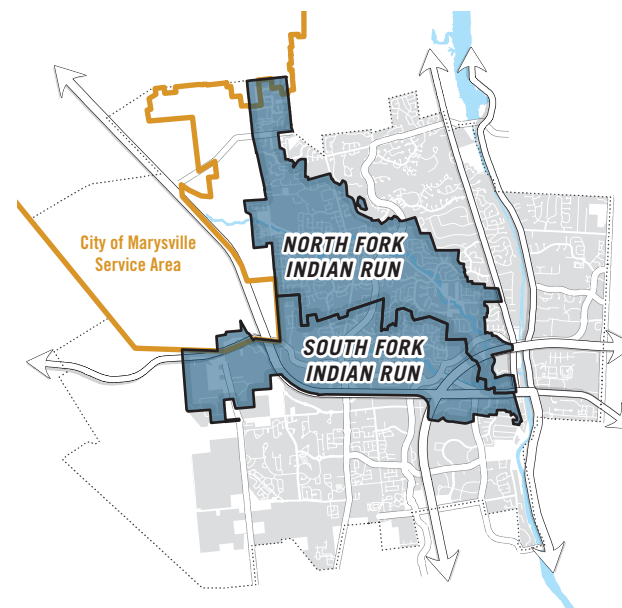
The South Fork Indian Run sewershed is located between the North Fork Indian Run and Cosgray sewersheds, consisting of residential and commercial development, as well as technology and innovation-based land uses. The west end remains undeveloped. A previous study was completed titled, “Sanitary Sewer Capacity Study for North & South Fork Indian Run Sewershed,” dated September 30, 2019. Based on this study, approximately 540-acres within the South Fork Indian Run sewershed could be developed with the existing available capacity. A portion of the South Fork Indian Run sewershed overlaps with the City of Marysville service area. The existing South Fork Indian Run sewershed is 4,342-acres in size, of which 1,112-acres overlaps with the City of Marysville service area. For this evaluation, five development scenarios were evaluated: the Current and Future Land Use Plans with and without the Marysville service area, and a fifth reduced area based on the Future Land Use Plan.

The results show the South Fork Indian Run sanitary trunk sewer only has sufficient capacity to service the existing tributary area under the Current Land Use Scenario when excluding the Marysville service area. As such, a fifth development scenario was evaluated based on the Future Land Use Plan, wherein the Marysville service area and about 361-acres of currently unserved land were removed from the western end of the existing tributary area until capacity was met per the model at a peak flow of 13.6 MGD. The Cosgray and Hayden Run Sewersheds were adjusted to capture the removed area (not including the Marysville service area).

The South Fork Indian Run trunk sewer can service the proposed area under the Future Land Use Plan if the previously recommended improvements are made. See South Fork Indian Run Sanitary Sewer Improvements table and the Sewershed map for a visual of the proposed tributary area and the Marysville service area boundary.

South Fork Indian Run Sanitary Sewer Improvements

Recommended Improvement	Project Status
Increase System Capacity – Install 8,400 LF of 12” Pipe from MH#1029 to MH#547, 2,500 LF of 15” Pipe from MH#2564 to MH#3792, 2,600 LF of 18” Pipe from MH#2554 to MH#2978	Not programmed in the adopted 2024-2028 Capital Improvements Program.



Cosgray Sanitary Sewershed

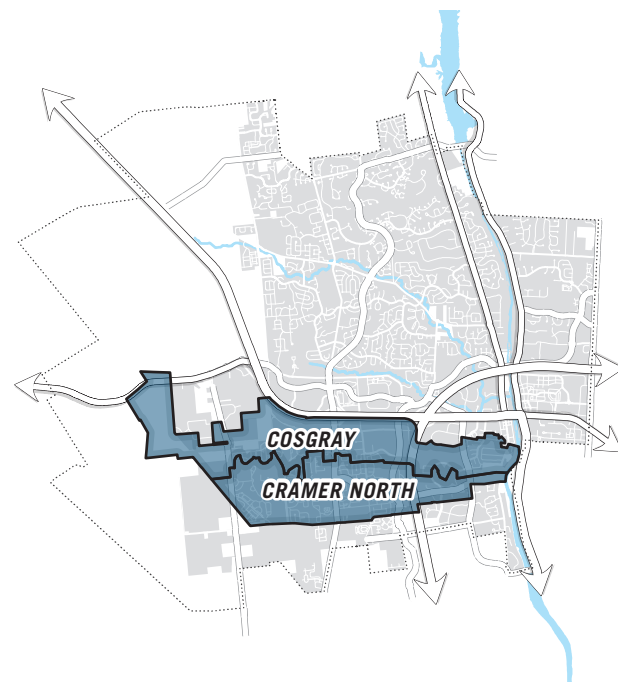
The Cosgray sewershed currently serves approximately 1,469-acres of developed land within the City of Dublin. The Cosgray sewershed is located between the South Fork Indian Run and Cramer North sewersheds, consisting of mostly residential and commercial development. The City previously completed a sanitary sewer capacity analysis using a calibrated hydraulic model for the Cosgray sewershed in 2022. Results of that analysis showed that the Cosgray sanitary sewer system had a maximum allowable additional flow of 4.2 cfs, or 2.7 MGD.

The results show the Cosgray sanitary trunk sewer has sufficient capacity to service the proposed tributary area under the Future Land Use Plan. An additional 563-acres of undeveloped land currently within the proposed tributary area can be developed at an average population density of 6.4 ppa before the current terminus reaches the previously determined maximum allowable additional flow. The tributary boundary was adjusted to take in area from the South Fork Indian Run sewershed. The proposed Cosgray tributary area would produce a total peak sanitary flow of 9.8 MGD. The sewershed extends beyond the Columbus 208 planning boundary, which would require a boundary revision and approval by the City of Columbus and OEPA. See Sewersheds map for a visual of the proposed tributary area.

Cramer North Sanitary Sewershed

The Cramer North sewershed currently serves approximately 1,716-acres of developed land within the City of Dublin. Cramer North is located south of the Cosgray sewershed, which discharges into Cramer South. The area consists of mostly residential and commercial development. The Future Land Use Plan proposes significant development to the west, with some redevelopment proposed within and around I-270.

The results show the Cramer North sanitary trunk sewer has sufficient capacity to service the existing tributary area under the Future Land Use Plan. An additional 34-acres of undeveloped land currently within the existing tributary area can be developed at an average population density of 9.0 ppa before the trunk sewer reaches 93% full pipe capacity. No additional service area outside of the existing tributary area was proposed. The proposed Cramer North tributary area would produce a peak sanitary flow of 8.4 MGD. The sewershed tributary area remained largely unchanged besides minor border adjustments to better match existing sewer infrastructure. While the North Cramer trunk sewer may have capacity, the downstream South Cramer trunk sewer does not; as such, capacity improvements for the Cramer South trunk sewer are necessary, as discussed in the following section. See the following Sewersheds map for a visual of the proposed tributary area.



Cramer South Sanitary Sewershed

The Cramer South sewershed currently serves approximately 607-acres of developed land within the City of Dublin, not including the areas served by Cramer North. Cramer South is located between Cramer North and Hayden Run, consisting of mostly residential and commercial development. The Future Land Use Plan proposes significant development to the west end of the sewershed, as well as areas of redevelopment throughout.

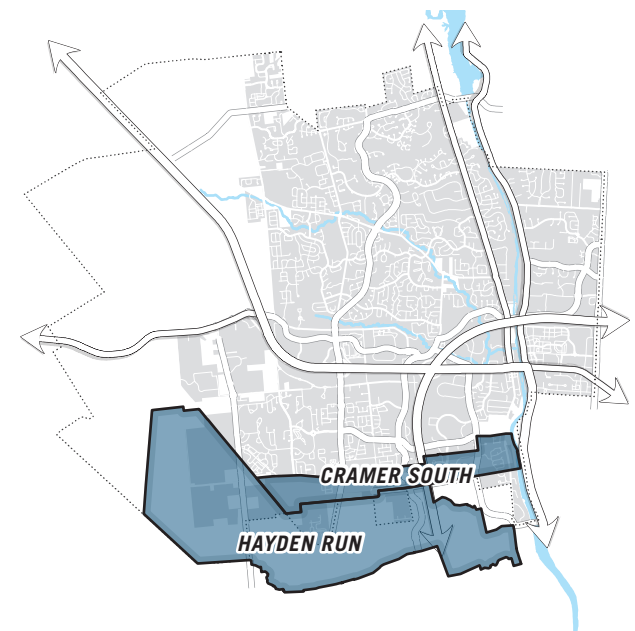
The results show the Cramer South sanitary trunk sewer does not have sufficient capacity to service the existing tributary area under either land use scenario. The point where Cramer North discharges into Cramer South may experience capacity issues at full-build. The 2,275-foot stretch of 21-inch sanitary sewer following where Cramer North and Cramer South meet would need capacity improvements up to the existing 36-inch sewer to ensure system operability; improvements could include upsizing the existing pipe or installing a parallel sanitary sewer line.

Assuming the capacity improvement is in place, the proposed Cramer South tributary area would produce a peak sanitary flow of 14.1 MGD; this includes the flows produced by Cramer North. An additional 273-acres of undeveloped land currently within the existing tributary area can be developed at an average population density of 15.8 ppa, or higher depending on the impact of the capacity improvement. The sewershed tributary area remained largely unchanged besides minor border adjustments to better match existing sanitary sewer infrastructure. See Sewersheds map for a visual of the proposed tributary area.

Hayden Run Sanitary Sewershed

The Hayden Run sewershed currently serves approximately 2,243-acres of developed land within the City of Dublin. The Hayden Run sewershed is located between the cities of Dublin and Hilliard, currently consisting of mostly residential and commercial development. The Future Land Use Plan proposes significant western expansion into the rural areas beyond the Columbus 208 planning boundary.

The results show the Hayden Run sanitary trunk sewer has sufficient capacity to service the proposed tributary area under the Future Land Use Plan. The proposed Hayden Run tributary area would produce a peak sanitary flow of 22.0 MGD. An additional 1,714-acres of undeveloped land within the proposed tributary area can be developed at an average population density of 8.7 ppa before the existing sanitary sewer infrastructure reaches 91% full pipe capacity. The sewershed tributary area was adjusted to match existing sanitary sewer infrastructure, and to take in land that the Cosgray sewershed was unable to service. About 500-acres south of Hayden Run Road, outside of the City of Dublin planning area, were removed from the sewershed as they were already being serviced by a City of Hilliard trunk sewer. See the Sewersheds map below for a visual of the proposed tributary area.



Llewellyn Farms Sanitary Sewershed

The Llewellyn Farms sewershed currently serves approximately 464-acres of developed land within the City of Dublin. Llewellyn Farms is nestled between Hayden Run and Cramer South, along the Scioto River. The sewershed consists of about half commercial and half residential development. Under the Future Land Use Plan, not much change is proposed, as the area is already mostly developed.

The results show the Llewellyn Farms sanitary sewer system has sufficient capacity to service the Future Land Use Plan. The proposed Llewellyn Farms tributary area would produce a peak sanitary flow of 2.3 MGD. There are no additional expansion areas to service, so the sewershed tributary area has remained largely unchanged. See Sewersheds map for a visual of the proposed tributary area.

Riverside Sanitary Sewershed

The Riverside sewershed currently serves approximately 1,945-acres of developed land within the City of Dublin. The Riverside sewershed is between the cities of Dublin and Worthington, along the east side of the Scioto River, across from the Deer Run sewershed. The sewershed is comprised of mostly residential and commercial development. The sewershed also captures flows from the Columbus Zoo via an 8-inch force main. The Future Land Use Plan proposes some redevelopment to the south and provides service to undeveloped areas to the north. Approximately 210-acres within the City of Dublin planning area are already being served by Delaware County, so those areas were excluded from the analysis.

The results show the Riverside sanitary trunk sewer currently only has sufficient capacity to service the proposed tributary area under the Current Land Use Scenario. The existing 12-inch terminus sanitary sewer does not have sufficient capacity to service the remaining 270-acres of undeveloped area at the population densities proposed by the Future Land Use Plan. Sanitary Sewer improvements would be necessary to either increase the capacity of the existing 2,270-feet of 12-inch sanitary sewer, or otherwise divert flows downstream where capacity is available. Then, the undeveloped area can be developed at an average population density of 5.6 ppa or higher depending on the impact of the improvements. The proposed Riverside tributary area would produce a peak sanitary flow of 14.7 MGD. See the Sewersheds map for a visual of the proposed tributary area.



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CONCLUSIONS AND RECOMMENDATIONS

It is recommended that more concentrated studies be completed on specific areas of interest in order to better determine the localized performance of the sanitary sewer collection system. Any sanitary sewer extension or proposed change in flows must be evaluated and approved by the City of Columbus on a case-by-case basis. Expansion of the Columbus 208 boundary will require boundary revision and approval from the City of Columbus and OEPA. The Sanitary Sewer Flow Projection Summary table below summarizes the results of the completed analyses.

Sanitary Sewer Flow Projection Summary

Sewershed	Proposed Tributary Area (Acres)	Total Peak Flow (MGD)
Deer Run	3,350	18.3
North Fork	3,468	10.8
South Fork	2,869	29.6
Cosgray	2,031	9.8
Cramer North	1,750	8.4
Cramer South	2,630	14.1
Hayden Run	4,119	22.0
Llewellyn Farms	464	2.3
Riverside	2,215	14.7

In general, the Future Land Use Plan will generate a more intense increase in city-wide flows. Under the Future Land Use Plan, the system can service up to and slightly beyond the Columbus 208 planning boundary at the proposed population densities, excluding the City of Marysville service area overlap with the City of Dublin Expansion Area, as seen in the Overall Sewersheds map. Capacity improvements are required within the Cramer South, Deer Run, North Fork Indian Run, South Fork Indian Run, and Riverside sewer-sheds. Post-improvement evaluations of Deer Run and North Fork Indian Run are recommended to determine if additional area can be served. Further evaluation of land use impacts on existing sanitary infrastructure is recommended.

Dublin Expansion Area

The Dublin expansion area to the north and west is currently not within City of Dublin corporation limits as defined by the water and sanitary sewer service agreements with the City of Columbus. Additionally, the City of Dublin planning boundary extends beyond the City of Columbus 208 boundary. The water and sanitary sewer infrastructure capacity analysis evaluated the feasibility of serving areas within existing Dublin corporation limits, the identified expansion area, and the remaining areas within the City of Dublin Planning Area Boundary.

The results of the water and sanitary sewer infrastructure capacity analysis show the sanitary sewer capacity is the limiting factor in expanding beyond the City of Columbus 208 boundary and cannot serve the full extents of the City of Dublin Planning boundary. Overall, the majority of the conclusions from the sanitary sewer capacity analysis are consistent with the conclusions from previous Community Plan utility analysis efforts. This includes:

- There are no significant capacity limitations within six of the nine City of Dublin sanitary sewersheds (Cosgray, Cramer North, Cramer South, Hayden Run, Llewellyn Farms, and Riverside).
- The Deer Run and North Fork Indian Run trunk sewers are at capacity, and in some locations exceeding capacity, under existing conditions. Capacity improvements have been previously identified and programmed in the City's Capital Improvements Program, in which post-improvement evaluation should occur to see if additional land can be included within these two sewersheds.
- The South Fork Indian Run trunk sewer has limited capacity under existing conditions.
- The downstream City of Columbus trunk sewers have been designed to accommodate 10 people per acre density, in which the average population density per the Future Land Use Plan is not exceeding.
- The City of Columbus has committed to serving the extents of the 208 boundary.
- Service for area outside the 208 boundary requires further coordination and approval from the City of Columbus.

The following are differences compared to previous Community Plan utility analysis efforts:

- Per the updated water and sanitary sewer service agreement with the City of Columbus in 2023, the City of Dublin has committed to serving the area generally bounded to the north by the Union County line, to the south by approximately 1,500 feet south of Rings Road, to the west by the Madison County line, and to the east by Houchard Road.
- The Future Land Use Plan represents a slightly higher increase in population density compared to the Current Land Use Scenario.
- The Hayden Run and Cosgray sanitary sewershed boundaries were revised in order to serve more land within the existing South Fork Indian Run sewershed.

Given the identified sanitary sewer infrastructure capacity limitations in select areas and the presence of overlapping service boundaries, the City should explore the feasibility of alternative sanitary sewer improvements to address capacity limitations in the City of Dublin's sanitary sewer collection system. The City should also continue to work with adjoining jurisdictions to explore the feasibility of coordinated water and sanitary sewer provisions that can result in greater efficiency and benefit to the entire region. It is important to note that, consistent with previous City of Dublin Community Plans, the results of the analysis provides the City with a plan along with recommendations to further explore as development occurs over time in order to achieve the goals of the Community Plan.





STORMWATER MANAGEMENT

Stormwater runoff is generated when rain or melted snow flows over land or impervious surfaces, such as paved streets, parking lots and building rooftops, and does not soak into the ground. As the runoff flows over the surfaces, it accumulates debris, chemicals, sediment or other pollutants that could adversely affect water quality if the runoff is untreated.

In natural areas, stormwater runoff is absorbed by the ground. It is filtered and ultimately replenishes underground water deposits or flows into waterways. In developed areas, impervious surfaces prevent stormwater runoff from naturally soaking into the ground. Instead, the stormwater runoff rapidly enters storm drains, storm sewer systems and drainage ditches. This can cause:

- Downstream flooding
- Contaminated waterways
- Stream bank erosion
- Increased sediment in the waterways from erosion
- Habitat destruction
- Changes in the stream flow
- Infrastructure damage

Stormwater management is the practice of controlling stormwater runoff in order to mitigate these negative impacts to the environment.

EXISTING CONDITIONS

Stormwater Management Program

The City of Dublin has implemented a comprehensive Stormwater Management Program in order to effectively manage stormwater. The Stormwater Management Program consists of the following six main components:

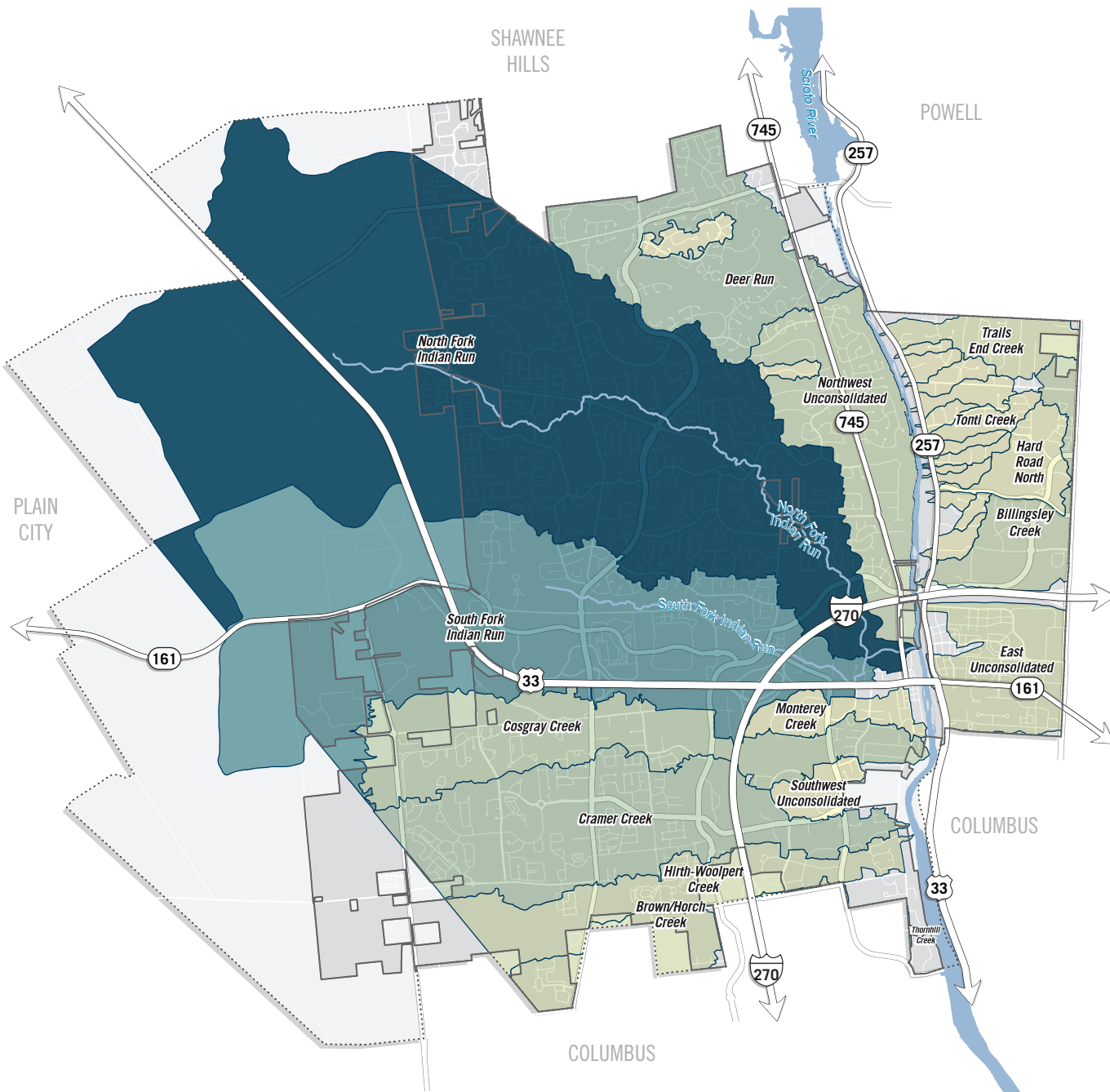
- Stormwater Master Plan
- National Pollutant Discharge Elimination System (NPDES) Permit Compliance
- Capital Improvement Projects
- Maintenance
- Chapter 53 – Stormwater Management and Stream Protection
- Chapter 151 – Flood Control

Stormwater Master Plan

Unlike the sanitary sewer collection system, stormwater flow naturally occurs by way of swales, creeks, and rivers, each of which contributes to a larger drainage area called watersheds. This means that the City needs to proactively maintain the integrity and capacity of these naturally occurring features. While stormwater management will not limit the intensity of development, the allowance for appropriately sized facilities on each development is important. The City of Dublin's Stormwater Master Plan gives the City a strong base for managing stormwater.

The Stormwater Master Plan is a document that was established in 1999 and updated in 2009. The purpose of the Stormwater Master Plan is to minimize impacts from development by establishing limits on stormwater discharges through modeling of City watersheds. The Stormwater Master Plan contains prescribed release rates per acre for all City watersheds that a developed site is not permitted by code to exceed. The sizing and design of stormwater management control measures are largely based on the prescribed release rates that are defined in the Stormwater Master Plan. The development and use of the prescribed release rates help mitigate flooding problems and improve the overall appearance and environmental quality of streams. The Stormwater Master Plan also effectively developed a drainage system map and database as well as identified capital improvement projects associated with stormwater management, many of which have been constructed.




The 2009 Stormwater Master Plan updated analysis confirmed that the City's current stormwater release rate requirements provide consistent and accepted criteria throughout the City and has minimized effects of development to the receiving streams.



City Watersheds



Context Layers

-  City of Dublin
-  River
-  Planning Area Boundary



National Pollutant Discharge Elimination System Permit Compliance

The City of Dublin is required by the United States Environmental Protection Agency to comply with its NPDES Phase II Municipal Separate Storm Sewer System (MS4) Program. This program requires local governments with fewer than 100,000 people to develop a plan to reduce stormwater pollution in order to protect and improve waterways. The Ohio Environmental Protection Agency manages the compliance of the local jurisdictions with their NPDES Phase II MS4 permits.

The program is comprised of six minimum control measures that, when implemented, should result in a significant reduction of pollutants discharged into receiving waters. The minimum control measures are:

- **Public Education and Outreach:** distribution of materials and performing outreach to inform citizens about the impacts of polluted stormwater runoff.
- **Public Participation and Involvement:** programs and events that involve people in stormwater management
- **Illicit Discharge Detection and Elimination:** detection and elimination of illegal discharges to the storm sewer system and improper disposal of waste.
- **Construction Site Runoff Control:** management of sediment, excessive runoff and pollution from construction sites.
- **Post-Construction Runoff Control:** management of stormwater runoff and pollution from development projects that are permanent facilities.
- **Pollution Prevention and Good House-keeping:** management of municipal facilities and operations to reduce pollution.

The City has developed an updated Stormwater Management Program Plan that outlines how the City will meet the minimum control measures during the current permit term. The City is required to submit an annual report that demonstrates how the City addressed each of these minimum control measures.

Capital Improvement Projects and Maintenance

The City owns and maintains a stormwater management system consisting of drainage structures, pipes, waterways, and stormwater management basins that are designed to convey stormwater runoff away from streets and buildings. The maintenance of the stormwater management system is vital in the protection of public health and safety.

The Capital Improvements Program (CIP) is a five-year outlook for anticipated capital projects and is reviewed annually by City Council, and adopted by Ordinance. The CIP provides funding for capital projects related to various City infrastructure, which includes the stormwater management system. The projects consist of both new stormwater management system infrastructure as well as the maintenance of the existing stormwater management system assets.

Chapter 53 – Stormwater Management and Stream Protection

Chapter 53 of the City of Dublin Code of Ordinances was established in 1998 and revised in 2005. Chapter 53 regulates stormwater from areas of new development and redevelopment for the purpose of protecting public health and safety and provides provisions for stream protection. Chapter 53 is the legal backing to enforce the Stormwater Master Plan, and also established the City of Dublin Stormwater Management Design Manual. The Stormwater Management Design Manual is a document that sets forth the City standards for stormwater management and provides guidance for engineers in developing plans and stormwater management calculations. The Stormwater Management Design Manual includes control for peak release rates of stormwater runoff (water quantity), water quality, and erosion and sediment on construction sites. The Stormwater Management Design Manual also provides guidelines for control measures, such as retention and detention basins.

Also codified in Chapter 53, Stream Corridor Protection Zones have added a layer of protection for stream corridors that may have otherwise been adversely effected by development and where no other regulations provided for the preservation of the riparian buffers. These zones apply to streams within Dublin that do not have federally designated floodways or floodplains. These zones will also aid to protect residents from the impacts of flooding and land loss through erosion. Chapter 53 regulates activities within the Stream Corridor Protection Zone.

Chapter 151 – Flood Control

Dublin has participated in the National Flood Insurance Program (NFIP) since 1980, administered by the Federal Emergency Management Agency (FEMA), through the adoption of Chapter 151 of the City of Dublin Code of Ordinances by Ordinance 27-80. The NFIP makes flood insurance available to property owners in communities that agree to adopt an ordinance regulating development in flood prone areas. The floodplain regulations required by NFIP are designed to accomplish three basic objectives related to flood damage protection:

- To prevent new developments from unduly increasing flood damages to others;
- To ensure that new buildings will be free from flood damage; and
- To ensure that existing buildings, when substantially damaged or improved, will be brought up to current floodplain regulations so they will be flood protected.

Dublin's code exceeds these minimum requirements. Chapter 151 requires the necessary controls and provisions, but also includes a 20 foot buffer zone to floodways. No fill shall be placed between the floodway and the base flood elevation (flood fringe) or between the floodway and 20 feet from the floodway, whichever is less.

Under NFIP, the Special Flood Hazard Area (SFHA), otherwise known as the floodplain or 1-percent chance of a flood, is the area of land that would be inundated by the base flood. This floodplain is the area regulated by Dublin for compliance with the NFIP. In addition, the floodplain limits that are shown on the FEMA Flood Insurance Rate Maps (FIRMs), FEMA publishes Flood Insurance Studies (FISs) that identify floodplain limits on many streams within the City. The limits of the floodplain are identified through engineering analysis that provides a flooding elevation at a particular location that can be compared to the ground elevations.

FUTURE PROJECTIONS

The future of stormwater management regulations will evolve over time and may include more prescriptive requirements for specific watersheds, numeric effluent limits, minimum control measures, encouragement of low-impact development design, and retrofits to restore urban hydrology.

Each state is required by Section 303(d) of the Clean Water Act (33 U.S.C. 1313), to submit a prioritized list of impaired waters to the U.S. Environmental Protection Agency (EPA) for approval. The list indicates the waters of Ohio that are currently impaired and may require total maximum daily load (TMDL) development in order to meet water quality standards.

TMDL reports identify and evaluate water quality problems in impaired water bodies and propose solutions to bring those waters to attain water quality standards. TMDLs are established for phosphorus, sediment, fecal coliform bacteria, dissolved oxygen, ammonia, floodplain capacity, bed load, and habitat. Some of the recommended solutions to address the impairments include storm water controls, point source controls, manure management, and habitat improvements. As part of the federal Clean Water Act, the U.S. EPA must review and approve each TMDL. The TMDL report for the Scioto River is under development as of early 2024.

The Ohio EPA issues the General Permit for Discharges of Stormwater Associated with Construction Activity and the Small Municipal Separate Storm Sewer Systems Permit that the City is required to comply with. The permits are updated every 5 years and were most recently issued in 2023 and 2021 respectively. The two permits complement one another, and contain provisions that require the City to maintain a stormwater management program.

Bridge Street District

The Bridge Street District is a highly walkable, urban environment within the City of Dublin. An integrated approach for stormwater management within sites in this District includes alternatives to traditional ponding of stormwater, such as the use of green roofs, permeable pavement, bio-retention facilities, rain barrels, planter boxes, etc. These practices optimize the land for creating the urban and walkable community desired. This stormwater management approach is described in the City of Dublin Stormwater Management Design Manual.

CONCLUSIONS AND RECOMMENDATIONS

Stormwater management continues to be an important part of the City's infrastructure system. The City's regulations regarding water quality, the management of stormwater, and the preservation of the natural stream corridors should be periodically reviewed and updated to comply with state and federal regulations as well as best management practices.



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