Project File Report

Township of King Water-Wastewater Master Plan

May 2026

Township of King

Table of Contents

List of Appendices

List of Figures

List of Tables

1 Introduction

1.1 Purpose

The Township of King (the Township) has retained T. Y. Lin International Canada Inc. (TYLin) to update their Water and Wastewater Master Plan within the communities of King City, Nobleton and Schomberg. The communities of King City, Nobleton and Schomberg are serviced via municipal water and wastewater networks and are currently experiencing growth.

The objective of this study is to assess any capacity deficiencies within the existing water and wastewater systems relating to the forecasted growth. The study will also identify the preferred alternatives to upgrade the systems where required to alleviate any capacity deficiencies to service the growth while providing the desired level of service to all residents and businesses.

The study will also allow the Township to coordinate municipal infrastructure planning with its Official Plan review, to ensure that the policies developed in each are compatible with one another and that the services are available in time to service the projected growth.

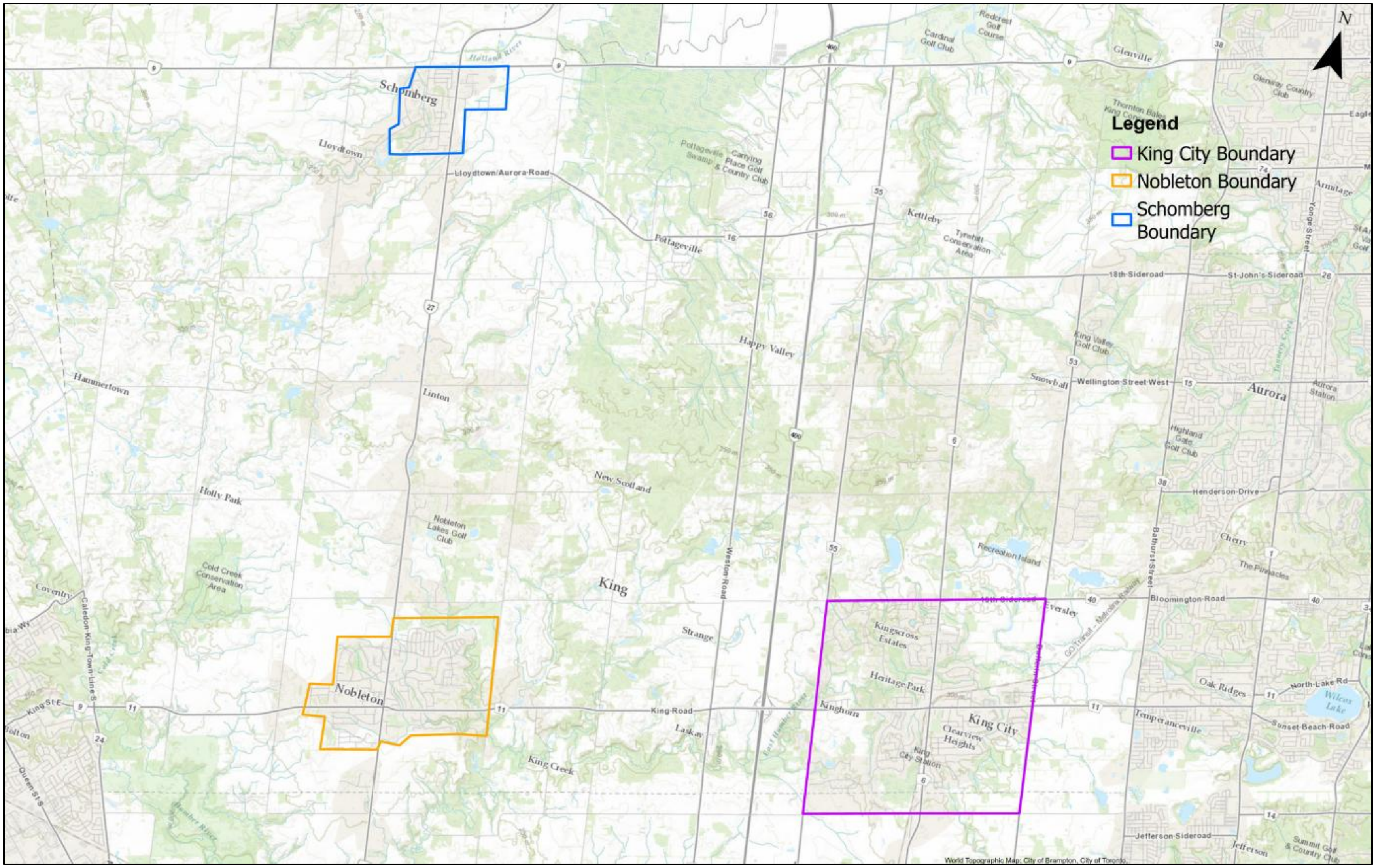
This Project File Report documents the planning process that was followed, the study area, a summary of the background information, the evaluation of the alternative water and wastewater solutions, and the preferred infrastructure upgrade solutions.

The water and wastewater master plan has been developed following the general framework of the Municipal Class Environmental Assessment (MCEA) process to provide structure and consistency in evaluating system needs. However, it is important to note that this study is not a formal MCEA. No public consultation was undertaken, and the plan does not carry the regulatory authority of an Environmental Assessment under Ontario's Environmental Assessment Act. The approach applied here is intended to guide planning decisions, while any future projects advancing under the MCEA would be required to meet the full procedural and consultation requirements of the formal process.

1.2 Study Area

The Study Area consists of the existing community boundaries for King City, Nobleton and Schomberg. The study area consists of the areas outlined in **Figure 1-1**.

Figure 1-1: Study Area within King Township



2 Background Information

The Township of King provided a variety of background information related to the water and wastewater system for the three communities. A preliminary review of the received data was conducted. This section summarizes the analysis of the information provided and TYLin's intended use of that information.

2.1 Official Plan Review

The Township of King initiated its Official Plan Review (OPR) in September 2023. The aim of the Official Plan Review is to develop a roadmap to guide growth in King to the year 2051 by reviewing the Township of King (Our King) Official Plan (2019), to align with recent changes in Provincial policy and legislation, integrate relevant policies from the York Region Official Plan (2022), and ensure the vision for King continues to meet the Township's evolving needs. A number of supporting studies, including an Employment Lands Strategy (ELS) and Growth Management Strategy (GMS) were undertaken to inform the OPR.

TYLin reviewed the GMS ELS Report and associated addendum report, prepared by Watson & Associates Economists Ltd. The Report states that King Township is expected to experience significant population growth, reaching approximately 51,000 by 2051, with a population increase of about 21,200. To accommodate this population growth, King Township will need around 7,800 new households by 2051, averaging 300 new households annually. There will be a shift from low-density housing (single and semi-detached units) to higher-density options such as townhouses and apartments.

The growth projections noted above reflect township-wide population and housing increases. Within the three primary communities, King City, Nobleton, and Schomberg—total population growth is estimated at approximately 20,780 residents, corresponding to approximately 7,700 new households over the planning horizon.

The Watson Report also states that the employment in King Township is forecast to increase by approximately 7,100 jobs between 2024 and 2051, reaching a total of 17,700 jobs. The annual employment growth rate is projected at 1.9%. Employment growth will be distributed across various land use categories, with significant contributions from Population-Related Employment (56%) and Employment Land Employment (36%).

2.2 Township of King Transportation Master Plan

Watson & Associates Economists Ltd. conducted a population, housing, and employment forecast at the traffic zone (TZ) level in 5-year increments to 2051 derived from the growth forecast allocations prepared by Watson's Growth Management Strategy (GMS) and Employment Lands Strategy (ELS) work.

As the Traffic Zones (TZs) provide a useful level of geography, they sometimes cross Village and policy area boundaries. To account for this, Watson created Small Geographic Units (SGUs) for King Township and segmented each TZ by policy area to ensure the findings of this TZ analysis align with the King GMS and ELS.

TYLin reviewed the 5-year increments population forecast for the SGUs and noted that the data is not specific to individual development areas or intensification parcels. An additional exercise was completed with the Township to break down the population growth by individual development areas, in 5 year increments.

2.3 Existing Population

The parcel GIS data was provided by the Township for TYLin to develop the Master Plan baseline model. The baseline serviced population was derived from billing account data and calculated using the Township's Design Criteria and person-per-unit (PPU) assumptions, resulting in a residential population estimate of 15,819 for King City, Nobleton and Schomberg. Because no established methodology exists for converting ICI land uses into equivalent population, a population estimate for ICI parcels was not developed. For comparison, the Township's GM & ELS estimated a mid-2025 population of 20,110 within King City, Nobleton and Schomberg. Because the Master Plan baseline reflects only the serviced residential population rather than the total Township population and relies on PPU design criteria assumptions that do not fully align with the Growth Management and Employment Land Strategy methodology nor the methodology used for the Statistics Canada post-censal population estimates, some discrepancies are expected.

2.4 York Region 2022 Water and Wastewater Master Plan

TYLin reviewed York Region's Water and Wastewater Master Plan (2022) and the Master Plan Amendment Report (2025) to identify the master plan projects relevant to the Township of King. These projects are summarized in **Table 2-1**. TYLin also examined the alignment of York Region's planned projects during the development of alternative solutions for the King Township Water and Wastewater Master Plan. Ongoing coordination with York Region will be required to maintain alignment, particularly with respect to population growth assumptions.

Table 2-1: King Township Projects Identified in the York Region Master Plan

Project Category	Project ID	Project Name	Project Description
Treatment	W8	Nobleton Water Servicing	Increase Nobleton well supply capacity in coordination with wastewater treatment expansion to accommodate the population identified in the Nobleton Servicing Class Environmental Assessment
	WW13	Nobleton Wastewater Servicing	Increase capacity of the Nobleton wastewater system (Pumping Station, Water Resources Recovery Facility and Wasewater Main) to accommodate the population identified in the Class Environmental Assessment.
Transmission, Conveyance and Pumping	WW14	King City Wastewater System Upgrades	Phase 1 - Optimize capacity of King City Sewage Pumping Station to accommodate interim growth in King City.
			Phase 2 - Expand King City wastewater pumping capacity and construct a new forcemain to accommodate long term growth in King City.

2.5 Planning Information

TYLIN received long-term population, housing, and employment growth data throughout the Township's three primary communities derived from the Growth Management and Employment Lands Strategy (GM &ELS), prepared by Watson & Associates Economists Ltd. This data along with the Township of King Official Plan Land Use Schedules and development application information served as the basis for TYLin's population growth estimates. See **Section 3** - Planning Considerations for more information.

At the time of this study, the Township's Official Plan review and update was still under review. Consequently, several assumptions were required regarding Designated Growth Areas (DGA) also referred to as Greenfield Areas, community residential intensification within the Built-Up Area (BUA), employment conversion areas, the Nobleton community and employment area expansions, and the King City commercial expansion areas. TYLin established the assumptions listed below through discussion with the Township ensuring alignment with the GM & ELS Study prepared by Watson & Associates Ltd., where possible:

- Community Residential Intensification, within the Built-Up Area (BUA):
  TYLin modeled existing and potential future intensification areas
- Community Residential, within the Designated Growth Area (DGA):
  TYLin included all growth within the DGA
- Employment Conversion Area:
  The former employment lands in Nobleton, commonly referred to as the Boynton Lands

have been converted to mixed use, including commercial, institutional and residential.

- Nobleton Community Area Expansion
  TYLin included all three original site options together, which can accommodate the 30-ha shortfall for Community Area land in Nobleton Village
- Nobleton Employment Area Expansion
  TYLin included Option 2 (Southwest Nobleton), which can accommodate the 39 ha shortfall for Employment Area land in Nobleton
- King City Commercial Expansion
  TYLin modeled the full 10 ha, services connecting at King Rd.
- Schomberg Employment Area Expansion

  Tylin modeled the full 10 ha in northeastern portion of the Village boundary

- King City White Belt Extension
  These areas were not included in the analysis presented in this report. These areas may warrant future consideration of servicing connections or looping watermains.

Following Council's endorsement of the new Official Plan, the assumptions used in this Master Plan Study should be revisited and updated as appropriate.
Refer to the Growth Management and Employment Lands Strategy Report, February 10 ,2025 and corresponding Addendum Report, June 11, 2025 prepared by Watson & Associates Economists Ltd, for more information and mapping.

2.6 Nobleton Groundwater Well Upgrades & Backwash

As part of York Region's ongoing capital initiatives, the Region is planning upgrades to the existing Nobleton Water Treatment Plant (WTP). These upgrades will result in additional backwash volumes being discharged into the Township's sanitary sewer system, requiring an assessment of downstream capacity. To support this review, TYLin examined the *Nobleton WTP Backwash Waste Sanitary Sewer Flow, Rev. 3* Technical Memo prepared by CIMA+ and ETO Engineering.

The Nobleton WTP will treat raw water from Wells 2, 5 and 6 with a maximum plant discharge flow of 96.9 L/s and an ultimate future plant discharge flow of up to 131 L/s. The Iron and Manganese filters at the Nobleton WTP will have a total filter treatment capacity of 106.6L/s across three (3) duty filters. The maximum day demand backwash volume is estimated to be 267m^3 at the maximum plant flow and 361m^3 at the ultimate plant flow.

As the backwash waste stream will be directed to the sanitary sewer system, TYLin has incorporated the estimated these discharge rates into the hydraulic model. The sanitary system is projected to receive 16 L/s by 2051, with phased flows of 8 L/s by 2031 and 12 L/s by 2041.

2.7 Wastewater Flow Monitoring Analysis

The Township provided wastewater flow monitoring data, supplied by York Region, for a total of 14 locations across the three serviced communities: 4 in King City, 8 in Nobleton, and 2 in Schomberg. The monitoring data covered the period from April to November 2024 and was used to evaluate system performance under existing conditions.

As part of this work, TYLin completed a wastewater flow monitoring analysis in February 2025 using the provided data. The analysis compared recorded flows against outputs from the existing-conditions design criteria model to assess the degree of conservatism built into the modelling approach. Based on results from the previous master plan and subsequent assessments using actual water billing and flow monitoring data, differences between the operational model and the design criteria model were anticipated. These differences can result in some sewers being flagged as capacity-deficient in the design model even though monitoring data indicates adequate performance.

The analysis completed for both King City and Nobleton was useful for screening level assessment; however, the results remain inconclusive for a detailed confirmation of available system capacity. The available flow monitoring dataset does not provide a sufficiently robust basis to fully validate wet weather response, isolate inflow and infiltration behavior, or confidently reconcile observed system performance against modelled results under a range of operating and climatic conditions.

For King City and Nobleton, a practical minimum program would be to monitor for no less 12 months, so that the data captures spring snowmelt or high groundwater conditions, summer rainfall response, and representative dry-weather periods. A shorter program may be suitable for preliminary screening, but a full seasonal cycle is generally preferred for calibration because it allows the model to be checked against both dry-weather flow and multiple wet-weather events under differing antecedent moisture conditions.The analysis also confirmed that the design criteria model significantly overpredicts maximum flow rates in Schomberg relative to the monitoring data recorded at the two gauges. This finding is consistent with past observations of monitoring data, billing rates, and other indicators showing lower-than-typical water use in Schomberg.

The analysis recommends allowing controlled surcharging of sanitary sewers in Schomberg only within the design criteria model during wet-weather events, provided the hydraulic grade line remains below basement elevations. This adjustment reflects the lower wastewater flows observed in Schomberg and helps avoid overstating capacity constraints. Refer to Appendix C for a copy of the report.

2.8 GIS Data

GIS data for the water and wastewater system for King City, Nobleton and Schomberg were received from the Township in the form of shapefiles.

2.9 Model Files

The Township provided existing water and wastewater operational hydraulic models for King City, Nobleton and Schomberg, which were last updated in 2023. The existing water distribution model is in InfoWater Pro Hydraulic Modelling software whereas sanitary sewer system is represented in InfoSewer Hydraulic Modelling software.

Existing hydraulic models were compared with the GIS data to identify any data gaps and were updated accordingly to establish baseline conditions. The water and wastewater models are critical tools in forecasting constraints through applying growth scenarios that will form the basis of the Masterplan infrastructure recommendations.

2.10 Water Billing Records

The Township provided water and wastewater consumption reports for the 3 communities for the period from January 2023 to December 2024. TYLin developed a corresponding consumption demand set. A comparative analysis was completed between the consumption-based demands and the calculated demands derived from the Township's Design Criteria. This analysis did not determine the modelling outcomes and recommendations; it served only as additional information and context.

2.11 Township of King 2021 Water/Wastewater Master Plan

TYLin reviewed the Class Environmental Assessment Water and Wastewater Plan prepared by TMIG for the Township of King for the communities of King City, Nobleton, and Schomberg. Each system was reviewed to further understand capacity requirements and constraints. Available GIS data was reviewed and compared as part of the QAQC procedures, and the Water and Wastewater models were updated accordingly.

The Class Environmental Assessment Master Plan allowed the Township to coordinate municipal infrastructure planning with its Official Plan, to ensure that the policies developed in each are compatible with one another and that the services are available in time to service the projected growth.

3 Planning Considerations

3.1 Growth Forecasts to 2051

As previously noted, the population growth within King City, Nobleton and Schomberg as noted within the Growth Management & Employment Lands Strategy Study prepared by Waston & Associates, dated June 2025 is projected to increase to about 20,780 by 2051. Through the Master Plan analysis the Population growth within the three communities is projected to increase by approximately 26,250 by 2051. The growth projections within the Master Plan are 30% greater, this variance is intentional and reflects the broader planning context under the Provincial Planning Statement, 2024 (PPS 2024). **Table 3-1** provides a comparison of the population growth projections between sources.

Table 3-1 : Comparison of Population Growth Projections to Watson Growth Management Strategy

	Population Growth to 2051 (Master Plan)	Population Growth to 2051 (Watson GMS)	2051 Population Difference	% Difference
King City	16,274	13,230	3,705	**28%**
Nobleton	8,905	6,750	2,157	**32%**
Schomberg	1,071	800	270	**34%**
Combined	**26,250**	**20,780**	**6,132**	**30%**

TYLin began the analysis using the growth forecast data from the GM & ELS Study for the Designated Growth Areas (DGA) and intensification areas. As development application data became available, this new information was incorporated into the models. Where development applications overlapped with DGA or intensification areas, the growth which projected a greater increase in population was retained to account for the most critical scenario. Information from development applications was used to form projections up to the cut-off date of April 2025. There were many instances where proposed developments in specific areas exceeded the planned population from the GM & ELS study.

The Township's Design Criteria density assumptions presented in **Section 4.2**, differ from the density assumptions provided by the Township's planning team. An analysis was undertaken to align these assumptions as closely as possible with the Township's Design Criteria; however, minor discrepancies remain.

For development or intensification areas where the dwelling type is unknown, the density assumptions provided by the planning team were applied. Conversely, the Design Criteria density assumptions were used for areas with active development applications where the dwelling type is known.

In situations where an active application produced a higher projected population than the original growth assumptions estimated using the density assumptions, the higher population estimate calculated using the Design Criteria density was adopted.

The GM & ELS population forecasts represent minimum growth targets, while the Master Plan considers a wider range of factors influencing future water and wastewater servicing needs. These additional considerations include:

- Potential future intensification opportunities within identified built-up;
- Active and pending development applications, which may exceed the minimum targets included in the GMS;
- Market driven growth pressures that influence the pace and form of new development.

By incorporating these elements, the Master Plan provides a robust assessment of long-term servicing requirements and ensures that infrastructure planning remains responsive to evolving development realities.

The higher population planning assumptions used for infrastructure purposes in this Master Plan are consistent with PPS 2024, which provides municipalities with expanded flexibility in infrastructure planning. While planning is limited to designating up to 30 years of growth, PPS 2024 provides that infrastructure planning may extend beyond the traditional 20 to 30 year timeframe, ensuring long-term servicing needs can be proactively addressed. This policy direction confirms that planning for infrastructure capacity is not limited to the minimum land-use planning horizon, enabling the Master Plan to consider long-range population potential.

Given these PPS 2024 directions, the Water & Wastewater Master Plan uses population forecasts that:

- Reflect the full servicing implications of potential future intensification,
- Incorporate known development applications and pipeline projects,
- Ensure infrastructure solutions are future-proof, resilient, and cost-effective.

This approach supports proactive long-term capital planning and ensures that infrastructure systems can accommodate growth that may exceed today's minimum population forecasts.

3.2 Incremental Growth Forecasts to 2051

For the purposes of infrastructure planning, projected growth was distributed in 5-year increments (2031, 2036, 2041 and 2046) across the planning horizon to the final year of study in 2051. This stepwise approach provides a structured basis for assessing the timing of capacity requirements, system performance, and capital needs. The sequencing applied in the analysis is an assumption developed for modelling purposes and does not represent a definitive forecast of when growth will occur. Actual development timing and distribution are subject to a range of external influences, including market conditions, approval processes, infrastructure coordination, funding, and other regulatory or economic considerations. Accordingly, the 5-year growth increments should be understood as a reasonable planning framework used to evaluate potential servicing needs under future development conditions. The incremental growth projections used in this study are estimates only and do not fully align with the incremental growth projections used in the Township's GM & ELS study.

The incremental projected growth in the Township's three primary communities under study, phased to the year 2051 is detailed in **Table 3-2**.

Table 3-2: Township of King Population Growth Projections (Master Plan)

Community	2031	2036	2041	2046	2051	Total
King City	10,696	3,667	676	600	635	**16,274**
Nobleton	5,235	2,260	507	526	378	**8,905**
Schomberg	715	46	0	310	0	**1,071**
Combined	**16,645**	**5,972**	**1,182**	**1,437**	**1,013**	**26250**

3.3 Designated Growth Areas (DGA)

As information was received, the Master Plan Models were updated to include water demands and wastewater loads expected from the DGA Residential Land. The Township provided future growth forecasts from the GM & ELS Study, for the DGA,which served as the basis for TYLin's population growth estimates. The updated development application information was then overlaid to reflect current conditions. In instances where discrepancies in population occurred between the DGA planning data and the updated development data, the higher value was applied. This approach resulted in population forecasts that exceed the original Planning estimates, ensuring that projections align with the most current information available.

DGA developments across all communities within the Township account for a projected population increase of 13,991 people, phased across forecast years indicating the expected dates of service for each development leading to 2051. Any development application submitted after April 2025 has not been considered in the analysis.

Table 3-3 summarizes the population growth expected from DGA residential land.

Table 3-3: Township of King DGA Residential Land Growth Projections

Community	2031	2036	2041	2046	2051	Total
King City	7,347	530	0	0	0	**7,887**
Nobleton	3,827	1,526	333	0	0	**5,686**
Schomberg	394	34	0	0	0	**427**
Combined	11,568	2,090	333	0	0	**13,991**

A detailed summary of the original DGA growth forecast data with the overlay of recent development application data can be found in **Appendix A.** The corresponding DGA growth forecast map for each community is provided in **Appendix B.** This information has been prepared for informational purposes only and does not constitute or imply any development approvals or decisions on behalf of the Township.

3.4 Intensification Areas

The Township provided GIS data identifying Intensification Opportunities within the three communities of King City, Nobleton, and Schomberg. These areas were classified by density and divided into existing and future Intensification Opportunities. Existing Intensification Areas include only lands where the current Land Use Designation under the Township of King Official Plan (2019) permits intensification. Future Intensification Areas represent potential new areas where intensification could occur but would require Land Use Designation changes through a future Official Plan Review.

The intensification opportunities data was then compared to the updated development information. Where intensification areas were found to correspond with development applications received throughout the modelling of the water and wastewater systems, the growth which projected a greater increase in population was retained to account for the most critical scenario. Information from development applications was used to form projections up to the cut-off date of April 2025. Between the intensification opportunities and development applications, several growth projections were duplicated. Duplicates identified by the Township were removed to avoid inflated growth projections. Furthermore, a thorough review of the GIS data was conducted to identify conflicts between developments and intensification opportunities. In instances of a complete overlap, information received with the development application was used to provide the most accurate growth projection available. In some instances, development applications were identified to be part of intensification opportunities while not representing a complete overlap. For these occurrences, the parcels were separated in the GIS data and the population from the development application was subtracted from the corresponding intensification, removing overcounted populations. The corresponding intensification areas table and map for each community are provided in **Appendix A** and **Appendix B.** This information has been prepared for informational purposes only and does not constitute or imply any development approvals or decisions on behalf of the Township. **Table 3-4** shows the phased intensification which is projected to lead to a population growth of 12,259 people.

Table 3-4: Township of King Intensification Growth Projections

Community	2031	2036	2041	2046	2051	Total
King City	3,349	3,137	676	600	635	8,396
Nobleton	1,408	734	174	526	378	3,219
Schomberg	321	12	0	310	0	644
Combined	**5,077**	**3,883**	**849**	**1,437**	**1,013**	12,259

infrastructure planning, projected growth was distributed in 5-year increments across the planning horizon. This stepwise approach provides a structured basis for assessing the timing of capacity requirements, system performance, and capital needs. The sequencing applied in the analysis is an assumption developed for modelling purposes and does not represent a definitive forecast of when growth will occur. Actual development timing and distribution are subject to a range of external influences, including market conditions, approval processes, infrastructure coordination, funding, and other regulatory or economic considerations. Accordingly, the 5-year growth increments should be understood as a reasonable planning framework used to evaluate potential servicing needs under future development conditions.

The GMS population forecasts represent minimum growth targets, while the Master Plan considers a wider range of factors influencing future water and wastewater servicing needs. These additional considerations include:

- Potential future intensification opportunities within identified built-up;
- Active and pending development applications, which may exceed the minimum targets included in the GMS;
- Market driven growth pressures that influence the pace and form of new development.

By incorporating these elements, the Master Plan provides a robust assessment of long-term servicing requirements and ensures that infrastructure planning remains responsive to evolving development realities.

4 Existing Water Infrastructure

4.1 Overview of King Township Water Distribution Systems

TYLin reviewed the provided existing models and updated the models based on the latest GIS data (KingTownship_KingCityWaterNetwork_2025July21.gdb) received from the Township. The water hydraulic model network consists of pipes, junctions, valves, reservoirs, tanks, and pumping stations.

4.1.1 Existing Water Facilities

Key infrastructure components within the water distribution system were modeled to reflect their physical characteristics and design parameters. Water treatment plants were represented as reservoir elements with fixed hydraulic grade lines (HGL), simulating the hydraulic head supplied to the network. Pumping stations were modeled using design point curves, incorporating both design head and design flow to reflect their intended performance. Elevated storage tanks were configured based on documented tank geometry, with operating levels sourced from Region Operations staff and supplemented by operations and maintenance (O&M) manuals. Groundwater wells were modeled as fixed-head reservoirs to represent their pressure contribution to the system.

It is important to note that this is a steady-state model developed based on the Township's Design Criteria, and not an operational model. As such, the model reflects idealized conditions for planning and design purposes, rather than dynamic system behavior under real-time operations.

4.1.2 Gap Analysis

As part of the data gap analysis, the hydraulic model was compared against the GIS data provided by the Township. Discrepancies in watermain sizes were identified and are summarized in **Table 4-1**. For King City and Nobleton, these discrepancies were corrected in the model to align with the GIS records. In Schomberg, several watermains were found to be missing entirely from the original model and the missing segments were added along with their associated attributes from the GIS data. These updates ensure a more complete and representative network for subsequent hydraulic analysis.

Table 4-1: Existing Water Model Gap Analysis

Community	Asset ID	Main Diameter from GIS (mm)	Watermain Diameter from Model (mm)
King City	KWWM_0271	250	150
King City	KWWM_0375	300	400

Nobleton	NWWM_0395	300	200
Nobleton	NWWM_0366	200	150
Nobleton	NWWM_0362	200	150
Nobleton	NWWM_0332	200	100
Nobleton	NWWM_0368	150	600
Nobleton	NWWM_0060	300	200
Nobleton	NWWM_0276	300	200
Nobleton	NWWM_0263	300	200
Nobleton	NWWM_0264	300	200
Nobleton	NWWM_0302	300	200
Nobleton	NWWM_0003	150	300

The water network for King City East has been constructed and was subsequently incorporated into the model as part of the existing scenario to reflect current infrastructure conditions.

Additionally, a discrepancy was identified in the GIS data for a segment of watermain along Highway 27 in Nobleton. While the GIS records indicated a 300 mm diameter, the Township confirmed that this information was incorrect. Accordingly, the model was updated to reflect the correct pipe diameter of 200 mm.

4.2 Review of Existing Design Criteria

The Township of King Design Criteria will govern the basis of analysis and required levels of service of the existing and future systems in the study area. The applicable watermain design criteria for this project are summarized below in **Table 4-2, Table 4-3** and **Table 4-4**. It is important to note that the Township's design criteria differ from York Region's water design criteria.

Table 4-2: Township of King Watermain System Servicing Design Criteria

Watermain System Servicing Design Criteria	
Fire Flow Requirement	7,000 L/min
System Pressures	
Maximum Sustained Operating Pressure	700 kPa (100 psi)
Normal Operating Pressure	350 to 480 kPa (50 to 70 psi)
Minimum Pressure during Maximum Day Demand	275 kPa (40 psi)
Minimum Pressure during Maximum Day and Fire Flow	140 kPa (20 psi)

Table 4-3: Township of King Friction Factors Criteria

Pipe Diameter	Hazen-Williams C-Factor
150mm	100
200 to 300mm	110
350 to 600mm	120
Over 600mm	130

Table 4-4: Township of King Population Density and Water Demands Criteria

Population Density and Water Demands Criteria	
Residential	
Single Detached Dwellings	3.5 ppu
Semi-Detached Dwellings	3.5 ppu
Townhouses	2.9 ppu
Apartments	2.0 ppu
Domestic Average Day Consumption Rate	370 L/capita/d
Commercial, Industrial and Institutional	
Population Density	86 persons/ha
Commercial Consumption	28 m^3/ha/d
Industrial Consumption	28 m^3/ha/d
Institutional Consumption	18 m^3/ha/d
Peaking Factors	
Maximum Day Demand	2.0
Peak Hour Demand	2.75

4.3 Water Model Update

4.3.1 Operational Model to Master Plan Model Conversion

The Township provided GIS parcel data, which TYLin used to calculate water demands in accordance with the Township's Design Criteria. The existing operational model was then converted back to steady-state models using these design-criteria flows. Master Plan scenarios were subsequently developed within the same model framework, allowing multiple scenarios to be evaluated from a single model.

In alignment with the RFP, the existing operational models were retained, and a new demand set based on the Township's Design Criteria was added to support both development review using operational flows and Master Planning analysis using design-criteria flows.

4.3.2 Consumption Data Model Development

TYLin received the 2024 consumption data and developed a corresponding consumption demand set. A comparative analysis was completed between the consumption-based demands and the calculated demands derived from the Township's Design Criteria. The total consumption for each community was compared to its total water demand. A ratio was then calculated for each community and applied to all junctions in the design criteria demand set, resulting in the updated consumption based demand set. This consumption-based analysis did not determine the modelling outcomes and recommendations; it served only as additional information and context.

4.4 Review of Existing Water Demands

The nodal demand was distributed based on land use and on a parcel-by-parcel basis.

- Parcels were assigned a number of units based on weighted densities developed for residential housing types, followed by the application of per capita consumption rates to determine water demand.
- ICI parcels were identified based on zoning and area was used for calculating demands
- Parcels were aggregated to the nearest node
- Model nodes were populated

For the water model, existing residential and ICI demands derived from the parcel data were allocated to Demand 1.

The model simulations are currently running as steady state for all scenarios in InfoWater Pro. There are four demand conditions set up under all time horizons, using Township Design Criteria:

- Average Day Demand (ADD): Represents the typical daily water demand averaged over an extended period
- Maximum Day Demand (MDD): Represents the highest total daily demand experienced
- Peak Hour Demand (PHD): Represents the highest hourly demand occurring within a day
- Maximum Day Demand Plus Fire Flow (MDD+FF): Represents maximum daily demand occurring simultaneously with firefighting flows

In addition to the demand conditions, the modelling scenarios are defined as follows:

- Baseline: Represents existing system conditions with no development added.
- Existing: Baseline conditions plus all active development applications before the cut-off date of April 2025.
- Full Build-Out: Existing scenario plus intensification areas and DGAs. As noted in Section 3, some overlaps may occur between development applications, intensification areas, and DGAs, and the approach to resolving these overlaps is detailed therein.

- Full Build-Out Plus System Upgrades: Full Build-Out conditions plus existing infrastructure upgrades and any proposed new infrastructure.

These scenario definitions are applied consistently across both the water and wastewater models.

4.5 Review of Potential Water Servicing Constraints

The existing scenario was modeled using current infrastructure and water demand conditions, incorporating approved development applications. **Sections 4.5.1** to **4.5.3** summarize the results of the existing-conditions simulations using design-criteria-based demands for King City, Nobleton, and Schomberg. The modelling results for the three communities are all provided in **Appendix D** (Figures 1 through 6).

The modelling undertaken for this Master Plan is based on planning-level assumptions and design criteria. Model results are inherently dependent on the input information and planning level assumptions and may not accurately reflect actual or future system conditions. The modelling outcomes are intended to support long-term planning and should not replace detailed engineering analysis required for design or implementation.

An alternative water-demand scenario was also developed using consumption data. While the Master Plan model scenarios were based on design criteria, which typically produce more conservative demand estimates, the consumption-based analysis was completed to provide additional context and a preliminary indication of how actual usage may compare to design assumptions. The consumption-based demand scenarios did not dictate the analysis conclusions and were used only to help inform the analysis.

The existing scenarios for King City, Nobleton, and Schomberg were simulated using the consumption-based demands, The simulation results show very minimal differences compared to the design-criteria-based simulations results.

It should be noted that an additional analysis was carried out with approved developments removed in order to evaluate true baseline conditions. It is important to note that the resulting recommended water projects outlined in Section 7 only contain projects that are triggered by future development. Details of this assessment are presented in the Alternative Servicing Solutions Technical Memorandum.

4.5.1 King City Water Modelling Results - Existing Condition

These results show that available fire flow in King City under existing Maximum Day Demand plus Fire Flow (MDD+FF) conditions ranges from 41 L/s to 704 L/s, with the highest values observed near the elevated tanks. Within the model it was identified that there are some areas under existing conditions which are experiencing low fire flow, further study and analysis is recommended. As noted previously, the modelling results are based on planning level assumptions and may not reflect actual conditions.

The simulated pressure levels across King City under existing Peak Hour Demand (PHD) conditions range from 49 psi to 85 psi, all of which fall within the required operational range.

4.5.2 Nobleton Water Modelling Results - Existing Condition

These results indicated that the available fire flow under existing MDD+FF ranges from 42 L/s to 1752 L/s, with higher values observed near the elevated tanks. Within the model it was identified that there are some areas under existing conditions which are experiencing low fire flow, further study and analysis is recommended. As noted previously, the modelling results are based on planning level assumptions and may not reflect actual conditions.

The simulated pressures in Nobleton under existing PHD conditions range from 53 psi to 99 psi, meeting the required criteria.

4.5.3 Schomberg Water Modelling Results - Existing Condition

These results show that fire flow availability in Schomberg under existing MDD+FF conditions ranges from 45 L/s to 104 L/s. Within the model it was identified that there are some areas under existing conditions which are experiencing low fire flow, further study and analysis is recommended. As noted previously, the modelling results are based on planning level assumptions and may not reflect actual conditions.

The simulated pressures across Schomberg under existing PHD conditions, ranging from 54 psi to 95 psi, which remains within acceptable operational limits.

5 Existing Wastewater Infrastructure

5.1 Overview of King Township Wastewater Systems

The pipe network consists of interconnected pipes, manholes, wet wells, pumping stations, outfalls, and other components that transport wastewater. TYLin updated the model using the most recent GIS data and record drawings from the Township. During this process, discrepancies were identified, and data gaps were filled, with assumptions made where necessary to resolve missing information.

5.1.1 Existing Wastewater Facilities

The Township's Sewage Pumping Stations were modeled in a simplified form, consisting of pumps, wet wells, and forcemains. The pumps were represented using Design Point Curves that incorporate the design flow and design head parameters. The wet well was configured based on available specifications, including minimum, maximum, and initial water levels, to reflect operational conditions. The Region SPS was modeled as the outlet point in the system, serving as the discharge location for flows conveyed through the Township's SPS infrastructure.

5.1.1.1 King City

Table 5-1 summarizes the sewage pumping stations in King City.

Table 5-1: King City Sewage Pumping Stations (SPS)

Facility	# of Pumps	Total Capacity [L/s]	Source
KSPS_0001 – Martin St. SPS	2	10.78	ECA 121-W601
KSPS_0002 - Keele St. N SPS	2	63.58	ECA 121-W601
KSPS_0003 – Alex Campbell SPS	3	135	ECA 121-W601
KSPS_0004 – Burton Grove SPS	2	19.03	ECA 121-W601
KSPS_0005 – Collard Dr. SPS	2	10.2	ECA 121-W601
KSPS_0007 – Kinghorn Rd. SPS	3	110	ECA 121-W601

Note: Sunny Acres Sewage Pumping Station within the King City East Development is constructed and operational but not fully assumed.

5.1.1.2 Nobleton

Table 5-2 summarizes the sewage pumping stations in Nobleton.

Table 5-2: Nobleton Sewage Pumping Stations

Facility	# of Pumps	Total Capacity [L/s]	Source
NSPS_0001 – Bluff Trail SPS	2	34.2	ECA 121-W601

5.1.1.3 Schomberg

Table 5-3 summarizes the sewage pumping stations in Schomberg.

Table 5-3: Schomberg Sewage Pumping Stations

Facility	# of Pumps	Total Capacity [L/s]	Source
SSPS_0001 - Proctor Rd PS	2	27	ECA 121-W601

5.1.2 Gap Analysis

A gap analysis conducted on the wastewater modeling system revealed discrepancies between the GIS data and the hydraulic model. Specifically, several invert levels were missing from the model, which compromised its accuracy and completeness. To address this issue, the absent inverts were supplemented using corresponding values extracted from the GIS database, ensuring better alignment between spatial data and model parameters. **Table 5-4** outlines the specific discrepancies identified.

Table 5-4: Wastewater Model and GIS Invert Level Discrepancies

Pipe ID	Model Upstream Invert (m)	Model Downstream Invert (m)	Updated Upstream Invert (m)	Updated Downstream Invert (m)	Length (m)	Diameter (mm)
KSPI_0457	0	0	298.564	298.014	110	200
KSPI_0459	0	0	297.968	295.430	81	200
KSPI_0520	0	294.94	295.370	294.940	38	200
KSPI_0620	0	0	296.984	296.606	57	200
KSPI_0765	282.764	0	282.764	282.762	5	450
NSPI_0502	0	0	257.976	255.140	92	300
NSPI_0504	0	0	247.980	247.818	32	200
NSPI_0636	0	0	269.670	269.150	105	200

NSPI_0685	270.78	0	270.780	268.780	71	200
NSPI_0692	278.6	0	278.600	278.100	48	200
NSPI_0698	0	273.08	273.080	272.530	45	200
NSPI_0700	0	275.18	275.180	274.300	25	200
NSPI_0711	262.68	0	262.680	262.250	41	200

In addition to the discrepancies in invert levels, the gap analysis also identified the pipes exhibiting adverse slopes in the wastewater model. These conditions, where the downstream invert is higher than the upstream invert, can lead to hydraulic inefficiencies and potential operational issues. To rectify this, the invert elevations for the affected pipes were reviewed and updated to ensure proper flow direction and model accuracy. The details of these adverse slope pipes are documented in **Table 5-5**.

Table 5-5: Pipes with Adverse Slopes Identified in Model

Pipe ID	Original Upstream Invert (m)	Original Downstream Invert (m)	Updated Upstream Invert (m)	Updated Downstream Invert (m)
NSPI_0191	255.99	256.56	255.99	255.56
NSPI_0347	256.03	257.68	258.03	257.68
NSPI_0441	253.85	253.9	253.9	253.86
NSPI_0659	277.41	277.53	277.41	277.25
NSPI_0664	277.89	277.92	277.89	277.33
NSPI_0668	272.48	272.53	275.07	272.53
NSPI_0670	272.48	272.53	272.48	270.6
NSPI_0671	267.33	269.11	270.59	269.11
NSPI_0672	265.62	265.66	267.33	265.66
NSPI_0673	265.62	265.66	265.62	264.21
NSPI_0674	264.18	264.21	264.18	263.86
NSPI_0675	263.83	263.86	263.83	263.5
NSPI_0676	261.65	261.71	263.48	263.33
NSPI_0677	261.55	261.57	261.65	261.57
NSPI_0678	261.28	261.3	261.55	261.3
NSPI_0680	267.78	268.5	268.5	267.78
NSPI_0681	264.65	264.67	264.65	264.23
NSPI_0682	265.52	265.6	265.04	264.67

NSPI_0683	265.8	265.9	265.47	265.3
NSPI_0684	265.28	265.3	265.28	265.08
NSPI_0686	268.77	268.78	268.77	266.82
NSPI_0687	265.51	265.82	265.82	265.51
NSPI_0688	275.78	275.8	275.78	275.13
NSPI_0691	277.21	277.56	277.56	276.72
NSPI_0693	278.04	278.1	278.04	277.07
NSPI_0694	276.99	277.07	276.99	275.44
NSPI_0695	275.34	275.44	275.34	273.47
NSPI_0696	273.02	273.03	273.41	273.03
NSPI_0704	269.63	269.66	270.78	269.66
NSPI_0713	271.48	273.05	271.48	269.14
NSPI_0716	267.44	268.71	268.71	267.44
NSPI_0723	261.1	262.09	262.09	261.1
NSPI_0730	261.01	261.03	261.28	261.03
NSPI_0731	261.01	261.03	261.01	260.3

Inconsistencies in pipe diameters between the GIS data and the hydraulic model were identified during the gap analysis. The actual diameters were confirmed by the Township and subsequently updated in the model to reflect accurate field conditions. **Table 5-6** presents a detailed summary of the affected pipes and the diameter adjustments made.

Table 5-6: Pipe Diameter Discrepancies and Verified Updates

Pipe ID	Model Diameter (mm)	GIS Diameter (mm)	Verified Diameter (mm)
NSPI_0021	200	300	300
NSPI_0048	300	200	300
NSPI_0162	300	375	375
NSPI_0281	300	200	300
NSPI_0705	250	<Null>	250
NSPI_0732	250	<Null>	250

5.2 Review of Existing Design Criteria

A Manning's Roughness Coefficient of 0.013 was assigned to all sewer pipe elements, based on the Township of King Design Criteria. Sanitary loads were assigned based on the Township of King Design Criteria as summarized in **Table 5-7** and **Table 5-8**. It is important to note that the Township's design criteria differ from York Region's water design criteria.

Table 5-7: Wastewater Design Criteria

Sanitary Sewer Design Criteria	
Residential Rate	370 Lpcd
Infiltration	0.21 L/s/ha
Residential Peaking Factor	Harmon, M=1 + 14 / (4 + $P^{0.5}$), where P = populations in thousands.
Industrial Peaking Factor	Mi=6.6604 * $Area^{-0.1992}$
Commercial Flows	65 m^3/ha/d, including infiltration and peaking effect
Industrial Sewage Flows	Light industry: 35 m^3/ha/d Heavy industry: 55 m3/ha/d
Schools and Institutions Sewage Flows	65 m^3/ha/d, including infiltration and peaking effect

Table 5-8: Wastewater Population Density Design Criteria

Land Use Type		Population Density
Single Family Dwelling		60 persons/ha or 3.5 persons/unit
Semi-detached and Duplex		100 persons/ha or 3.5 persons/unit
Townhouse		125 persons/ha or 2.9 persons/unit
Apartment	Low Density (62 u/ha)	150 persons/ha or 2 persons/unit
	Medium to Low Density (86 u/ha)	210 persons/ha or 2 persons/unit
	Medium Density (124 u/ha)	300 persons/ha or 2 persons/unit
	High Density (274 u/ha)	600 persons/ha or 2 persons/unit

5.3 Wastewater Model Update

5.3.1 Wastewater Model Update

- As noted in **Section 6**, the backwash discharge location and quantities for the Nobleton Water Treatment Plant, along Highway 27, have been updated. Based on estimated discharge rates, the sanitary system is projected to receive 16 L/s by 2051, with phased flows of 8 L/s by 2031 and 12 L/s by 2041. These discharge rates have been incorporated into the hydraulic model across the relevant planning scenarios.
- The Sunny Acres Sewage Pumping Station (SPS) within the King City East (KCE) development has been incorporated into the model, with sanitary flows from 13330 Dufferin Street and King Rocks directed to discharge into the Sunny Acres SPS. The location, configuration of the SPS, along with the downstream connection, were modeled based on the Sunny Acres SPS design report and associated drawings.

5.3.2 Operational Model to Master Plan Model Conversion

The Township provided GIS parcel data, which TYLin used to calculate wastewater loads in accordance with the Township's Design Criteria. The existing operational model was then converted back to steady-state models using these design-criteria flows. Master Plan scenarios were subsequently developed within the same model framework, allowing multiple scenarios to be evaluated from a single model.

5.3.3 Consumption Data Model Development

TYLin received the 2024 consumption data and developed a corresponding consumption demand set. A comparative analysis was completed between the consumption-based flow and the calculated flow derived from the Township's Design Criteria. The total consumption for each community was compared to its total wastewater load. A ratio was then calculated for each community and applied to all manholes in the design-criteria load set, resulting in the updated consumption-based load set. This consumption-based analysis did not determine the modelling outcomes and recommendations; it served only as additional information and context.

5.4 Review of Existing Wastewater Flows

The nodal load was distributed based on land use and on a parcel-by-parcel basis.

- Parcels were assigned a number of units based on weighted densities developed for residential housing types
- ICI parcels were identified based on zoning and area was used for calculating sanitary

generation loads

- Parcels were aggregated to the nearest node/conduit
- Model nodes were populated

For the existing conditions, the model is built on design criteria according to the Township's request.

5.5 Levels of Service

In this study, acceptable levels of service are defined to ensure that the sewer system functions efficiently and does not face undue pressure under different flow conditions.

- **Free flow under Dry-Weather Flow (DWF):** This condition refers to the ideal operating scenario during periods of dry weather when there is no significant rainfall. The sewer system is expected to carry wastewater without experiencing any surcharge, which means that the flow within the pipes should not exceed the pipe's capacity. In this case, the maximum flow depth should be below the top of the pipe (the obvert), ensuring that there is no backup of wastewater in the system.
- **Limited Surcharge under Wet-Weather Flow (WWF):** When it rains, the sewer system may experience an increase in flow due to inflow and infiltration (I/I) from stormwater. This can cause the system to surcharge, meaning that the flow exceeds the normal pipe capacity. However, it is acceptable for the pipes to operate under surcharge conditions, provided that the distance between the ground surface and the Hydraulic Grade Line (HGL), which represents the water level in the pipe, is greater than 1.8 meters. This ensures that even under surcharge conditions, there is enough clearance to prevent flooding or significant damage.

The criteria mentioned above are generally applied to maintain system efficiency and prevent overflows. However, exceptions may be made based on factors such as age, condition, or specific location of the pipes. For example, pipes in areas where surcharging is less critical or where mitigation measures are in place may be subject to different operational standards.

5.6 Review of Potential Sanitary Servicing Constraints

The existing condition was modeled using the current infrastructure and wastewater demands while accounting for projected loads from approved development applications. See **Section 4.4** for the model scenario definitions. **Sections 5.6.1** to **5.6.3** summarize the results of the existing-conditions simulations using design-criteria-based wastewater loads for King City, Nobleton, and Schomberg. The modelling results for the three communities are all provided in **Appendix D** (Figures 7 through 9).

The modelling undertaken for this Master Plan is based on planning-level assumptions and design criteria. Model results are inherently dependent on the input information and planning level assumptions and may not accurately reflect actual or future system conditions. The modelling outcomes are intended to support long-term planning and should not replace detailed engineering analysis required for design or implementation.

Similar to the water consumption-based analysis, an alternative wastewater load scenario was also developed using consumption data. While the Master Plan model scenarios were based on design criteria, which typically produce more conservative wastewater flow estimates, the consumption-based analysis was completed to provide additional context and a preliminary indication of how actual usage may compare to design assumptions. The consumption-based demand scenarios did not dictate the analysis conclusions and were used only to help inform the analysis.

The existing scenarios for King City, Nobleton, and Schomberg were simulated using the consumption-based wastewater loads, The simulation results show very minimal differences compared to the design-criteria-based simulations results.

It should be noted that an additional analysis was carried out with approved developments removed in order to evaluate true baseline conditions, no capacity constraints were identified under the true baselines conditions. It is important to note that the resulting recommended waste water projects outlined in Section 8 only contain projects that are triggered by future development. Details of this assessment are presented in the Alternative Servicing Solutions Technical Memorandum.

5.6.1 King City Wastewater Modelling Results – Existing Condition

The results show the pipe capacity and manhole freeboard results in King City under wet weather flow conditions. Sewer flows remain within 85% of pipe capacity across most of the network and surpass this threshold only in sections of sewer along King Road and in the south-west of King City, reaching over 100% capacity in certain pipe segments.

Manhole freeboard levels under existing conditions generally exceed 1.8 m across the study area, although localized surcharge is observed in the modelling results. Overall freeboard values range from 0 m to 13.18 m under existing conditions.

5.6.2 Nobleton Wastewater Modelling Results – Existing Condition

The results show the pipe capacity and manhole freeboard results in Nobleton under wet weather flow conditions. Within the majority of the network, sewer flows are beneath 85% of the pipe capacity, with the exception of a section of sewers along McCutcheon Avenue. In addition, the maintenance hole freeboard levels are found to exceed 1.8 m throughout most of the study area, with no signs of surcharge under existing conditions.

5.6.3 Schomberg Wastewater Modelling Results – Existing Condition

The results show the pipe capacity and manhole freeboard results under wet weather flow conditions. Sewer flows remain within 85% of pipe capacity across most of the network, with the exception of the DGA area west of Main Street, where flows exceed the 85% capacity threshold.

Manhole freeboard levels exceed 1.8 meters throughout the majority of the study area, and no signs of surcharging or flooding were identified under existing conditions. The freeboard ranges from 0.55 m to 8.27m.

As noted in **Section 7**, the Wastewater Flow Monitoring Analysis Technical Memorandum indicates that the model outputs are highly conservative relative to observed conditions. The memorandum recommends allowing pipes to surcharge during wet-weather events, provided the hydraulic grade line remains below basement elevations. Based on these findings, no wastewater projects are recommended for Schomberg under existing conditions.

6 Development and Evaluation of Alternative Solutions

This section describes the development of alternative servicing solutions considered for the water and wastewater systems in the Township of King's communities of King City, Nobleton, and Schomberg, and the evaluation methodology applied to identify the preferred alternatives for each system.

6.1 Evaluation and Selection of Broad Water & Wastewater Servicing Alternatives

Broad water and wastewater servicing alternatives were comparatively and qualitatively evaluated using criteria developed within the main categories listed in **Table 6-1**. The broad alternatives are: 1) Do nothing, 2) Limit Community Growth, 3) Water Conservation and I&I Reduction and 4) Expand and Enhance Existing Municipal Systems. These categories align with the broad definition of the environment in Ontario's Environmental Assessment Act. However, this study was not undertaken as a formal Environmental Assessment under the Act, nor was it carried out as a Municipal Class EA. Instead, the evaluation framework drew upon concepts from the MCEA process to guide the assessment of alternatives. It is also important to note that no public engagement was conducted as part of this study.

Table 6-1: Water and Wastewater Evaluation Criteria

Category	Description	Considerations
Natural Environment	The potential impacts to the natural and physical components of the environment (i.e., air, land, water and biota) including natural and/or environmentally sensitive areas	• Impact on Natural Environment • Need for Greenbelt or Oak Ridges Moraine Crossings • Impact on Terrestrial or Aquatic Habitats
Socio-Economic Environment	The potential impacts to residents, neighbourhoods, businesses, community character, social cohesion, historical/archaeological remains and heritage features, and community features	• Cultural Heritage Impacts • Transportation Impacts and Road Closures • Impacts to Residents and Businesses • Odour and Air Quality
Technical	The technical feasibility, constructability, ease of access, operation and maintenance, and other	• Hydraulic Performance • Constructability

Merit	engineering aspects of the alternative solution	
Financial Impact	The capital costs of the alternative solution	• Anticipated Construction Cost

Each of the broad servicing alternatives was scored based on its impact relative to the other alternatives, as shown in **Table 6-2**.

Table 6-2: Evaluation Scoring

Score	Relative Impacts
High	No or Positive Impact
Medium	Neutral
Low	Negative Impact

The following table presents the results of the evaluation process for each of the broad servicing alternatives considered for both the Township's water and wastewater systems. Alternative 4, being the expansion and enhancement of the Township's existing water and wastewater infrastructure, was identified as the preferred alternative as Alternatives 1 through 3 are not able to satisfy the Township's growth mandate.

Table 6-3: Evaluation of Water and Wastewater Alternatives

	ALTERNATIVE 1 *Do Nothing*	**ALTERNATIVE 2** *Limit Community Growth*	**ALTERNATIVE 3** *Water Conservation and I/I Reduction*	**ALTERNATIVE 4** *Expand and Enhance Existing Municipal Systems*
Technical Merit	This would result in the desired level of service not being provided	Does not permit the Township to achieve the Regional growth targets.	This would maximize the use of the existing built capacity but does not provide for servicing of greenfield development.	Completely addresses the growth envisioned in the Community Plans through intensification and expansions to urban boundaries. However, the local wastewater systems may be limited by the capacity of Regional facilities and the collection systems area expanded accordingly

Natural Environment	No impact but does not offer improvements to existing conditions.	No impact but does not offer improvements to existing conditions.	No impact and offers improvements to existing conditions.	Some impact as a result of construction works including creek crossings. Most construction will occur in road right-of-ways and the use of trenchless technologies will largely mitigate concerns. Offers valuable improvements to existing conditions.
Socio-Economic Environment	Could result in basement flooding associated with surcharged sanitary sewers. Minimum pressure requirements or fire flow availability might not meet the desired level-of-service	This option does not meet the growth and density objectives of the Township's Community Plans.	Socially, it can be difficult to force residents/businesses to conserve to the degree required to ensure success. Cannot guarantee long-term compliance. Greenfield development not serviced.	Modest impacts during construction, most of which will occur in outlying areas Completely satisfies the Township's growth objectives.
Financial Impact	No impact.	Minor financial investment required to address existing capacity constraints.	Modest financial investment required. If not successful, would require additional investment in implementing another solution.	Reasonable financial investment required.
OVERALL	**Cannot satisfy Township's Servicing Policies.**	**Cannot satisfy Provincially-mandated growth targets.**	**Cannot satisfy Provincially-mandated growth targets.**	**Optimal balance of benefits and impacts across all evaluation criteria while fully satisfying The Township's growth objectives.**
				PREFERRED ALTERNATIVE

6.2 Evaluation and Selection of Specific Water & Wastewater Servicing Alternatives

Within the preferred Broad Servicing Alternative, groups of specific service alternatives (projects) were reviewed and evaluated for each community. The alternatives focus on enhancing existing infrastructure while extending services into planned growth areas. They are designed to accommodate mandated development within established communities as well as new areas included in the expanded urban boundary outlined in the Township Official Plan and the GM & ELS. This approach enables the Township to make full use of available and planned municipal capacity while providing servicing to currently unserviced lands that have already been designated for future development. These specific service alternatives were reviewed in detail within the Alternative Servicing Solutions Tech Memo.

The following tables present the results of the evaluation process for each of the specific servicing alternatives considered for both the Township's water and wastewater systems.

Table 6-4: Evaluation of Water Servicing Alternatives

Option	Comparative Criterion Scoring							Rank
	Environment*		Hydraulic Performance			Financial Impact		
	Natural Impacts	Socio-Economic Impacts	Velocity **	Headloss m/km **	Fire Flow**	Capital Cost	Operation & Maintenance Cost	
King City								
A	Med	Med	High	High	Med	High	High	2
B	Med	Med	High	High	High	Low	Low	3
C	Med	Med	High	High	High	Med	Med	**1**
Nobleton								
A	Med	Med	High	High	Med	High	High	2
B	Med	Med	High	High	High	Low	Low	3
C	Med	Med	High	High	High	Med	Med	**1**
D	Low***	Med	High	High	High	Low	Low	4
Schomberg								
A	Med	Med	High	High	High	Med	Med	2
B	Med	Med	High	High	High	High	High	**1**

Score	Relative Impacts
High	No or Positive Impact
Medium	Neutral
Low	Negative Impact

* Score of preferred broad service alternative
** For hydraulic assessment summary, refer to Alternatives Memo
*** Alternative has impact on natural areas.

Table 6-5: Evaluation of Wastewater Alternatives

Option	Comparative Criterion Scoring							Rank
	Environment*		Hydraulic Performance			Financial Impact		
	Natural Impacts	Socio-Economic Impacts	Minimum Velocity**	Maintenance Hole Freeboard**	Sewer Capacity**	Capital Cost	Operation & Maintenance Cost	
King City								
A	Med	Med	High	High	High	Low	Low	4
B	Med	Med	High	High	High	High	High	**1**
C	Med	Low	High	High	High	High	Med	3
D	Med	Low	High	High	High	High	Med	2
Nobleton								
A	Med	Med	High	High	High	Med	Med	2
B	Med	Med	High	High	High	High	High	**1**
Schomberg								
A	Med	Med	High	High	High	High	High	**1**

Score	Relative Impacts
High	No or Positive Impact
Medium	Neutral
Low	Negative Impact

* Score of preferred broad service alternative

** For hydraulic assessment summary, refer to Alternatives Memo

It is important to note that the Region-owned infrastructure upgrades are not included in the Township's Master Plan and will be addressed through future Regional studies.

7 Description of Preferred Water Alternative Solutions

The preferred water servicing alternative consists of a set of projects aimed to support the ongoing use of the existing water distribution infrastructure as well as its expansion into areas that are currently undeveloped within the urban boundary. This list of projects with their preliminary cost estimates are provided in **Table 7-1** and **Table 7-3**. Plans showing the projects are provided in **Figure 7-1** and **Figure 7-2**. Refer to **Appendix F** for detailed information and phasing of each project. The timelines provided are high-level estimates that will vary based on development applications, funding availability, and other external factors, and any projections beyond ten years are indicative only. Note that the projects included in the project list are those triggered by future growth.

Appendix E provides side-by-side comparisons illustrating pre-existing conditions and post-upgrade improvements.

The triggers identified below are often the result of cumulative upstream development. Accordingly, ongoing analysis should be undertaken as development applications are received to confirm applicability and identify any emerging needs.

It should be noted that several of the identified capital water projects may have water quality implications, particularly in existing residential areas where watermain upsizing is proposed. Additional studies and investigations are recommended to confirm any potential water quality impacts associated with the larger watermains before proceeding with the upgrades. Further detailed analysis will be required during the design stage of each project to confirm all technical details.

As the Information on the regional supply side is limited, it is advisable to refer to York Region WWWMP for a full understanding of the Region’s planned water projects and their timelines/phasing.

7.1 King City Preferred Water Servicing Alternatives

This section outlines the preferred alternatives for the King City water system and describes the triggers that initiate each project. It provides an overview of the recommended improvements, summarized in **Table 7-1**, and illustrates their location and ownership in **Figure 7-1**: .

Table 7-1: Recommended Water Servicing Projects for King City

King City Water Projects					
Project ID	**Project Description**	**Trigger**	**EA Schedule**	**Total Cost (2025 Dollars)**	**Funding Source**
WAT-KING-02	Upgrade WM from 150mm to 200mm along Charles St, Melrose Ave, and John St	Providing sufficient fire flows at the minimum required pressure to support future growth	Exempt	$890,000	Local Service
WAT-KING-03	Upgrade WM from 150mm to 200mm along Langdon Dr	Providing sufficient fire flows at the minimum required pressure to support future growth	Exempt	$170,000	Local Service
WAT-KING-04	Upgrade WM from 150mm to 200mm along Findlay Ave	Providing sufficient fire flows at the minimum required pressure to support future growth	Exempt	$620,000	Local Service
WAT-KING-05	Upgrade WM from 250mm to 300mm along Burns Blvd and Station Rd	Providing sufficient fire flows at the minimum required pressure to support future growth	Exempt	$4,520,000	DC Fundable
WAT-KING-06	Upgrade WM from 150mm to 200mm along Chuck Ormsby Cres and Richard Serra Crt	Providing sufficient fire flows at the minimum required pressure to support future growth	Exempt	$710,000	Local Service
WAT-KING-08	Upgrade WM from 200mm to 250mm along Lavender Valley Rd and Spring Hill Dr	Providing sufficient fire flows at the minimum required pressure to support future growth	Exempt	$1,530,000	DC Fundable
WAT-KING-09	Proposed 300mm watermains east of Hwy 400	Servicing of future commercial area	Exempt	$4,040,000	DC Fundable
WAT-KING-10	Proposed 300mm watermains along Jane St south of King Rd	Servicing of future development	Exempt	$1,310,000	DC Fundable
WAT-KING-11	Proposed 300mm watermains connecting 2955 King Rd and existing 250mm watermain on Burns Blvd	Security of supply to approved development	Exempt	$1,980,000	DC Fundable
WAT-KING-12	Proposed 300mm watermains along	Servicing of future development	Exempt	$1,350,000	DC Fundable

	Jane St north of King Rd				
WAT-KING-13	Proposed 200mm watermains for Mansions of King	Servicing of future development	Exempt	$1,680,000	DC Fundable
WAT-LCL-01	Proposed 300mm local watermains for Bushland Heights	Servicing of future development		$1,960,000	*Local Service
WAT-LCL-02	Proposed 300mm local watermains for 2955 King Rd	Servicing of future development		$3,420,000	*Local Service
WAT-LCL-03	Proposed local watermains for 13130 and 13176 Dufferin Street	Servicing of future development		$1,830,000	*Local Service
WAT-LCL-04	Proposed local watermains from Tatton Crt to King Rd	Servicing of future development		$1,090,000	*Local Service

* All water and wastewater projects identified as local service are funded in accordance with the Local Service Policy outlined in the DC Background Study.

7.1.1 WAT-KING-02: Charles St, Melrose Ave, and John St Watermain Upgrade

This project involves upgrading the existing 150 mm watermain to a 200 mm watermain along Charles Street, Melrose Avenue, and John Street. The upgrade is required to ensure that sufficient fire flow can be provided at the minimum required pressure to support future growth within the area. This project has been deemed a local service as per the Township's Local Service Policy within the DC Background Study.

7.1.2 WAT-KING-03: Langdon Dr Watermain Upgrade

This project involves upgrading the existing 150 mm watermain along Langdon Drive to a 200 mm diameter watermain. This improvement is required to ensure sufficient fire flow at the minimum required pressure to support future growth in the area. The surrounding network is already serviced by 200 mm watermains, and this segment represents the only remaining undersized link. Upsizing this section will improve system performance and ensure the network is consistent with surrounding watermains. This project has been deemed a local service as per the Township's Local Service Policy within the DC Background Study.

7.1.3 WAT-KING-04: Findlay Ave Watermain Upgrade

This project involves upgrading the existing 150 mm watermain along Findlay Avenue to a 200 mm diameter watermain. The improvement is required to ensure sufficient fire flow at the minimum required pressure to support future growth within the area. This project has been deemed a local service as per the Township's Local Service Policy within the DC Background Study.

7.1.4 WAT-KING-05: Burns Blvd and Station Rd Watermain Upgrade

This project involves upgrading the existing 250 mm watermain to a 300 mm diameter watermain along Burns Boulevard and Station Road. Upsizing this section will complete a 300 mm loop in the local network, which will improve service reliability and better support the customers enclosed within the loop. The improvement is required to ensure sufficient fire flow at the minimum required pressure to support future growth in the area. Increasing the capacity of this segment will also enhance overall system performance as development continues.

7.1.5 WAT-KING-06: Chuck Ormsby Cres and Richard Serra Crt Watermain Upgrade

This project involves upgrading the existing 150 mm watermain to a 200 mm diameter watermain along Chuck Ormsby Crescent and Richard Serra Court. The improvement is required to ensure sufficient fire flow at the minimum required pressure to support future growth in the area. Increasing the capacity of this segment will also enhance overall system performance as development continues. This project has been deemed a local service as per the Township's Local Service Policy within the DC Background Study.

7.1.6 WAT-KING-08: Lavender Valley Rd and Spring Hill Dr Watermain Upgrade

This project involves upgrading the existing 200 mm watermain to a 250 mm diameter watermain along Lavender Valley Road and Spring Hill Drive. By increasing these 200 mm sections to 250 mm, the loop will receive higher-capacity flow from both sides, improving fire flow availability for customers along Burton Grove who are currently experiencing fire flow deficiencies and providing additional capacity to support future growth.

7.1.7 WAT-KING-09: East of Hwy 400 Proposed Watermain

This project involves installing proposed 300 mm watermains east of Highway 400 to service the planned future commercial area.

7.1.8 WAT-KING-10: Jane St South of King Rd Proposed Watermain

This project involves installing proposed 300 mm watermains along Jane Street south of King Road to service future development south of King Rd.

7.1.9 WAT-KING-11: 2955 King Rd Proposed Watermain

This project involves installing proposed 300 mm watermains to connect 2955 King Road to the existing 250 mm watermain on Burns Boulevard. This connection is required to provide security of supply for the approved development, ensuring a reliable dual-feed source and improving overall system resilience in the area.

7.1.10 WAT-KING-12: Jane St North of King Rd Proposed Watermain

This project involves installing proposed 300 mm watermains along Jane Street north of King Road to service future development north of King Rd.

7.1.11 WAT-KING-13: Mansions of King Proposed Watermain

This project involves installing proposed 200 mm watermains to service the Mansions of King development.

7.1.12 WAT-LCL-01: Bushland Heights Proposed Watermain

This project involves installing new 300 mm watermains extending from the north end of WAT-KING-12 on Jane Street, heading east to connect with WAT-KING-13. The new watermain is required to support servicing for the future Bushland Heights development. This project has been deemed a local service as per the Township's Local Service Policy within the DC Background Study.

7.1.13 WAT-LCL-02: King Jane Proposed Watermain

This project involves installing new 300 mm watermains south of King Road and east of Jane Street to provide servicing for the future King Jane development. This project has been deemed a local service as per the Township's Local Service Policy within the DC Background Study.

7.1.14 WAT-LCL-03: 1310 and 13176 Dufferin Street Proposed Watermain

This project involves installing new 150 mm watermains north of Tatton Court to provide servicing for the 13130 and 13176 Dufferin Street development. This project has been deemed a local service as per the Township's Local Service Policy within the DC Background Study.

7.1.15 WAT-LCL-04: Tatton Court to King Road Proposed Watermain

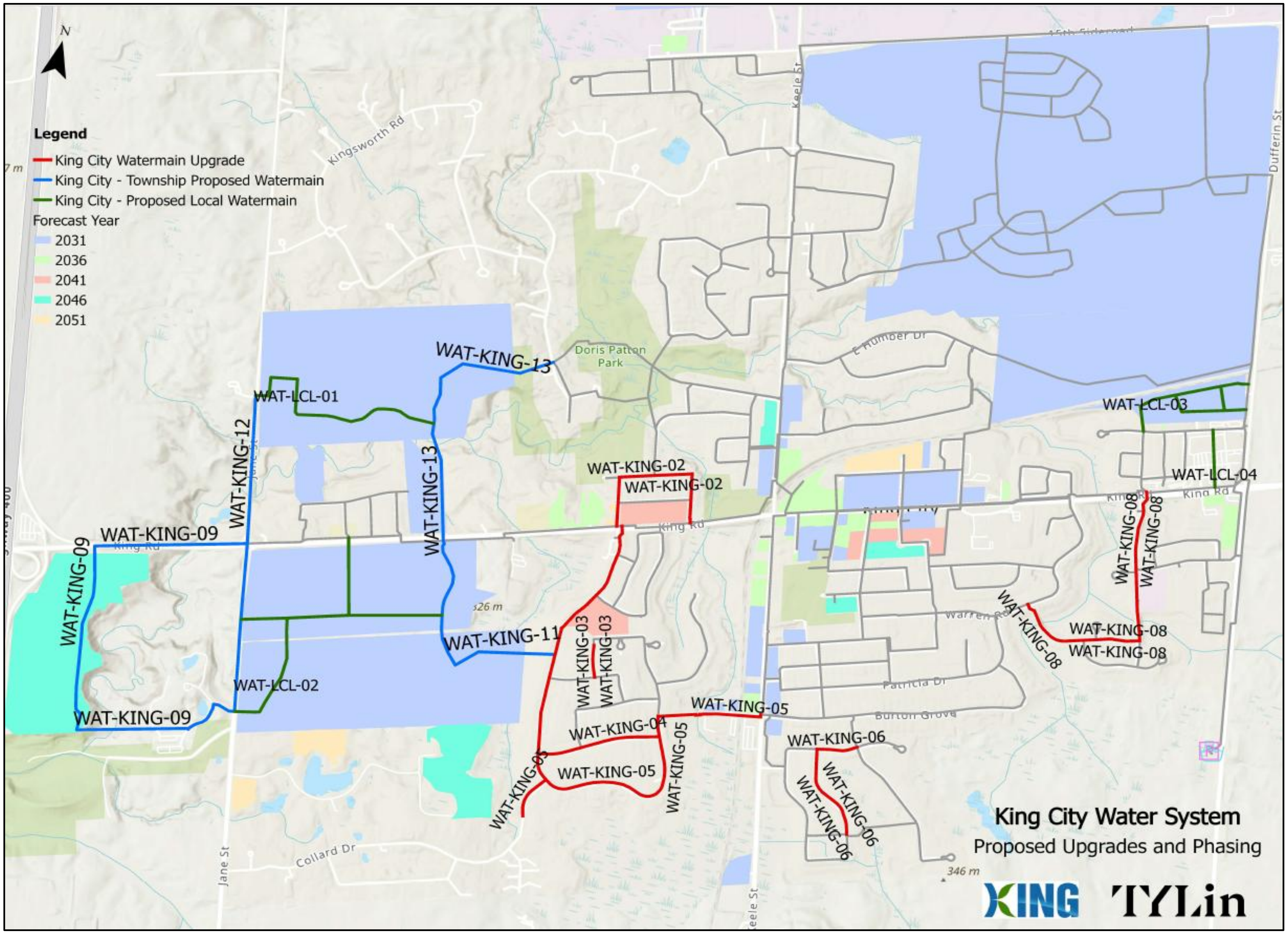
This project involves installing new 150 mm watermains from Tatton Court to King Road. This project has been deemed a local service as per the Township's Local Service Policy within the DC Background Study.

Within the set of fire-flow-related projects for King City, a priority ranking was established based on the modelled fire flow results, with lower available fire flow assigned a higher priority (see **Table 7-2**). Projects with the same priority ranking either address deficiencies within the same localized area or exhibit a similar severity of fire flow shortfall. The prioritization rankings presented are indicative only and do not establish development priority. Actual prioritization will be driven by the advancement of individual development applications.

Table 7-2: Priority Ranking of Projects Addressing Fire Flow Deficiencies

Project ID	Priority Ranking	Notes
WAT-KING-03	1	Upsize to be consistent with surrounding network; address the 24% fire-flow deficiency relative to the required 117 L/s
WAT-KING-04	1	Address the 21% fire-flow deficiency relative to the required 117 L/s
WAT-KING-06	1	Address the 23% fire-flow deficiency relative to the required 117 L/s
WAT-KING-02	2	Address the 16% fire-flow deficiency relative to the required 117 L/s
WAT-KING-05	3	Complete a 300mm loop
WAT-KING-08	3	Receive higher-capacity flow from both sides

Figure 7-1: Recommended King City Water Projects



7.2 Nobleton Preferred Water Servicing Alternatives

This section outlines the preferred alternatives for the Nobleton water system and describes the triggers that initiate each project. It provides an overview of the recommended improvements, summarized in **Table 7-3**, and illustrates their location and ownership in **Figure 7-2**.

Table 7-3: Recommended Water Servicing Projects for Nobleton

Nobleton Water Projects					
Project ID	**Project Description**	**Trigger**	**EA Schedule**	**Total Cost (2025 Dollars)**	**Funding Source**
WAT-LCL-05	Proposed 200mm WM from Ballard Dr to Oliver Emmerson Ave	Servicing of future development		$430,000	Local Service

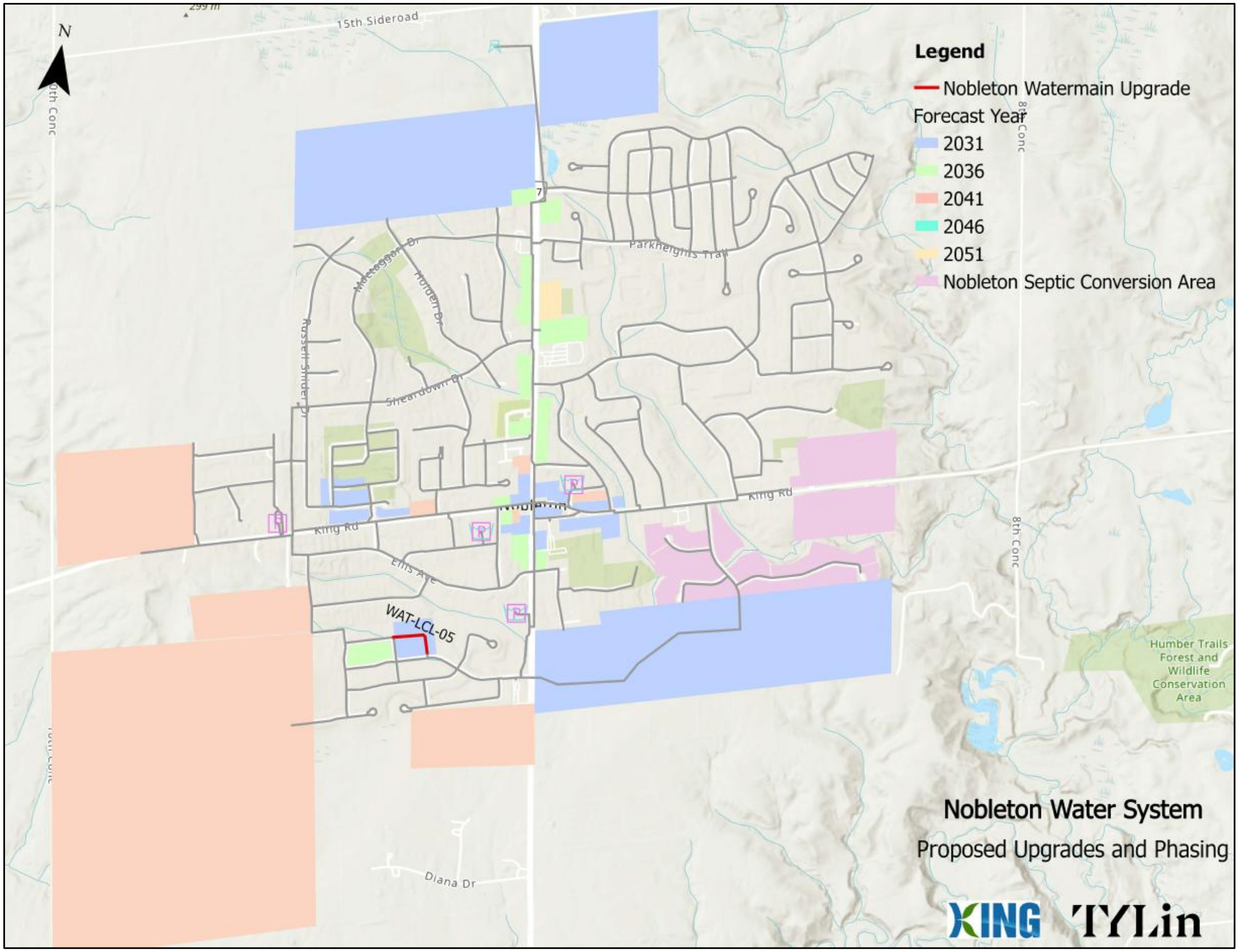
7.2.1 WAT-LCL-05: Ballard Dr to Oliver Emmerson Ave Proposed Watermain

This project contemplates installing a new 200 mm watermain from Ballard Drive to Oliver Emmerson Avenue to support the servicing of future development within the area. This project has been deemed a local service as per the Township's Local Service Policy within the DC Background Study.

7.3 Schomberg Preferred Water Servicing Alternatives

No upsizing of the water system is required to accommodate growth in Schomberg, and the analysis indicates that future development will have no negative impact on the performance of the water network.

Figure 7-2: Recommended Nobleton Water Projects



8 Description of Preferred Wastewater Alternative Solutions

The preferred wastewater servicing alternative consists of a set of projects aimed to increase the sewer capacities by increasing the sewers diameters at different locations and support the expansion areas that are currently undeveloped but within the urban boundary. The list of projects with preliminary cost estimates is provided in and . Plans showing the projects are provided in **Figure 8-1** through **Figure 8-2**. Refer to Appendix D for detailed information and phasing of each project. The timelines provided are high-level estimates that will vary based on development applications, funding availability, and other external factors, and any projections beyond ten years are indicative only. Note that the projects included in the project list are those triggered by future growth. No capacity issues, nor any corresponding wastewater projects, were identified under the baseline conditions excluding approved developments. Any problematic areas shown below are triggered by the planned development.

Appendix E provides side-by-side comparisons illustrating pre-existing conditions and post-upgrade improvements.

The triggers identified below are often the result of cumulative upstream development. Accordingly, ongoing analysis should be undertaken as development applications are received to confirm applicability and identify any emerging needs.

As the Information on the regional discharge side is limited, it is advisable to refer to York Region WWWMP for a full understanding of the Region's planned wastewater projects and their timelines/phasing. Further detailed analysis will be required during the design stage of each project to confirm all technical details.

I/I identification and reduction measures should be considered by the Township to maximize the long-term efficiency of the wastewater collection system, and to ensure that future upgrades are not triggered by excessive volumes of groundwater or stormwater entering the wastewater collection system. Excessive I/I flow effectively consumes some of the capacity within the pipes, pumping stations and treatment facilities.

8.1 King City Preferred Wastewater Servicing Alternatives

This section outlines the preferred alternatives for the King City wastewater system and describes the triggers that initiate each project. It provides an overview of the recommended improvements, summarized in , and illustrates their location and ownership in **Figure 8-1**.

Table 8-1: Recommended Wastewater Servicing Projects for King City

Project ID	Project Description	Trigger	EA Schedule	Total Cost (2025 Dollars)	Funding Source
WW-KING-01	Sewer Upgrade from 375 mm to 450mm from south of Kinghorn Rd to Kingsview SPS	Future Growth that creates sewer capacity constraints requiring sewer upgrades	Exempt	$620,000	DC Fundable
WW-KING-02	Sewer Upgrade from 375 mm to 450mm along King Rd	Future Growth that creates sewer capacity constraints requiring sewer upgrades	Exempt	$3,430,000	DC Fundable
WW-KING-03	Sewer Upgrade from 200 mm to 250mm along Bri Way and Rober Berry Cres	Future Growth that creates sewer capacity constraints requiring sewer upgrades	Exempt	$1,520,000	DC Fundable
WW-KING-05	Sewer Upgrade from 375 mm to 450mm along the sewer between Hogan Ct and Keele St, from Station Rd to King Rd	Future Growth that creates sewer capacity constraints requiring sewer upgrades	Exempt	$5,750,000	DC Fundable
WW-KING-06	Sewer Upgrade from 250 mm to 350mm along Keele St	Future Growth that creates sewer capacity constraints requiring sewer upgrades	Exempt	$1,320,000	DC Fundable
WW-KING-07	Sewer Upgrade from 450 mm to 525mm along King Rd from Keele St to William St	Future Growth that creates sewer capacity constraints requiring sewer upgrades	Exempt	$3,580,000	DC Fundable
WW-KING-08	Sewer Upgrade from 200 mm to 250mm along King Rd and Alex Campbell Cres	Future Growth that creates sewer capacity constraints requiring sewer upgrades	Exempt	$2,200,000	Local Service

WW-KING-10	Upgrade of Alex Campbell SPS (130 to 150 L/s) (Forcemain 300mm, L= 700m, No Forcemain Upgrade)	Future growth that increases flows beyond the SPS's available capacity	Exempt	$730,000	DC Fundable
WW-KING-11	Upgrade of Kinghorn SPS (110 L/s to 152 L/s) (Forcemain 350mm, L= 1000m, No Forcemain Upgrade)	Future growth that increases flows beyond the SPS's available capacity	Exempt	$2,180,000	DC Fundable

The estimated cost for SPS upgrade assumes no upsizing or modification of the existing wet well and does not include the addition of extra pumps. The scope is limited to the replacement of the existing sanitary pumps with new pumps sized to meet the required duty point, The estimate is intended to cover pump replacement, including the supply and installation of the replacement pumps and the normal associated appurtenances for a municipal pump setup, but excluding any increase in wet well volume, structural expansion, or creation of additional wet well capacity. No allowance has been made to add new wet well chambers, enlarging the existing wet well, or changing the station layout; the intent is to maintain the existing wet well configuration and replace the pumps with units appropriate for future flows and head requirements.

8.1.1 WW-KING-01: South of Kinghorn Rd to Kingsview SPS Sewer Upgrade

This project contemplates upsizing of the existing sewers south of Kinghorn Rd upstream of the Kingsview Sewage Pumping Station from 375mm to 400mm. This infrastructure upgrade is recommended, as it will provide additional capacity required to service the existing system and planned future development.

8.1.2 WW-KING-02: King Rd Sewer Upgrade

This project contemplates upsizing the existing sewers along King Road from 375 mm to 450 mm. This infrastructure upgrade is recommended, as it will provide the additional capacity required to service the existing system and accommodate future growth that is expected to create sewer capacity constraints.

8.1.3 WW-KING-03: Bri Way and Robert Berry Cres Sewer Upgrade

This project contemplates upsizing the existing sewers along Bri Way and Robert Berry Crescent from 200 mm to 250 mm. This infrastructure upgrade is recommended, as it will provide the additional capacity required to service the existing system and accommodate future growth that is expected to create sewer capacity constraints.

8.1.4 WW-KING-05: Sewer Upgrade between Hogan Ct and Keele St, from Station Rd to King Rd

This project contemplates upsizing the existing sewers between Hogan Court and Keele Street, from Station Road to King Road, from 375 mm to 450 mm. This infrastructure upgrade is recommended, as it will provide the additional capacity required to service the existing system and accommodate future growth that is expected to create surcharging issues.

8.1.5 WW-KING-06: Keele St Sewer Upgrade

This project contemplates upsizing the existing sewers along Keele Street from 250 mm to 350 mm. This infrastructure upgrade is recommended, as it will provide the additional capacity required to service the existing system and accommodate future growth that is expected to create sewer surcharging issues.

8.1.6 WW-KING-07: King Rd from Keele St to William St Sewer Upgrade

This project contemplates upsizing the existing sewers along King Road, from Keele Street to William Street, from 450 mm to 525 mm. This infrastructure upgrade is recommended, as it will provide the additional capacity required to service the existing system and accommodate future growth that is expected to create sewer surcharging issues.

8.1.7 WW-KING-08: King Rd and Alex Campbell Cres Sewer Upgrade

This project contemplates upsizing the existing sewers along King Road and Alex Campbell Crescent from 200 mm to 250 mm. This infrastructure upgrade is recommended, as it will provide the additional capacity required to service the existing system and accommodate future growth that is expected to create sewer surcharging issues. This project has been deemed a local service as per the Township's Local Service Policy within the DC Background Study.

8.1.8 WW-KING-10: Upgrade of Alex Campbell SPS (130 to 150 L/s)

The existing firm capacity of Alex Campbell Sewage Pumping Station is approximately 130 L/s, and the planned upgrade will increase this capacity to 150 L/s. This infrastructure upgrade is recommended, as future growth is expected to increase flows beyond the station's available capacity. The station can achieve this increase without adding new pumps or replacing the existing units. Instead, the upgrade will involve modifying the existing pumps, likely through impeller adjustments to achieve a higher output.

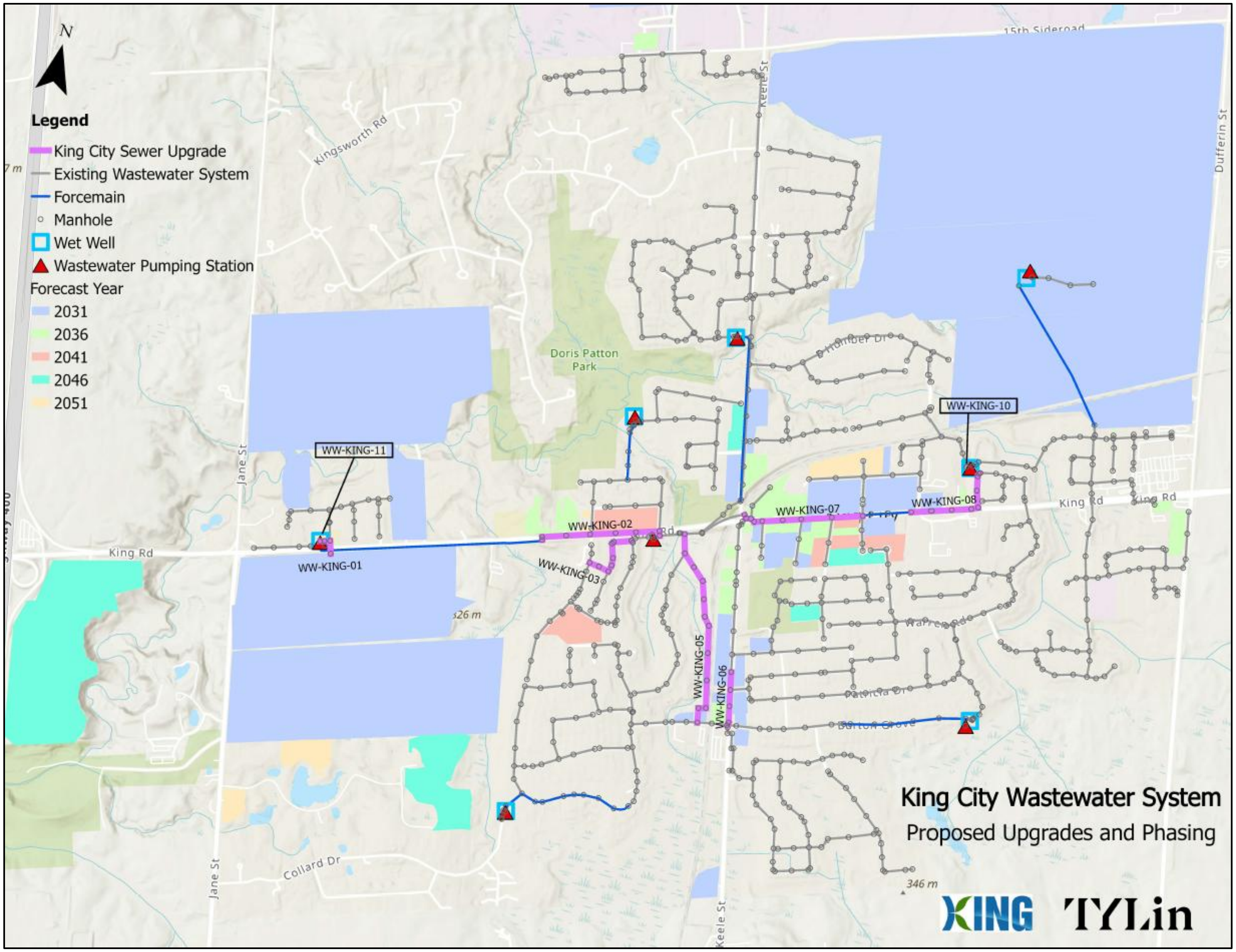
The station's wet well volume and forcemain capacity are sufficient to support the increased pumping rate, and no new wet well or forcemain construction is required. The total number of pumps and the existing station configuration will remain unchanged, with improvements focused solely on optimizing the performance of the current pumping equipment.

8.1.9 WW-KING-11: Upgrade of Kinghorn SPS (110 L/s to 152 L/s)

The Kinghorn SPS currently provides a firm capacity of 110 L/s with two pumps operating. The proposed upgrade will increase the firm capacity to 152 L/s. This infrastructure upgrade is recommended, as future growth is expected to increase flows beyond the station's available capacity. This upgrade will require replacement of the existing pumps with higher capacity.

The station floor plan, wet well size, and cast-in-place suction and discharge piping were originally designed to support higher capacities and can accommodate pump capacities two to three times greater than the current rating. As a result, the pump replacements can be completed within the existing station configuration, and no new wet well or forcemain infrastructure is required.

Figure 8-1: Recommended King City Wastewater Projects



8.2 Nobleton Preferred Wastewater Servicing Alternatives

This section outlines the preferred alternatives for the Nobleton water system and describes the triggers that initiate each project. It provides an overview of the recommended improvements, summarized in , and illustrates their location and ownership in **Figure 8-2**.

Table 8-2: Recommended Wastewater Servicing Projects for Nobleton

Project ID	Project Description	Trigger	EA Schedule	Total Cost (2025 Dollars)	Funding Source
WW-NOBL-01	Sewer Upgrade from 200 mm to 250mm along McCutcheon Ave	Future Growth that creates sewer capacity constraints requiring sewer upgrades	Exempt	$2,550,000	Local Service
WW-NOBL-02	Sewer Upgrade from 200 mm to 450mm along Hill Farm Rd and Lynwood Cres	Future Growth that creates sewer capacity constraints requiring sewer upgrades	Exempt	$4,830,000	DC Fundable
WW-NOBL-03	Sewer Upgrade from 200 mm to 250mm along Hwy 27	Future Growth that creates sewer capacity constraints requiring sewer upgrades	Exempt	$320,000	Local Service
WW-NOBL-04	Sewer Upgrade from 200 mm to 300mm along Old King Rd;	Future Growth that creates sewer capacity constraints requiring sewer upgrades	Exempt	$2,770,000	DC Fundable
	Sewer Upgrade from 250 mm to 300mm along King Rd	Future Growth that creates sewer capacity constraints requiring sewer upgrades	Exempt		
WW-NOBL-05	Sewer Upgrade from 200 mm to 250mm along Paradise Valley Trail and Kettle Vly Trl	Future Growth that creates sewer capacity constraints requiring sewer upgrades	Exempt	$1,590,000	Local Service
WW-NOBL-06	Sewer Upgrade from 200 mm to 300mm along	Future Growth that creates sewer capacity constraints	Exempt	$440,000	DC Fundable

	Parkheigths Trail	requiring sewer upgrades			
WW-NOBL-07	Sewer Upgrade from 300 mm to 450 mm through Nobleton Park pipe	Nobleton west employment land that creates sewer capacity constraints requiring sewer upgrades	Exempt	$1,450,000	DC Fundable
WW-NOBL-07-A	Sewer Upgrade from 300 mm to 450 mm along Parkview pipe	Nobleton west employment land that creates sewer capacity constraints requiring sewer upgrades	Exempt	$870,000	DC Fundable
WW-NOBL-07-B	Sewer Upgrade from 300 mm to 400 mm along Crestview Rd	Nobleton west employment land that creates sewer capacity constraints requiring sewer upgrades	Exempt	$1,540,000	DC Fundable
	Sewer Upgrade from 250 mm to 400 mm from Crestview to Highway 27	Nobleton west employment land that creates sewer capacity constraints requiring sewer upgrades	Exempt	$1,140,000	DC Fundable
WW-NOBL-07-C	Sewer Upgrade from 250 mm to 400 mm along Highway 27	Nobleton west employment land that creates sewer capacity constraints requiring sewer upgrades	Exempt	$1,380,000	DC Fundable
WW-NOBL-07-D	Sewer Upgrade from 250 mm to 400 mm along Oliver Emerson Ave	Nobleton west employment land that creates sewer capacity constraints and manhole flooding requiring sewer upgrades	Exempt	$1,800,000	DC Fundable
WW-NOBL-07-E	Sewer Upgrade from 200 mm to 300 mm along Larkie Ave	Nobleton west employment land that creates sewer capacity constraints requiring sewer upgrades	Exempt	$2,620,000	DC Fundable

WW-NOBL-07-F	Sewer Upgrade from 200 mm to 300 mm along Wilkie Ave	Nobleton west employment land that creates sewer capacity constraints requiring sewer upgrades	Exempt	$560,000	DC Fundable
WW-NOBL-08	Sewer Upgrade from 600 mm to 750mm near Janet Ave to SPS	Nobleton west employment land that creates sewer capacity constraints requiring sewer upgrades	Exempt	$360,000	DC Fundable

8.2.1 WW-NOBL-01: McCutcheon Ave Sewer Upgrade

This project contemplates upsizing the existing sewers along McCutcheon Avenue from 200 mm to 250 mm. This infrastructure upgrade is recommended, as it will provide the additional capacity required to service the existing system and accommodate future growth that is expected to create sewer surcharging issues. This project has been deemed a local service as per the Township's Local Service Policy within the DC Background Study.

8.2.2 WW-NOBL-02: Hill Farm Rd and Lynwood Cres Sewer Upgrade

This project contemplates upsizing the existing sewers along Hill Farm Road and Lynwood Crescent from 200 mm to 450 mm. This infrastructure upgrade is recommended, as it will provide the additional capacity required to service the existing system and accommodate future growth that is expected to create sewer capacity constraints.

8.2.3 WW-NOBL-03: Hwy 27 Sewer Upgrade

This project contemplates upsizing the existing sewers along Highway 27 from 200 mm to 250 mm. This infrastructure upgrade is recommended, as it will provide the additional capacity required to service the existing system and accommodate future growth that is expected to create sewer surcharging issues. This project has been deemed a local service as per the Township's Local Service Policy within the DC Background Study.

8.2.4 WW-NOBL-04: Old King Rd and King Rd Sewer Upgrade

This project includes two components:

- Upsizing the existing sewers along Old King Road from 200 mm to 300 mm.
- Upsizing the existing sewers along King Road from 250 mm to 300 mm.

These two upgrades are recommended, as it will provide the additional capacity required to service the existing system and accommodate future growth that is expected to create sewer surcharging issues.

8.2.5 WW-NOBL-05: Paradise Valley Trail and Kettle Vly Trl Sewer Upgrade

This project contemplates upsizing the existing sewers along Paradise Valley Trail and Kettle Valley Trail from 200 mm to 250 mm. It is recommended that the slopes of sewers NSPI_0474 and NSPI_0189 be revised, as the current slopes are insufficiently steep. Even with the increased diameter, both sewers continue to exhibit capacity deficiencies under the existing slope conditions. However, these deficiencies can be mitigated by increasing the slopes, utilizing the available depth in the adjacent manholes, while maintaining the proposed 250 mm diameter. This infrastructure upgrade is recommended, as it will provide the additional capacity required to service the existing system and accommodate future growth that is expected to create sewer surcharging issues. This project has been deemed a local service as per the Township's Local Service Policy within the DC Background Study.

8.2.6 WW-NOBL-06: Parkheigths Trail Sewer Upgrade

This project contemplates upsizing the existing sewers along Parkheights Trail from 200 mm to 300 mm. This infrastructure upgrade is recommended, as it will provide the additional capacity required to service the existing system and accommodate future growth that is expected to create sewer capacity constraints.

8.2.7 WW-NOBL-07: Nobleton Park Sewer Upgrade

This project contemplates upsizing the existing sewers through Nobleton Park from 300 mm to 450 mm. This infrastructure upgrade is recommended, as it will provide the additional capacity required to service the existing system and accommodate future growth within the Nobleton west employment area, which is expected to create sewer surcharging issues.

8.2.8 WW-NOBL-07-A: Parkview Sewer Upgrade

This project contemplates upsizing the existing sewers along Parkview from 300 mm to 450 mm. This infrastructure upgrade is recommended, as it will provide the additional capacity required to service the existing system and accommodate future growth within the Nobleton west employment area, which is expected to create sewer surcharging issues.

8.2.9 WW-NOBL-07-B: Crestview Rd and Crestview Rd to Hwy 27 Sewer Upgrade

This project involves upsizing the existing sewers along Crestview Road from 300 mm to 400 mm and the sewers from Crestview Road to Highway 27 from 250 mm to 400 mm.

These infrastructure upgrades are recommended, as they will provide the additional capacity required to service the existing system and accommodate future growth within the Nobleton west employment area, which is expected to create sewer capacity constraints and surcharging issues.

8.2.10 WW-NOBL-07-C: Highway 27 Sewer Upgrade

This project contemplates upsizing the existing sewers along Highway 27 from 250 mm to 400 mm. This infrastructure upgrade is recommended, as it will provide the additional capacity required to service the existing system and accommodate future growth within the Nobleton west employment area, which is expected to create sewer surcharging issues.

8.2.11 WW-NOBL-07-D: Oliver Emerson Ave Sewer Upgrade

This project contemplates upsizing the existing sewers along Oliver Emerson Avenue from 250 mm to 400 mm. This infrastructure upgrade is recommended, as it will provide the additional capacity required to service the existing system and accommodate future growth within the Nobleton west employment area, where sewer surcharging and manhole flooding have been identified.

8.2.12 WW-NOBL-07-E: Larkie Ave Sewer Upgrade

This project contemplates upsizing the existing sewers along Larkie Avenue from 200 mm to 300 mm. This infrastructure upgrade is recommended, as it will provide the additional capacity required to service the existing system and accommodate future growth within the Nobleton west employment area, which is expected to create sewer capacity constraints.

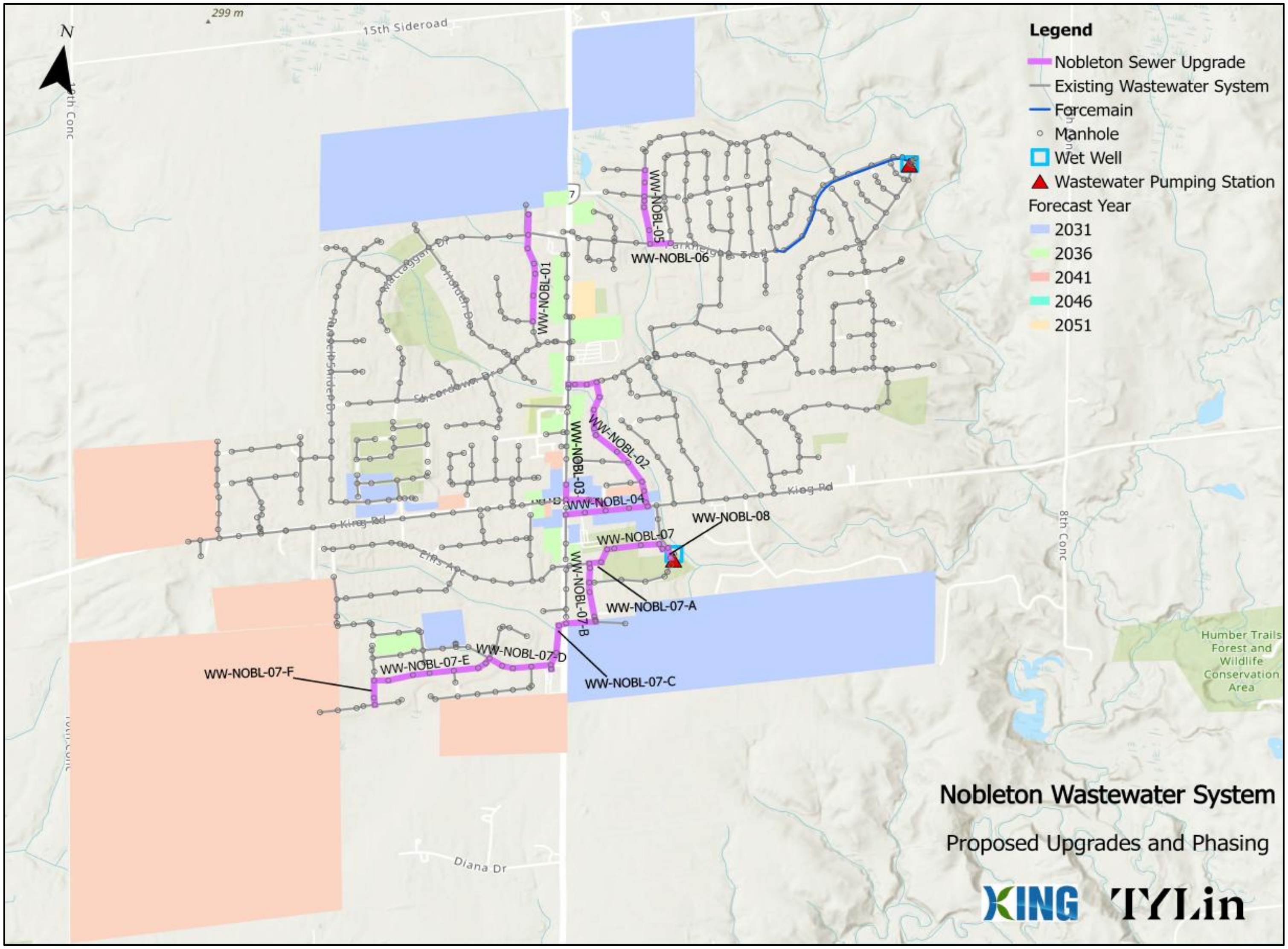
8.2.13 WW-NOBL-07-F: Wilkie Ave Sewer Upgrade

This project contemplates upsizing the existing sewers along Wilkie Avenue from 200 mm to 300 mm. This infrastructure upgrade is recommended, as it will provide the additional capacity required to service the existing system and accommodate future growth within the Nobleton west employment area, which is expected to create sewer surcharging issues.

8.2.14 WW-NOBL-08: Janet Ave to SPS Sewer Upgrade

This project contemplates upsizing the existing sewers near Janet Avenue to the sewage pumping station from 600 mm to 750 mm. Under the 2051 loading conditions, this sewer is projected to operate above 85% of its capacity, so upsizing is required to ensure it can accommodate all future growth.

Figure 8-2: Recommended Nobleton Wastewater Projects



8.3 Schomberg Preferred Wastewater Servicing Alternatives

Minimal wastewater capacity constraints were identified in the community of Schomberg. Wastewater flow monitoring analysis completed in February 2025 shows that the hydraulic model significantly overpredicts peak flow rates when compared with the recorded monitoring data.

The Wastewater Flow Monitoring Analysis Technical Memorandum notes that the model outputs are highly conservative relative to observed conditions. It recommends allowing pipes to surcharge during wet-weather events, provided the hydraulic grade line remains below basement elevations.

Under 2051 full-buildout wet-weather conditions, the master plan model indicates that while several pipes do surcharge, hydraulic grades remain below basement levels, in which case system upgrades should not be triggered. Consequently, no community-specific servicing alternatives were developed.

9 Conclusions and Recommendations

The Township of King is experiencing significant growth, necessitating improvements and upgrades to its water and wastewater infrastructure to meet current and future demands up to 2051. While planning is limited to designating up to 30 years of growth, PPS 2024 provides that infrastructure planning may extend beyond the traditional 20- to 30-year timeframe.

A desktop capacity assessment was conducted for all water and wastewater systems, identifying constraints across, the networks, the storage facilities, and the sewage pumping stations. The sanitary collection systems and water distribution systems were also analyzed for the projected planned growth.

As part of this exercise, water and wastewater projects were identified to support planned growth and a planning horizon was established for implementing these projects in the near term and in 2031, 2036, 2041, 2046 and 2051.

To support long-term planning, it is important to note that development timing is inherently unpredictable. As new development applications are submitted to the Township, the Master Plan model must be updated with the associated demands, flows, and servicing sequences. This ongoing model maintenance is essential to identify required upgrades early and to ensure that infrastructure improvements are implemented in time to meet projected growth.

Beyond the capital projects identified, this Master Plan emphasizes a broader set of short- and long-term monitoring activities and programs that will strengthen the Township's understanding of system performance and support proactive, evidence-based infrastructure planning. A major priority for the Township should be improving the quality, resolution, and consistency of system data. Better data directly improves model accuracy, operational decision-making, and long-term capital planning. Further study is also recommended to support continuous improvement of the Township's water and wastewater systems and to ensure that future planning decisions are informed by reliable, high-quality data. These studies should build directly on the monitoring and data collection initiatives outlined in the previous section, using enhanced datasets to refine system understanding, improve model accuracy, and guide long-term infrastructure planning.

9.1.1 Hydrant Flow Testing

Hydrant flow testing should be undertaken to support calibration and validation of the hydraulic model. These tests must follow NFPA 291 procedures and be completed with accurate operational information, including reservoir levels, valve status, and pump operation, to ensure that observed results can be reliably compared to model predictions.

9.1.2 District Metered Area Monitoring Program

A District Metered Area (DMA) is recommended within the water distribution system where all inflow is measured through one or more metered points, allowing the Township to accurately track consumption, leakage, and pressure behavior at a localized scale. Establishing DMAs provides detailed flow and pressure data that cannot be obtained from system-wide monitoring alone, making them a critical component of the Township's data-collection and flow-monitoring strategy. This information directly supports model calibration, non-revenue water analysis, and future water conservation planning.

9.1.3 System-Wide Consumption Data Collection

To further improve the accuracy and reliability of future modelling efforts, the Township should also collect more comprehensive system-wide consumption data that extends beyond DMA boundaries. This includes diurnal demand patterns, seasonal variation, spatial distribution of usage, customer-level consumption records, and enhanced SCADA information. These broader datasets will complement DMA monitoring by providing a complete picture of how water is used across the entire system, supporting the development of an improved operational model and enabling more representative, consumption-based assessments.

9.1.4 SCADA System Enhancements

Improvements to network flow metering and flow monitoring at sewage pumping stations should also be considered as part of the Township's ongoing SCADA integration program. Upgrading or installing permanent flow meters at key locations will provide more reliable and continuous flow data, which can be integrated directly into the Township's SCADA system for trending, analysis, and model calibration. These enhancements will strengthen both water and wastewater monitoring capabilities and will require coordination with York Region to ensure data compatibility and consistent reporting standards across interconnected systems.

The Township may consider further integration of advanced SCADA functionality to support real-time operational decision-making at pumping stations. Potential measures include flow- and rainfall-responsive pump control, automated alarm thresholds for high-flow conditions, and trend-based performance monitoring. These measures could improve system reliability during extreme weather events and support more proactive operation and maintenance practices.

9.1.5 Wastewater Flow Monitoring

For the wastewater system, the flow monitoring analysis completed for both King City and Nobleton provided useful information for a screening-level assessment; however, the results remain insufficient for a detailed confirmation of available system capacity. The available flow monitoring dataset does not provide a sufficiently robust basis to fully validate wet weather response, isolate inflow and infiltration behavior, or confidently reconcile observed system performance against modelled results under a range of operating and climatic conditions.

To support a more reliable evaluation, a practical monitoring program for no less 12 months would be required for King City and Nobleton, so that the data captures spring snowmelt or high groundwater conditions, summer rainfall response, and representative dry-weather periods. A shorter program may be suitable for preliminary screening, but a full seasonal cycle is generally preferred for calibration because it allows the model to be checked against both dry-weather flow and multiple wet-weather events under differing antecedent moisture conditions.

9.1.6 Water Conservation and I&I Reduction

The Township would benefit from a focused review of potential water conservation programs that could be implemented to reduce system demand and improve long-term sustainability. This work should draw on the detailed consumption data, DMA flow information, and continuous pressure and flow monitoring collected through the recommended monitoring program. With these datasets, the Township can evaluate opportunities for leak detection analysis, non-revenue water reduction strategies, and targeted public education programs. In parallel, further study of inflow and infiltration (I&I) reduction strategies is recommended to identify priority areas for rehabilitation. The expanded sanitary sewer flow monitoring and sewage pumping station data will allow the Township to quantify I&I more accurately, assess the effectiveness of rehabilitation measures, and develop a structured, long-term I&I reduction plan.

9.1.7 Model Calibration and Validation

A comprehensive calibration and validation program is recommended to improve the accuracy and reliability of the Township's hydraulic models. This work should rely heavily on the new monitoring data collected across the system, including hydrant flow testing results, continuous pressure and flow measurements, reservoir level trends, updated SCADA information, and seasonal wastewater flow monitoring. Flow data obtained from sanitary pump station drawdown testing should also be incorporated, as it provides direct verification of pump performance and actual station discharge rates. To support a future dynamic Dry and Wet Weather Flow model, the system will need targeted field data, including flow-monitoring at key sewer locations and local rainfall gauges to capture rainfall-dependent I&I behaviour. These datasets can then be used to calibrate a rainfall-responsive WWF model, replacing the current I&I allowance of 0.26 L/s/ha and providing a more accurate representation of wet-weather system performance.

Calibration should be undertaken using data that captures a full range of operating and seasonal conditions, ensuring that the models accurately reflect real-world system behavior. Once calibrated, the models should be validated against independent datasets to confirm that they reliably reproduce observed system responses. A fully calibrated and validated model will provide a stronger foundation for operational decision-making, capital planning, and future Master Plan updates.

9.1.8 Water Quality Analysis

Water capital projects were identified; however, the water quality implications of the proposed watermain upsizing require additional investigation. Further study is recommended to confirm whether larger diameter pipes could reduce system velocities and increase water age, which may affect disinfectant residuals, turnover rates, and overall water quality within the distribution system. This assessment should evaluate existing and projected demand conditions, reservoir turnover, and operational strategies to ensure that any upgrades maintain compliance with water quality objectives. Confirming these potential impacts before advancing the upgrades will help ensure that capital investments support both capacity and water quality goals.

9.1.9 Consequences of Failure Analysis

Consequences of Failure analysis are recommended for both the water and wastewater systems to assess the impacts of pipe or asset failure and to identify vulnerable junctions, sewers, forcemains, or service areas. The analysis will help quantify potential service disruptions, environmental impacts, operational risks, and customer consequences associated with asset failure. This information will support risk-based asset management, prioritization of capital upgrades, and long-term system planning.

Table 9-1 provides an overview of the recommended project timeline along with the estimated duration of each phase.

Table 9-1 Recommended Programs/Studies Estimated Timeline

Program/Study	Recommended Timeline	Estimated Duration	Estimated Budget (CAD) (Contingencies Included)
Hydrant Flow Testing	Short-term (to be repeated every 5 years)	1 year	15,000 (Priority Areas only)
DMA Program	Medium- to long-term	5 years	125,000
Consumption Data Collection	Short-term	1-2 years	175,000
SCADA Enhancement	Medium- to long-term	5 years	275,000
Wastewater Flow Monitoring	Short-term (to be repeated every 5 years)	1 year	60,000
Water Conservation and I&I Reduction	Short- to medium-term	5 years	150,000
Model Calibration and Validation	Short-term (to be repeated every 5 years)	1 year	175,000
Water Quality Analysis	Short-term	1 year	75,000
Consequences of Failure Analysis	Short-term	1 year	15,000

10 Resources

Our King: 2051 Official Plan, September 2023

King Township - 2020 Transportation Master Plan, March 2020

York Region Water and Wastewater Master Plan, 2022

Nobleton WTP Backwash Waste Sanitary Sewer Flow, Rev. 3 Technical Memo, August 2024

Township of King Water and Wastewater Master Plan, 2021

King Township Water and Wastewater Masterplan Update - Wastewater Flow Monitoring Analysis Summary, February 2025

Growth Management and Employment Lands Strategy Report, February 10 ,2025 and corresponding Addendum Report, June 11, 2025, Watson & Associates Economists Ltd

APPENDIX A

FUTURE GROWTH PROJECTION*

* The information in this Appendix has been prepared for informational purposes only and does not constitute or imply any development approvals or decisions on behalf of the Township.

King Township Master Plan Population Growth Summary from 2031 to 2051

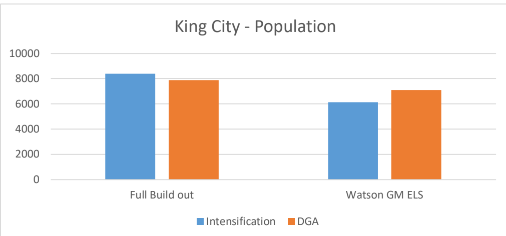
King City		
	Full Build out	Watson GM ELS
Intensification	8396	6126
DGA	7878	7103
Nobleton		
	Full Build out	Watson GM ELS
Intensification	3219	1926
DGA	5686	4822
Schomberg		
	Full Build out	Watson GM ELS
Intensification	644	608
DGA	427	193

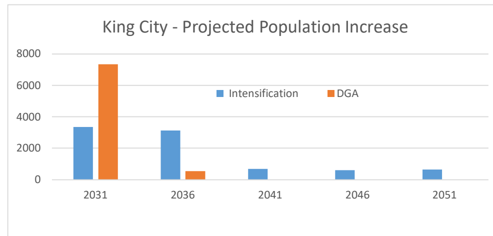
King City						
	2031	2036	2041	2046	2051	**Total**
Intensification	3349	3137	676	600	635	**8396**
DGA	7348	530	0	0	0	**7878**
Nobleton						
	2031	2036	2041	2046	2051	**Total**
Intensification	1408	734	174	526	378	**3219**
DGA	3827	1526	333	0	0	**5686**
Scomberg						
	2031	2036	2041	2046	2051	**Total**
Intensification	321	12	0	310	0	**644**
DGA	394	34	0	0	0	**427**

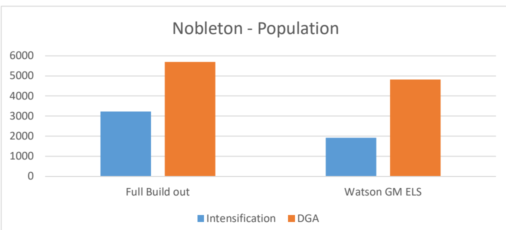
Overall

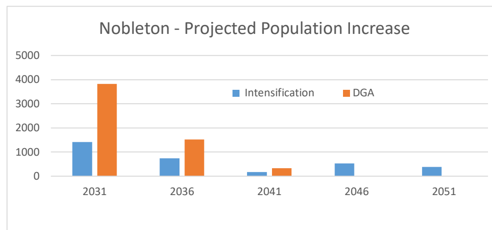
	Full Build out	Watson GM ELS
Intensification	12259	8660
DGA	13991	12118

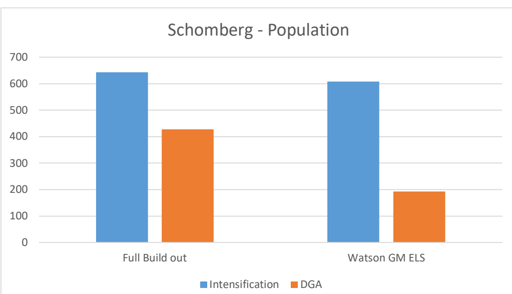
	2031	2036	2041	2046	2051	**Total**
Intensification	5077	3883	849	1437	1013	**12259**
DGA	11568	2090	333	0	0	**13991**

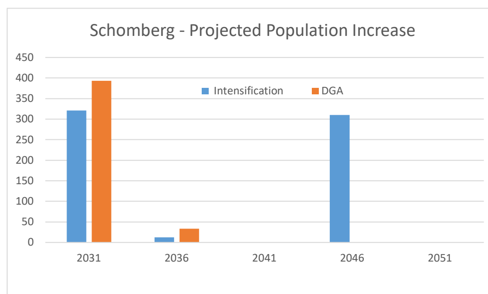












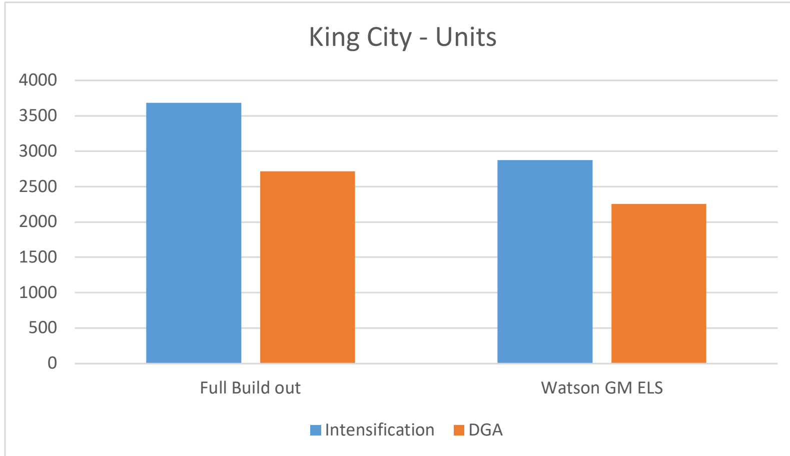
King Township Master Plan Housing Growth Summary from 2031 to 2051

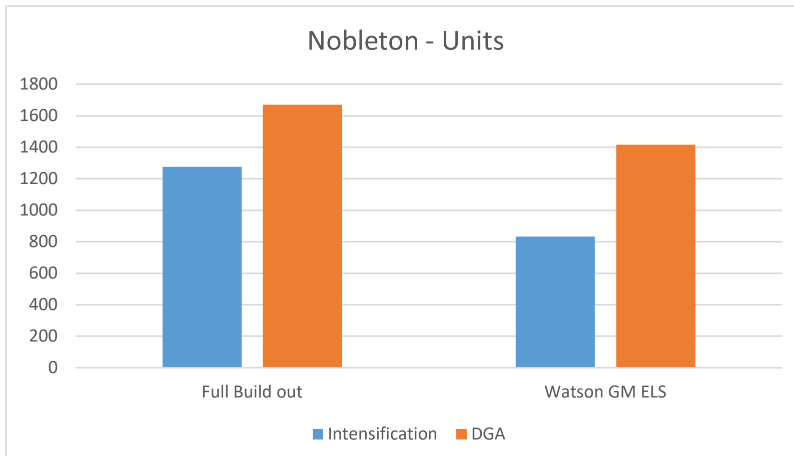
King City		
	Full Build out	Watson GM ELS
Intensification	3683	2873
DGA	2717	2257
Total	6400	5130

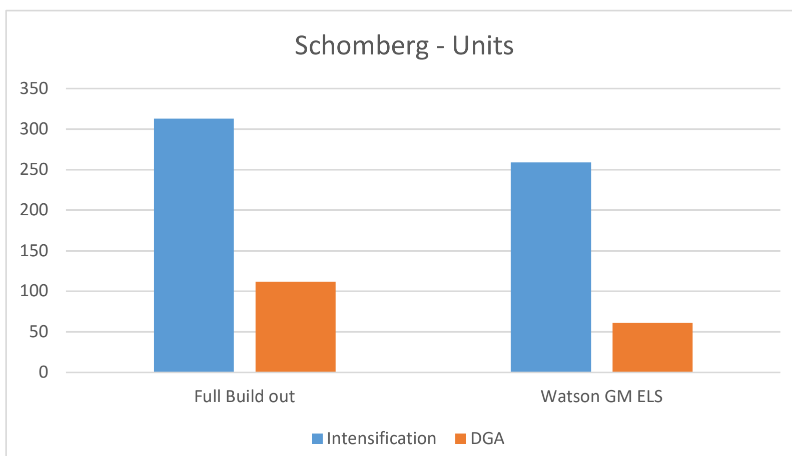
Nobleton		
	Full Build out	Watson GM ELS
Intensification	1276	833
DGA	1670	1417
Total	2946	2250

Schomberg		
	Full Build out	Watson GM ELS
Intensification	313	259
DGA	112	61
Total	425	320

Overall		
	Full Build out	Watson GM ELS
Intensification	5272	3965
DGA	4499	3735
Total	9771	7700







King City Designated Growth Areas Population Growth Projections

DGA developments info provided by the Township

OBJECTID	ADDRESS	Number of Units	Density/Type	Est Pop	Master Plan Map ID	Development Application	Number of Units from Development Application	Population from Development Application	Selected Number of Units Value	Projected Population	Forecast
2806	13245 JANE ST	88	Single Detached	308	K-1	Bushland Heights Ltd	88	308	**88**	**308**	2031
2812	13371 JANE ST	66	Single Detached	231	K-2	Mansions of King Inc. (c/o Joseph Chetti)	Detached: 66 Townhome: 115	461	**181**	**565**	2031
2804	2710 KING RD	115	Townhouse	334							
2669	12805 JANE ST	155	Single Detached	543	K-3	King Jane Holdings Inc. & Jane King Holdings South Inc. and King Hill Inc.	276	966	**276**	**966**	2031
2642	12665 JANE ST	121	Townhouse	351							
2892	13711 KEELE ST	108	Medium*	304	K-4	Fandor Homes	89	296	**108**	**304**	2031
7113	2015 15TH SIDEROAD	42	Single Detached	147	K-5	Kingsfield Estates Ltd.	42	147	**42**	**147**	2031
7132	13500 DUFFERIN ST	521	Single Detached	2068	K-6	Remcor King Inc. & Bracor Developments Inc.	603	2111	**603**	**2111**	2031
7134	13700 DUFFERIN	84	Townhouse								
7133	1793 15TH SIDEROAD										
7142	13630 DUFFERIN ST	6	Single Detached	21	K-7	Supco Construction Limited	7	25	**7**	**25**	2031
10995	60 TAWES TRAIL	98	Single Detached	343	K-8	Scouli Developments (BT) Inc. (c.o Treasure Hill)	107	375	**107**	**375**	2031
1167	1925 15TH SIDEROAD	89	Single Detached	312	K-9	King Green Developments CR Inc. (c/o Brookvalley Holdings Ltd.)	91	319	**91**	**319**	2031
631	13376 DUFFERIN	70 77	Single Detached Condo	399	K-10	King Rocks Developments CR Inc. (c/o Brookvalley Holdings Ltd.)	117	410	**147**	**410**	2031
828	13196 DUFFERIN ST	55	Single Detached	193	K-11	The Acorn Development Corporation	55	193	**55**	**193**	2031
830	13330 DUFFERIN ST	28	Single Detached	98	K-12	632025 Ontario Ltd. (Gougoulias)	28	99	**28**	**99**	2031
2725	2720 KING RD	5	Single Detached	18	K-13	Rimrock Estates Inc.	5	18	**5**	**18**	2031
2710	52 JAMES STOKES CRT	4	Single Detached	14	K-14	Domenic Baldesarra	4	14	**4**	**14**	2031
	50 Tatton Court	25	Townhouse	73	K-15	50 Tatton Court	25	88	**25**	**88**	2036
	13130 Dufferin ST		High*	252	K-16	Alpa Somerville - High Density Block Mixed Use - Alpa Somverville Towns	353	826	**353**	**826**	2031
	13130 Dufferin ST		Medium*	409							
	12988, 12970, 12950 Dufferin Street		Medium*	217	K-17	Dufferin Street south of King Road	77	217	**77**	**217**	2036
	1545, 1529 King Road		Medium*	68	K-18	King Road, west of Esso	24	68	**24**	**68**	2036
	1555 King Road		Medium*	158	K-19	Mixed Use - King Bible Church	56	158	**56**	**158**	2036
Additional DGA developments from Development Application added by TYLin											
					K-20	13760 Keele St	160	640	**160**	**640**	2031
					K-21	2955 King Road	Industrial				2031
					K-22	2239 King Road and 12991 Keele Street.	commercial				2036
					K-23	Commercial Area East of 400	commercial				2031
					K-24	251031 Ont. Ltd**	8	28	**8**	**28**	2031
								Total	**2445**	**7879**	

*When the dwelling type info is available, the PPU is based on the King Township Water Design Criteria. When the dwelling type is unknown, the PPU is based on the estimated PPU from the planning land use based on the density.

** 251031 Ont Ltd was not included in the original greenfield list and has been added in to reflect the full King City East

King City Intensification Areas Population Growth Projections

ID	Location	Area	Density	Average Net Units	Est. Net Population	Development Application	Number of Units from Development Application	Population from Development Application	Selected Number of Units Value	Projected Population	Forecast
						Existing Intensification					
1	Block Plan - Arena Site + LGL	1.81	High	190	349				**190**	**349**	2031
2	King Road b/t Banner and Patton	0.42	High	44	81				**44**	**81**	2041
3	Dew Street Block - West	3.28	Medium-High	221	546	125, 137 & 145 Dew Street	32	93	**221**	**546**	2036
4	NE corner of Keele and King Road (hoop st)	2.84	High	298	547				**298**	**547**	2036
5	12984 Keele (Water's Site)	0.23	High	24	44	12984 keele st	23	48	**24**	**48**	2031
6	Dew Street Block - West	3.18	Medium-High	215	530	2022-2086 King Road	447	894	**447**	**894**	2036
8	2075 King Road	1.02	High	107	197	2075 King Road (King Cort)	284	568	**284**	**568**	2031
10	MTSA - Keele Street North of Keele West Dev.	0.83	High	87	160				**87**	**160**	2031
11	MTSA - Keele West Developmnent	1.10	High	116	212	12764-12800 Keele Street	258	535	**258**	**535**	2031
12	MTSA -South of Keele West Development	0.28	High	29	54	12734 & 12750 Keele Street	144	288	**144**	**288**	2031
13	MTSA -Keele One	0.19	High	20	37				**20**		
14	MTSA - NW Corner of Station and Keele	0.57	High	60	110				**60**	**110**	2036
15	MTSA - Station Road	0.20	High	21	39				**21**	**39**	2031
16	MTSA - Stramota (King Heights) Site	0.54	High	57	104	12765 Keele Street (Allcon)	166	332	**166**	**332**	2031
17	Core - b/t Banner and Patton	0.35	Medium-High	24	58	24 Banner Lane	16	32	**24**	**58**	2036
18	Core b/t Patton & Fisher	0.40	Medium-High	27	67				**27**	**67**	2036
20	Core SW corner of King & Patton	0.38	Medium-High	26	63				**26**	**63**	2036
19	Core - west side of Fisher	0.34	Medium-High	23	57				**23**	**57**	2036
21	Core - West side of Doctors Lane	0.30	Medium-High	20	50				**20**	**50**	2031
23	Core - end of Doctors Lane	0.07	Medium-High	5	12				**5**	**12**	2036
22	Core - Doctors Lane	0.07	Medium-High	5	12	20 Doctors Lane	4	8	**5**	**12**	2036
24	Core - King Road - east of Library	0.22	Medium-High	15	37				**15**	**37**	2036
25	Core King Road & King Blvd 5th Ave Homes	0.59	Medium-High	40	98	1986, 2000-2008 King Road	26	76	**40**	**98**	2031
26	Core west side of Keele Street	0.36	Medium-High	24	60				**24**	**60**	2036
27	Core - west side of Keele Street	0.75	Medium-High	51	125				**51**	**125**	2036
28	MTSA - United Church	0.53	Medium-High	36	88				**36**	**88**	2031
29	MTSA - East Side of Keele b/t Clearview & Burton	0.78	Medium-High	53	130				**53**	**130**	2031
30	MTSA SE corner of Keele & Burton	0.43	Medium-High	29	72				**29**	**72**	2031
32	Mided Use - Soth of the MTSA on Keele (Island)	1.27	Medium-High	86	212				**86**	**212**	2031
31	MTSA - Station Road -5th Ave Site	0.27	Medium-High	18	45				**18**	**45**	2031
35	King Road - East of cemetary	2.18	Medium-High	147	363				**147**	**363**	2036
36	King Road b/t Doctors Lane & Fisher	0.68	Medium	23	65				**23**	**65**	2036
37	Core - Fisher Street	0.35	Medium	12	33				**12**	**33**	2031
38	Core - SE corner of King & Fisher	0.19	Medium	6	18				**6**	**18**	2031
39	Core - West side of Keele, nothr of King	1.19	Medium	40	113				**40**	**113**	2031
40	Mixed use - East side of Keele, north of King	1.28	Medium	43	122	13131 Keele St	5	15	**43**	**122**	2036
41	Mixed Use - Stateview	1.40	Medium	47	133	13151 Keele Street (Stateview)	49	143	**49**	**143**	2031
44	Yellow Horizon	0.35	Medium-Low	9	26	204 Dew Street	8	28	**9**	**28**	2031
						Future Intensification					
57	Patton Street -south of Core	0.36	Medium	12	34				**12**	**34**	2041
56	Patton Street south	0.34	Medium-Low	8	26				**8**	**26**	2041
55	South of Core between Patton and Banner Lane	0.71	Medium-Low	17	54				**17**	**54**	2041
54	Banner Lane south of 2075 King Road	1.30	Medium-Low	32	98				**32**	**98**	2041
53	King Road & James Street	2.49	Medium-Low	61	188				**61**	**188**	2041
52	School Site - King Station	2.58	Medium-Low	63	195				**63**	**195**	2041
51	Keele Street- west side, north of Core	1.06	Medium-Low	26	80				**26**	**80**	2046
50	Banner Lane to Patton	1.43	Low	21	73				**21**	**73**	2046
49	Patton Lots & Eva L Dennis School Site	0.84	Low	13	43				**13**	**43**	2046
48	East end of South Summit Farm Road	7.99	Low	120	405				**120**	**405**	2046
47	West end of South Summit Farm Road	2.41	Low	36	122				**36**	**122**	2051
46	West end of South Summit Farm Road along Jane	1.21	Low	18	61				**18**	**61**	2051
45	Dew Street North	2.61	Medium-High	176	435				**176**	**435**	2051
58	King Road & Charles St.	0.22	Medium-Low	5	17				**5**	**17**	2051
								TOTAL	**3,683**	**8,396**	

*When the dwelling type info is available, the PPU is based on the King Township Water Design Criteria. When the dwelling type is unknown, the PPU is based on the estimated PPU from the planning land use based on the density.

Nobleton Designated Growth Areas Population Growth Projections

OBJECTID	ADDRESS	Number of Units	Density/Type	Est. Pop	Master Plan Map ID	Development Application	Number of Units from Development Application	Population from Development Application	Selected Number of Units Value	Projected Population	Forecast
DGA developments info provided by the Township											
8821	13120 CONCESSION 8 RD	5	Single Detached	18	N-1				**5**	**18**	2031
9765	OLIVER EMERSON AVE	22	Single Detached	77	N-2	Block 208 Maidenstone Subdivision	25	88	**25**	**88**	2031
3292	13580 Highway 27	226	Single Detached	791	N-3	Crisdan Holdings Inc.	226	791	**226**	**791**	2031
3264	13450 and 13500 Highway 27	238	Single Detached	833	N-4	Treasure Hill Homes (TG Nobleton LP)	708	2336	**708**	**2336**	2031
6951	13735 Highway 27	170	Single Detached	595	N-5	Nobleton 2715 Developments Limited (Linvest)	170	595	**170**	**595**	2031
9125	12805 Highway 27	429	Single Detached	1502	N-6	Prebrick System Corp. (Boynton)	430	1505	**430**	**1505**	2036
3293	13440 Highway 27	6	Single Detached	21	N-7	Noblestone Developments Inc.	6	21	**6**	**21**	2036
Additional DGA developments from Development Application/Expansion added by TYLin											
					N-8	13305 Highway 27	commercial				
					N-9A N-9B N-9C	Residential Expansion			**100**	**333**	2041
					N-10	Employment Lands - Option 2				**0**	2041
								Total	**1,670**	**5,686**	

*When the dwelling type info is available, the PPU is based on the King Township Water Design Criteria. When the dwelling type is unknown, the PPU is based on the estimated PPU from the planning land use based on the density.

Nobleton Intensification Areas Population Growth Projections

ID	Location	Area	Density	Average Net Units	Est. Net Population	Development Application	Number of Units from Development Application	Population from Development Application	Selected Number of Units Value	Projected Population	Forecast
					Existing Intensification						
1	Block Plan Highway 27 South of Old King Road	0.36	High	38	69				**38**	**69**	2031
2	Block Plan - South side of Old King Road	0.30	Medium	10	29				**10**	**29**	2031
3	Block Plan - Southside of King Road	0.60	Medium-High	41	100				**41**	**100**	2031
4	Block Plan - Mosaic	0.55	Medium	19	52		58	163	**58**	**163**	2031
5	Block Plan - NE Corner of Hollywood Cres. and King Road	0.22	Medium	7	21				**7**	**21**	2031
6	Block Plan - Highway 27/King Rd/Old King Rd	0.39	High	41	75				**41**	**75**	2031
7	Block Plan- north side of King Road b/t Royal and Hollywood	0.53	Medium	18	50				**18**	**50**	2031
9	Block Plan - North Side of King Road, west of Royal	0.48	Medium-High	32	80				**32**	**80**	2031
10	Block Plan- Highway 27, north of King Road	0.51	Medium-High	34	107				**34**	**107**	2031
11	Hambley House -Development Site	0.75	Medium-High	51	143		33	61	**51**	**143**	2031
12	SW Highway 27 & King - Mosaic Condos	0.66	High	69	127	2978, 12972, 12966, 12958 Highway 27 and 15 Wellington St	160	320	**160**	**320**	2031
13	Core Area - Highway 27, south of Mosaic	0.88	Medium-High	59	147				**59**	**147**	2036
14	NW corner of Hwy 17 and Wilsen Road	0.61	Medium	21	58				**21**	**58**	2036
15	Hwy 27, north of Norman Ave	0.48	Medium	16	46				**16**	**46**	2036
16	Block Plan - Hwy 27 north of Parkview Drive	0.33	Medium-High	22	55				**22**	**55**	2036
18	West side of Hwy 17, north of Sheardown Dr.	1.43	Medium	48	136				**48**	**136**	2036
19	East side of 27, north of Parkheights Trail	0.80	Medium	27	76				**27**	**76**	2036
20	Fandor	0.41	Medium-Low	10	30		4	14	**10**	**30**	2031
21	Fandor	0.90	Medium-Low	21	65		27	3	**27**	**65**	2031
22	Fandor	0.88	Medium	30	84		8	25	**30**	**84**	2031
23	Fandor	0.41	Medium-Low	10	30				**10**	**30**	2031
24	Fandor	0.45	Medium	15	43				**15**	**43**	2031
25	6029 King Road	0.19	Medium	9	24		4	11	**9**	**24**	2041
26	North side of King Road, west of 27	0.27	Medium	12	34				**12**	**34**	2036
27	South Side of King Road, west of 27	0.26	Medium	12	33				**12**	**33**	2036
28	West Side of 27, north of King Road (south of Cal-Wilsen)	0.49	Medium	17	47				**17**	**47**	2041
29	East side of 27, South of Hill Farm Road	0.85	Medium	29	81				**29**	**81**	2036
30	Easr Side of 27, South of Sheardown	0.94	Medium-Low	22	68				**22**	**68**	2036
					Future Intensification						
31	East side of Hwy 27 - vacant commercial land	1.46	Medium-High	153	378				**153**	**378**	2051
32	East side of Hwy 27 - existing commercial plaza	2.03	Medium-High	213	526				**213**	**526**	2046
33	North side of King Rd, east of Fandor	0.64	Medium	22	61				**22**	**61**	2041
34	Royal Ave, north of core area - within block plan area	0.56	Medium-Low	14	42				**14**	**42**	2041
								TOTAL	**1,278**	**3,219**	

*When the dwelling type info is available, the PPU is based on the King Township Water Design Criteria. When the dwelling type is unknown, the PPU is based on the estimated PPU from the planning land use based on the density.

Schomberg Designated Growth Areas Population Growth Projections

OBJECTID	ADDRESS	Number of Units	Density/Type	Est Pop	Master Plan Map ID	Development Application	Number of Units from Development Application	Population from Development Application	Selected Number of Units Value	Projected Population	Forecast
DGA developments info provided by the Township											
4713	199 CHURCH ST	51	Single Detached	179	S-1	199 church st	51	215	51	215	2031
9758		51	Single Detached	179					51	179	2031
5209	6365 HIGHWAY 9	10	Low	34	S-3				10	34	2036
Additional DGA developments from Development Application/Expansion added by TYLin											
					S-4	30 Dillane Drive (dev type: heavy industry)					2031
					S-5	Schomberg Employment Expansion Area					2036
								Total	**112**	**427**	

*When the dwelling type info is available, the PPU is based on the King Township Water Design Criteria. When the dwelling type is unknown, the PPU is based on the estimated PPU from the planning land use based on the density.

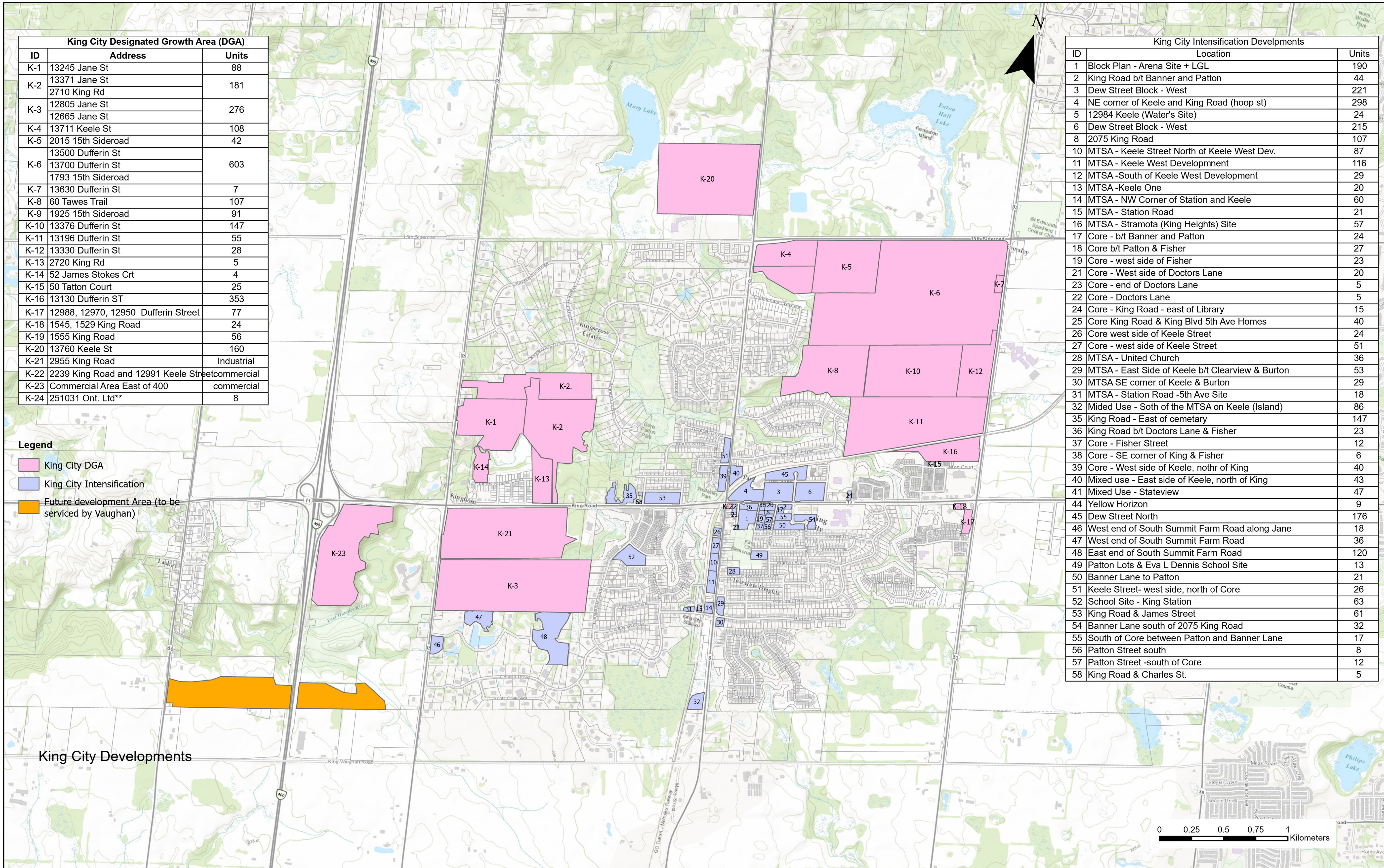
Schomberg Intensification Areas Population Growth Projections

ID	Location	Area	Density	Average Net Units	Est. Net Population	Development Application	Number of Units from Development Application	Population from Development Application	Selected Number of Units Value	Projected Population	Forecast
Existing Intensification											
1	66 Main Street	1.22	Medium	41	116	66 Main Street (dev type: townhouse)	24	73	41	116	2031
2	Old Gas Station on Hwy 27	0.16	Medium-Low	4	12				4	12	2036
3	Cooper Drive & Dillane Drive	0.15	Medium-Low	4	11		4	12	4	12	2031
4	326 Main Street	0.79	Medium-High	53	132	326 Main Street (dev type: apartment + Commercial)	92	184	92	184	2031
5	32 Marlynn Crt & Moore Park Drive	0.17	Low	3	9		1	3	3	9	2031
Future Intensification											
6	Old Schomberg Arena Site	1.61	Medium-High	169	310				169	310	2046
								TOTAL	**313**	**644**	

*When the dwelling type info is available, the PPU is based on the King Township Water Design Criteria. When the dwelling type is unknown, the PPU is based on the estimated PPU from the planning land use based on the density.

APPENDIX B

FUTURE GROWTH MAPS



King City Designated Growth Area (DGA)

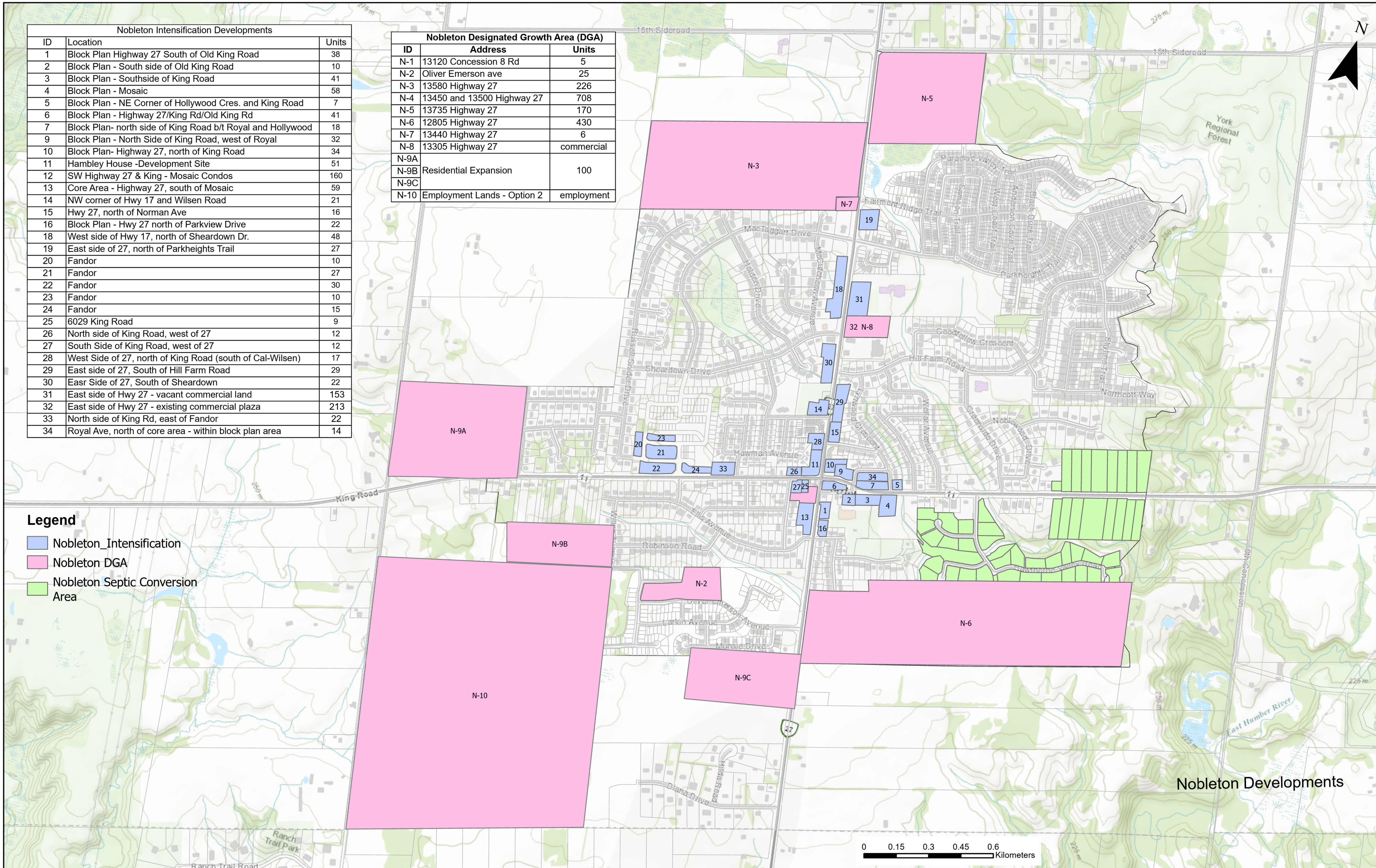
ID	Address	Units
K-1	13245 Jane St	88
K-2	13371 Jane St 2710 King Rd	181
K-3	12805 Jane St 12665 Jane St	276
K-4	13711 Keele St	108
K-5	2015 15th Sideroad	42
K-6	13500 Dufferin St 13700 Dufferin St 1793 15th Sideroad	603
K-7	13630 Dufferin St	7
K-8	60 Tawes Trail	107
K-9	1925 15th Sideroad	91
K-10	13376 Dufferin St	147
K-11	13196 Dufferin St	55
K-12	13330 Dufferin St	28
K-13	2720 King Rd	5
K-14	52 James Stokes Crt	4
K-15	50 Tatton Court	25
K-16	13130 Dufferin ST	353
K-17	12988, 12970, 12950 Dufferin Street	77
K-18	1545, 1529 King Road	24
K-19	1555 King Road	56
K-20	13760 Keele St	160
K-21	2955 King Road	Industrial
K-22	2239 King Road and 12991 Keele Street	commercial
K-23	Commercial Area East of 400	commercial
K-24	251031 Ont. Ltd**	8

King City Intensification Develpments

ID	Location	Units
1	Block Plan - Arena Site + LGL	190
2	King Road b/t Banner and Patton	44
3	Dew Street Block - West	221
4	NE corner of Keele and King Road (hoop st)	298
5	12984 Keele (Water's Site)	24
6	Dew Street Block - West	215
8	2075 King Road	107
10	MTSA - Keele Street North of Keele West Dev.	87
11	MTSA - Keele West Developmnent	116
12	MTSA -South of Keele West Development	29
13	MTSA -Keele One	20
14	MTSA - NW Corner of Station and Keele	60
15	MTSA - Station Road	21
16	MTSA - Stramota (King Heights) Site	57
17	Core - b/t Banner and Patton	24
18	Core b/t Patton & Fisher	27
19	Core - west side of Fisher	23
21	Core - West side of Doctors Lane	20
23	Core - end of Doctors Lane	5
22	Core - Doctors Lane	5
24	Core - King Road - east of Library	15
25	Core King Road & King Blvd 5th Ave Homes	40
26	Core west side of Keele Street	24
27	Core - west side of Keele Street	51
28	MTSA - United Church	36
29	MTSA - East Side of Keele b/t Clearview & Burton	53
30	MTSA SE corner of Keele & Burton	29
31	MTSA - Station Road -5th Ave Site	18
32	Mided Use - Soth of the MTSA on Keele (Island)	86
35	King Road - East of cemetary	147
36	King Road b/t Doctors Lane & Fisher	23
37	Core - Fisher Street	12
38	Core - SE corner of King & Fisher	6
39	Core - West side of Keele, nothr of King	40
40	Mixed use - East side of Keele, north of King	43
41	Mixed Use - Stateview	47
44	Yellow Horizon	9
45	Dew Street North	176
46	West end of South Summit Farm Road along Jane	18
47	West end of South Summit Farm Road	36
48	East end of South Summit Farm Road	120
49	Patton Lots & Eva L Dennis School Site	13
50	Banner Lane to Patton	21
51	Keele Street- west side, north of Core	26
52	School Site - King Station	63
53	King Road & James Street	61
54	Banner Lane south of 2075 King Road	32
55	South of Core between Patton and Banner Lane	17
56	Patton Street south	8
57	Patton Street -south of Core	12
58	King Road & Charles St.	5

Nobleton Intensification Developments		
ID	Location	Units
1	Block Plan Highway 27 South of Old King Road	38
2	Block Plan - South side of Old King Road	10
3	Block Plan - Southside of King Road	41
4	Block Plan - Mosaic	58
5	Block Plan - NE Corner of Hollywood Cres. and King Road	7
6	Block Plan - Highway 27/King Rd/Old King Rd	41
7	Block Plan- north side of King Road b/t Royal and Hollywood	18
9	Block Plan - North Side of King Road, west of Royal	32
10	Block Plan- Highway 27, north of King Road	34
11	Hambley House -Development Site	51
12	SW Highway 27 & King - Mosaic Condos	160
13	Core Area - Highway 27, south of Mosaic	59
14	NW corner of Hwy 17 and Wilsen Road	21
15	Hwy 27, north of Norman Ave	16
16	Block Plan - Hwy 27 north of Parkview Drive	22
18	West side of Hwy 17, north of Sheardown Dr.	48
19	East side of 27, north of Parkheights Trail	27
20	Fandor	10
21	Fandor	27
22	Fandor	30
23	Fandor	10
24	Fandor	15
25	6029 King Road	9
26	North side of King Road, west of 27	12
27	South Side of King Road, west of 27	12
28	West Side of 27, north of King Road (south of Cal-Wilsen)	17
29	East side of 27, South of Hill Farm Road	29
30	Easr Side of 27, South of Sheardown	22
31	East side of Hwy 27 - vacant commercial land	153
32	East side of Hwy 27 - existing commercial plaza	213
33	North side of King Rd, east of Fandor	22
34	Royal Ave, north of core area - within block plan area	14

Nobleton Designated Growth Area (DGA)		
ID	Address	Units
N-1	13120 Concession 8 Rd	5
N-2	Oliver Emerson ave	25
N-3	13580 Highway 27	226
N-4	13450 and 13500 Highway 27	708
N-5	13735 Highway 27	170
N-6	12805 Highway 27	430
N-7	13440 Highway 27	6
N-8	13305 Highway 27	commercial
N-9A N-9B N-9C	Residential Expansion	100
N-10	Employment Lands - Option 2	employment

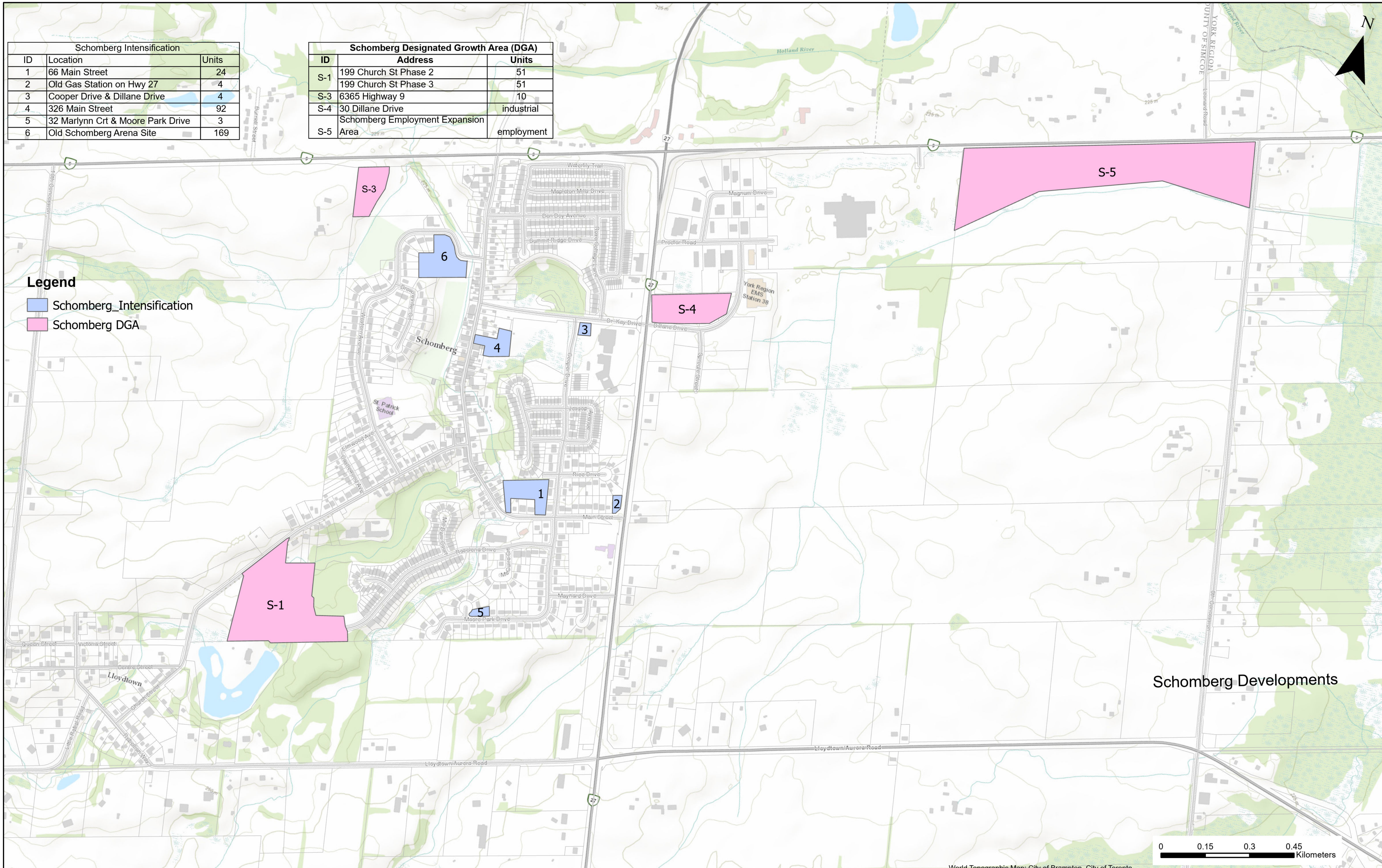


World Topographic Map. City of Brampton, City of Toronto, Schomberg Intensification

ID	Location	Units
1	66 Main Street	24
2	Old Gas Station on Hwy 27	4
3	Cooper Drive & Dillane Drive	4
4	326 Main Street	92
5	32 Marlynn Crt & Moore Park Drive	3
6	Old Schomberg Arena Site	169

Schomberg Designated Growth Area (DGA)

ID	Address	Units
S-1	199 Church St Phase 2	51
	199 Church St Phase 3	51
S-3	6365 Highway 9	10
S-4	30 Dillane Drive	industrial
S-5	Schomberg Employment Expansion Area	employment



Schomberg Developments

APPENDIX C

WASTEWATER FLOW MONITORING ANALYSIS SUMMARY

TYLin

Technical Memorandum

Project:	King Township Water and Wastewater Masterplan Update	
Client Project No.:		**TYLin Project No.:** 0100477
Date / Time	February 14, 2025 Revised February 14, 2025	
To	Daniel Wilkinson	
From	Steve Hollingworth	
Cc		
Subject	Wastewater Flow Monitoring Analysis Summary	

1 INTRODUCTION

The Township of King retained TYLin International Canada (TYLin) to undertake King's Water and Wastewater Masterplan Update considering growth forecasts to year 2051. The hydraulic modeling tasks included updating the existing operational models completed in 2022 and converting them into 'design criteria' models before applying any growth.

Based on the results of the previous masterplan and subsequent assessments of the systems based on actual water billing and flow monitoring data, it was expected that there would be differences between the operational model and the design criteria model, which may result in some sewers being flagged as having insufficient capacity whereas flow monitoring may show the sewer as having adequate capacity.

In order to assess the degree of conservatism for each system, flow monitoring data has been compared against the output from the existing conditions 'design criteria' model. The Township provided flow monitoring data (supplied by York Region) for 14 locations: 4 in King City, 2 in Schomberg and 8 in Nobleton. The monitoring data covered the period from April to November 2024.

The existing conditions model outputs are attached to this memo.

2 FLOW MONITORING ANALYSIS

The flow monitoring data was analyzed to yield the maximum flow rates observed during both dry and wet weather flow conditions. These are compared against the design criteria model flows in the following tables.

Dry Weather Flow Comparison

Location	Monitor ID	Maximum Recorded Flow (L/s)	Model Result (L/s)	Difference
King City	KI001a_10	41.41	17.54 / 393.04*	-58% / 849%
King City	KI001a_20	4.95	3.07	-38%
King City	KI001c_11	3.23	1.54	-52%
King City	KI001c_20	5.12	5.32	4%
Schomberg	KI002_20	4.59	19.67	329%
Schomberg	KI003	3.89	19.29	396%
Nobleton	KI004a_11	29.7	31.86 / 68.54*	7% / 131%
Nobleton	KI004a_20	7.82	7.93	1%
Nobleton	KI004b	16.27	9.37 / 46.05*	-42% / 183%
Nobleton	KI-005-PB	19.07	5.13 / 41.81*	-73% / 119%
Nobleton	KI-006	5.81	1.9	-67%
Nobleton	KI-008	2.08	7.35	253%
Nobleton	KI-009_ml01	9.45	2.26	-76%
Nobleton	KI-010	7.21	2.46	-66%

* Based on upstream sanitary pump stations operating at minimum and maximum capacities

Wet Weather Flow Comparison

Location	Monitor ID	Maximum Recorded Flow (L/s)	Model Result (L/s)	Difference
King City	KI001a_10	114.8	77.7 / 453.21	-32% / 295%
King City	KI001a_20	7.67	6.02	-22%
King City	KI001c_11	10.85	7.35	-32%
King City	KI001c_20	43.76	16.03	-63%
Schomberg	KI002_20	6.09	31.94	424%
Schomberg	KI003	7.56	34.37	355%
Nobleton	KI004a_11	72.82	80.68 / 117.37	11% / 61%
Nobleton	KI004a_20	35.82	18.51	-48%
Nobleton	KI004b	35.08	20.4 / 57.08	-42% / 63%
Nobleton	KI-005-PB	38.48	10.607 / 47.29	-72% / 23%
Nobleton	KI-006	12.46	7.47	-40%
Nobleton	KI-008	10.05	20.93	108%
Nobleton	KI-009_ml01	26.46	9.94	-62%
Nobleton	KI-010	18.22	4.95	-73%

* Based on upstream sanitary pump stations operating at minimum / maximum capacities

3 DISCUSSION OF RESULTS

3.1 King City

The results from the first row in the table (KI001a_10) should not be considered, as there are 6 pumping stations located upstream of this flow monitor and the steady-state design criteria model can only represent these at their maximum or minimum pumping rates. The remaining three gauges suggest that the design criteria model is underpredicting flow rates under both dry weather and wet weather flow conditions.

Given this unexpected result, the flow monitoring data was reviewed by comparing the depth and velocity values in the data. The analysis suggests that there may be issues with the quality of the data (i.e. depth remains relatively static across all recorded velocities).

In addition, the flow comparison was made using the existing conditions model, which excludes recently approved and constructed developments. It is possible that some developments not included in our baseline existing conditions model have been occupied and are generating sanitary flows.

3.2 Schomberg

The design criteria model is significantly over-predicting maximum flow rates relative to the monitoring data recorded at the two gauges in Schomberg. This is consistent with past observations of monitoring data, billing rates and other data which show lower than typical water use in Schomberg. Flow monitoring data was also screened for the two Schomberg gauges, and did not reveal any significant concerns with the quality of the data.

3.3 Nobleton

Three of the 8 flow gauges in Nobleton are located downstream of a single pumping station. As noted in the discussion of data for King City, it is difficult to make meaningful comparisons against data recorded downstream of pumping stations, but it is noted that the observed flows generally fall between the modelled rates under minimum and maximum pumping capacities.

A screening of the data suggests that there may be issues with some of the gauges (KI004a_11, KI-009_ml01, and KI-010). Of the remaining gauges that have apparently valid data and are independent of pumping stations, two are significantly under-predicting maximum flow rates, and one is significantly over-predicting peak flow rates. It is possible that the existing conditions model did not capture some recent developments which were contributing flows during the monitoring period, or that different areas of Nobleton generate sanitary flows at rates that differ from design criteria. Note finally that at all locations with valid data, the pipes were less than half full at maximum flow rates.

4 IMPLICATIONS AND RECOMMENDATIONS

4.1 King City

For King City, there are few conclusions that can be drawn from the flow monitoring analysis, given the potential issues with data quality and relatively poor comparison with observed flows. **It is therefore recommended to maintain the Township's current level of service criteria for King City.**

4.2 Schomberg

For Schomberg, the model results appear to be very conservative relative to the observed flow monitoring data.

Given the degree of conservatism, it is recommended that the level of service criteria for Schomberg be relaxed. **It is recommended that pipes be allowed to surcharge under wet weather flow conditions, and upgrades not be triggered as long as the hydraulic grade line in surcharging sewers remains below basement levels.** In other words, there would be no criteria related to the ratio of flow to capacity, and any decisions for replacement would be based exclusively on the elevation of the hydraulic grade line relative to basement elevations. With this approach, the degree of conservatism in the models effectively achieves a freeboard to basement elevations in wet weather flow events.

4.3 Nobleton

For Nobleton, it is difficult to draw conclusions from the monitoring data. There may be issues with the quality of the data at some locations, other locations are influenced by upstream pumping stations, and the comparison at remaining stations does not show a consistent patter. The model is overpredicting flow rates at one location, and underpredicting flow rates at two locations.

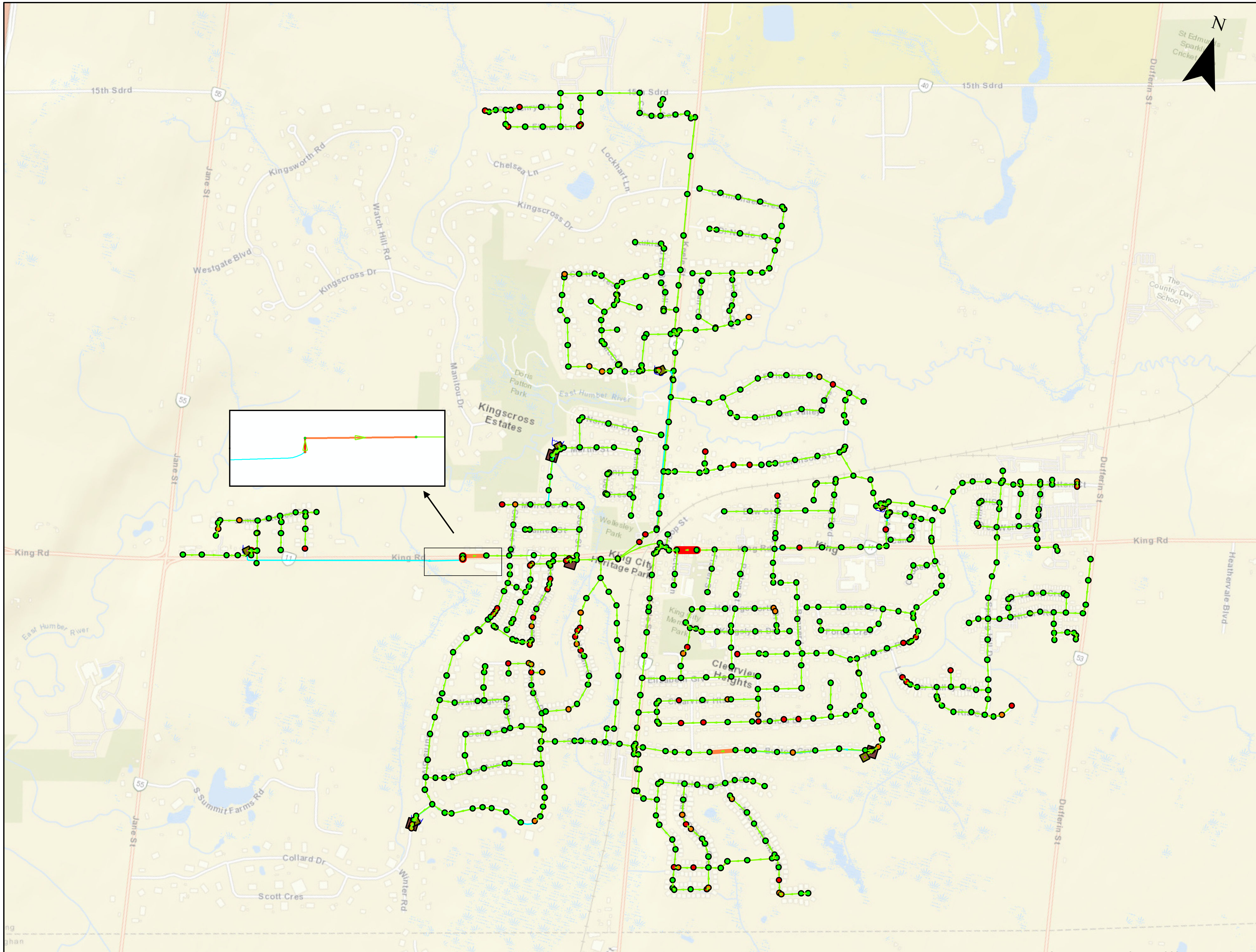
Given the above, **it is recommended to maintain the Township's current level of service criteria for Nobleton.**

Should you have any questions or concerns regarding the information noted, please do not hesitate to contact the undersigned.

T.Y. Lin International Canada Inc.

Steve Hollingworth
Director of Water Resources
M +1 416.300.0415
steve.hollingworth@tylin.com

APPENDIX A



Legend

Manhole

UNFILDEPTH

- Less than 1.5 m
- 1.5 ~ 2.0 m
- Greater than 2.0 m

Gravity Main

Q_OVER_Q

- Less than 85%
- 85% - 100%
- Greater than 100%

Outlet

- <all other values>

TYPE

- Active
- Domain
- Inactive

Forcemain

- <all other values>

TYPE

- Active
- Domain
- Inactive

Pump

- <all other values>

TYPE

- Active
- Domain
- Inactive

TYLin

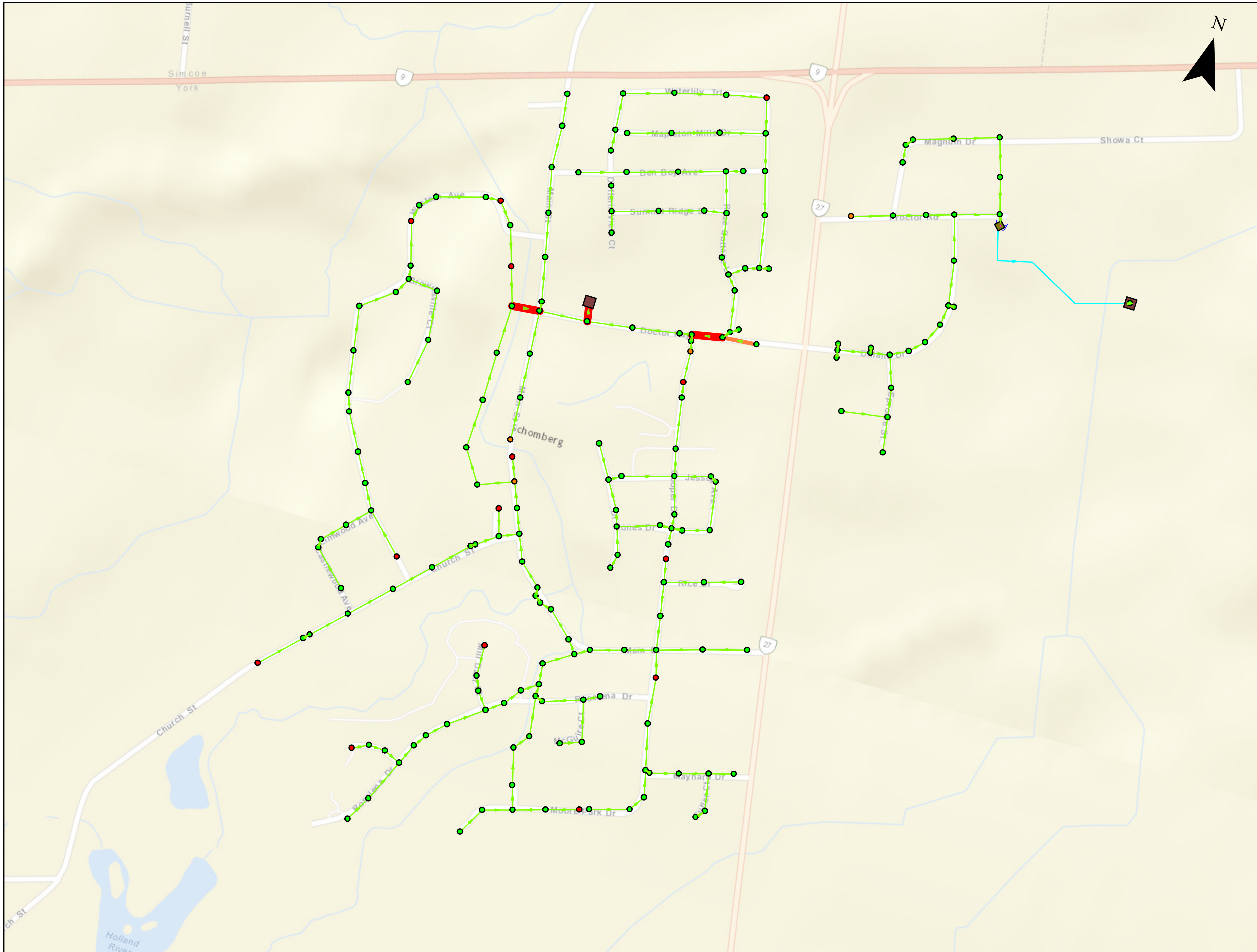
King Wastewater Master Plan Update

Existing without Developments
Wet Weather Condition-King City

0 0.15 0.3 0.45 0.6 Kilometers

Project No: 100447

December 2024



Legend

Manhole

UNFILDEPTH

- Less than 1.5 m
- 1.5 ~ 2.0 m
- Greater than 2.0 m

Gravity Main

Q_OVER_Q

- Less than 85%
- 85% - 100%
- Greater than 100%

Outlet

- <all other values>

TYPE

- Active
- Domain
- Inactive

Forcemain

- <all other values>

TYPE

- Active
- Domain
- Inactive

Pump

- <all other values>

TYPE

- Active
- Domain
- Inactive

TYLin

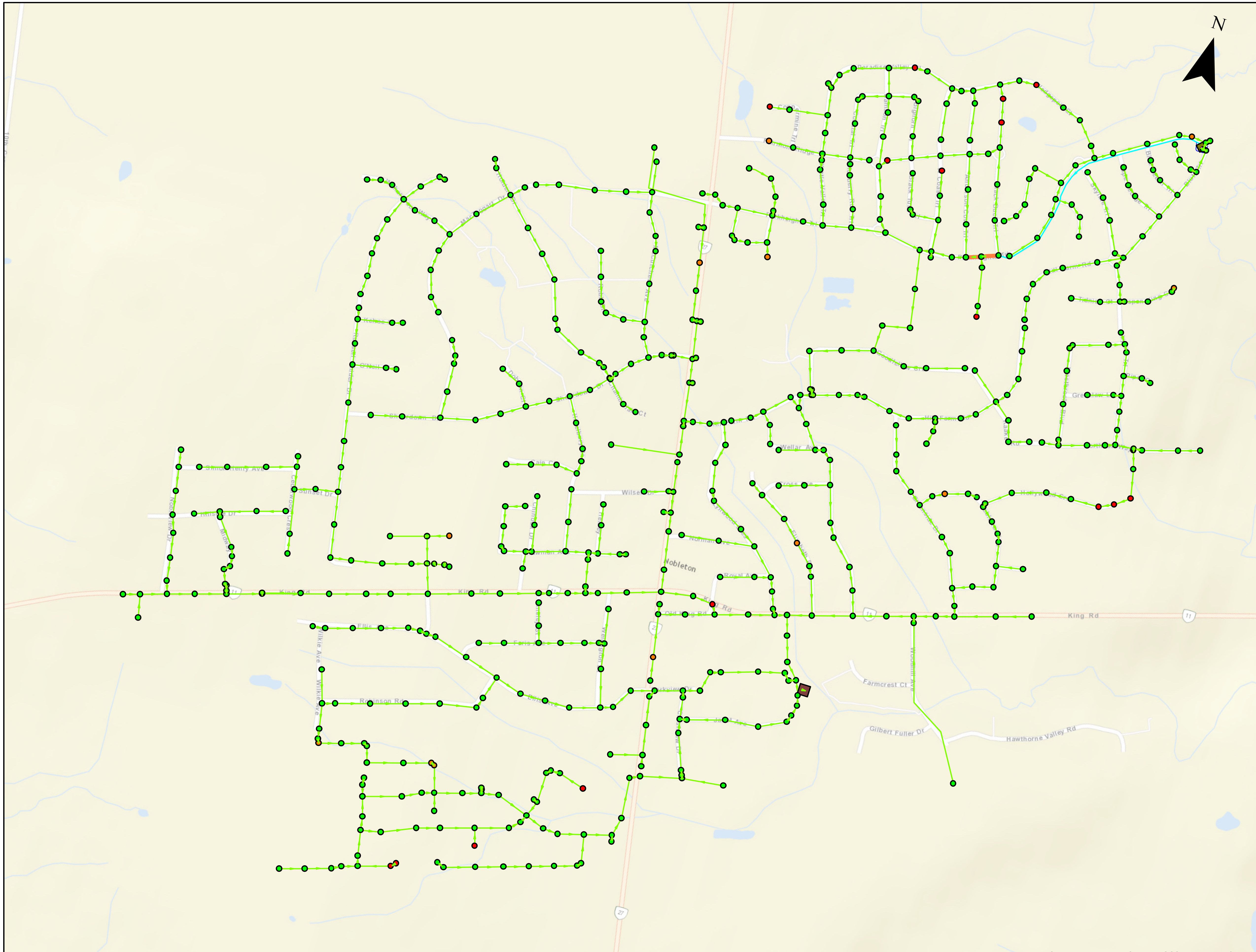
King Wastewater Master Plan Update

Existing without Developments
Wet Weather Condition-Schomberg

0 0.09 0.18 0.27 0.36 Kilometers

Project No: 100447

December 2024



Legend

Manhole

UNFILDEPTH

- Less than 1.5 m
- 1.5 ~ 2.0 m
- Greater than 2.0 m

Gravity Main

Q_OVER_Q

- Less than 85%
- 85% - 100%
- Greater than 100%

Outlet

- <all other values>

TYPE

- Active
- Domain
- Inactive

Forcemain

- <all other values>

TYPE

- Active
- Domain
- Inactive

Pump

- <all other values>

TYPE

- Active
- Domain
- Inactive

TYLin

King Wastewater Master Plan Update

Existing without Developments
Wet Weather Condition-Nobleton

0 0.1 0.2 0.3 0.4 Kilometers

Project No: 100447

December 2024

APPENDIX D

Existing Conditions Modelling Results

Figure 1: King City Simulated Available Fire Flow under Existing MDD+FF Scenario

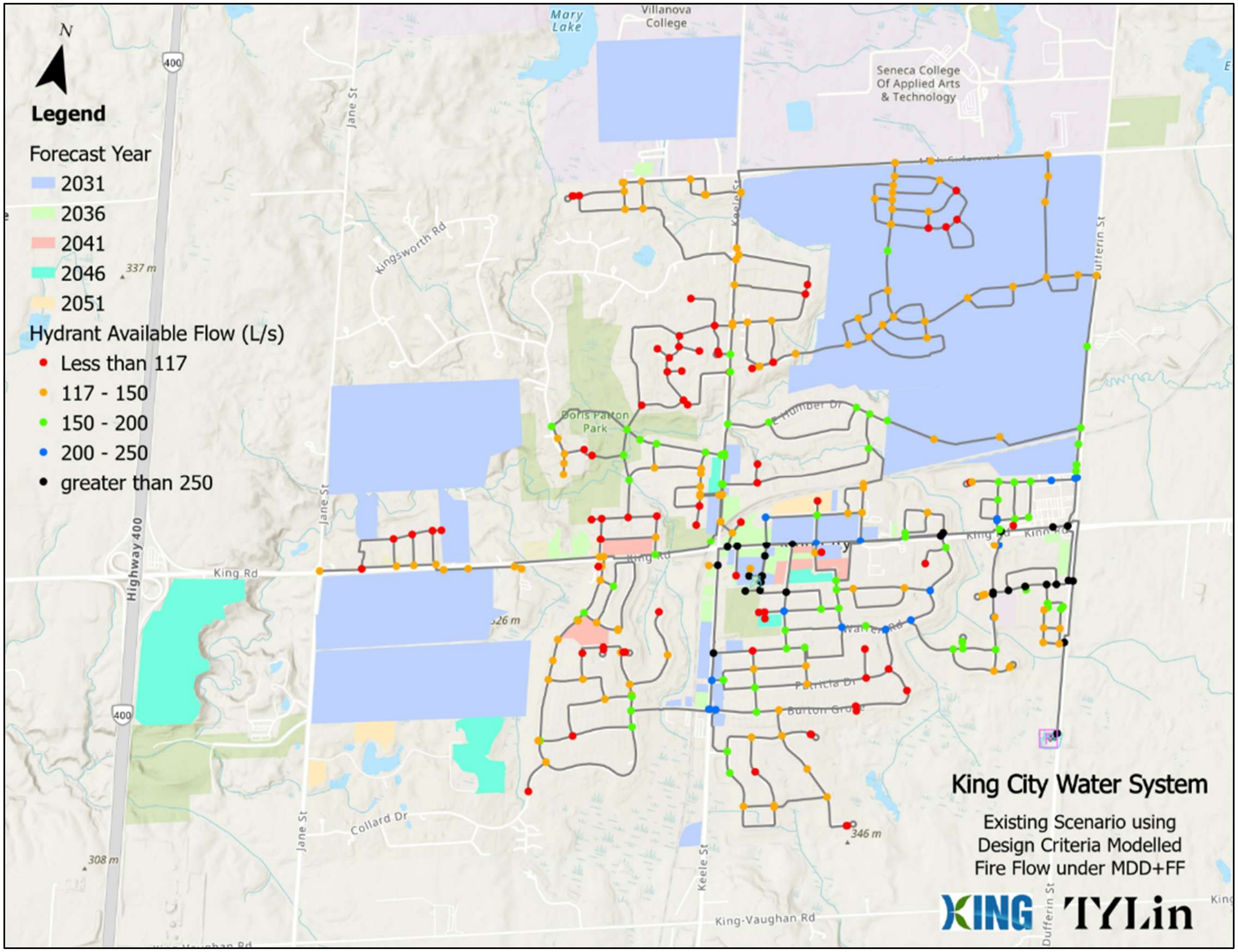


Figure 2: King City Simulated Pressures under Existing PHD Scenario

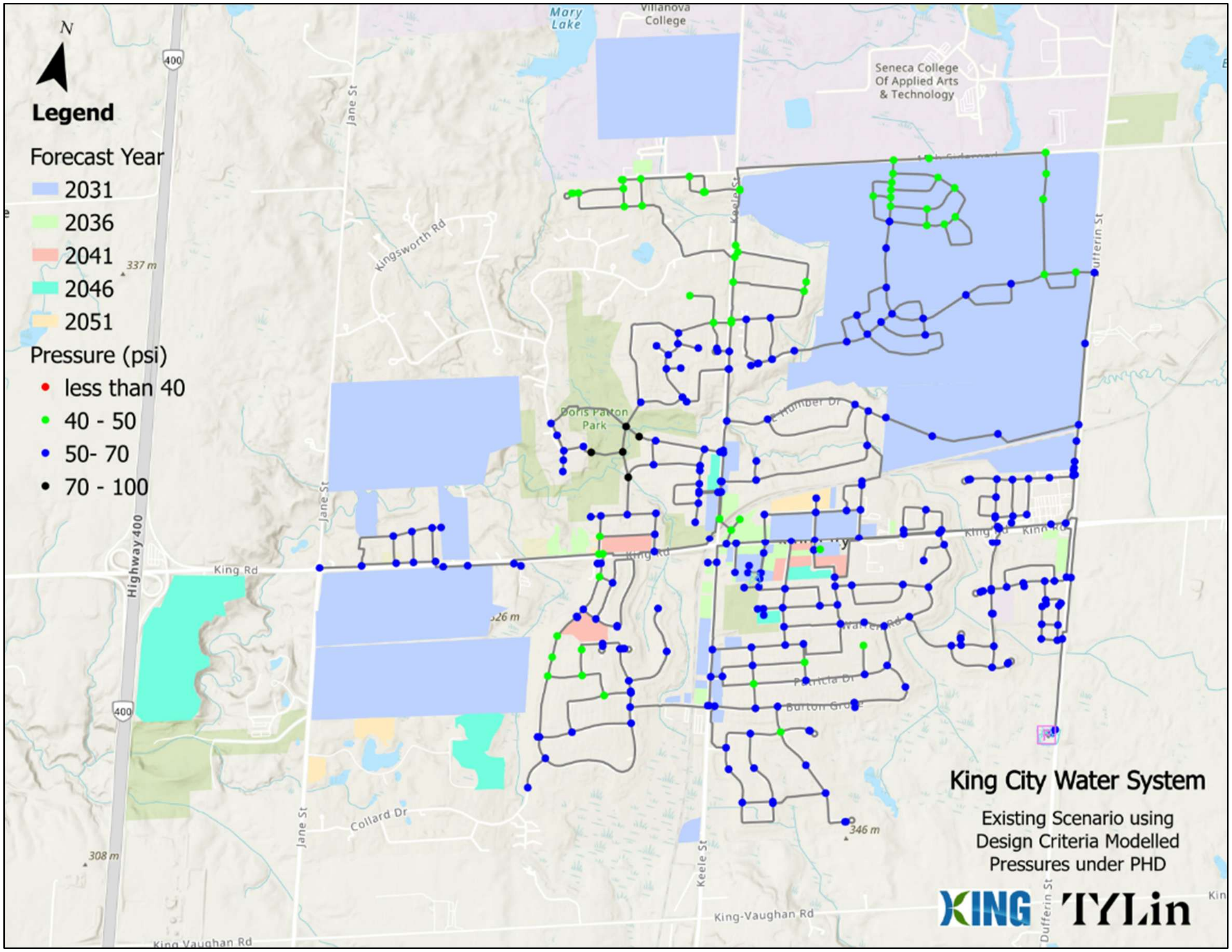


Figure 3: Nobleton Simulated Available Fire Flow under Existing MDD+FF Scenario

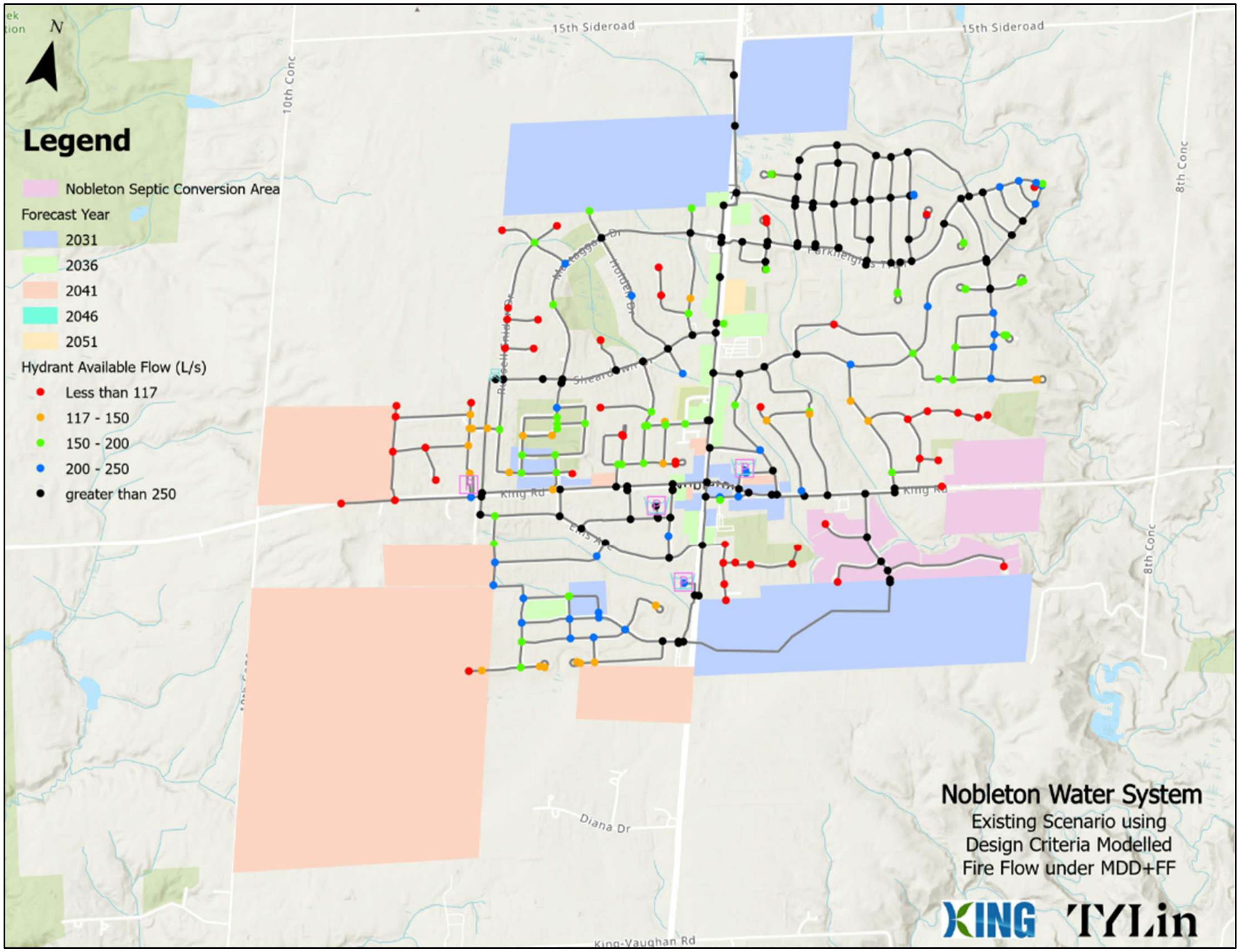


Figure 4: Nobleton Simulated Pressures under Existing PHD Scenario

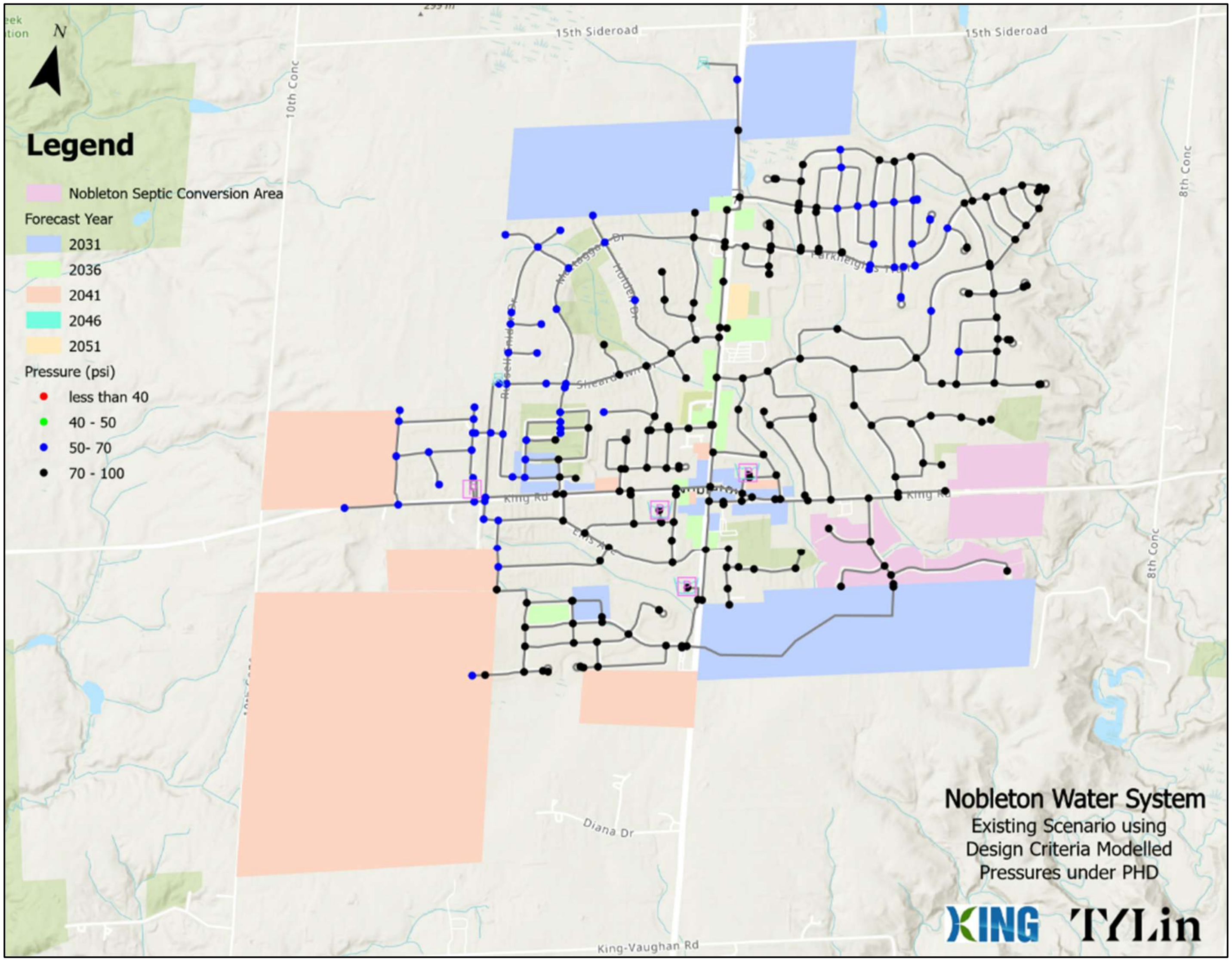


Figure 5: Schomberg Simulated Available Fire Flow under Existing MDD+FF Scenario

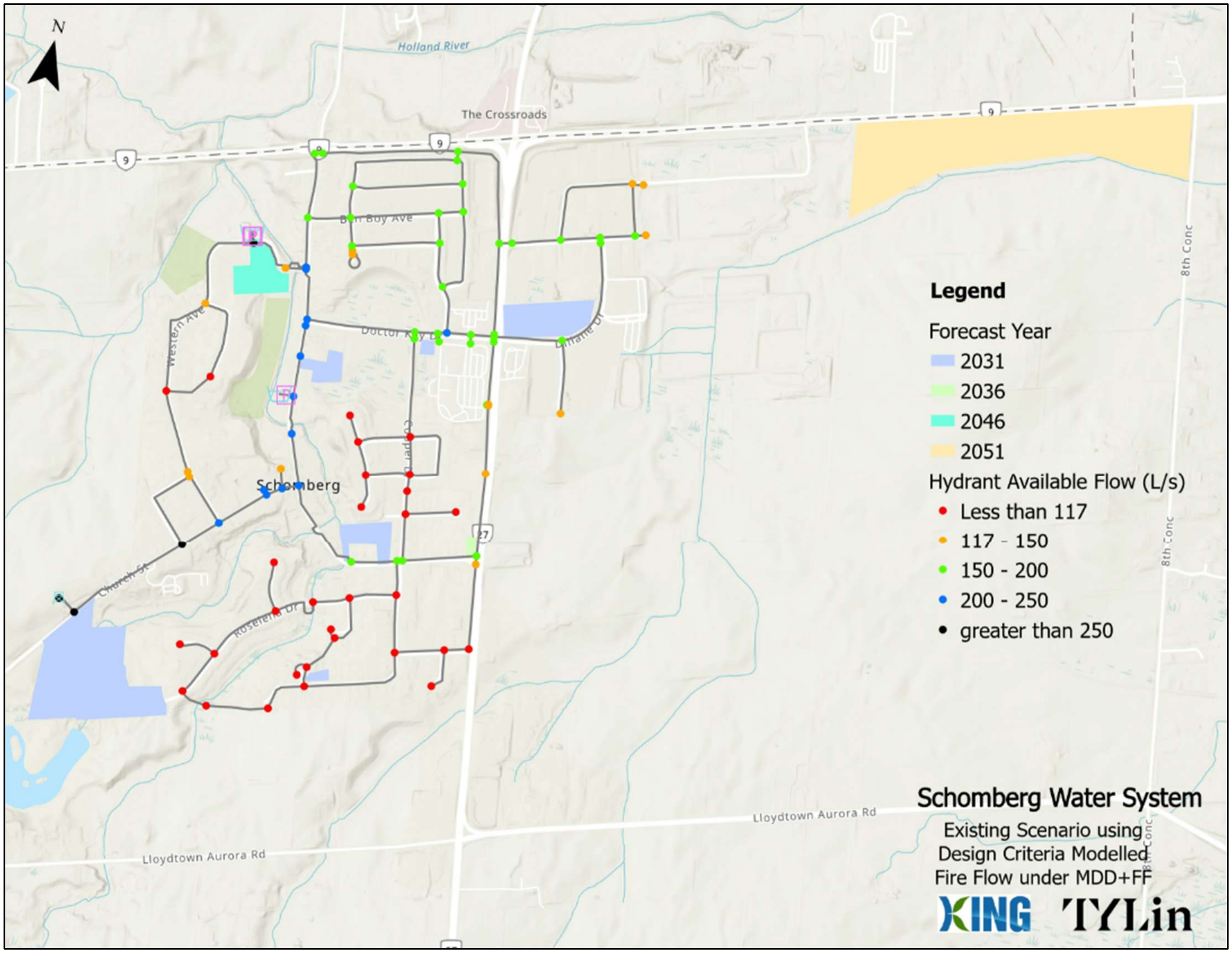


Figure 6: Schomberg Simulated Pressures under Existing PHD Scenario

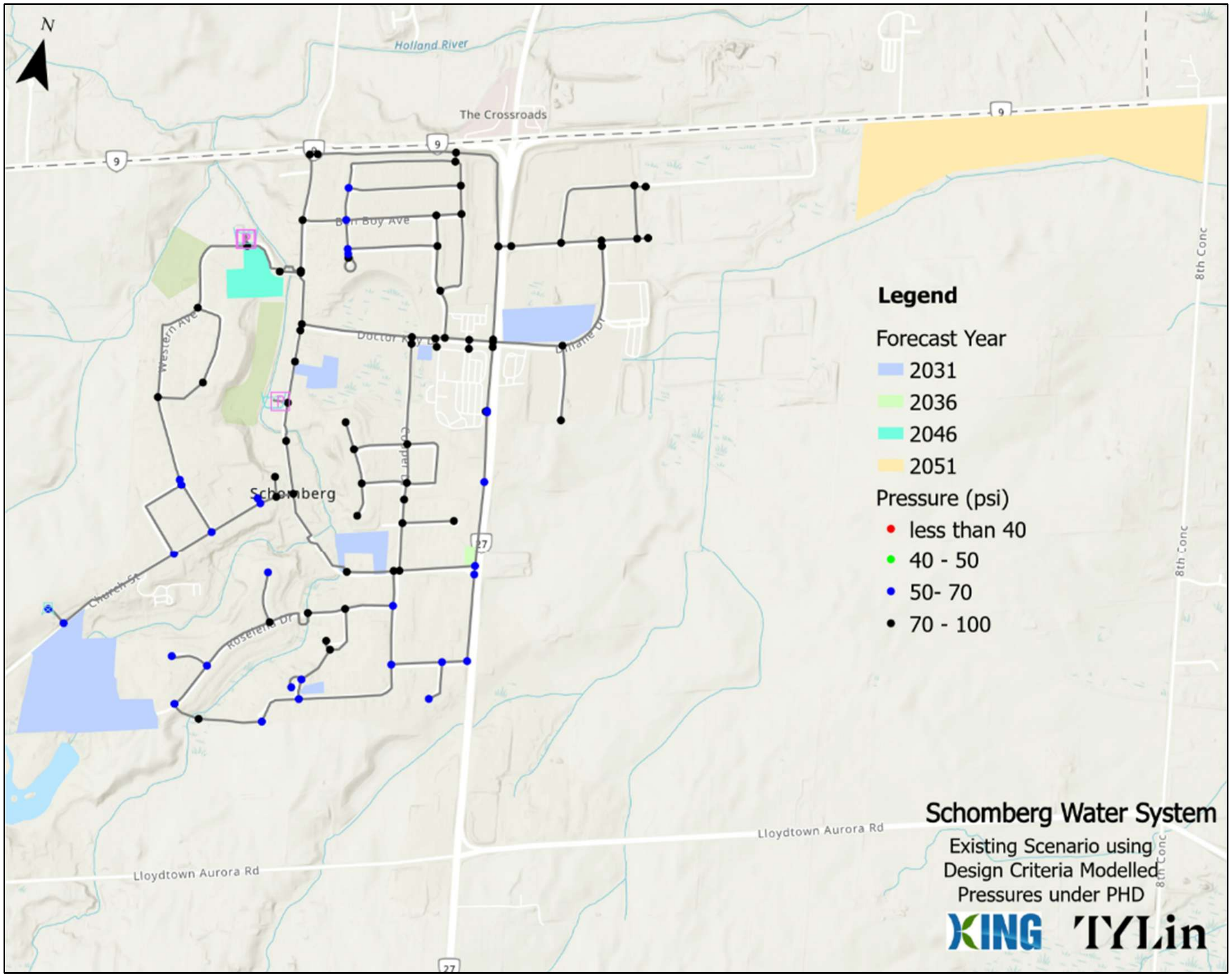


Figure 7: King City Simulated Wet Weather Flow under Existing Scenario

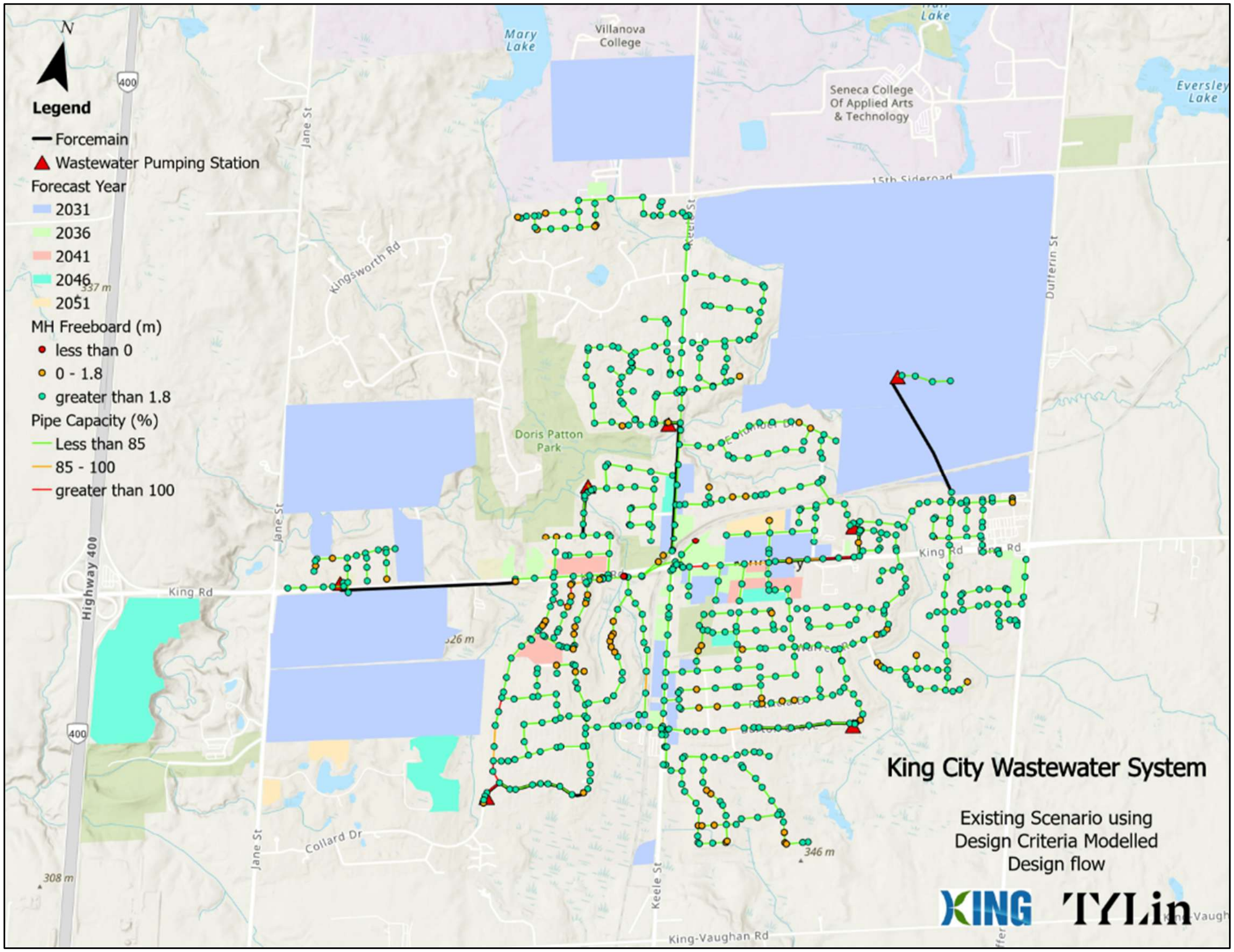


Figure 8: Nobleton Simulated Wet Weather Flow under Existing Scenario

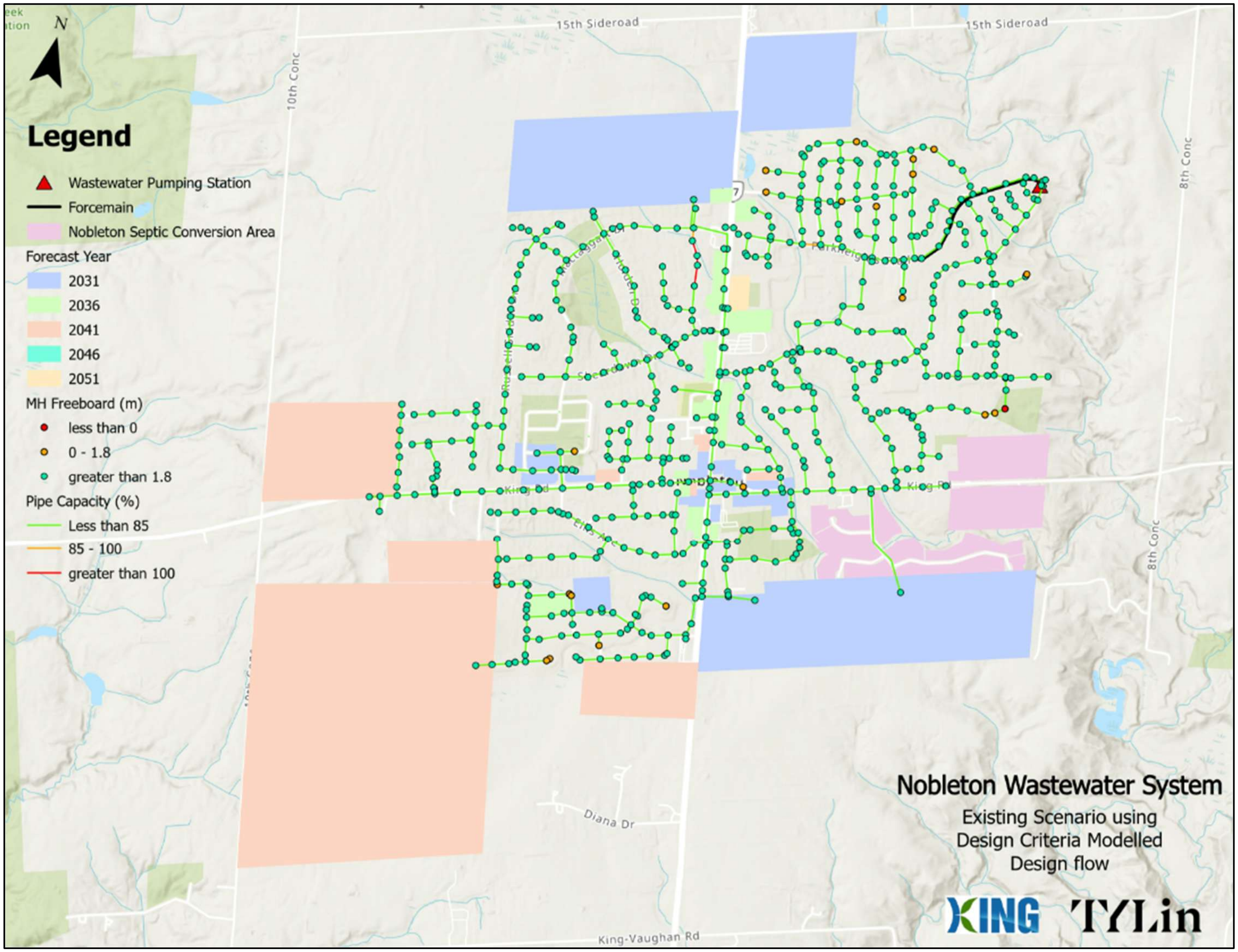
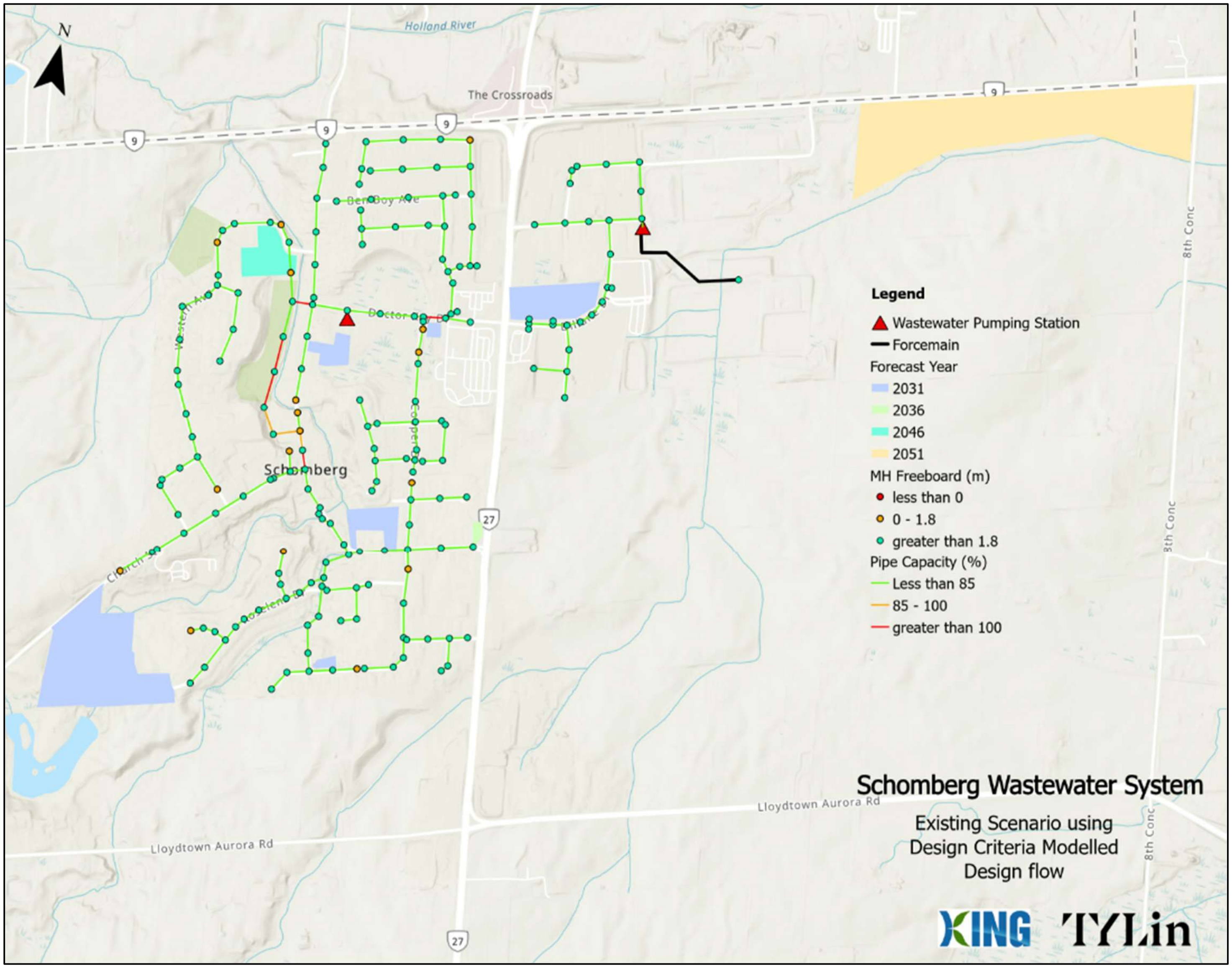


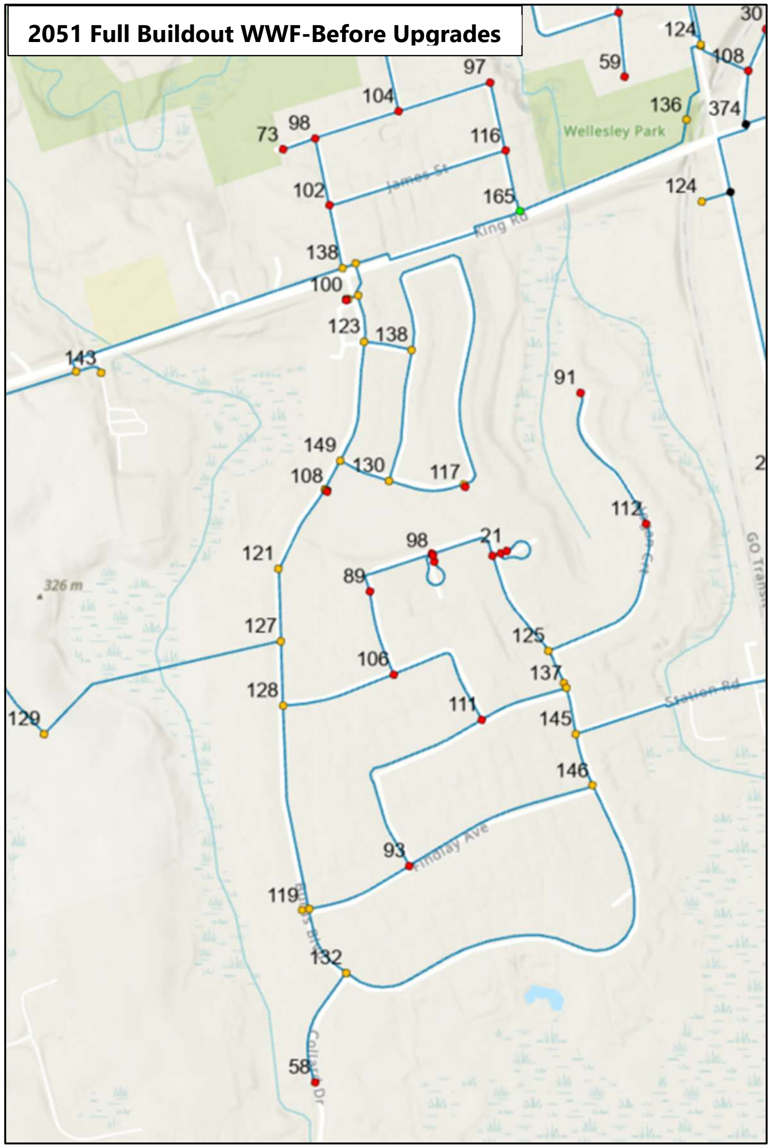
Figure 9: Schomberg Simulated Wet Weather Flow under Existing Scenarios

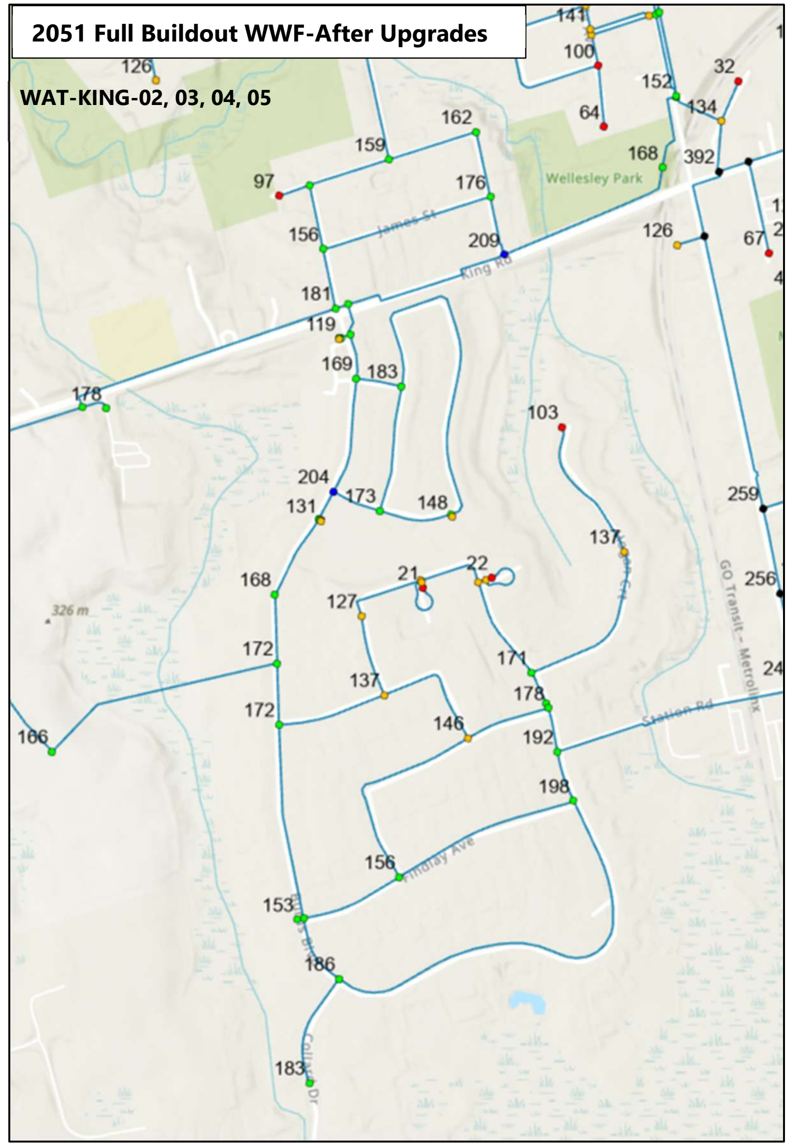


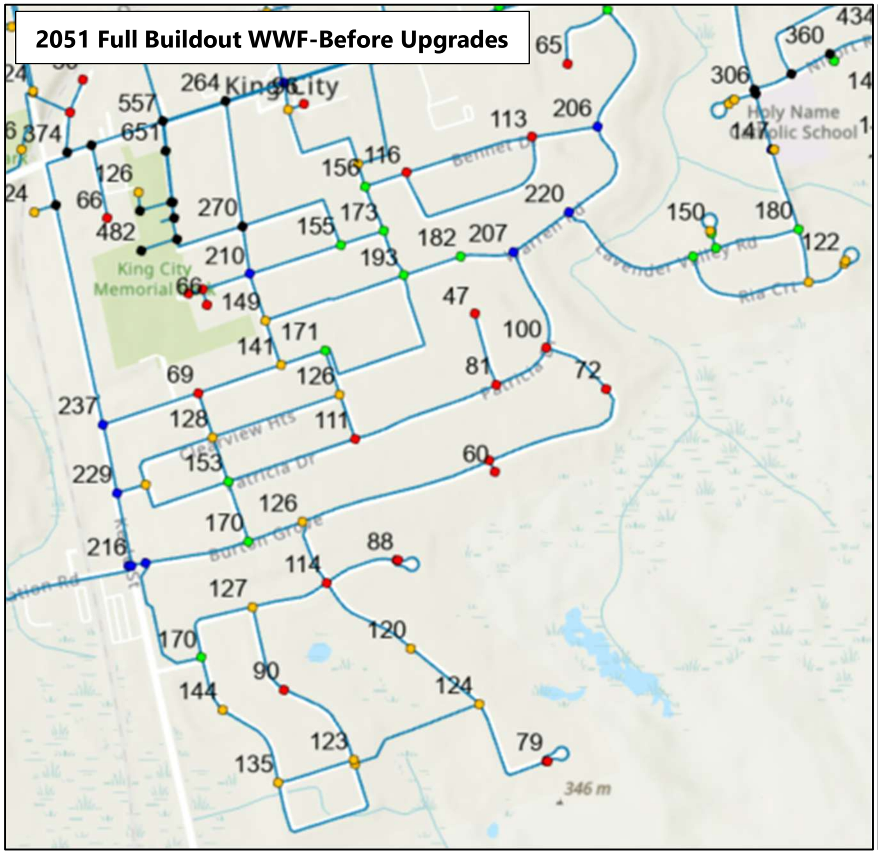
APPENDIX E

MODELLING RESULTS COMPARISON FOR IDENTIFIED CONSTRAINT AREAS (PRE- AND POST-UPGRADE)

Figure 1: King City Simulated Available Fire Flow (L/s) under Full Buildout Before and After Upgrades






2051 Full Buildout WWF-Before Upgrades
King City
King City Memorial
Holy Name Catholic School
Bennet Dr
Warren Rd
Lavender Valley Rd
Ria Crt
Clearview Hts
Patricia Dr
Burton Grove
346 m

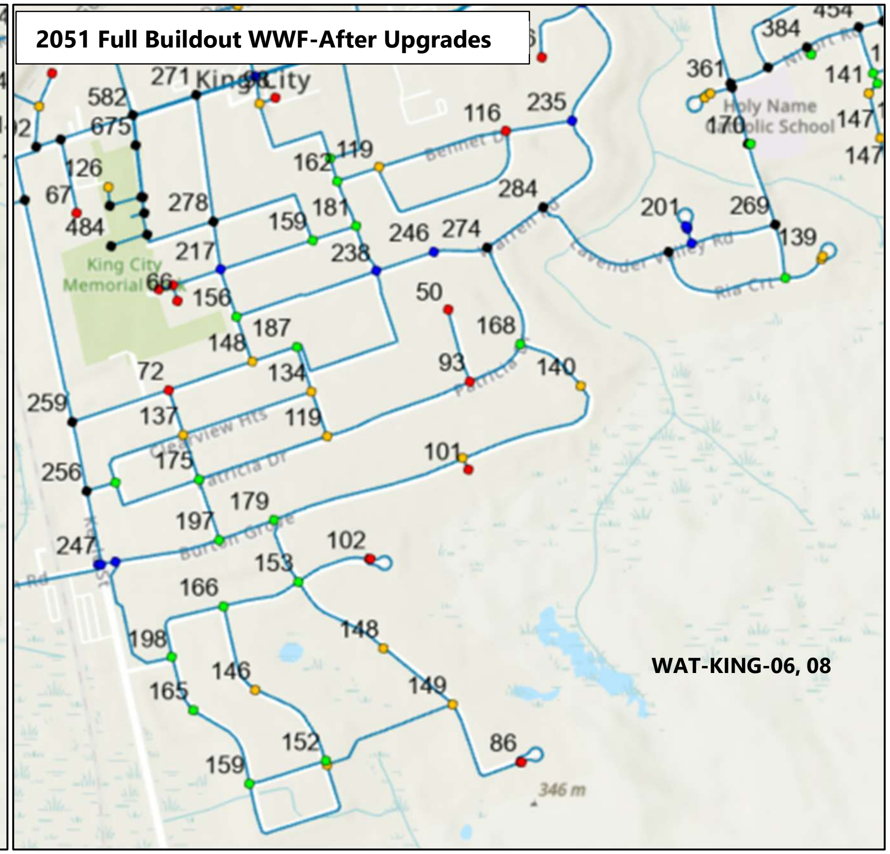
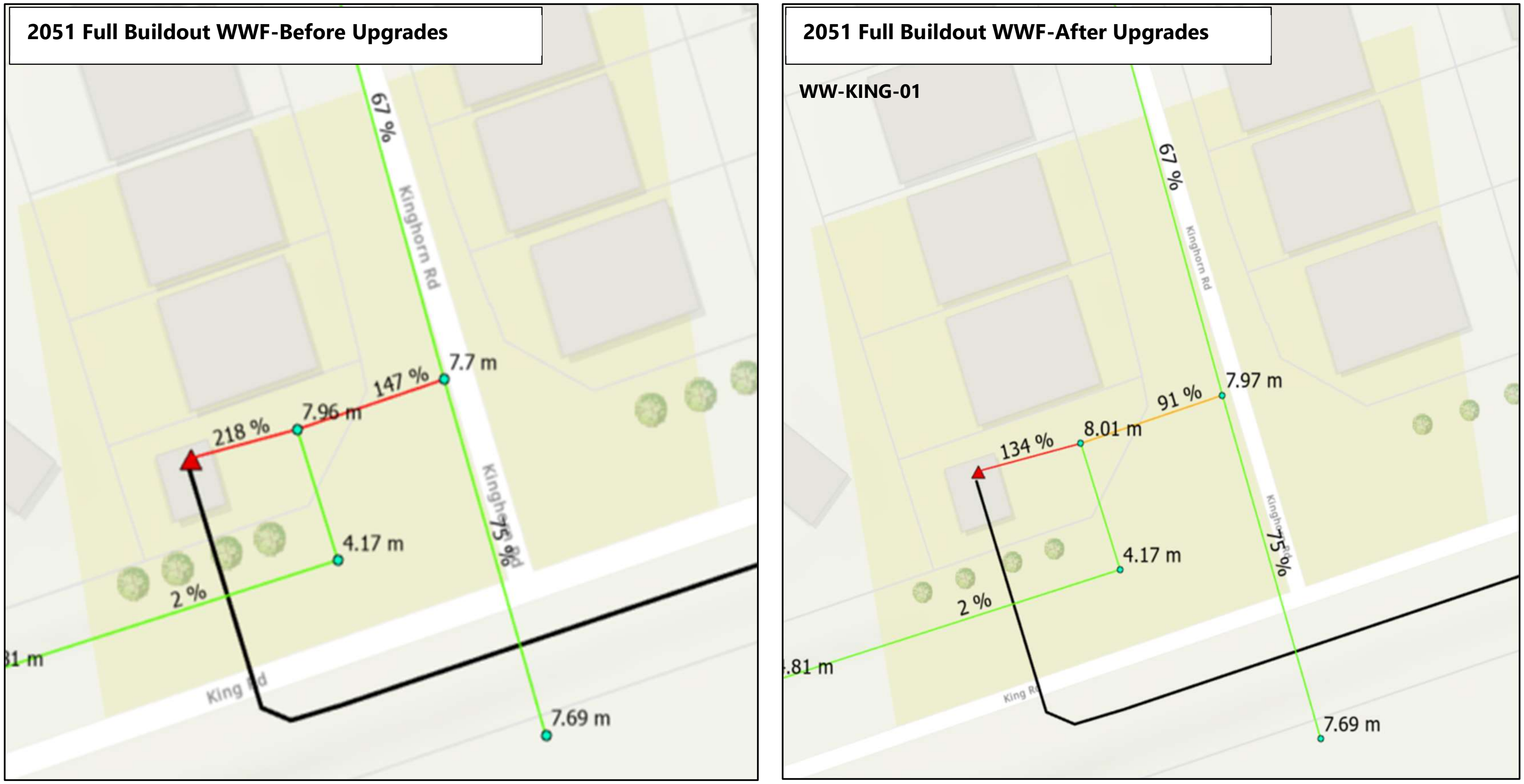
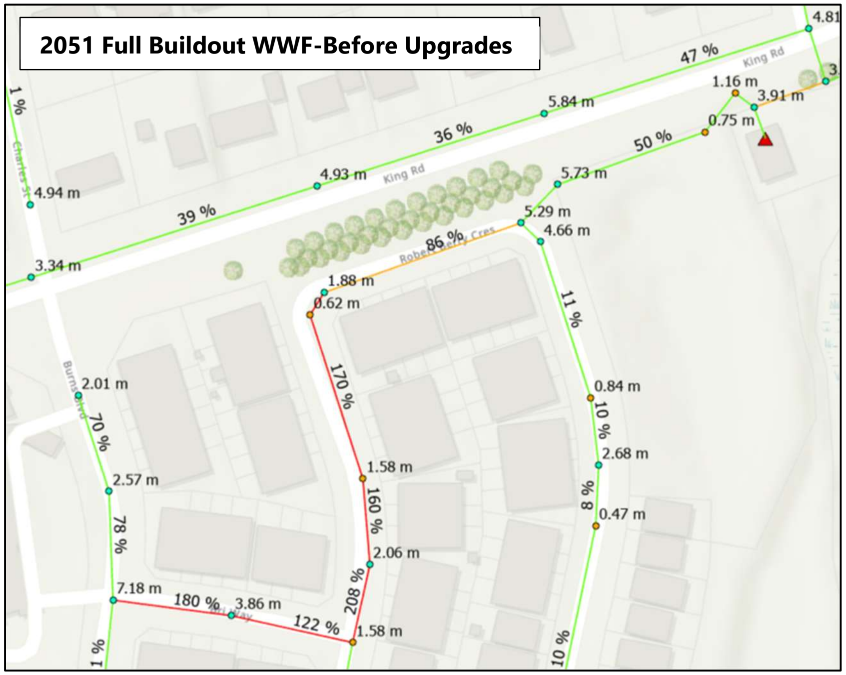
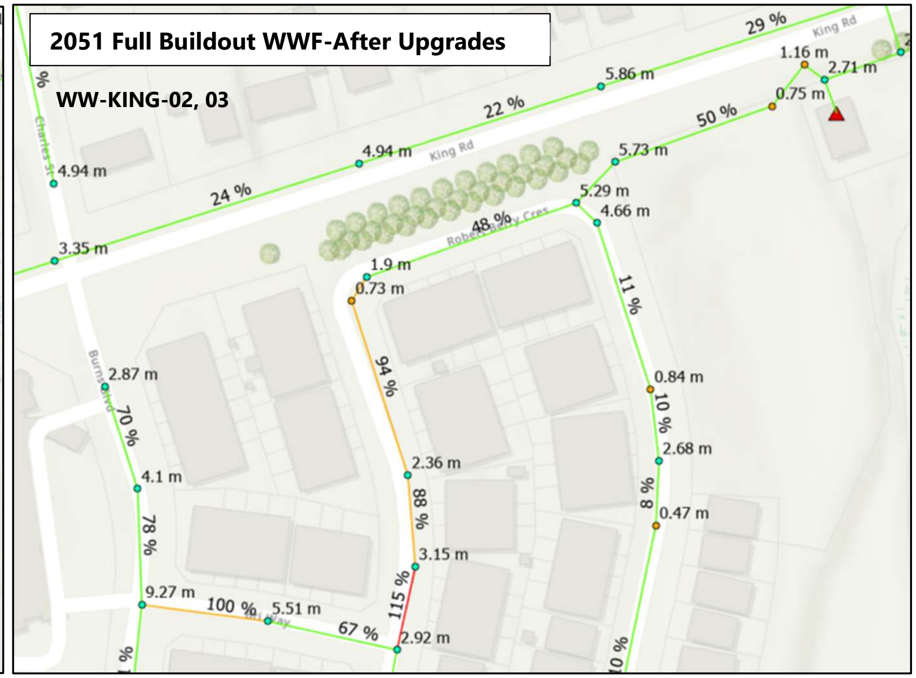

2051 Full Buildout WWF-After Upgrades
King City
King City Memorial
Holy Name Catholic School
Bennet Dr
Warren Rd
Lavender Valley Rd
Ria Crt
Clearview Hts
Patricia Dr
Burton Grove
WAT-KING-06, 08
346 m

Figure 2: King City Simulated Pipe Capacity% and Manhole Freeboard under WWF Before and After Upgrades

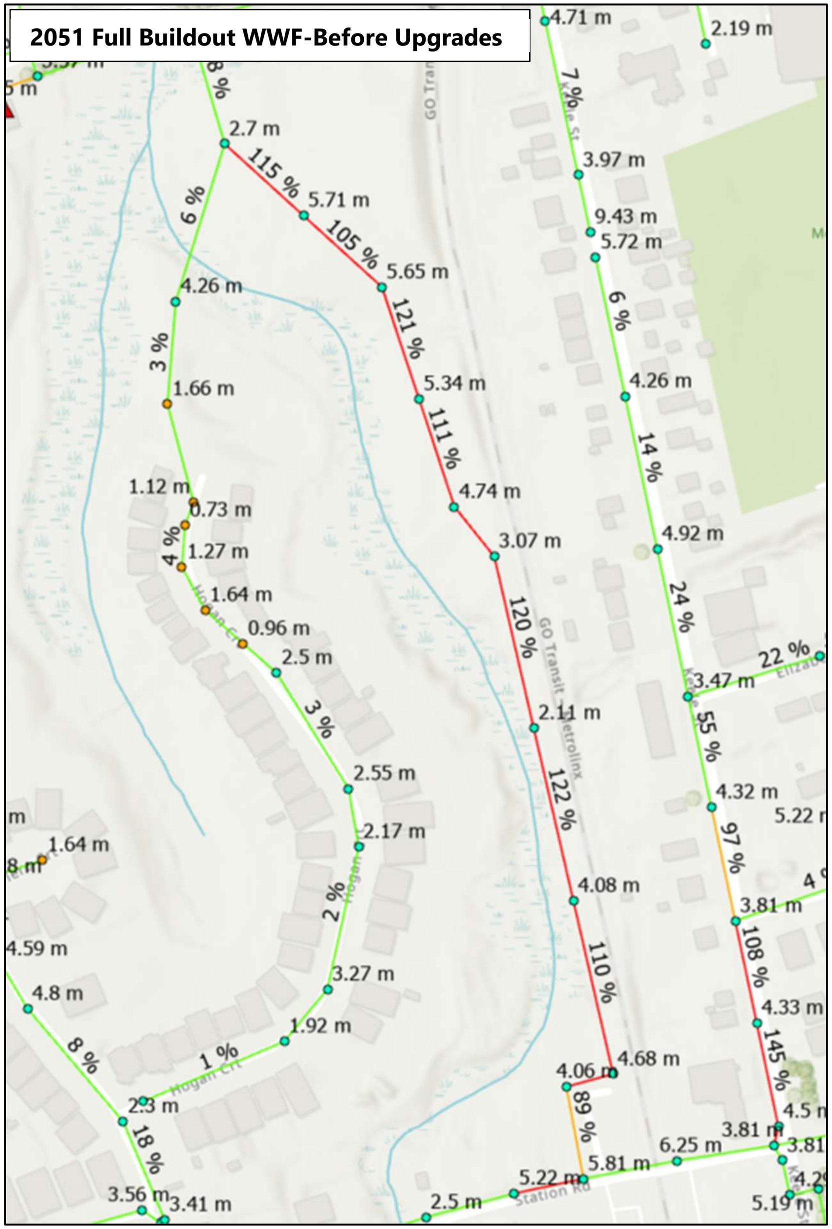


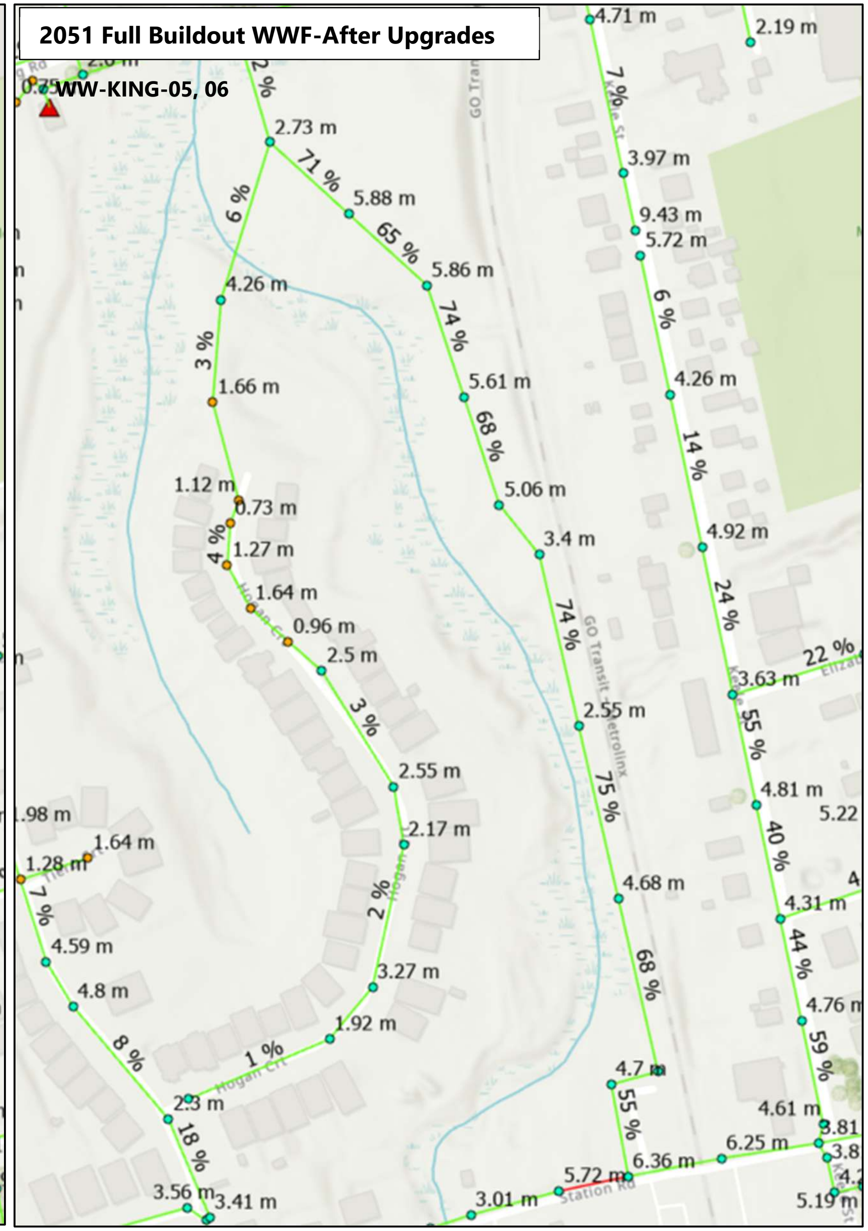


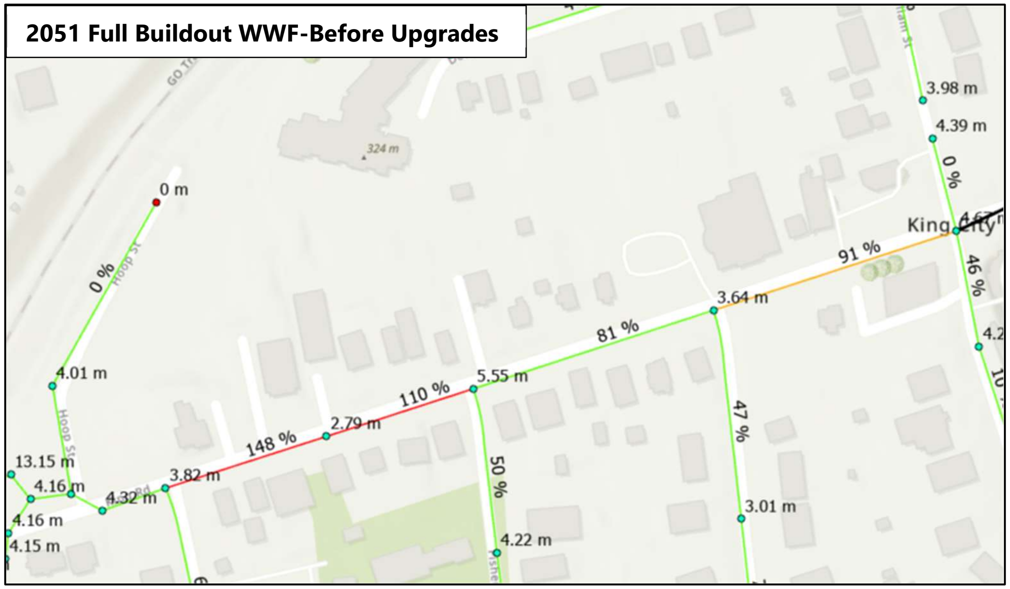
2051 Full Buildout WWF-Before Upgrades



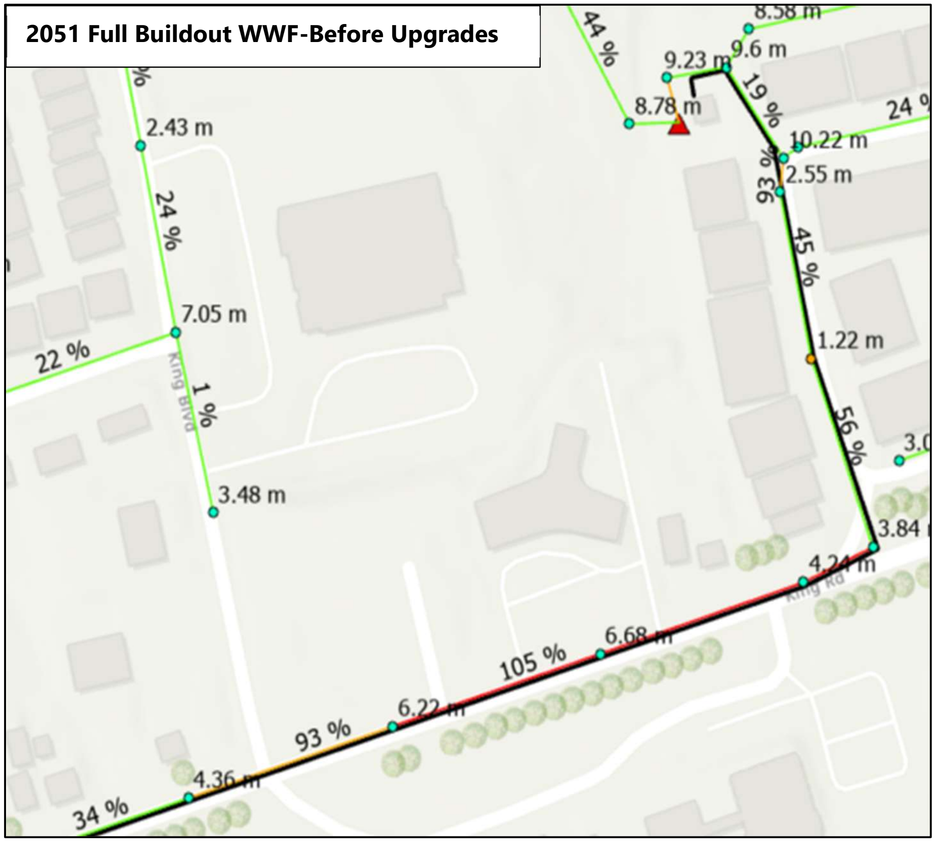
2051 Full Buildout WWF-After Upgrades


2051 Full Buildout WWF-Before Upgrades
4.71 m
2.19 m
2.7 m
115 %
5.71 m
105 %
5.65 m
6 %
4.26 m
121 %
3 %
1.66 m
5.34 m
111 %
4.74 m
3.07 m
1.12 m
0.73 m
4 %
1.27 m
1.64 m
0.96 m
2.5 m
120 %
3 %
2.11 m
2.55 m
122 %
2.17 m
1.64 m
4.08 m
2 %
110 %
4.59 m
3.27 m
4.8 m
1.92 m
1 %
8 %
4.06 m
4.68 m
2.3 m
89 %
18 %
5.22 m
5.81 m
6.25 m
3.56 m
3.41 m
2.5 m
3.97 m
9.43 m
5.72 m
6 %
4.26 m
14 %
4.92 m
24 %
3.47 m
22 %
55 %
4.32 m
5.22 m
97 %
3.81 m
108 %
4.33 m
145 %
3.81 m
4.5 m
3.81 m
5.19 m
GO Transit
Station Rd
Hogan Crt


2051 Full Buildout WWF-After Upgrades
WW-KING-05, 06
4.71 m
2.19 m
2.73 m
71 %
5.88 m
65 %
5.86 m
6 %
4.26 m
74 %
3 %
1.66 m
5.61 m
68 %
5.06 m
3.4 m
1.12 m
0.73 m
4 %
1.27 m
1.64 m
0.96 m
2.5 m
74 %
3 %
2.55 m
75 %
2.55 m
2.17 m
1.98 m
1.28 m
1.64 m
4.68 m
7 %
2 %
68 %
4.59 m
3.27 m
4.8 m
1.92 m
1 %
8 %
4.7 m
55 %
2.3 m
18 %
5.72 m
6.36 m
6.25 m
3.56 m
3.41 m
3.01 m
3.97 m
9.43 m
5.72 m
6 %
4.26 m
14 %
4.92 m
24 %
3.63 m
22 %
55 %
4.81 m
5.22
40 %
4.31 m
44 %
4.76 m
59 %
4.61 m
3.81
3.8
5.19 m
GO Transit
Station Rd
Hogan Crt


2051 Full Buildout WWF-Before Upgrades
0 m
0 %
4.01 m
13.15 m
4.16 m
4.16 m
4.15 m
4.32 m
3.82 m
148 %
2.79 m
110 %
5.55 m
50 %
4.22 m
81 %
3.64 m
47 %
3.01 m
91 %
King City
46 %
0 %
4.39 m
3.98 m


2051 Full Buildout WWF-After Upgrades
WW-KING-07
0 m
0 %
4.01 m
3.37 m
13.16 m
4.74 m
4.71 m
4.5 m
4.23 m
4.35 m
3.84 m
98 %
3.08 m
73 %
5.98 m
50 %
4.22 m
61 %
3.67 m
47 %
3.01 m
7 %
69 %
King
46 %
0 %
4.39 m
3.98 m


2051 Full Buildout WWF-Before Upgrades
8.58 m
44 %
9.23 m
9.6 m
8.78 m
19 %
24 %
2.43 m
10.22 m
2.55 m
93 %
24 %
45 %
7.05 m
1.22 m
22 %
1 %
56 %
3.48 m
3.84
4.24 m
6.68 m
105 %
6.22 m
93 %
4.36 m
34 %

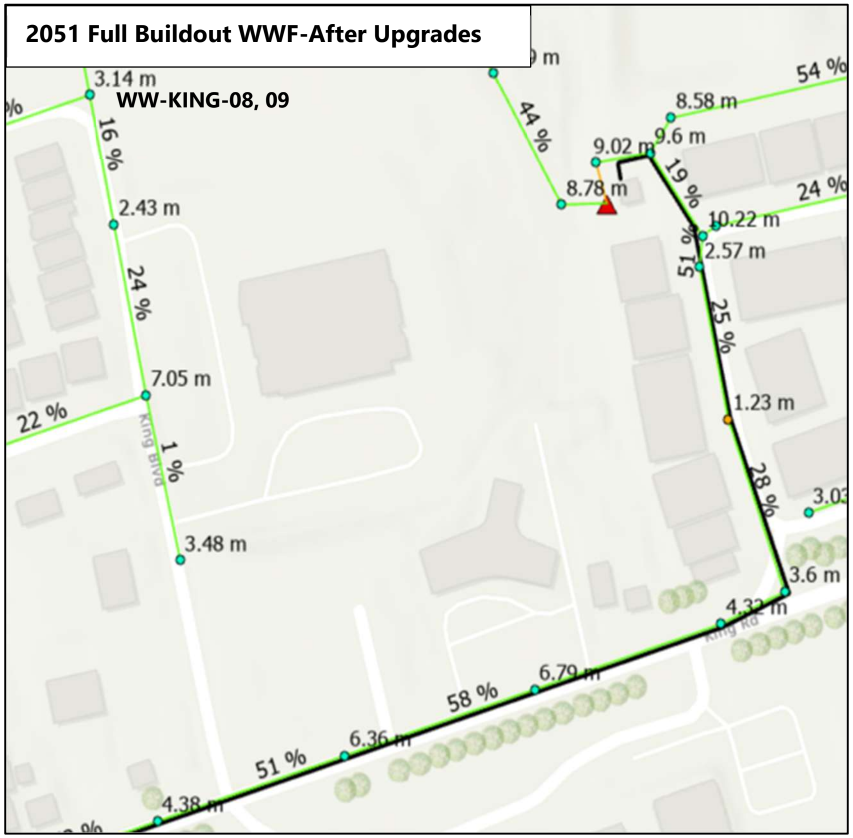
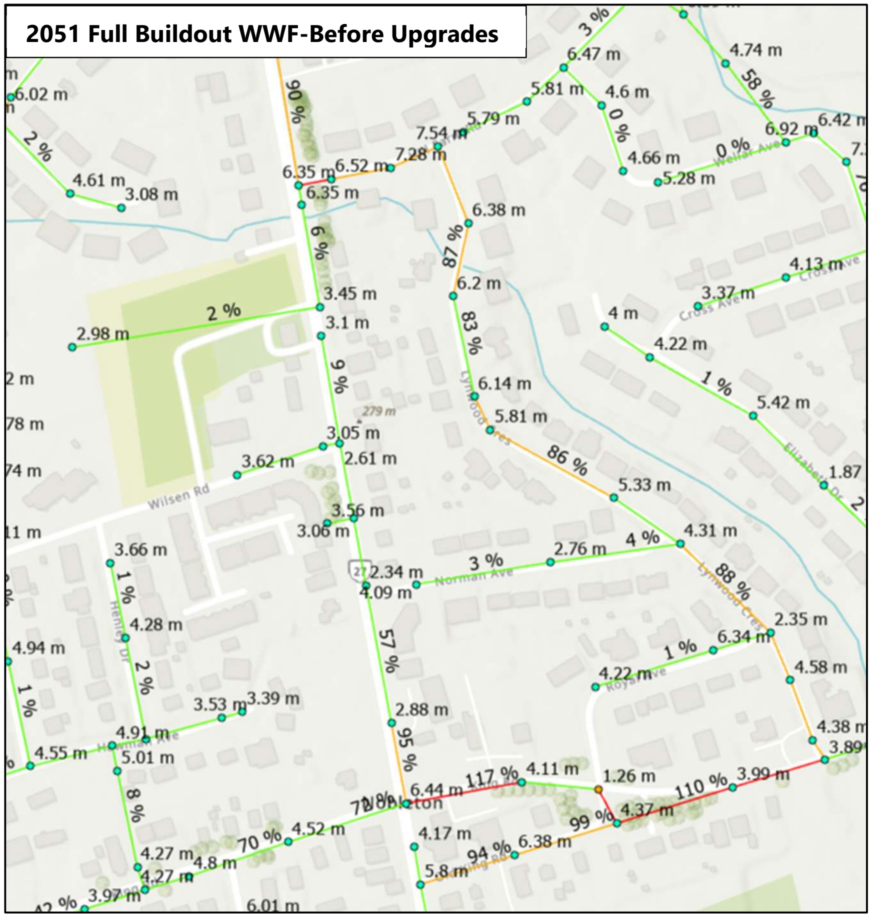
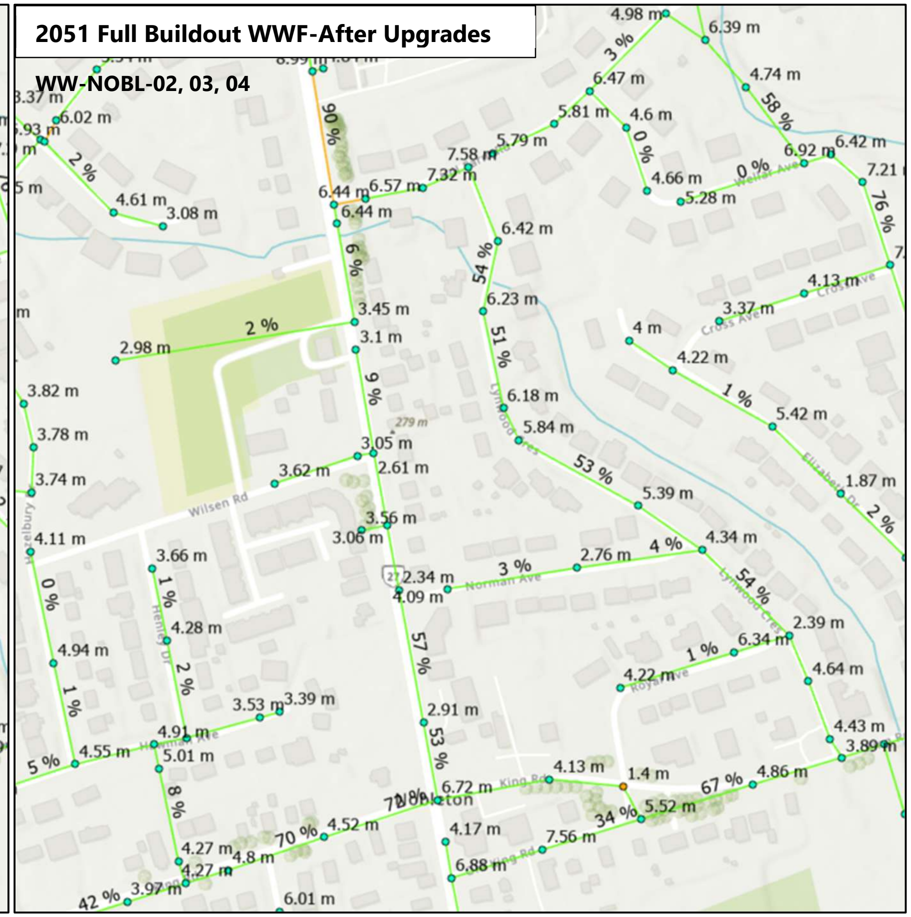
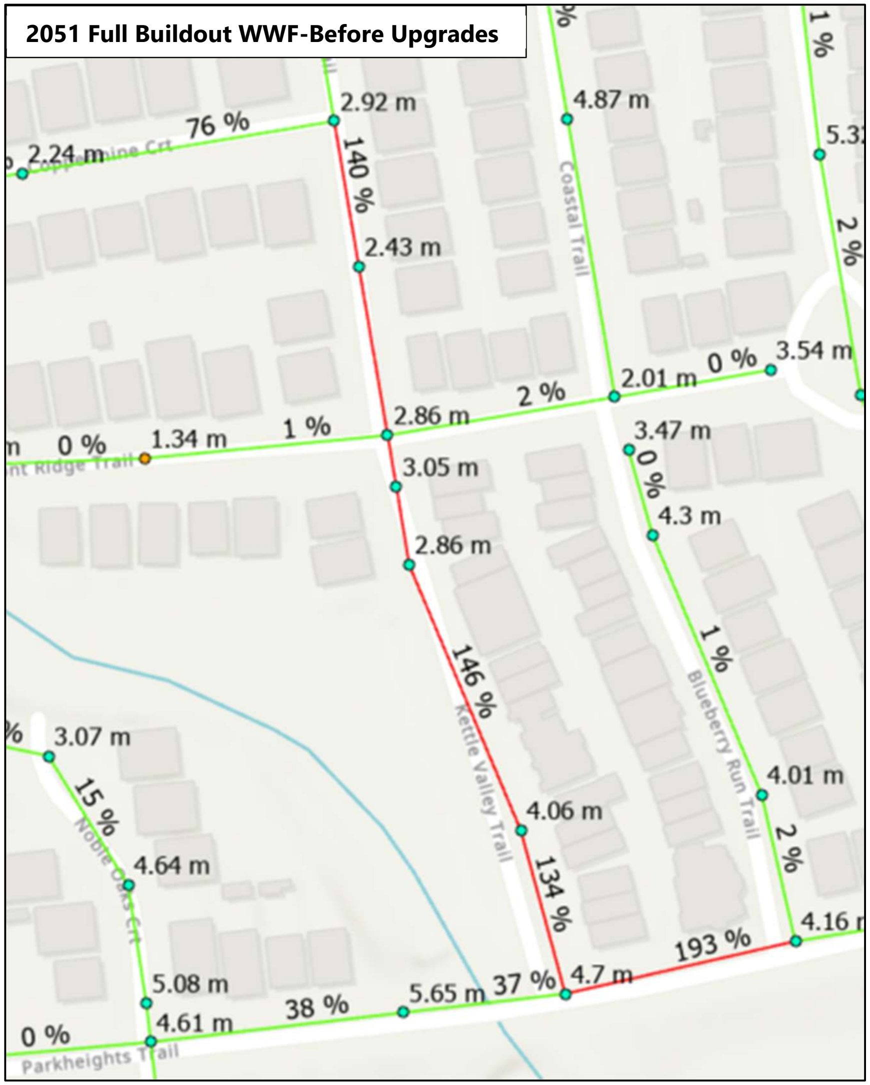
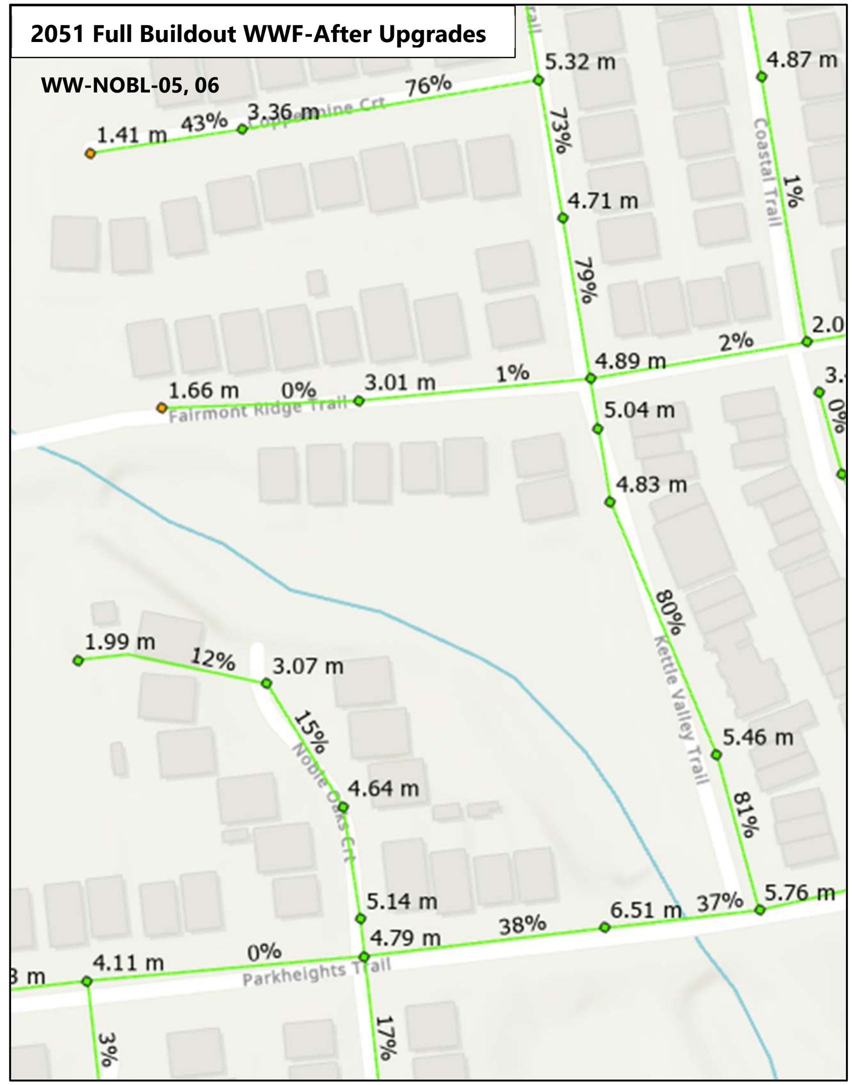

2051 Full Buildout WWF-After Upgrades
3.14 m
WW-KING-08, 09
54 %
16 %
8.58 m
44 %
9.02 m
9.6 m
8.78 m
19 %
24 %
2.43 m
10.22 m
2.57 m
51 %
24 %
25 %
7.05 m
22 %
1.23 m
1 %
28 %
3.48 m
3.6 m
4.32 m
6.79 m
58 %
6.36 m
51 %
4.38 m

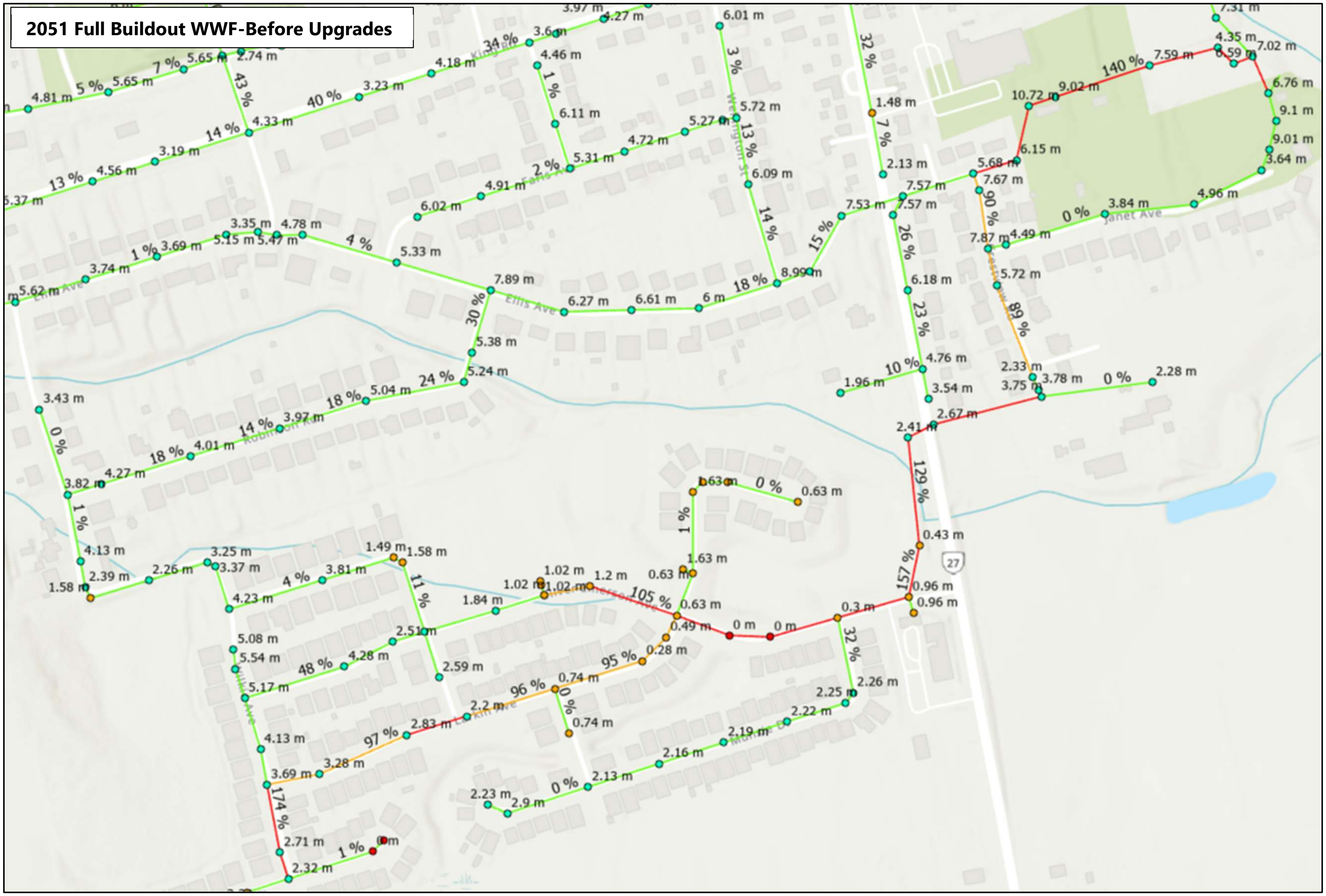
Figure 3: Nobleton Simulated Pipe Capacity% and Manhole Freeboard under WWF Before and After Upgrades

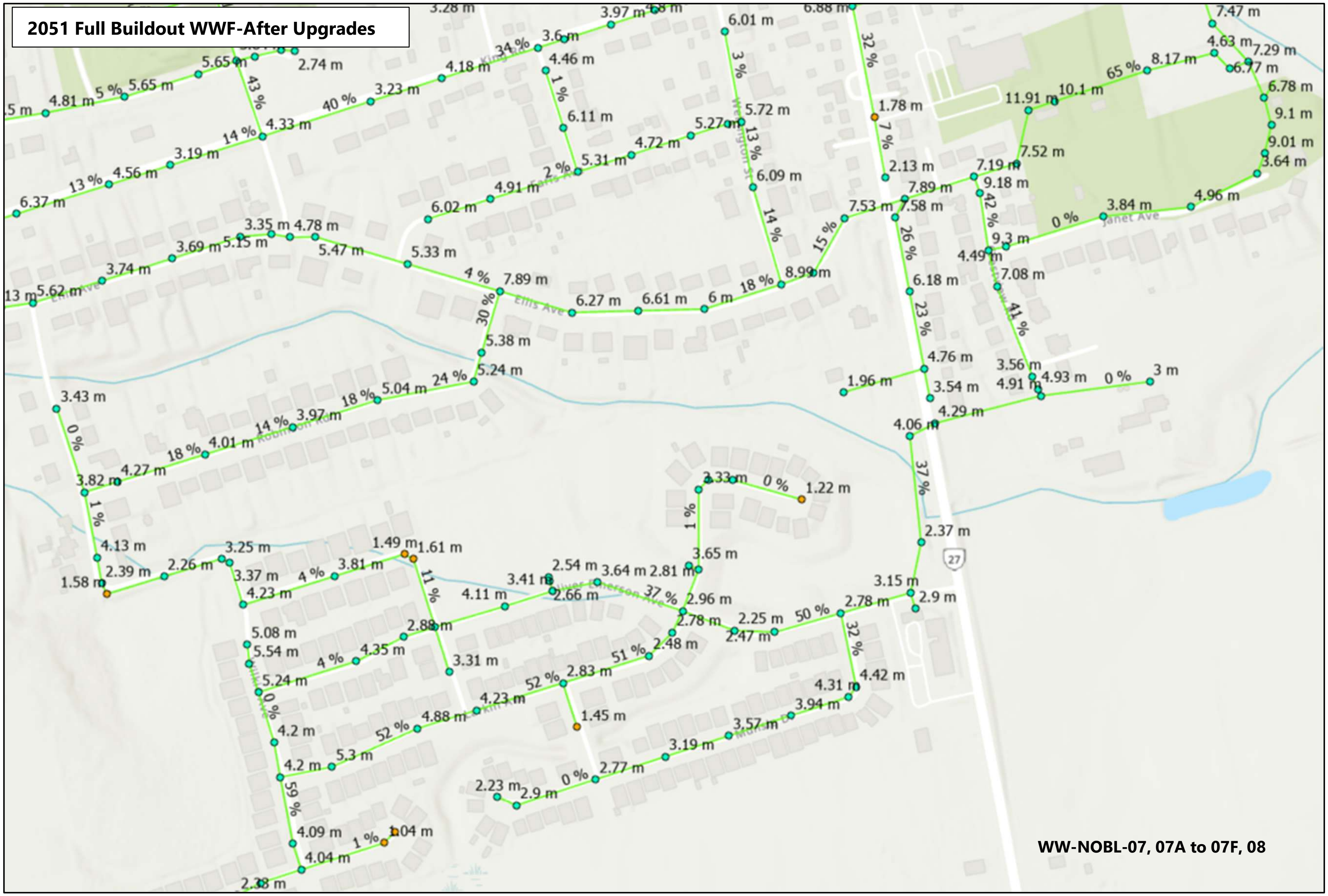

2051 Full Buildout WWF-Before Upgrades


2051 Full Buildout WWF-After Upgrades
WW-NOBL-02, 03, 04


2051 Full Buildout WWF-Before Upgrades
2.92 m
76 %
2.24 m
140 %
2.43 m
4.87 m
Coastal Trail
5.3
1 %
2 %
3.54 m
0 %
2.01 m
2 %
2.86 m
1 %
1.34 m
0 %
3.47 m
0 %
3.05 m
4.3 m
2.86 m
1 %
Blueberry Run Trail
146 %
Kettle Valley Trail
3.07 m
15 %
Noble Oaks Crt
4.01 m
4.06 m
2 %
134 %
4.64 m
4.16
193 %
4.7 m
37 %
5.65 m
5.08 m
38 %
4.61 m
0 %
Parkheights Trail


2051 Full Buildout WWF-After Upgrades
WW-NOBL-05, 06
5.32 m
4.87 m
76%
3.36 m
43%
1.41 m
73%
Coastal Trail
1%
4.71 m
79%
2%
2.0
4.89 m
1%
3.01 m
1.66 m
0%
Fairmont Ridge Trail
5.04 m
4.83 m
80%
Kettle Valley Trail
1.99 m
12%
3.07 m
15%
Noble Oaks Crt
4.64 m
5.46 m
81%
5.14 m
6.51 m
37%
5.76 m
4.79 m
38%
4.11 m
0%
Parkheights Trail
3%
17%


2051 Full Buildout WWF-Before Upgrades
Ellis Ave
Janet Ave


2051 Full Buildout WWF-After Upgrades
WW-NOBL-07, 07A to 07F, 08

APPENDIX F

CAPITAL PROJECT LISTS

Township of King Water Wastewater Master Plan - Water Capital Project List

New Project ID	Project Description	Size	Unit	Length (m)	New/ Upsizing?	Unit Cost	Cost	Crossings [count]	Crossings Cost	Subtotal	EA Schedule	Engineering	Contingency	GRAND TOTAL (2025 Dollars)	Estimated Construction Duration (months)	Planned Year	Funding Source
King City 2051 Water Upgrades									**$150,000**			0%	30%				
WAT-KING-02	Upgrade WM from 150mm to 200mm along Charles St, Melrose Ave, and John St	200	mm	735	Upsize	$ 935	$ 686,885	0	$ -	$ 686,885	Exempt	$ -	$ 206,065	$ 890,000	6 ~ 9	2031	Local Service
WAT-KING-03	Upgrade WM from 150mm to 200mm along Langdon Dr	200	mm	141	Upsize	$ 935	$ 131,835	0	$ -	$ 131,835	Exempt	$ -	$ 39,551	$ 170,000	3 ~ 6	2036	Local Service
WAT-KING-04	Upgrade WM from 150mm to 200mm along Findlay Ave	200	mm	510	Upsize	$ 935	$ 476,850	0	$ -	$ 476,850	Exempt	$ -	$ 143,055	$ 620,000	6 ~ 9	2036	Local Service
WAT-KING-05	Upgrade WM from 250mm to 300mm along Burns Blvd and Station Rd	300	mm	2704	Upsize	$ 1,360	$ 3,677,440	0	$ -	$ 3,677,440	Exempt	$ -	$ 1,103,232	$ 4,780,000	9 ~ 12	2036	DC Fundable
WAT-KING-06	Upgrade WM from 150mm to 200mm along Chuck Ormsby Cres and Richard Serra Crt	200	mm	585	Upsize	$ 935	$ 546,975	0	$ -	$ 546,975	Exempt	$ -	$ 164,093	$ 710,000	6 ~ 9	2036	Local Service
WAT-KING-08	Upgrade WM from 200mm to 250mm along Lavender Valley Rd and Spring Hill Dr	250	mm	1216	Upsize	$ 965	$ 1,173,440	0	$ -	$ 1,173,440	Exempt	$ -	$ 352,032	$ 1,530,000	6 ~ 9	2031	DC Fundable
WAT-KING-09	Proposed 300mm watermains east of Hwy 400	300	mm	2173	New	$ 1,360	$ 2,955,933	1	$ 150,000	$ 3,105,933	Exempt	$ -	$ 931,780	$ 4,040,000	9 ~ 12	2046	DC Fundable
WAT-KING-10	Proposed 300mm watermains along Jane St south of King Rd	300	mm	738	New	$ 1,360	$ 1,004,170	0	$ -	$ 1,004,170	Exempt	$ -	$ 301,251	$ 1,310,000	6 ~ 9	2031	DC Fundable
WAT-KING-11	Proposed 300mm watermains connecting 2955 King Rd and existing 250mm watermain on Burns Blvd	300	mm	1008	New	$ 1,360	$ 1,370,880	1	$ 150,000	$ 1,520,880	Exempt	$ -	$ 456,264	$ 1,980,000	6 ~ 9	2031	DC Fundable
WAT-KING-12	Proposed 300mm watermains along Jane St north of King Rd	300	mm	653	New	$ 1,360	$ 888,080	1	$ 150,000	$ 1,038,080	Exempt	$ -	$ 311,424	$ 1,350,000	6 ~ 9	2031	DC Fundable
WAT-KING-13	Proposed 200mm watermains for Mansions of King	200	mm	1222	New	$ 935	$ 1,142,290	1	$ 150,000	$ 1,292,290	Exempt	$ -	$ 387,687	$ 1,680,000	6 ~ 9	2031	DC Fundable
WAT-LCL-01	Proposed 300mm local watermains for Bushland Heights	300	mm	1001	New	$ 1,360	$ 1,361,360	1	$ 150,000	$ 1,511,360		$ -	$ 453,408	$ 1,960,000		2031	Local Service
WAT-LCL-02	Proposed 300mm local watermains for 2955 King Rd	300	mm	1716	New	$ 1,360	$ 2,333,760	2	$ 300,000	$ 2,633,760		$ -	$ 790,128	$ 3,420,000		2031	Local Service
WAT-LCL-03	Proposed local watermains for 13130 and 13176 Dufferin Street	150	mm	1026	New	$ 935	$ 959,310	3	$ 450,000	$ 1,409,310		$ -	$ 422,793	$ 1,830,000		2031	Local Service
WAT-LCL-04	Proposed local watermains from Tatton Crt to King Rd	150	mm	252	New	$ 935	$ 235,620	4	$ 600,000	$ 835,620		$ -	$ 250,686	$ 1,090,000		2031	Local Service
														$19,060,000.00			
Nobleton 2051 Water Upgrades																	
WAT-LCL-05	Proposed 200mm WM from Ballard Dr to Oliver Emmerson Ave	200	mm	200	New	$ 935	$ 187,000	1	$ 150,000	$ 337,000		$ -	$ 101,100	$ 440,000		2031	Local Service

An allowance of $150,000 per wetland crossing is included. Actual costs depend on crossing length, site conditions, and the construction method used, such as HDD.

King City 2051 Upgrades				
		WAT-KING-02		
ID	**From Node**	**To Node**	**Length (m)**	**Upgraded Diameter (mm)**
KWWM_0058	J236	J200	103	200
KWWM_0179	J202	J88	112	200
KWWM_0372	J1004	J202	104	200
KWWM_0373	J1236	J88	144	200
KWWM_0371	J1236	J1238	157	200
KWWM_0071	J200	J1238	115	200
		WAT-KING-03		
ID	**From Node**	**To Node**	**Length (m)**	**Upgraded Diameter (mm)**
KWWM_0220	J102	J434	141	200
		WAT-KING-04		
ID	**From Node**	**To Node**	**Length (m)**	**Upgraded Diameter (mm)**
KWWM_0070	J94	J30	181	200
KWWM_0250	J974	J94	329	200
		WAT-KING-05		
ID	**From Node**	**To Node**	**Length (m)**	**Upgraded Diameter (mm)**
KWWM_0018	J30	J32	336	300
KWWM_0057	J104	J106	441	300
KWWM_0064	J112	J30	125	300
KWWM_0112	J164	J166	54	300
KWWM_0113	J168	J170	55	300
KWWM_0015	J32	J524	224	300
KWWM_0069	J112	J560	198	300
KWWM_0259	J106	J974	89	300
KWWM_0209	J170	J572	77	300
KWWM_0205	J572	J166	200	300
KWWM_0204	J164	J524	150	300
KWWM_0248	J974	J112	755	300
		WAT-KING-06		
ID	**From Node**	**To Node**	**Length (m)**	**Upgraded Diameter (mm)**
KWWM_0346	J972	J566	222	200
KWWM_0074	J108	J126	168	200
KWWM_0324	J972	J126	195	200
		WAT-KING-08		
ID	**From Node**	**To Node**	**Length (m)**	**Upgraded Diameter (mm)**
KWWM_0225	J136	J138	262	250
KWWM_0082	J460	J136	91	250
KWWM_0228	J474	J476	125	250
KWWM_0229	J478	J480	53	250
KWWM_0234	J138	J474	10	250
KWWM_0224	J480	J456	317	250
KWWM_0185	J476	J132	178	250
KWWM_0078	J132	J478	180	250
		WAT-KING-09		
ID	**From Node**	**To Node**	**Length (m)**	**Proposed Diameter (mm)**
P345	J926	J1645	630	300
P347	J1645	J1647	425	300
P349	J1647	J1655	1118	300

		WAT-KING-10		
ID	**From Node**	**To Node**	**Length (m)**	**Proposed Diameter (mm)**
P317	J1569	J926	334	300
P375	J1569	J1655	404	300
		WAT-KING-11		
ID	**From Node**	**To Node**	**Length (m)**	**Proposed Diameter (mm)**
P357	J1585	J1651	429	300
P365	J1653	J1637	348	300
P367	J1653	J1585	231	300
		WAT-KING-12		
ID	**From Node**	**To Node**	**Length (m)**	**Proposed Diameter (mm)**
P385	J926	J1659	653	300
		WAT-KING-13		
ID	**From Node**	**To Node**	**Length (m)**	**Proposed Diameter (mm)**
P321	J1637	J1685	520	200
P383	J1657	J1497	219	200
P427	J1685	J1657	96	200
		WAT-LCL-01		
ID	**From Node**	**To Node**	**Length (m)**	**Proposed Diameter (mm)**
P429	J1659	J1717	582	300
P487	J1717	J1719	266	300
P489	J1719	J1685	153	300
		WAT-LCL-02		
ID	**From Node**	**To Node**	**Length (m)**	**Proposed Diameter (mm)**
P377	J1579	J1567	255	300
P363	J1579	J1653	385	300
P379	J116	J1579	341	300
P207	J1567	J1569	192	300
P381	J1655	J1567	543	300
		WAT-LCL-03		
ID	**From Node**	**To Node**	**Length (m)**	**Proposed Diameter (mm)**
P147	J1531	J1661	78	150
P389	J1661	J1533	191	150
P481	J1661	J470	266	150
P149	J1533	J1527	107	150
P153	J1531	J1527	177	150
P477	J1533	J1711	117	150
P479	J1527	J1713	90	150
		WAT-LCL-04		
ID	**From Node**	**To Node**	**Length (m)**	**Proposed Diameter (mm)**
P485	J242	J1715	253	150
		Nobleton 2051 Upgrades		
		WAT-LCL-05		
ID	**From Node**	**To Node**	**Length (m)**	**Proposed Diameter (mm)**
P491	J1286	J1176	197	200
NWWM_0171	J1286	J1186	3	200

*The pipe information in this table reflects the proposed pipe conditions.

Township of King Water Wastewater Master Plan - Wastewater Capital Project List

ID	Project Description	Size	Unit	Length	New/ Upsizing?	Unit Cost	Base Cost	Crossings	Crossings Cost*	Subtotal	EA Schedule	Engineering	Contingency	GRAND TOTAL (2025 Dollars)	Estimated Construction Duration (months)	Planned Year	Funding Source
King City 2051 Wastewater Upgrades								[count]	$150,000			15%	30%				
WW-KING-01	Sewer Upgrade from 375 mm to 450mm from south of Kinghorn Rd to Kingsview SPS	450	mm	98	Upsize	4380	$ 428,456		-	$ 428,456	Exempt	$ 64,268	$ 128,537	$ 620,000	6~9	2046	DC Fundable
WW-KING-02	Sewer Upgrade from 375 mm to 450mm along King Rd	450	mm	540	Upsize	4380	$ 2,365,875		-	$ 2,365,875	Exempt	$ 354,881	$ 709,762	$ 3,430,000	9 ~ 12	2031	DC Fundable
WW-KING-03	Sewer Upgrade from 200 mm to 250mm along Bri Way and Rober Berry Cres	250	mm	300	Upsize	3490	$ 1,046,084		-	$ 1,046,084	Exempt	$ 156,913	$ 313,825	$ 1,520,000	9 ~ 12	2041	DC Fundable
WW-KING-05	Sewer Upgrade from 375 mm to 450mm along the sewer between Hogan Ct and Keele St, from Station Rd to King Rd	450	mm	872	Upsize	4380	$ 3,817,723	1	$ 150,000	$ 3,967,723	Exempt	$ 595,158	$ 1,190,317	$ 5,750,000	9 ~ 12	2031	DC Fundable
WW-KING-06	Sewer Upgrade from 250 mm to 350mm along Keele St	350	mm	231	Upsize	3950	$ 911,574		-	$ 911,574	Exempt	$ 136,736	$ 273,472	$ 1,320,000	6~9	2031	DC Fundable
WW-KING-07	Sewer Upgrade from 450 mm to 525mm along King Rd from Keele St to William St	525	mm	526	Upsize	4690	$ 2,466,477		-	$ 2,466,477	Exempt	$ 369,971	$ 739,943	$ 3,580,000	9 ~ 12	2036	DC Fundable
WW-KING-08	Sewer Upgrade from 200 mm to 250mm along King Rd and Alex Campbell Cres	250	mm	434	Upsize	3490	$ 1,515,328		-	$ 1,515,328	Exempt	$ 227,299	$ 454,598	$ 2,200,000	9 ~ 12	2031	Local Service
WW-KING-10	Upgrade of Alex Campbell SPS (130 to 150 L/s) (Pump modification, Forcemain 300mm, L= 700m, No Forcemain Upgrade)	20	L/s		Upsize	25000	$ 500,000			$ 500,000	Exempt	$ 75,000	$ 150,000	$ 730,000		2036	DC Fundable
WW-KING-11	Upgrade of Kinghorn SPS (110 L/s to 152 L/s) (Pump Replacement, Forcemain 350mm, L= 1000m, No Forcemain Upgrade)	42	L/s		Upsize		$ 1,500,000			$ 1,500,000	Exempt	$ 225,000	$ 450,000	$ 2,180,000		2046	DC Fundable
														$ 21,330,000			
Nobleton 2051 Wastewater Upgrades																	
WW-NOBL-01	Sewer Upgrade from 200 mm to 250mm along McCutcheon Ave	250	mm	462	Upsize	3490	$ 1,611,109	1	$ 150,000	$ 1,761,109	Exempt	$ 264,166	$ 528,333	$ 2,550,000	9 ~ 12	2031	Local Service
WW-NOBL-02	Sewer Upgrade from 200 mm to 450mm along Hill Farm Rd and Lynwood Cres	450	mm	726	Upsize	4380	$ 3,179,010	1	$ 150,000	$ 3,329,010	Exempt	$ 499,351	$ 998,703	$ 4,830,000	9 ~ 12	2036	DC Fundable
WW-NOBL-03	Sewer Upgrade from 200 mm to 250mm along Hwy 27	250	mm	64	Upsize	3490	$ 222,303		-	$ 222,303	Exempt	$ 33,345	$ 66,691	$ 320,000	6~9	2031	Local Service
WW-NOBL-04	Sewer Upgrade from 200 mm to 300mm along Old King Rd; Sewer Upgrade from 250 mm to 300mm along King Rd	300	mm	514	Upsize	3720	$ 1,910,902		-	$ 1,910,902	Exempt	$ 286,635	$ 573,270	$ 2,770,000	9 ~ 12	2031	DC Fundable
WW-NOBL-05	Sewer Upgrade from 200 mm to 250mm along Paradise Valley Trail and Kettle Vly Trl	250	mm	315	Upsize	3490	$ 1,099,869		-	$ 1,099,869	Exempt	$ 164,980	$ 329,961	$ 1,590,000	6~9	2036	Local Service
WW-NOBL-06	Sewer Upgrade from 200 mm to 300mm along Parkheigths Trail	300	mm	82	Upsize	3720	$ 304,792		-	$ 304,792	Exempt	$ 45,719	$ 91,438	$ 440,000	6~9	2036	DC Fundable
WW-NOBL-07	Sewer Upgrade from 300 mm to 450 mm through Nobleton Park pipe	450	mm	228	Upsize	4380	$ 997,939		-	$ 997,939	Exempt	$ 149,691	$ 299,382	$ 1,450,000	6~9	2041	DC Fundable
WW-NOBL-07-A	Sewer Upgrade from 300 mm to 450 mm along Parkview pipe	450	mm	137	Upsize	4380	$ 599,053		-	$ 599,053	Exempt	$ 89,858	$ 179,716	$ 870,000	6~9	2041	DC Fundable
WW-NOBL-07-B	Sewer Upgrade from 300 mm to 400 mm along Crestview Rd	400	mm	250	Upsize	4240	$ 1,061,950		-	$ 1,061,950	Exempt	$ 159,293	$ 318,585	$ 1,540,000	6~9	2041	DC Fundable
	Sewer Upgrade from 250 mm to 400 mm from Crestview to Highway 27	400	mm	149	Upsize	4240	$ 633,442	1	$ 150,000	$ 783,442	Exempt	$ 117,516	$ 235,033	$ 1,140,000	6~9	2041	DC Fundable
WW-NOBL-07-C	Sewer Upgrade from 250 mm to 400 mm along Highway 27	400	mm	190	Upsize	4240	$ 804,198	1	$ 150,000	$ 954,198	Exempt	$ 143,130	$ 286,259	$ 1,380,000	6~9	2041	DC Fundable
WW-NOBL-07-D	Sewer Upgrade from 250 mm to 400 mm along Oliver Emerson Ave	400	mm	258	Upsize	4240	$ 1,093,920	1	$ 150,000	$ 1,243,920	Exempt	$ 186,588	$ 373,176	$ 1,800,000	6~9	2041	DC Fundable
WW-NOBL-07-E	Sewer Upgrade from 200 mm to 300 mm along Larkie Ave	300	mm	485	Upsize	3720	$ 1,804,200		-	$ 1,804,200	Exempt	$ 270,630	$ 541,260	$ 2,620,000	9 ~ 12	2041	DC Fundable
WW-NOBL-07-F	Sewer Upgrade from 200 mm to 300 mm along Wilkie Ave	300	mm	103	Upsize	3720	$ 383,160		-	$ 383,160	Exempt	$ 57,474	$ 114,948	$ 560,000	6~9	2041	DC Fundable
WW-NOBL-08	Sewer Upgrade from 600 mm to 750mm near Janet Ave to SPS	750	mm	43	Upsize	5760	$ 247,680		-	$ 247,680	Exempt	$ 37,152	$ 74,304	$ 360,000	6~9	2036	DC Fundable
														$ 24,220,000			

*An allowance of $150,000 per wetland crossing is included. Actual costs depend on crossing length, site conditions, and the construction method used, such as HDD.

King City 2051 Upgrades

WW-KING-01

ID	From ID	To ID	From Invert	To Invert	Diameter (mm)	Length (m)	Total Flow (L/s)	Pipe Capacity, q/Q
KSPI_0668	5	KSMH_0711	275.02	274.74	450	55.41	152.19	0.75
KSPI_0677	KSMH_0712	KSPS_0007	274.51	274.47	450	17.73	181.72	1.34
KSPI_0670	KSMH_0711	KSMH_0712	274.69	274.57	450	24.68	180.70	0.91

WW-KING-02

ID	From ID	To ID	From Invert	To Invert	Diameter (mm)	Length (m)	Total Flow (L/s)	Pipe Capacity, q/Q
KSPI_0356	KSMH_0164	KSMH_0102	293.92	293.05	450	104.46	188.66	0.72
KSPI_0357	KSMH_0415	KSMH_0447	283.98	281.67	450	101.95	198.30	0.46
KSPI_0008	KSMH_0447	KSMH_0386	281.61	281.17	450	20.36	211.78	0.47
KSPI_0101	KSMH_0102	KSMH_0466	293.04	291.01	450	102.69	197.87	0.49
KSPI_0095	KSMH_0380	KSMH_0415	287.42	284.02	450	87.72	198.16	0.35
KSPI_0244	KSMH_0466	KSMH_0380	291.00	287.46	450	110.01	197.92	0.39
26	KSMH_0718	KSMH_0164	294.15	294.00	450	12.97	185.07	0.88

WW-KING-03

ID	From ID	To ID	From Invert	To Invert	Diameter (mm)	Length (m)	Total Flow (L/s)	Pipe Capacity, q/Q
KSPI_0602	KSMH_0585	KSMH_0586	287.45	287.09	250	63.13	42.16	0.94
KSPI_0599	KSMH_0583	KSMH_0584	287.79	287.68	250	29.30	41.88	1.15
KSPI_0603	KSMH_0586	KSMH_0587	287.07	287.02	250	9.73	42.26	0.99
KSPI_0575	KSMH_0589	KSMH_0588	288.53	288.32	250	43.86	41.07	1.00
KSPI_0601	KSMH_0584	KSMH_0585	287.67	287.47	250	31.56	41.98	0.88
KSPI_0600	KSMH_0587	KSMH_0599	286.98	285.28	250	76.58	42.34	0.48
KSPI_0598	KSMH_0588	KSMH_0583	288.34	287.86	250	45.56	41.25	0.67

WW-KING-05

ID	From ID	To ID	From Invert	To Invert	Diameter (mm)	Length (m)	Total Flow (L/s)	Pipe Capacity, q/Q
KSPI_0243	KSMH_0071	KSMH_0122	283.43	283.22	450	71.18	136.55	0.88
KSPI_0238	KSMH_0497	KSMH_0071	283.68	283.43	450	70.81	136.55	0.80
KSPI_0163	KSMH_0501	KSMH_0310	284.32	284.19	450	42.73	136.55	0.87
KSPI_0019	KSMH_0203	KSMH_0014	285.54	285.42	450	32.36	136.55	0.78
KSPI_0298	KSMH_0122	KSMH_0412	281.07	280.35	450	83.51	138.00	0.52
KSPI_0326	KSMH_0076	KSMH_0203	285.90	285.59	450	62.42	136.55	0.68
KSPI_0160	KSMH_0101	KSMH_0111	284.97	284.66	450	118.31	136.55	0.93
KSPI_0270	KSMH_0356	KSMH_0497	283.90	283.69	450	78.52	136.55	0.92
KSPI_0018	KSMH_0310	KSMH_0356	284.17	283.93	450	75.79	136.55	0.85
KSPI_0104	KSMH_0014	KSMH_0101	285.36	284.98	450	118.50	136.55	0.84
KSPI_0034	KSMH_0111	KSMH_0501	284.66	284.34	450	117.49	136.55	0.92

WW-KING-06

ID	From ID	To ID	From Invert	To Invert	Diameter (mm)	Length (m)	Total Flow (L/s)	Pipe Capacity, q/Q
KSPI_0088	KSMH_0359	KSMH_0201	288.65	288.59	350	12.96	82.97	0.83
KSPI_0273	KSMH_0495	KSMH_0500	289.35	288.99	350	69.86	68.40	0.65
KSPI_0327	KSMH_0500	KSMH_0359	288.97	288.67	350	70.61	82.97	0.87
KSPI_0328	KSMH_0257	KSMH_0495	289.75	289.36	350	77.35	60.69	0.58

WW-KING-07

ID	From ID	To ID	From Invert	To Invert	Diameter (mm)	Length (m)	Total Flow (L/s)	Pipe Capacity, q/Q
KSPI_0007	KSMH_0416	KSMH_0347	296.23	295.86	525	21.54	233.62	0.41
KSPI_0161	KSMH_0365	KSMH_0416	297.40	297.18	525	18.48	230.30	0.49
KSPI_0002	KSMH_0347	KSMH_0156	294.92	294.85	525	16.38	238.41	0.41
KSPI_0055	KSMH_0062	KSMH_0436	300.55	299.73	500	132.01	198.48	0.67
KSPI_0188	KSMH_0417	KSMH_0365	297.92	297.46	525	35.16	227.16	0.46
KSPI_0158	KSMH_0436	KSMH_0433	299.69	299.35	525	80.51	218.46	0.78
KSPI_0177	KSMH_0433	KSMH_0417	299.34	299.13	525	88.29	222.37	1.06
KSPI_0024	KSMH_0171	KSMH_0062	301.10	300.57	500	133.53	179.21	0.75

WW-KING-08

ID	From ID	To ID	From Invert	To Invert	Diameter (mm)	Length (m)	Total Flow (L/s)	Pipe Capacity, q/Q
KSPI_0311	KSMH_0095	KSMH_0348	295.19	293.30	250	62.34	26.59	0.26
KSPI_0172	KSMH_0437	KSMH_0440	297.57	297.13	250	84.50	25.78	0.60
KSPI_0131	KSMH_0293	KSMH_0342	298.49	298.04	250	85.00	22.38	0.51
KSPI_0133	KSMH_0440	KSMH_0334	297.09	296.93	250	30.19	26.33	0.61
KSPI_0310	KSMH_0334	KSMH_0095	296.90	295.22	250	73.60	26.33	0.32
KSPI_0140	KSMH_0342	KSMH_0437	298.00	297.58	250	86.00	24.84	0.60
KSPI_0316	KSMH_0348	KSMH_0271	293.27	293.18	250	12.56	26.69	0.53

Nobleton 2051 Upgrades

WW-NOBL-01

ID	From ID	To ID	From Invert	To Invert	Diameter (mm)	Length (m)	Total Flow (L/s)	Pipe Capacity, q/Q
NSPI_0716	NSMH_0571	NSMH_0570	268.71	267.44	250	87.87	25.14	0.35
NSPI_0717	NSMH_0570	NSMH_0572	267.30	266.64	250	57.56	26.63	0.42
NSPI_0718	NSMH_0572	NSMH_0573	266.50	266.11	250	69.95	26.82	0.60
NSPI_0719	NSMH_0573	NSMH_0574	266.09	265.88	250	43.20	27.06	0.65
NSPI_0720	NSMH_0574	NSMH_0575	265.86	265.37	250	93.37	27.41	0.63
NSPI_0721	NSMH_0575	NSMH_0576	265.32	262.69	250	109.69	27.76	0.30

WW-NOBL-02

ID	From ID	To ID	From Invert	To Invert	Diameter (mm)	Length (m)	Total Flow (L/s)	Pipe Capacity, q/Q
NSPI_0259	NSMH_0620	NSMH_0093	254.32	254.23	450	17.89	128.27	0.63
NSPI_0513	NSMH_0132	41	258.23	258.18	450	26.01	105.99	0.89
NSPI_0283	NSMH_0258	NSMH_0298	257.68	257.39	450	64.76	106.30	0.56
NSPI_0300	41	NSMH_0372	258.18	258.00	450	47.40	106.11	0.60
NSPI_0208	NSMH_0391	NSMH_0463	255.84	255.50	450	62.89	107.25	0.48
NSPI_0217	NSMH_0118	NSMH_0390	254.87	254.68	450	40.43	115.59	0.59
NSPI_0053	NSMH_0334	NSMH_0382	256.59	256.46	450	28.71	106.79	0.55
NSPI_0044	NSMH_0372	NSMH_0258	257.95	257.75	450	40.57	106.24	0.53
NSPI_0050	NSMH_0463	NSMH_0118	255.42	254.92	450	99.30	109.44	0.54
NSPI_0215	NSMH_0263	NSMH_0334	257.04	256.61	450	80.14	106.61	0.51
NSPI_0002	NSMH_0298	NSMH_0263	257.35	257.07	450	58.25	106.44	0.54
NSPI_0086	NSMH_0382	NSMH_0391	256.43	255.88	450	109.60	107.10	0.53
NSPI_0490	NSMH_0390	NSMH_0620	254.61	254.41	450	49.86	115.99	0.64

WW-NOBL-03

ID	From ID	To ID	From Invert	To Invert	Diameter (mm)	Length (m)	Total Flow (L/s)	Pipe Capacity, q/Q
NSPI_0016	NSMH_0266	NSMH_0342	261.46	261.16	250	63.70	21.55	0.53

WW-NOBL-04

ID	From ID	To ID	From Invert	To Invert	Diameter (mm)	Length (m)	Total Flow (L/s)	Pipe Capacity, q/Q
NSPI_0204	NSMH_0085	NSMH_0252	260.50	259.50	300	59.95	62.22	0.50
NSPI_0126	NSMH_0108	NSMH_0348	257.82	257.42	300	83.67	33.66	0.50
NSPI_0012	NSMH_0342	NSMH_0085	261.09	260.51	300	92.19	55.36	0.72
NSPI_0220	NSMH_0348	NSMH_0233	257.40	255.56	300	95.07	102.00	0.76
NSPI_0180	NSMH_0252	NSMH_0348	259.42	259.15	300	30.26	63.37	0.69
NSPI_0131	NSMH_0312	NSMH_0108	258.24	257.89	300	77.05	31.97	0.49
NSPI_0231	NSMH_0233	NSMH_0093	255.44	254.33	300	75.49	106.36	0.90

WW-NOBL-05

ID	From ID	To ID	From Invert	To Invert	Diameter (mm)	Length (m)	Total Flow (L/s)	Pipe Capacity, q/Q
NSPI_0474	NSMH_0278	NSMH_0458	265.40	265.12	250	51.24	32.36	0.73
NSPI_0189	NSMH_0283	NSMH_0100	263.85	263.56	250	58.81	34.03	0.81
NSPI_0476	NSMH_0165	39	264.82	264.66	250	17.83	33.68	0.60
NSPI_0144	NSMH_0141	NSMH_0283	264.36	263.86	250	100.06	33.86	0.80
NSPI_0442	NSMH_0458	NSMH_0165	265.12	264.84	250	59.41	32.52	0.79
NSPI_0160	39	NSMH_0141	264.66	264.41	250	27.79	33.75	0.60

WW-NOBL-06

ID	From ID	To ID	From Invert	To Invert	Diameter (mm)	Length (m)	Total Flow (L/s)	Pipe Capacity, q/Q

NSPI_0127	NSMH_0100	NSMH_0147	263.56	263.18	300	81.93	43.29	0.66

WW-NOBL-07

ID	From ID	To ID	From Invert	To Invert	Diameter (mm)	Length (m)	Total Flow (L/s)	Pipe Capacity, q/Q
NSPI_0129	NSMH_0371	NSMH_0389	250.45	250.38	400	21.86	109.66	0.92
NSPI_0029	NSMH_0623	NSMH_0369	251.66	251.11	300	106.93	107.61	1.55
NSPI_0073	NSMH_0322	NSMH_0371	250.67	250.48	300	24.11	107.61	1.24
NSPI_0286	NSMH_0369	NSMH_0322	251.09	250.74	300	74.95	107.61	1.62

WW-NOBL-07-A

ID	From ID	To ID	From Invert	To Invert	Diameter (mm)	Length (m)	Total Flow (L/s)	Pipe Capacity, q/Q
NSPI_0498	NSMH_0337	NSMH_0623	251.88	251.69	300	29.29	107.61	1.37
NSPI_0035	NSMH_0076	NSMH_0381	252.59	252.29	300	47.96	105.70	1.36
NSPI_0241	NSMH_0381	NSMH_0337	252.26	251.90	300	59.52	105.73	1.39

WW-NOBL-07-B

ID	From ID	To ID	From Invert	To Invert	Diameter (mm)	Length (m)	Total Flow (L/s)	Pipe Capacity, q/Q
NSPI_0027	NSMH_0324	NSMH_0076	252.70	252.62	300	18.98	59.47	0.93
NSPI_0147	NSMH_0129	NSMH_0365	253.24	253.05	300	40.05	59.13	0.88
NSPI_0039	NSMH_0109	NSMH_0129	253.76	253.26	300	106.12	58.93	0.89
NSPI_0400	NSMH_0050	NSMH_0009	254.54	253.94	250	118.91	56.69	1.34
NSPI_0441	NSMH_0009	42	253.90	253.87	300	8.19	58.89	0.87
NSPI_0440	42	NSMH_0109	253.87	253.82	300	14.43	58.89	0.67
NSPI_0399	NSMH_0049	NSMH_0050	254.78	254.58	250	30.49	54.69	1.13
NSPI_0272	NSMH_0365	NSMH_0324	253.02	252.73	300	62.69	59.40	0.90

WW-NOBL-07-C

ID	From ID	To ID	From Invert	To Invert	Diameter (mm)	Length (m)	Total Flow (L/s)	Pipe Capacity, q/Q
NSPI_0397	NSMH_0036	NSMH_0048	255.66	255.47	250	55.66	54.69	1.57
NSPI_0398	NSMH_0048	NSMH_0049	255.46	254.87	250	116.20	54.69	1.29
NSPI_0396	NSMH_0008	NSMH_0036	256.09	255.90	200	17.81	0.46	0.01

WW-NOBL-07-D

ID	From ID	To ID	From Invert	To Invert	Diameter (mm)	Length (m)	Total Flow (L/s)	Pipe Capacity, q/Q
NSPI_0395	NSMH_0035	NSMH_0036	256.03	255.68	250	79.16	54.23	1.45
NSPI_0394	NSMH_0046	NSMH_0035	256.36	256.05	250	74.90	46.73	1.24
NSPI_0393	NSMH_0045	NSMH_0046	256.58	256.38	250	43.80	46.64	1.22
NSPI_0392	NSMH_0044	NSMH_0045	256.86	256.62	250	60.26	46.64	1.24

WW-NOBL-07-E

ID	From ID	To ID	From Invert	To Invert	Diameter (mm)	Length (m)	Total Flow (L/s)	Pipe Capacity, q/Q
NSPI_0429	NSMH_0016	NSMH_0017	275.38	257.09	200	35.92	24.59	0.93
NSPI_0430	NSMH_0017	NSMH_0044	257.06	256.93	200	25.58	24.62	0.98
NSPI_0428	NSMH_0015	NSMH_0016	258.02	257.41	200	98.48	24.50	0.95
NSPI_0424	NSMH_0013	NSMH_0014	258.95	258.65	200	67.04	24.20	1.10
NSPI_0425	NSMH_0014	NSMH_0015	258.62	258.04	200	98.53	24.29	0.96
NSPI_0422	NSMH_0011	NSMH_0012	259.89	259.59	200	57.43	23.77	1.00
NSPI_0423	NSMH_0012	NSMH_0013	259.55	258.97	200	102.15	24.05	0.97

WW-NOBL-07-F

ID	From ID	To ID	From Invert	To Invert	Diameter (mm)	Length (m)	Total Flow (L/s)	Pipe Capacity, q/Q
NSPI_0413	NSMH_0052	NSMH_0053	260.38	260.25	200	29.42	37.59	1.72
NSPI_0414	NSMH_0053	NSMH_0011	260.23	259.91	200	73.88	37.74	1.74

WW-NOBL-08

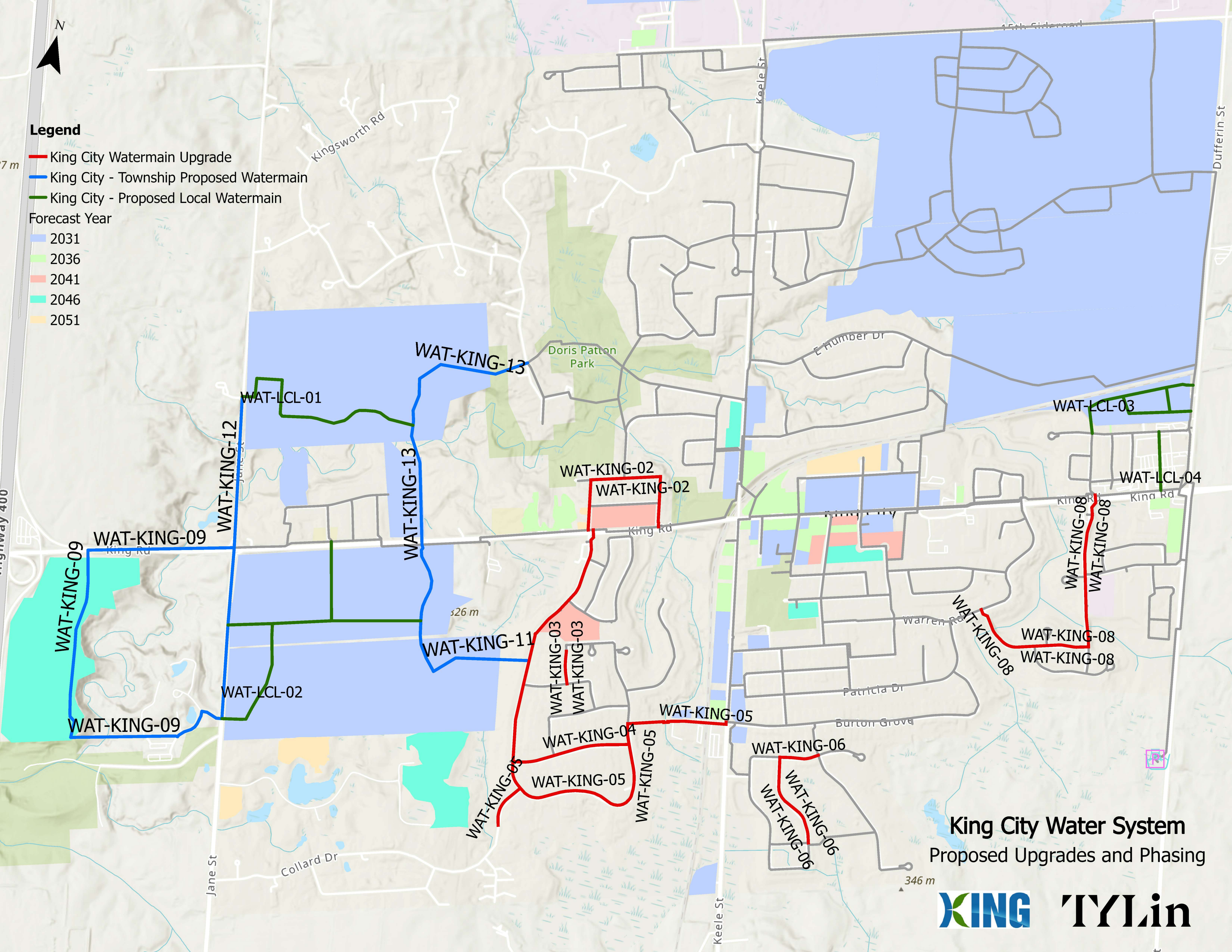
ID	From ID	To ID	From Invert	To Invert	Diameter (mm)	Length (m)	Total Flow (L/s)	Pipe Capacity, q/Q
NSPI_0296	NSMH_0389	54	247.88	247.70	600	43.17	427.63	1.32
OUTLET	54	OUTLET_MH	247.00	246.00	600	23.00	468.74	0.37

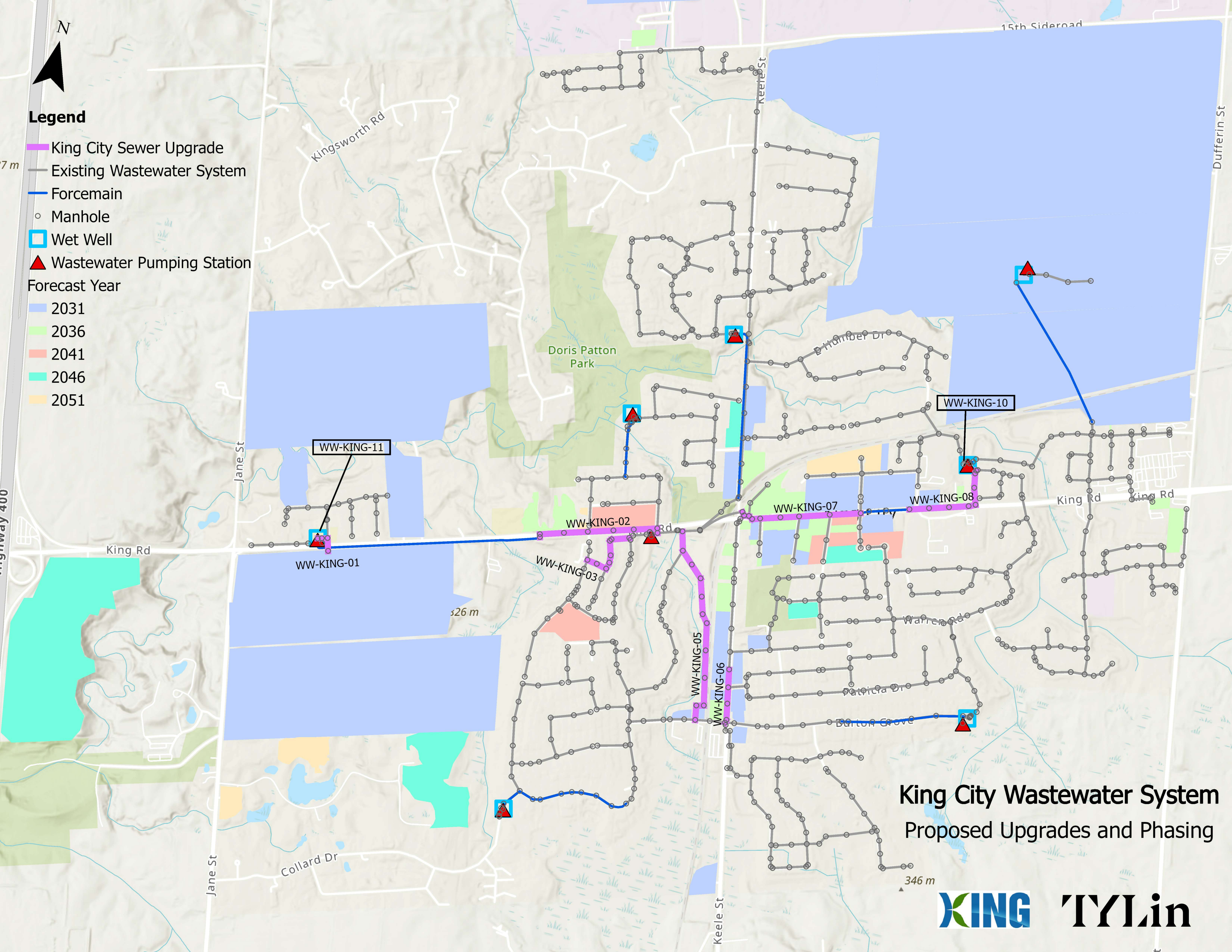
*Total Flow (L/s) is calculated under future 2051 conditions with system upgrades

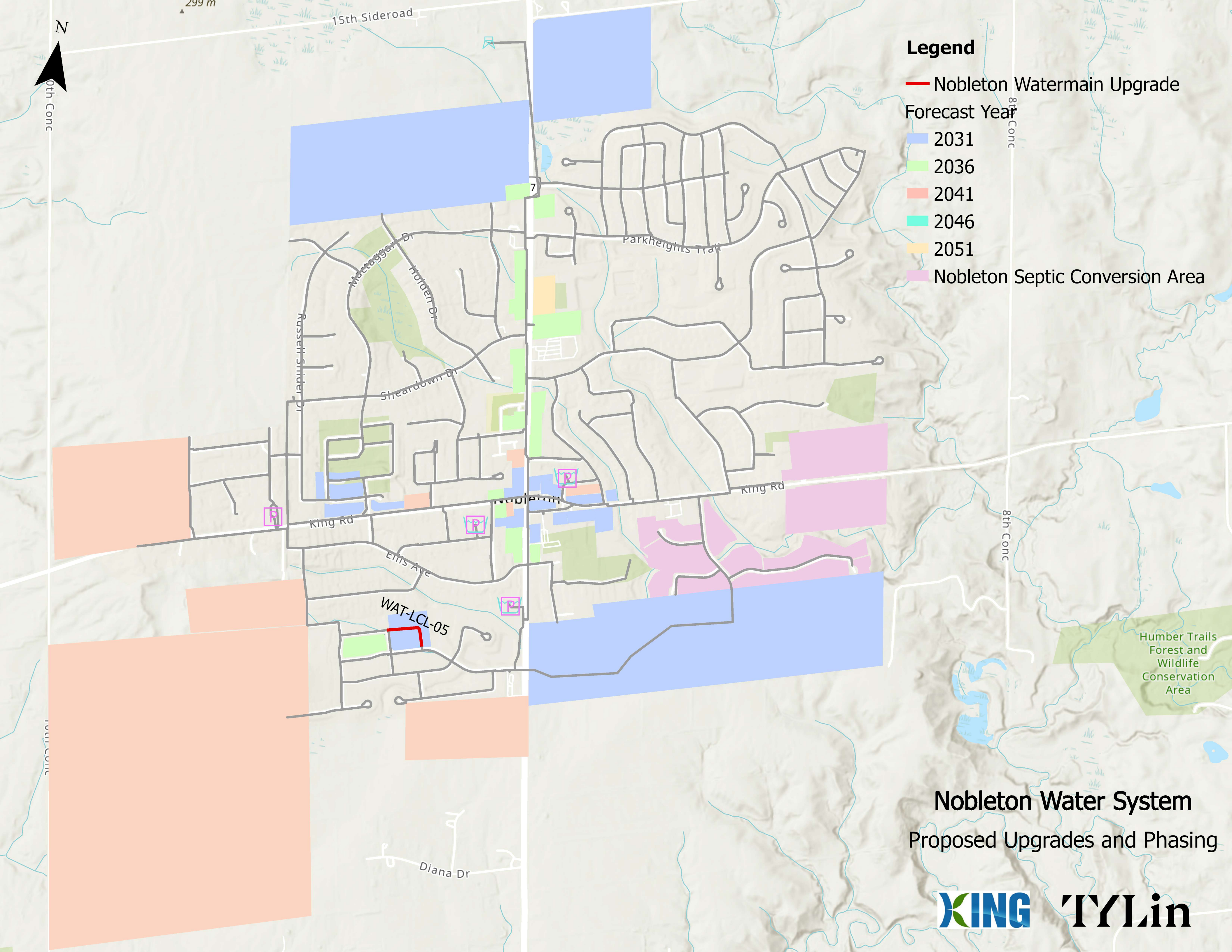
*The pipe information in this table reflects the proposed pipe conditions.

APPENDIX G

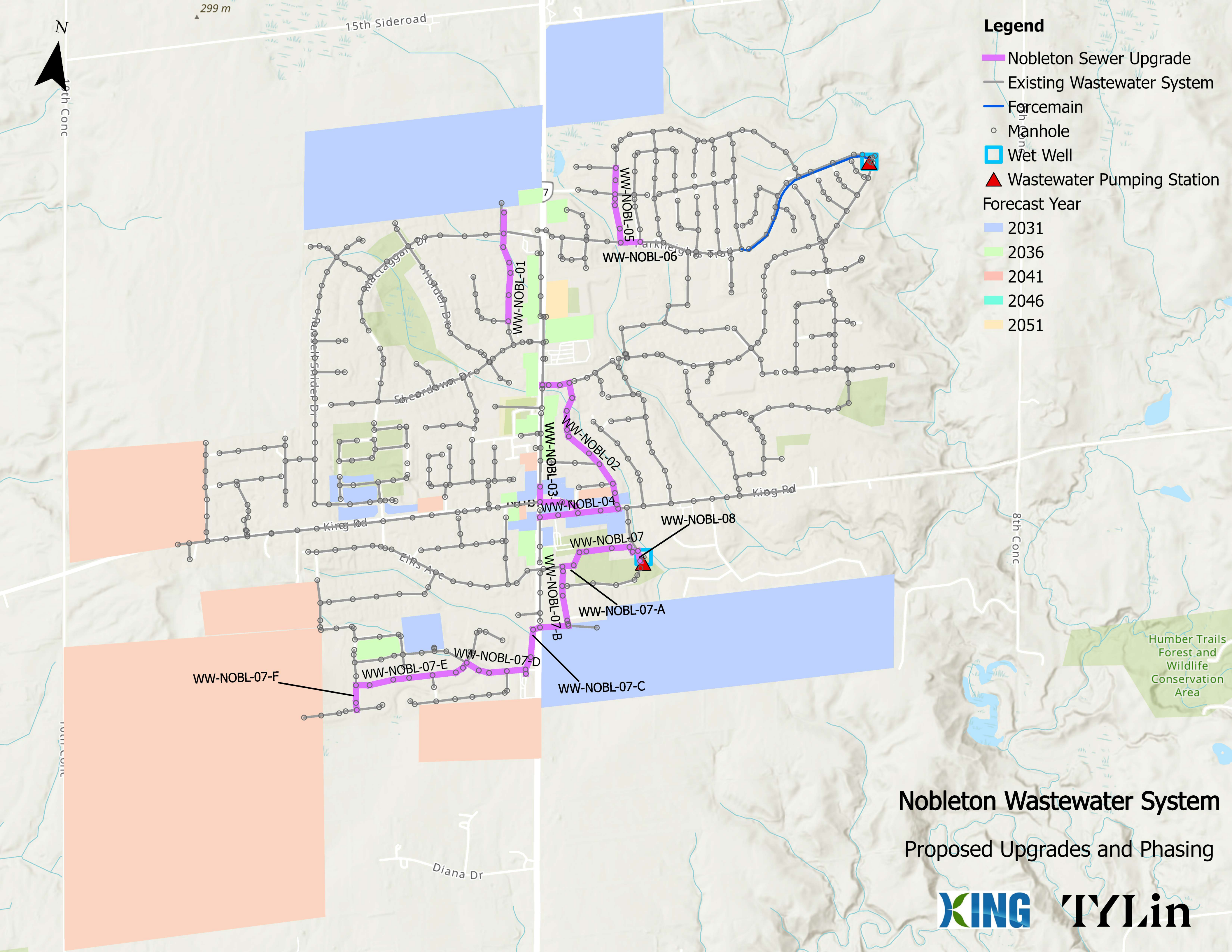
CAPITAL PROJECT MAPS


N
Legend
King City Watermain Upgrade
King City - Township Proposed Watermain
King City - Proposed Local Watermain
Forecast Year
2031
2036
2041
2046
2051
WAT-KING-02
WAT-KING-03
WAT-KING-04
WAT-KING-05
WAT-KING-06
WAT-KING-08
WAT-KING-09
WAT-KING-11
WAT-KING-12
WAT-KING-13
WAT-LCL-01
WAT-LCL-02
WAT-LCL-03
WAT-LCL-04
Kingsworth Rd
Keele St
Dufferin St
Jane St
King Rd
Warren Rd
Patricia Dr
Burton Grove
Collard Dr
E Humber Dr
Doris Patton Park
Highway 400
326 m
346 m
King City Water System
Proposed Upgrades and Phasing
KING
TYLin


King City Wastewater System
Proposed Upgrades and Phasing
N
Legend
King City Sewer Upgrade
Existing Wastewater System
Forcemain
Manhole
Wet Well
Wastewater Pumping Station
Forecast Year
2031
2036
2041
2046
2051
WW-KING-01
WW-KING-02
WW-KING-03
WW-KING-05
WW-KING-06
WW-KING-07
WW-KING-08
WW-KING-10
WW-KING-11
15th Sideroad
Keele St
Dufferin St
Kingsworth Rd
Doris Patton Park
Jane St
King Rd
Highway 400
Collard Dr
Patricia Dr
Burton Grove
346 m
KING
TYLin



Legend
Nobleton Watermain Upgrade
Forecast Year
2031
2036
2041
2046
2051
Nobleton Septic Conversion Area
Nobleton Water System
Proposed Upgrades and Phasing
KING
TYLin
WAT-LCL-05
15th Sideroad
Parkheights Trail
King Rd
8th Conc
Ellis Ave
Diana Dr
Sheardown Dr
Holden Dr
Mactaggart Dr
Russell Snider Dr
Humber Trails Forest and Wildlife Conservation Area
N
299 m



Legend
Nobleton Sewer Upgrade
Existing Wastewater System
Forcemain
Manhole
Wet Well
Wastewater Pumping Station
Forecast Year
2031
2036
2041
2046
2051
N
299 m
15th Sideroad
King Rd
8th Conc
Diana Dr
Elm Ave
Sheardown Dr
Humber Trails Forest and Wildlife Conservation Area
WW-NOBL-01
WW-NOBL-02
WW-NOBL-03
WW-NOBL-04
WW-NOBL-05
WW-NOBL-06
WW-NOBL-07
WW-NOBL-07-A
WW-NOBL-07-B
WW-NOBL-07-C
WW-NOBL-07-D
WW-NOBL-07-E
WW-NOBL-07-F
WW-NOBL-08
Nobleton Wastewater System
Proposed Upgrades and Phasing