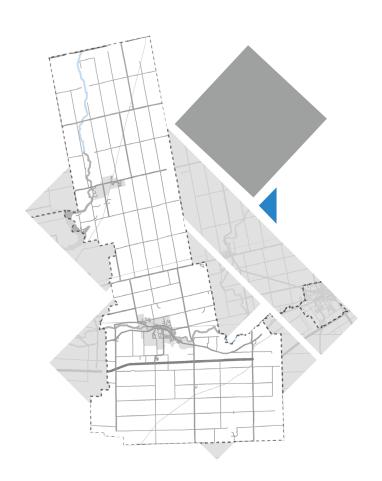


APPENDIX A

PLANNING AND DEVELOPMENT INFORMATION









Date: September 5, 2019 File: 418109

To: Carlos Reyes, Municipality of Thames Centre

From: Matthew Fisher - GM BluePlan

Julien Bell – GM BluePlan

Project: Water and Wastewater Master Plan Update

Subject: Growth Projections and Allocation Methodology (Updated with Final Growth Projections Numbers

for inclusion in the 2019 Water and Wastewater

Master Plan Final Report)

TECHNICAL MEMO

1 Introduction

This memo is intended to outline the Municipality of Thames Centre's growth projections; as well as the allocation approach and assumptions which will be utilized to support the Water and Wastewater Infrastructure Evaluation and Needs Assessment. The growth projections will be used to estimate future system demands and flows (and ultimately the growth-related water and wastewater infrastructure needs).

This technical memorandum has been updated for inclusion in the 2019 Water and Wastewater Master Plan Final Report and replaces the February 22, 2019 document. This technical memorandum has been updated with final growth projections numbers based on comments provided by the City and best available development plan information.

2 Alternative Methodologies for Growth Projections

GM BluePlan initially completed a review of the Build-Out projections set-out in the 2018 DC Background Study compared to the available draft plans and concept plans and the area of available lands to be developed for residential and employment use in Dorchester, Thorndale and the Peripheral Areas (to the Settlement Boundaries) and the 401 Corridor Lands. This initial review identified inconsistent resultant densities and prompted a more detailed review of growth projection and allocation methodologies.

The review of alternative growth projection and allocation methodologies will ensure that the design of planned infrastructure upgrades best balances the needs of providing for growth across the whole of Dorchester, Thorndale and the Peripheral and 401 Corridor Lands along with the requirements for localized development areas.

2.1 Development of Alternative Methodologies

Growth projections within Dorchester, Thorndale and the peripheral areas located outside of the two communities' Settlement Boundaries can be generally considered based on the following methodologies:

- Growth Projections to Buildout based on best available development application information and the Municipality's Development Charges Background Study; and,
- Growth Projections to Buildout based on best available development application information and future developable lands at established target densities.
 - Established target densities are determined through review of existing and planned development and consultation with the Municipality.

As noted above, there are three main areas within the Municipality of Thames Centre that are considered for growth that is to be serviced by municipal water and wastewater. These are:

- Within the Dorchester Settlement Boundary (Dorchester);
- Within the Thorndale Settlement Boundary (Thorndale); and,
- Outside of the Existing Dorchester and Thorndale Settlement Boundaries (noted in this technical memorandum as Peripheral Lands and 401 Corridor Lands and noted in the DC Background Study as Rural Lands).



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The Municipality has provided GMBP with their internal development maps for Dorchester and Thorndale along with supporting drawings for development applications within the municipality's two urban areas. This information is considered the best available development application information. Growth projections for areas where development application information is available is based on the type and number of units specified in the drawing package.

Three methods will be developed to establish growth projections across Thames Centre utilizing the above noted methodologies and the above noted areas where growth is to be provided with municipal servicing. A summary of the methods is shown in **Table 2-1**.



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Table 2-1: Summary of Growth Projection and Allocation Methodologies

Area Type	Method 1	Method 2	Method 3
Within the Dorchester and	I Thorndale Settlement Area	Boundaries	
For Areas Where Developm	ent Application Information is	Available	
 Under Construction and Draft Plan Approved – 	Growth projections based of drawings	on type and number of units	specified in provided plans /
 Developments with Conceptual Plans 	urawings		
For Areas Identified as Developable in the	Build-Out to DC Growth Projections	Build-Out by Developable	e Area x Target Densities
Municipality's Development Maps where no Development Application Information is Available	Total growth projection matches DC Background Study for Dorchester and Thorndale.	Dorchester and Thorndale	d for land use types within the Settlement Area Boundaries ble areas where there is no nation available.
	Remainder of lands		
	Total DC Growth within Settlement Boundaries		
	Growth Specified in Areas Where Development Application Information is Available	t	
	Growth for Developable Lands where drawing / plan information is available is distributed by land use and developable area to equal Projections set out in DC Background Study.		
Outside of the Dorchester and Thorndale Settlement Build-Out to DC Growth Projections		rowth Projections	Build-Out by Developable Area x Target Densities
Boundaries (Peripheral and 401 Corridor Lands)	Total growth projection mater for "Rural" Areas (Peripheral Boundaries in Dorchester an Corridor Lands south of Dorce	matches DC Background Study pheral Lands to Settlement identified for land types in the Periph	



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The Municipality's Land Use Maps for Dorchester and Thorndale taken from the Municipality's official plan are included in **Appendix A**.

2.2 Purpose and Use of Growth Projection Methodologies

The procedure and purpose / use of the alternative growth projection methodologies is summarized in **Table 2-2**.

Table 2-2: Purpose and Use of Proposed Growth and Allocation Methodologies to Inform Master Plan Recommendations

Approach	Procedure and Purpose	Method 1	Method 2	Method 3
	For Dorchester and Thorndale	Build-Out to DC Growth Projections	,	ppable Area x Target sities
Procedure	For the Peripheral Lands and 401 Corridor Lands	Build-Out to DC (Growth Projections	Build-Out by Developable Area x Target Densities
Purpose / Us	se	 Identification of Upgrade Triggers Development of Capital Plan 	Sizing of infrastructure uses been triggered by degenerated by Method 1. Where proposed sizing I varies from sizing based detailed engineering revand sizing based on preconsultation with the Mu	based on Method 2 I on Method 3; more iew will be undertaken, ferred approach in

Using the approach summarized in **Table 2-2**:

- 1. Growth allocated under Method 1 can trigger a required upgrade (e.g. a new gravity sewer required to convey flows from Peripheral Lands development);
- 2. Sizing of the new upgrade is completed utilizing Method 2 and Method 3;
- 3. If the proposed size differs based on Method 2 versus Method 3 (e.g. new gravity sewer is sized as 250mm diameter under Method 2 versus 375mm under Method 3), then more detailed review of risks versus operational issues is undertaken.

Sizing planned infrastructure based on this approach provides for oversized area infrastructure that can help protect against future capacity constraints that will require costly oversizing or construction of new "relief" infrastructure through newly urbanized areas. Alternatively, oversized infrastructure can lead to operational issues in the interim period prior to build-out (or if build-out does not progress to the projected densities).

The application of the alternative methodologies to determine Buildout projections are detailed in the following sections.



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3 Existing and Ultimate Growth Projections

3.1 Existing Residential and Employment Population

Existing equivalent population (residential population (persons) and employment population (jobs) for which municipal water servicing is provide was determined as follows:

Table 3-1: Existing Water Serviced Population in Dorchester and Thorndale

Area	Dorchester	Thorndale
Existing Serviced Residential Population	5,346	1,216
Existing Serviced Employment Population	1,765	402
Total Existing Serviced Equivalent Population	7,111	1,618

Existing residential populations are based on the serviced residential populations for the Dorchester Water Treatment Plant and the Thorndale Water Treatment Plant (taken from the 2018 DC Background Study (Schedule 6c). Population was assumed to be WTP Users x 2018 Persons Per Unit (P. P. U.). 2018 P. P. U. is 2.673 as set out in **Table 3-1** of the DC Background Study.

Employment Population is based on the total ratio of 2018 Urban jobs to residential population. 2018 Urban jobs / residential population and is equal to 2,545 jobs / 7,708 persons = 0.33 jobs/person. This information was taken from Schedule 2a in the DC Background Study. Based on this, the estimated existing serviced Employment populations are:

- Dorchester Employment Population = 0.33 jobs/p x 5,346 persons = 1,765 jobs
- Thorndale Employment Population = 0.33 jobs/p x 1,216 persons = 402 jobs

3.2 Best Available Development Information

At present, there are six residential developments within Dorchester and Thorndale which are under construction or have draft plan approval. There are an additional three residential developments within Dorchester and Thorndale where potential developers have provided the Municipality with preliminary plans / development concepts – but the potential developments have no official status.

The developments with best available development information are summarized in **Table 3-2**.



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Table 3-2: Best Available Development Information for Dorchester and Thorndale

	Projected Growth at Buildout (Equivalent Population)		
Developable Area by Official Plan Land Use	Equiv. Pop. / Jobs	Area (Ha)	Density (ppjha)
Dorchester Residential			
Proposed Developments Under Construction / With Draft Plan Approval	1,114	46.9	25.7
Proposed Developments with Preliminary / Concept Plans (No Official Status)	751	21.0	35.7
Total Dorchester Proposed Developments with Best Available Development Information	1,865	68.0	28.6
Thorndale Residential			
Proposed Developments Under Construction / With Draft Plan Approval	1,221	67.5	18.1
Proposed Developments with Preliminary / Concept Plans (No Official Status)	576	18.9	30.4
Total Thorndale Proposed Developments with Best Available Development Information	1,796	86.5	20.8

Detailed unit counts based on best available development information is included in **Appendix A**.

3.3 Growth Projections based on the Municipality's Development Charges Background Study Growth projections to Buildout were provided by the Municipality as part of the 2018 Development Charges (DC) Background Study (Watson and Associates Economists Ltd., 2018).

Areas of Growth within the municipality have been categorized as follows:

- Urban includes Thames Centre's two urban areas:
 - Dorchester; and,
 - Thorndale;
- Rural includes the 401 development corridor lands located outside of the urban boundary that are being considered as potentially developable by the Municipality.

Within the study, urban residential growth was separated into Dorchester and Thorndale and Rural Areas. Residential growth projected within Dorchester and Thorndale has been allocated based on distribution across developable area and Official Plan land use.

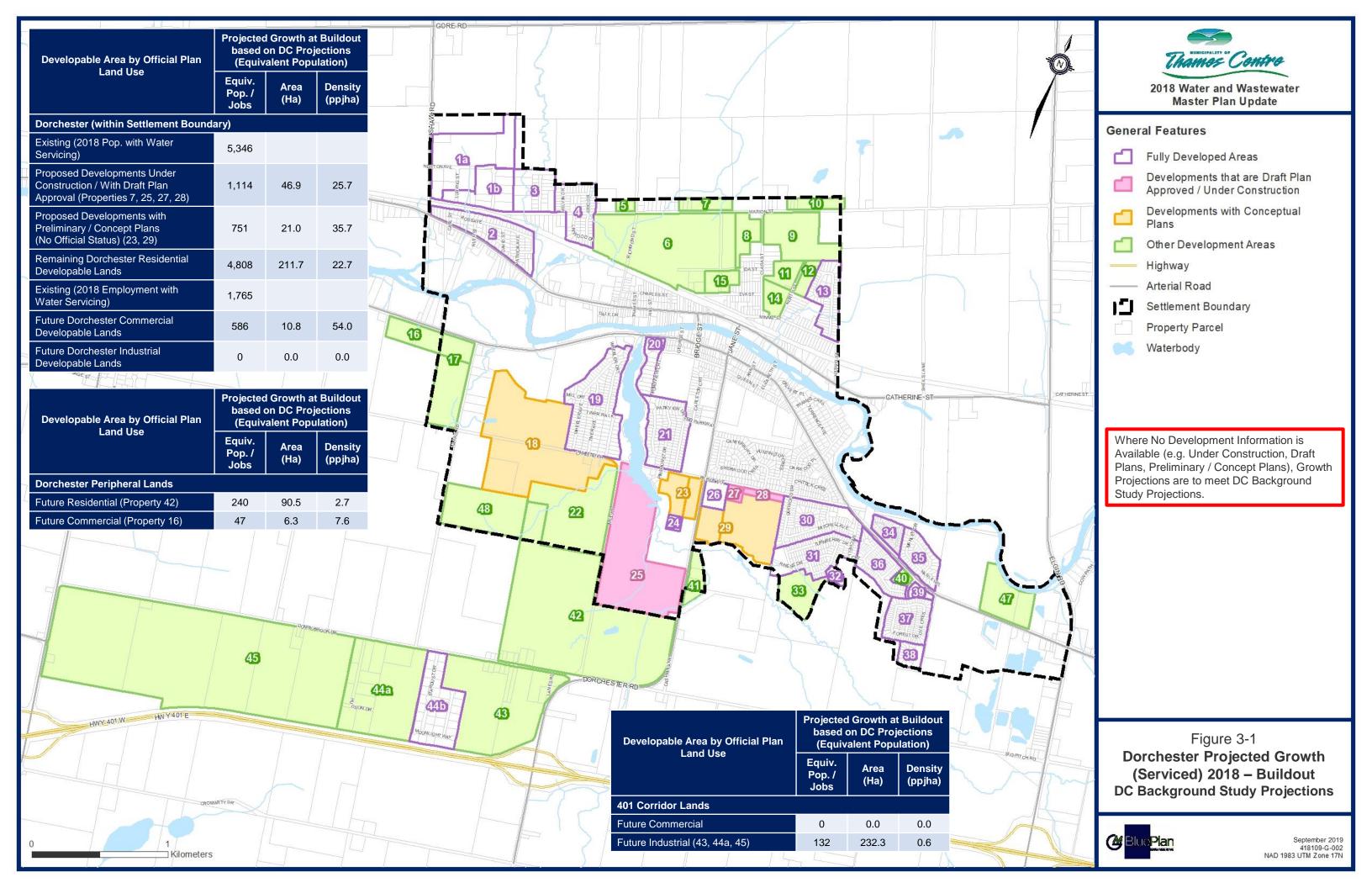
Employment growth within the Dorchester and Thorndale Settlement Boundaries was categorized only as urban (not specifically separated into Dorchester and Thorndale). The projected Urban Industrial and Commercial growth has been distributed between Dorchester and Thorndale based on developable area and Official Plan designated land use.

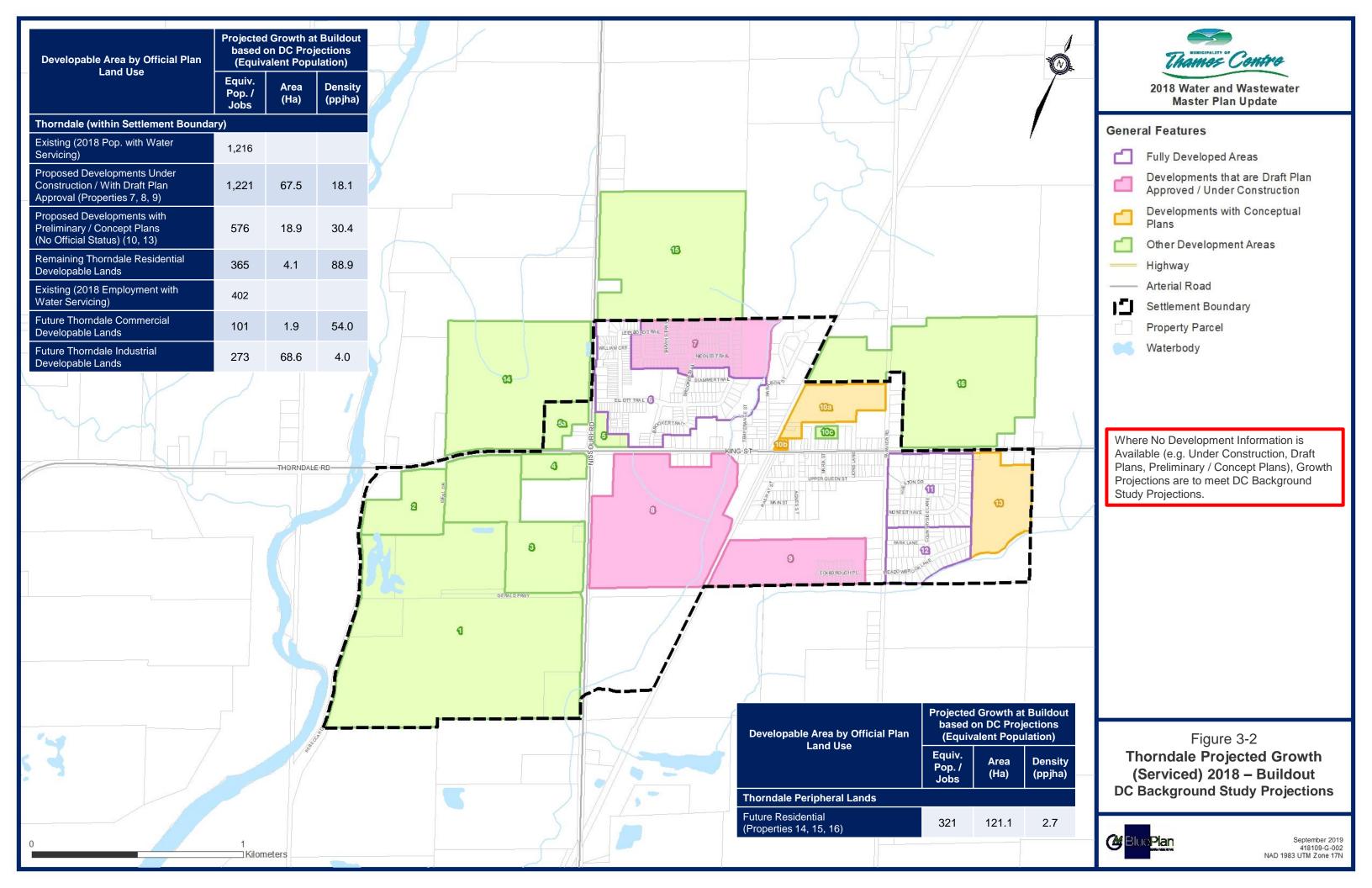
Rural residential and industrial and commercial employment growth has been distributed across Peripheral Areas and 401 Corridor Lands based on Official Plan land use.



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Projected growth from 2018 to Buildout based on the projections from the 2018 DC Background Study for Dorchester, Thorndale and the Peripheral Lands and 401 Corridor Lands is shown in **Figure 3-1** and **Figure 3-2**.







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Equivalent serviced populations at Buildout (based on DC Study Projections) for Dorchester, Thorndale and the Peripheral Lands and 401 Corridor Lands are included in **Appendix A**.

The DC Study also identifies employment growth in the Primary, Work at Home and Institutional categories. Growth at Buildout for these employment categories is summarized in **Table 3-3**.

Table 3-3: Summary of Growth Projections at Buildout for Primary, Work at Home and Institutional Employment Categories at Buildout

Location	Primary	Work at Home	Institutional
Urban	2	951	340
Rural	2	951	0

Employment growth projections for Primary, Work at Home and Institutional at Buildout are taken from Schedule 10a in the DC Background Study. Schedule 10c notes that there is no Institutional Employment growth projected for Rural areas.

Work at Home growth is accounted for in the per capita residential water and wastewater design criteria to be utilized for the Master Plan and does not require to be considered separately for allocation purposes.

There are three schools within Dorchester (Northdale and River Heights Public Schools and Lord Dorchester Secondary School) and no schools within Thorndale. It is estimated that the 340 Urban Institutional jobs will be distributed evenly between Dorchester and Thorndale. Institutional job growth in Dorchester will be distributed uniformly between the existing three schools, and Institutional job growth in Thorndale will be estimated at an assumed new school location within the residential growth areas.

3.4 Growth Projections based on the Target Densities

As noted above in Section 2, initial review of the Build-Out projections set-out in the 2018 DC Background Study compared to the available draft plans and concept plans prompted discussions with the Municipality about determining alternative growth projections based on target densities.

Determining area infrastructure needs based on a reasonable estimate of growth density within developable areas will ensure that the Municipality's local area knowledge and planning expertise is best incorporated into the Master Plan servicing.

We have reviewed proposed development densities for the draft plans and preliminary / concept plans in Dorchester and Thorndale as well as for employment lands in similarly sized municipalities. Based on our review, we are proposing that the Municipality proceed with the target densities summarized in **Table 3-4**

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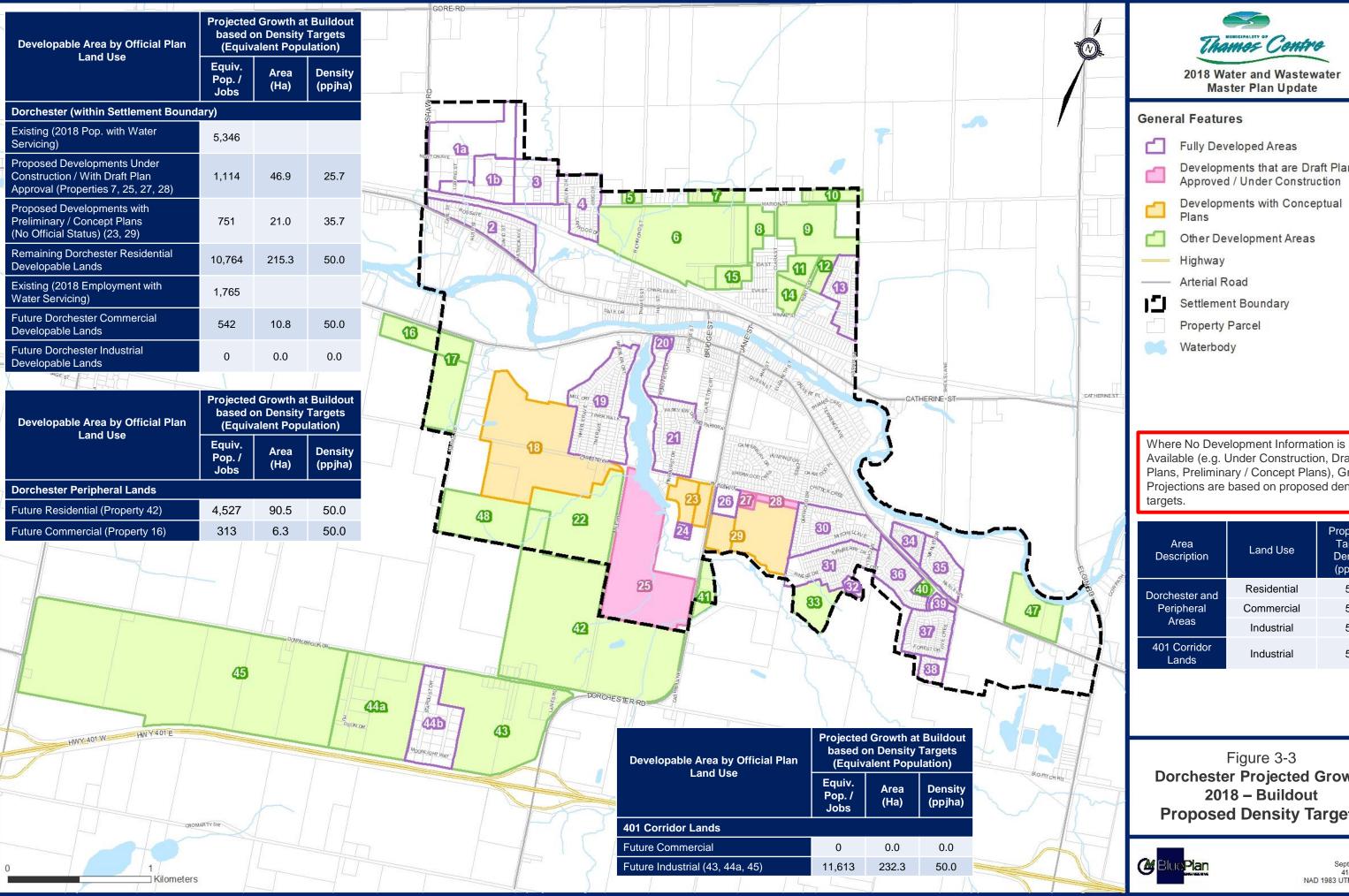
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Table 3-4: Proposed Target Growth Densities by Land Use

Area Description	Land Use	Proposed Target Density (ppjha)
	Residential	50
Dorchester, Thorndale and Peripheral Areas	Commercial	50
	Industrial	50
401 Corridor Lands	Industrial	50

Unserviced Dry Industrial land use is already permitted within the 401 Corridor Lands. This may impact the ultimate serviced target density of the lands within this area. However, there remains more than 200 hectares of developable Industrial land use within the 401 Corridor Lands, and because there remains so much potential for future development within the 401 Corridor Lands, it is expected that there is significant opportunity for growth within this area once municipal servicing becomes available. It is recommended that the target density remain 50 jpha at Buildout in order to accommodate the potential for municipally-serviced growth.

Projected growth from 2018 to Buildout based on the proposed target densities for Dorchester, Thorndale and the Peripheral Lands and 401 Corridor Lands is shown in **Figure 3-3** and **Figure 3-4**.





Developments that are Draft Plan

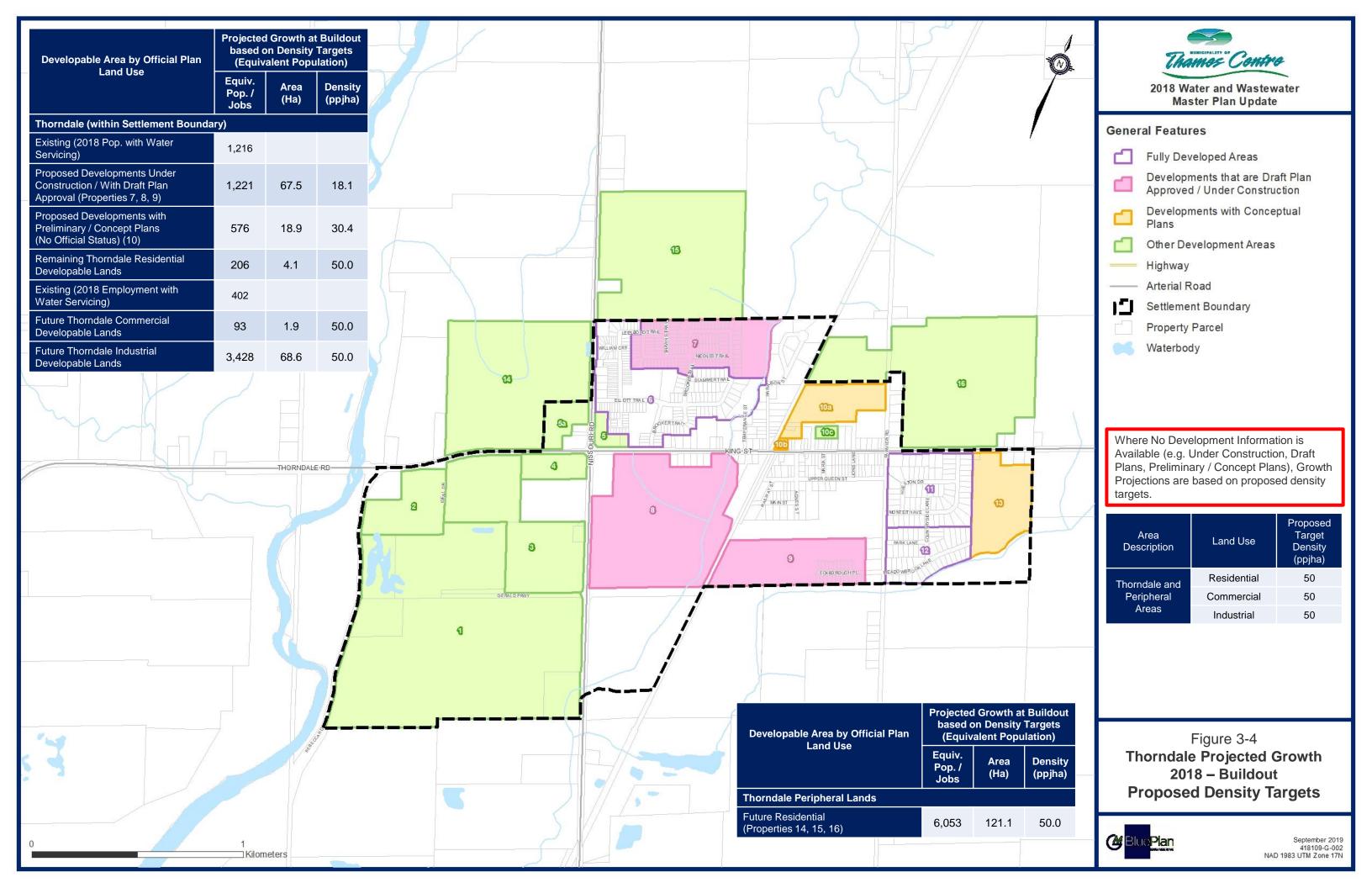
Developments with Conceptual

Available (e.g. Under Construction, Draft Plans, Preliminary / Concept Plans), Growth Projections are based on proposed density

Area Description	Land Use	Proposed Target Density (ppjha)
Dorchester and	Residential	50
Peripheral	Commercial	50
Areas	Industrial	50
401 Corridor Lands	Industrial	50

Dorchester Projected Growth 2018 – Buildout **Proposed Density Targets**

> September 2019 418109-G-002 NAD 1983 UTM Zone 17N





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Equivalent serviced populations at Buildout (based on target densities) for Dorchester, Thorndale and the Peripheral Lands and 401 Corridor Lands are summarized in **Appendix A**.

3.5 Summary of Buildout Projections based on Alternative Methodologies

Buildout projections for Dorchester and Thorndale (including areas outside of the Settlement Boundary) based Incorporating the calculations set out in Section 3, Buildout Projections based on Method 1 through Method 3 are summarized in **Table 3-5** and **Table 3-6**.

Table 3-5: Summary of Buildout Projections based on Alternative Methods (Dorchester)

Dorchester	Equivalent Population (Persons + Jobs)	Method 1	Method 2	Method 3
Within Sattlement Boundary Only	Existing		7,111	
Within Settlement Boundary Only	Ultimate Buildout	14,451	14,451 20,282	
Within Settlement Boundary and Including Peripheral and 401 Corridor Lands to be Developed	Ultimate Buildout	14,870	20,701	36,735

Table 3-6: Summary of Buildout Projections based on Alternative Methods (Thorndale)

Thorndale	Equivalent Population (Persons + Jobs)	Method 1	Method 2	Method 3
Within Settlement Boundary Only	Existing		1,618	
Within Settlement Boundary Only	Ultimate Buildout	4,154	7,	141
Within Settlement Boundary and Including Peripheral Lands to be Developed	Ultimate Buildout	4,475	7,462	13,195

4 Phasing

When establishing the capital plan for water and wastewater infrastructure upgrades, it is important to determine reasonable phasing of development based on expectations of how quickly approved development will be constructed and where there will be future development interest. These factors are then balanced with the potential impacts on development of the costs of required and recommended upgrades.

After the water and wastewater servicing concepts are determined for Buildout, more detailed review of the proposed phasing will be completed in conjunction with the determination of the capital plan.



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5 Closing

It is recommended that the Municipality proceed with the development of the 2018 Water and Wastewater Master Plan models utilizing the growth projections and allocation methodology outlined above.

We trust the above to be in order for your approval. Should you have any questions or wish to discuss further, please do not hesitate in contacting the undersigned.

Yours Truly,

GM BluePlan Engineering Ltd.

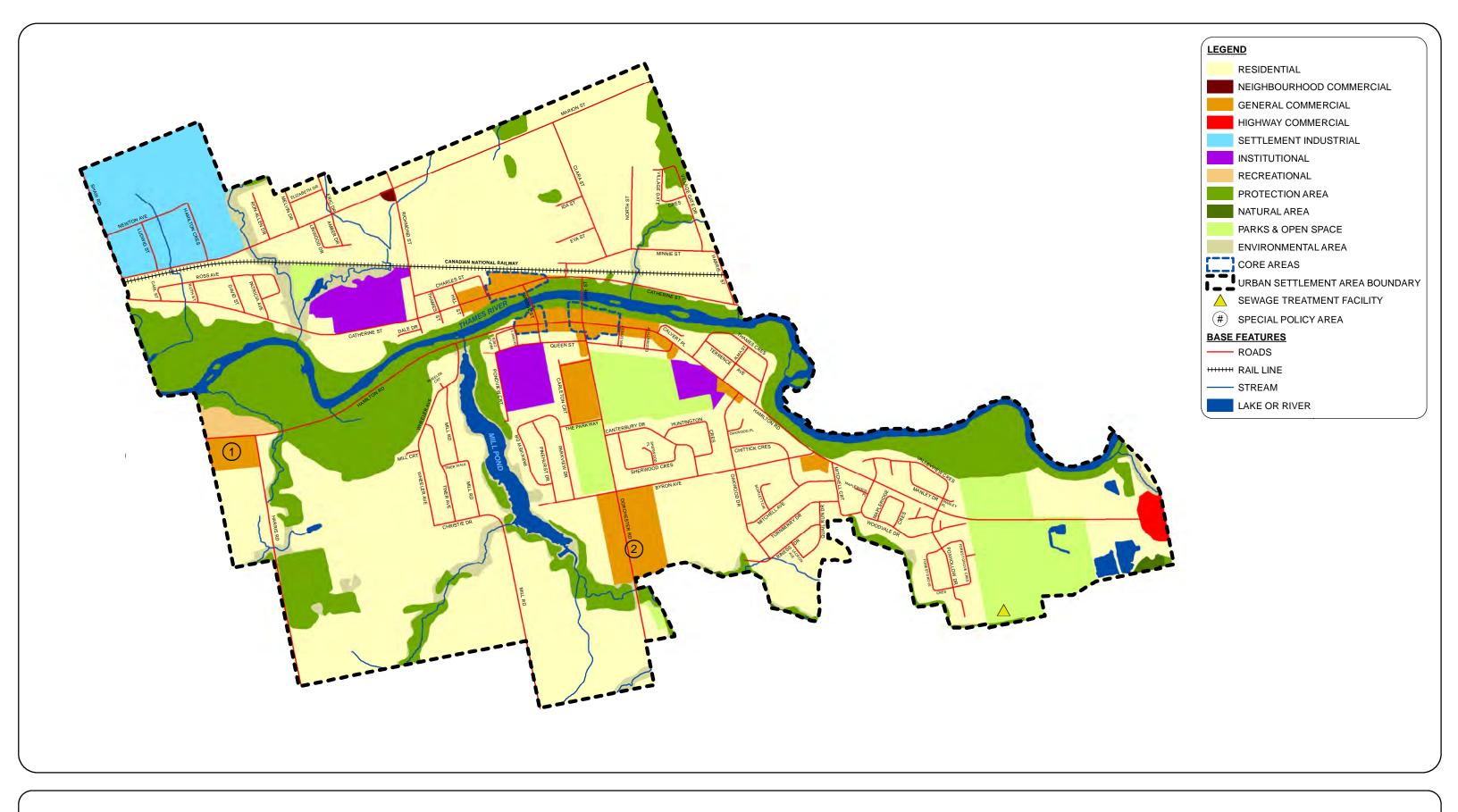
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Per:

Matthew Fisher, P.Eng. Infrastructure Planning



Appendix A

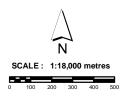


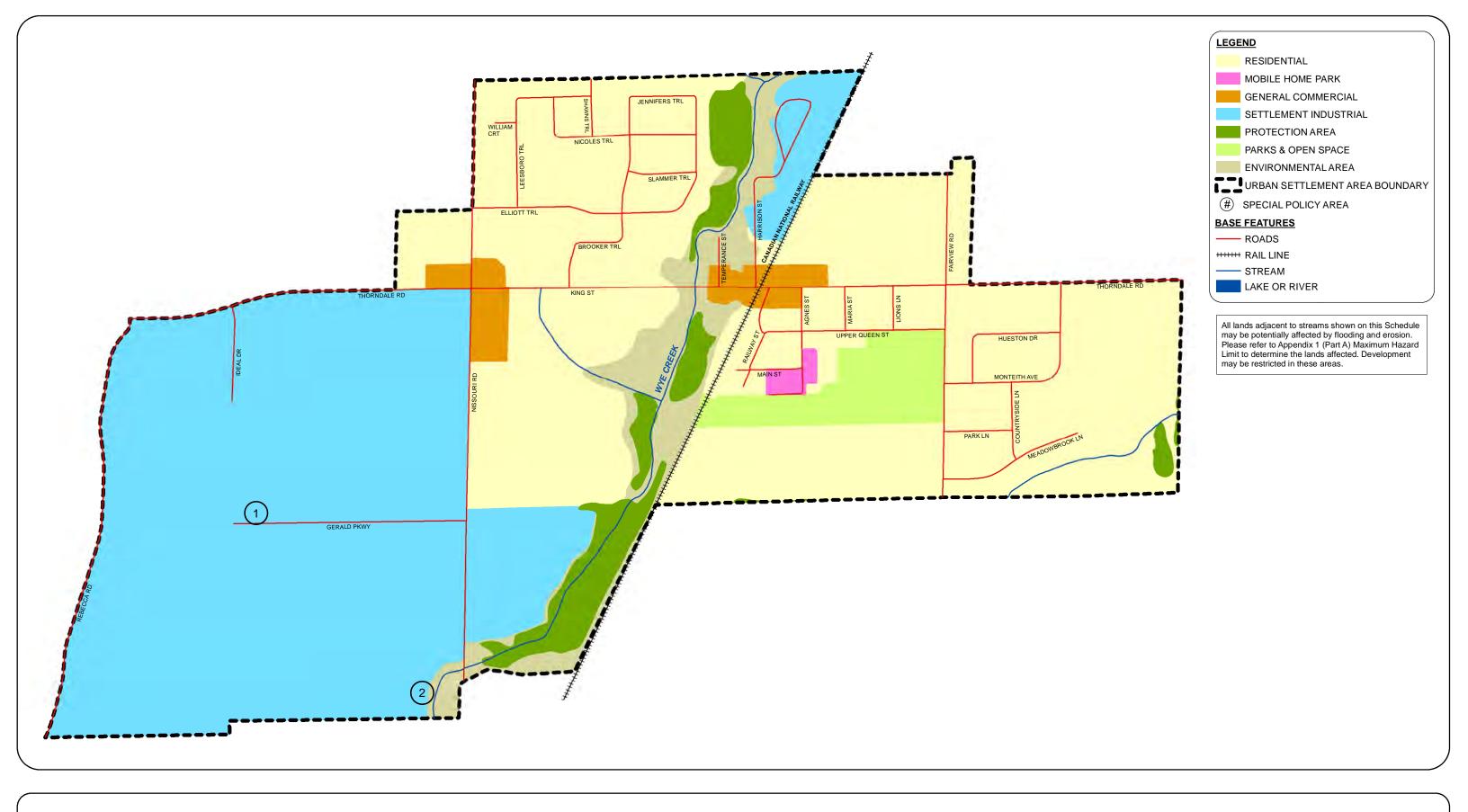


LAND USE PLAN - DORCHESTER SETTLEMENT AREA

MUNICIPALITY OF THAMES CENTRE
OFFICIAL PLAN









SCHEDULE 'B-2'

LAND USE PLAN - THORNDALE SETTLEMENT AREA

MUNICIPALITY OF THAMES CENTRE
OFFICIAL PLAN

