



Employment Area Expansion Analysis

Municipality of Middlesex Centre

Final Report

February 4, 2022

Watson & Associates Economists Ltd.
905-272-3600
info@watsonecon.ca

In association with:





Appendix A

Servicing Feasibility Analysis



**Middlesex Centre Foreign Direct
Investment – Servicing Feasibility
Report**

January 31, 2022

Prepared for:

The Municipality of Middlesex Centre

Prepared by:

Stantec Consulting Ltd.
600-171 Queens Avenue
London ON N6A 5J7

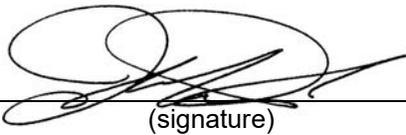
MIDDLESEX CENTRE FOREIGN DIRECT INVESTMENT – SERVICING FEASIBILITY REPORT

Revision	Description	Author		Quality Check	
1	Draft Report	JP	Nov 12/21	NO	Nov 12/21
2	Final Report	JP	Nov 19/21	NO	Nov 19/21
3	Revised Report	JP	Jan 28/22	NO	Jan 28/22

MIDDLESEX CENTRE FOREIGN DIRECT INVESTMENT – SERVICING FEASIBILITY REPORT

This document entitled Middlesex Centre Foreign Direct Investment – Servicing Feasibility Report was prepared by Stantec Consulting Ltd. (“Stantec”) for the account of the Municipality of Middlesex Centre (the “Client”). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec’s professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared by _____



(signature)

Jeffrey Paul, P.Eng.

Reviewed by _____



(signature)

Nelson Oliveira, P.Eng.

Table of Contents

- 1.0 BACKGROUND1.1**
- 2.0 TRANSPORTATION ANALYSIS2.1**
 - 2.1 SCOPE OF ANALYSIS2.1
 - 2.2 ROADWAY NETWORK.....2.1
 - 2.3 DATA COLLECTION AND EXISTING CONDITIONS2.2
 - 2.4 FUTURE BACKGROUND TRAFFIC VOLUMES2.2
 - 2.5 SITE TRIPS.....2.3
 - 2.5.1 Site Trip Generation2.3
 - 2.6 SITE TRIP DISTRIBUTION AND ASSIGNMENT2.4
 - 2.7 TOTAL FUTURE TRAFFIC ASSESSMENT (2046)2.6
 - 2.8 CONCLUSIONS2.8
- 3.0 STORMWATER MANAGEMENT3.1**
 - 3.1 SCOPE OF ANALYSIS3.1
 - 3.2 STORMWATER SERVICING FEASIBILITY3.1
- 4.0 SANITARY SERVICING.....4.1**
 - 4.1 EXISTING SERVICING4.1
 - 4.2 DESIGN FLOW4.1
 - 4.3 PROPOSED SERVICING STRATEGY.....4.1
 - 4.4 PHASING4.2
 - 4.5 OPINION OF PROBABLE CONSTRUCTION COST4.2
- 5.0 MUNICIPAL WATER SERVICING5.1**
 - 5.1 EXISTING SERVICING5.1
 - 5.2 DESIGN FLOW5.1
 - 5.3 PROPOSED SERVICING STRATEGY.....5.1
 - 5.4 PHASING5.2
 - 5.5 OPINION OF PROBABLE CONSTRUCTION COST5.4
- 6.0 CONCLUSIONS AND RECOMMENDATIONS6.1**

MIDDLESEX CENTRE FOREIGN DIRECT INVESTMENT – SERVICING FEASIBILITY REPORT

LIST OF TABLES

Table 1 – Site Trip Generation – Proposed Employment lands2.3
Table 2 – Site Trip Generation – Delaware Employment Lands2.3
Table 3 – Reduced Trip Generation2.4
Table 4 – Site Trip Distribution2.6

LIST OF FIGURES

Figure 1 – Location of the Selected New Employment Area Site 1.1
Figure 2 – Proposed Site Accesses 2.5
Figure 3 – Proposed Sanitary Servicing 4.3
Figure 4 – Proposed Water Servicing 5.3

Background

1.0 BACKGROUND

Watson & Associates Economists Ltd. (“Watson”) has been engaged by the Municipality of Middlesex Centre (Municipality) as part of the Official Plan Review. As a part of this review, a Foreign Direct Investment Strategy was requested to include a comprehensive long-term assessment of the Municipality’s employment land needs to 2046 along the Highway 401/402 corridor. Based on the discussion with the Municipality and County of Middlesex staff, a development site that is adjacent to the Delaware settlement area was selected as the preferred new employment lands. This selected new employment lands are located southeast of Delaware and 15 km southwest of the core area of the City of London. This site is adjacent to the Provincial Highway 402 to the north and the County Highway 2 (local name as Longwoods Road) to the south, and it was intersected by the County Highway 15 (local name as Carriage Road). **Figure 1** illustrates the location of the selected new employment lands.

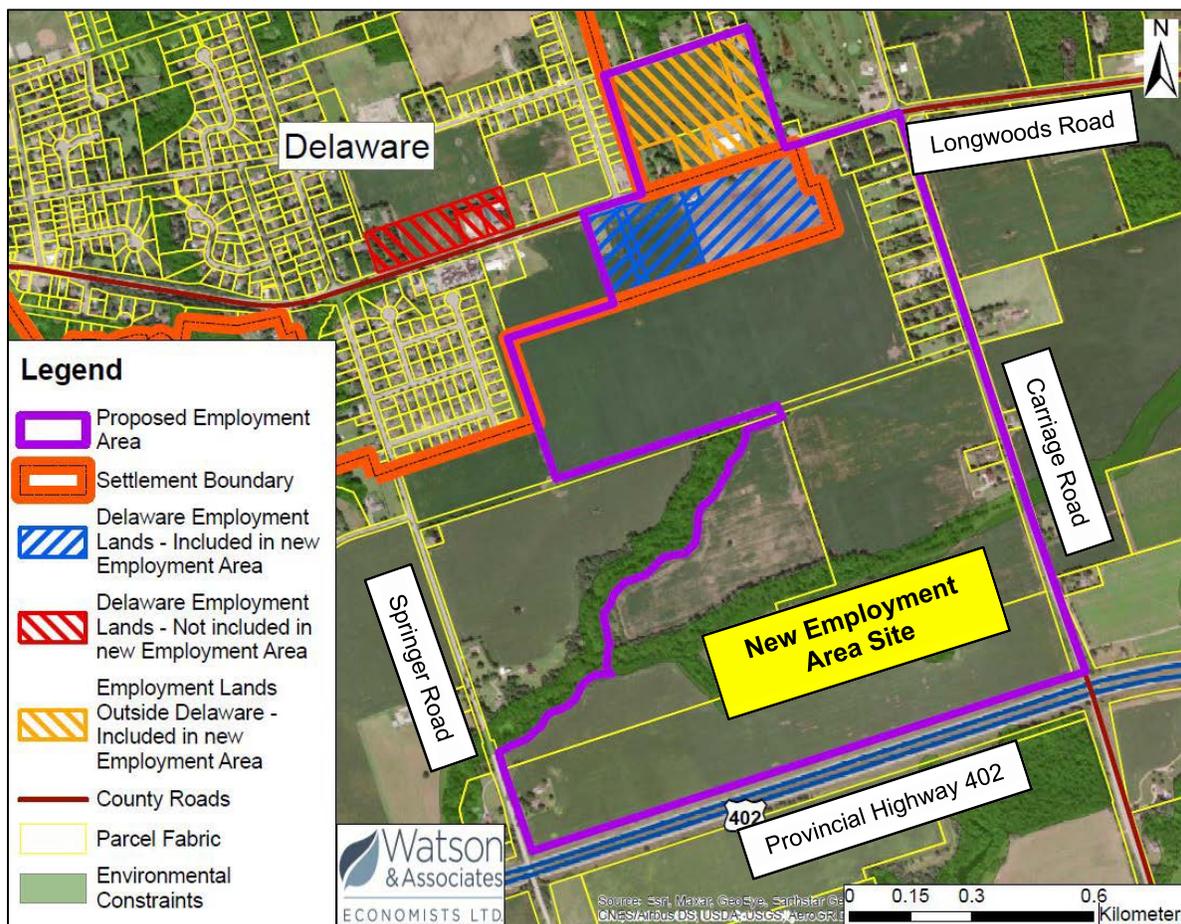


Figure 1 – Location of the Selected New Employment Area Site



MIDDLESEX CENTRE FOREIGN DIRECT INVESTMENT – SERVICING FEASIBILITY REPORT

Background

As shown in **Figure 1**, this proposed site consists of some existing but vacant Employment Lands within Delaware Settlement Boundary in addition to the proposed employment lands. The total area of the employment lands (both new employment lands and existing employment lands) is approximately 162 ha. It is estimated that some of these lands will not be developable and this report assumes that the total developable acreage will be approximately 147 ha.



2.0 TRANSPORTATION ANALYSIS

2.1 SCOPE OF ANALYSIS

The scope of this report included the requirement to undertake a high-level Transportation Assessment (“TA”) of the proposed new employment lands to determine the transportation feasibility to support future developments at this site. Specific elements of the TA included:

- Collecting and reviewing existing conditions and available traffic volume data in the study area, and other development-relevant background information
- Establishing future background traffic in 2046 (i.e., assumed future horizon year when the new employment lands is fully developed)
- Estimating trips generated by all potential developments in the new employment lands and conducting trip distribution and assignment on the roadway network which is adjacent to the site
- Conducting a high-level traffic operational assessment based on future total traffic volumes (i.e., the summation of future background traffic and site-generated traffic) in 2046
- Conducting a high-level site access assessment

Currently, there is no existing site conceptual plan to illustrate the details of future developments on site. It was assumed in this study that the potential future site accesses will be proposed on Carriage Road and Springer Road (see more details in the following sections).

2.2 ROADWAY NETWORK

As shown in **Figure 1**, the major roads in the study area are:

Highway 402 is an east-west two-way provincial freeway in Ontario under the jurisdiction of MTO to connect Blue Water Bridge International Crossing near Sarnia to Highway 401 in the City of London. The section of **Highway 402** to the south of the site has four lanes with a wide grass median and a posted speed limit of 100 km/h. There are no at-grade intersections or interchanges between Highway 402 and Springer Road or Carriage Road in the study area.

Longwoods Road is an east-west undivided two-lane county road (County Road 2) under the jurisdiction of the County of Middlesex with a posted speed limit of 80 km/h within the study area.

Carriage Road is a north-south undivided two-lane county road (County Road 15) under the jurisdiction of the County of Middlesex with a posted speed limit of 60 km/h within the study area.



Transportation Analysis

Springer Road is a north-south undivided two-lane local road under the jurisdiction of the Municipality of Middlesex Centre. There is no posted speed limit on the Springer Road section within the study area. According to the Ontario Traffic Act, any road is restricted to 50 km/h without posted speed.

2.3 DATA COLLECTION AND EXISTING CONDITIONS

Based on the County's latest 2019 Traffic Counts Spreadsheet, the average daily traffic counts on the following site-adjacent roadway sections were provided:

- Longwoods Road (County Road 2): 6,230 vehicles/day
- Carriage Road (County Road 15): 1,865 vehicles/day

No other background traffic data was available for this report.

2.4 FUTURE BACKGROUND TRAFFIC VOLUMES

Based on the Growth Management Study Technical Report (draft, October 25, 2021) for the Municipality's Official Plan Review, which was prepared by Watson, in association with WSP, a compound annual traffic growth rate of 2.3%, which is consistent with the recommended 2.3% annual population growth rate between 2011 and 2016 for Middlesex Centre in this report, was applied to the collected 2019 daily traffic counts to establish the future 2046 background daily traffic volumes on the roadway sections of Longwoods Road and Carriage Road in this study.

Also, potential COVID-19 impacts that may reduce traffic along those two roadway sections were not considered in this study to reflect a conservative analysis result.

The established daily traffic volumes on Longwoods Road and Carriage Road within the study area in 2046 are:

- Longwoods Road (County Road 2): 10,099 vehicles/day
- Carriage Road (County Road 15): 3,023 vehicles/day

According to similar traffic assessments in Ontario that were completed by Stantec, conservatively, it can be assumed that traffic volumes during a peak hour are approximately 1/8 of daily traffic volumes on a roadway section. Thus, the typical peak hour traffic volumes for the above-mentioned two-lane roadway sections are:

- Longwoods Road (County Road 2): 1,262 vehicles/peak hour
- Carriage Road (County Road 15): 378 vehicles/peak hour



2.5 SITE TRIPS

2.5.1 Site Trip Generation

As mentioned above, currently, there are no available development details of the proposed employment lands. The employment density provided by the Municipality, which is 10 jobs per gross hectare, was used in this study to calculate the total employment jobs on the Employment lands. As a result, a maximum of 1,470 employment jobs at the site’s full buildout in 2046 was estimated by Watson.

There are some employment lands in the boundary of the Delaware settlement (“the Delaware employment lands”) but not included in the new employment lands (i.e., red rectangles), as shown in **Figure 1**, which may also generate some future trips on the adjacent roads such as Longwoods Road and Carriage Road. Similarly, no development details for these employment lands are available. The total area of these Delaware employment lands is approximately 4 hectares. Based on the assumed employment density provided by the Municipality, these employment lands should provide approximately 40 employment jobs. As a conservative approach, it was assumed that all these lands will also be fully developed by 2046.

Trips generated by both the proposed Employment lands and the Delaware employment lands were estimated by using the Institute of Transportation Engineers (“ITE”) Trip Generation Manual, 10th Edition. AM and PM peak hour trips were calculated by using trip generation rates for General Light Industrial (ITE Code 110).

The proposed Employment lands peak hour trip generation is provided in **Table 1**.

Table 1 – Site Trip Generation – Proposed Employment lands

Description/ITE Code	Units	ITE Vehicle Trip Generation Rates						Generated Trips			
		AM	PM	AM In	AM Out	PM In	PM Out	AM In	AM Out	PM In	PM Out
General Light Industrial 110	1,470 (employees)	0.52	0.49	83%	17%	22%	78%	634	130	158	562
Total:								764		720	

The proposed Delaware employment lands peak hour trip generation is provided in **Table 5.2**.

Table 2 – Site Trip Generation – Delaware Employment Lands

Description/ITE Code	Units	ITE Vehicle Trip Generation Rates						Generated Trips			
		AM	PM	AM In	AM Out	PM In	PM Out	AM In	AM Out	PM In	PM Out
General Light Industrial 110	40 (employees)	0.52	0.49	83%	17%	22%	78%	17	4	4	16
Total:								21		20	



MIDDLESEX CENTRE FOREIGN DIRECT INVESTMENT – SERVICING FEASIBILITY REPORT

Transportation Analysis

Based on the 2016 Middlesex County Census Profile – Main Mode of Commuting, a conservative 5% trip reduction was applied to the generated trips shown in **Table 1** and **Table 2**, due to the potential traffic split to active transportation (i.e., walking and biking) and transit modes, once these proposed developments are fully built out in 2046. The final generated trips are shown in **Table 3**.

Table 3 – Reduced Trip Generation

Proposed Development	Generated Trips					
	AM In	AM Out	PM In	PM Out	AM Total	PM Total
Proposed Employment Area Site	602	124	150	534	726	684
Delaware Employment Lands	16	4	4	15	20	19
Total	618	128	154	549	746	703

2.6 SITE TRIP DISTRIBUTION AND ASSIGNMENT

In this TA, it was assumed that four accesses will be proposed on Carriage Road and Longwood Road to support the proposed Employment lands and the Delaware employment lands, as shown in **Figure 2**.



Transportation Analysis



Figure 2 – Proposed Site Accesses

Two scenarios below were developed to indicate possible site trip distribution and assignment, as well as traffic operational assessment which was included in the following section:

- Scenario 1:
 - 100% trips generated by the proposed Employment lands will be assigned to Carriage Road at Access 1 and Access 3; specifically, it was assumed that 86% of these trips, the trips generated by the developments on vacant/existing rural residential lands, will be assigned to Access 1 and 14% of these trips, the trips generated by other lands in the employment lands, will be assigned to Access 3
 - 100% trips generated by the Delaware employment lands will be evenly assigned to Longwood Road at Access 4



Transportation Analysis

- Scenario 2:
 - 85% trips generated by the proposed employment lands will be assigned to Carriage Road at Access 1 and Access 3 (the trip splits between Access 1 and Access 3 are the same shown in Scenario 1; 15% trips generated by the proposed employment lands will be assigned to Springer Road at Access 2
 - 100% trips generated by the Delaware employment lands will be evenly assigned to Longwood Road at Access 4

It was assumed that the site trips generated by both developments will be distributed to the adjacent roadway network based on local traffic patterns and contexts surrounding the site locations. The assumed site trip distribution percentages were shown in **Table 4**.

Table 4 – Site Trip Distribution

Direction To/From	Inbound		Outbound	
	AM	PM	AM	PM
South (Carriage Road, south of Highway 402)	5%	5%	5%	5%
North (Carriage Road, north of Longwoods Road)	35%	35%	35%	35%
East (Longwoods Road, east of Carriage Road)	40%	40%	40%	40%
West (Longwoods Road, west of Gideon Drive (County Road 3))	20%	20%	20%	20%

2.7 TOTAL FUTURE TRAFFIC ASSESSMENT (2046)

Future total peak hour traffic volumes were established by adding the site-generated peak hour traffic volumes¹, to the background peak hour traffic volumes in 2046 to which are:

- Scenario 1:
 - Longwoods Road (west leg of the Carriage Road & Longwoods Road intersection): 1,262 (background traffic 2046) + 16 (Delaware employment land trip generation) + 127 (proposed employment lands trip generation) = 1,405 vehicles/peak hour
 - Longwoods Road (east leg of the Carriage Road & Longwoods Road intersection): 1,262 (background traffic 2046) + 8 (Delaware employment land trip generation) + 292 (proposed employment lands trip generation) = 1,562 vehicles/peak hour
 - Carriage Road (north leg of the Carriage Road & Longwoods Road intersection): 378 (background traffic 2046) + 7 (Delaware employment land trip generation) + 253 (proposed employment lands trip generation) = 638 vehicles/peak hour

¹ In this study, site-generated traffic volumes during AM peak hour in **Table 3** were applied to calculate future total peak hour traffic volumes since it represents a worst-case scenario comparing to PM peak hour volumes.



MIDDLESEX CENTRE FOREIGN DIRECT INVESTMENT – SERVICING FEASIBILITY REPORT

Transportation Analysis

- Carriage Road (south leg of the Carriage Road & Longwoods Road intersection): 378 (background traffic 2046) + 1 (Delaware employment land trip generation) + 520 (proposed employment lands trip generation) = 899 vehicles/peak hour
- Scenario 2:
 - Longwoods Road (west leg of the Carriage Road & Longwoods Road intersection): 1,262 (background traffic 2046) + 16 (Delaware employment land trip generation) + 213 (proposed employment lands trip generation) = 1,491 vehicles/peak hour
 - Longwoods Road (east leg of the Carriage Road & Longwoods Road intersection): 1,262 (background traffic 2046) + 8 (Delaware employment land trip generation) + 290 (proposed employment lands trip generation) = 1,560 vehicles/peak hour
 - Carriage Road (north leg of the Carriage Road & Longwoods Road intersection): 378 (background traffic 2046) + 7 (Delaware employment land trip generation) + 255 (proposed employment lands trip generation) = 640 vehicles/peak hour
 - Carriage Road (south leg of the Carriage Road & Longwoods Road intersection): 378 (background traffic 2046) + 1 (Delaware employment land trip generation) + 464 (proposed employment lands trip generation) = 843 vehicles/peak hour

Based on some local roadway characteristics, the single lane capacities for both Longwoods Road and Carriage Road, which are both categorized as Rural Collector, were assumed as:

- Longwoods Road: $800 \text{ vehicle/hour/lane} * 2 \text{ lanes} = 1,600 \text{ vehicle/hour}$
- Carriage Road: $800 \text{ vehicle/hour/lane} * 2 \text{ lanes} = 1,600 \text{ vehicle/hour}$

The volume to capacity (“V/C”) ratio indicates the level of congestion for a lane. A V/C ratio equal to or greater than 1.00 indicates that the lane is operating at or above capacity, and a V/C ratio equal to or less than 0.85 is recommended. The maximum calculated peak hour V/C ratios for these two roads are:

- Longwoods Road: V/C ratio = 0.98 (Scenario 1, east leg of the Carriage Road & Longwoods Road intersection); V/C ratio = 0.93 (Scenario 1, west leg of the Carriage Road & Longwoods Road intersection)
- Carriage Road: V/C ratio = 0.56 (Scenario 1, south leg of the Carriage Road & Longwoods Road intersection); V/C ratio = 0.40 (Scenario 1, north leg of the Carriage Road & Longwoods Road intersection)

The calculated V/C ratios for both roadways show that Longwoods Road will be close to (both east and west of Carriage Road) its capacity but it should still be capable to accommodate traffic once both the proposed employment lands and the Delaware employment lands in this study are fully built out in 2046; while Carriage Road will have extra capacity to accommodate traffic in 2046.

Since this transportation assessment is a high-level study for this early stage of all proposed employment lands, a detailed analysis to further confirm the capacity of the study roadway sections should be conducted in the future during different phases of the projects for those lands.



2.8 CONCLUSIONS

Based on the results of the roadway capacity analysis for two selected roadway sections on Longwoods Road and Carriage Road, which are adjacent to these sites, it was concluded that both roadway sections will be capable to accommodate traffic with the full development of the sites in 2046 and based on the existing roadway configurations. No traffic operational issues were identified.



3.0 STORMWATER MANAGEMENT

3.1 SCOPE OF ANALYSIS

Under this report, the scope of our analysis was to conduct a high-level feasibility analysis to determine if stormwater management could be provided for the proposed employment lands. This report considers servicing feasibility only and does not include the development of a stormwater servicing strategy.

3.2 STORMWATER SERVICING FEASIBILITY

The study area exhibits a generally flatter topography with slightly higher elevations in the north east corner of the study area. The topography indicates that much of the study area discharges existing flows to the existing watercourse that bisects the site. This watercourse flows in a westerly direction before discharging into a series of small ponds. The watercourse / pond system crosses Springer Road before then crossing Highway 402. South of Highway 402, the watercourse continues in a southwesterly direction before discharging directly into the Thames River. No study has been undertaken on this watercourse and any recommendations in this report are high level and will need further study.

Stormwater servicing for the employment lands will require further study, however, it is recommended that a combination of low impact development measures be considered in conjunction with end of pipe facilities. While not studied as part of this report, soil conditions in the Delaware area are generally sandy in nature with higher permeability which are conducive to the implementation of infiltration measures. High groundwater levels, however, are also known to be present in the Delaware area which may limit the ability to implement these measures. Further study of soil conditions as well as the groundwater regime will be necessary to develop a stormwater servicing strategy.

These measures, when considered in a treatment train approach including at-source controls and end of pipe treatment are anticipated to provide a feasible stormwater servicing strategy. The presence of the watercourse noted above is anticipated to provide a discharge point for end of pipe facilities, although this will need to be confirmed by further study.

Due to the high-level nature of this report, stormwater servicing costs have not been considered. Further study will need to be undertaken to determine the scope and cost of these projects. Additionally, as a part of the stormwater servicing strategy, consideration will need to be provided as to whether these works are constructed as a part of individual development applications or whether an overall servicing strategy for the study area will be advanced.



4.0 SANITARY SERVICING

4.1 EXISTING SERVICING

Currently there is no sanitary servicing to the Delaware settlement area. The existing development is currently serviced by individual septic systems. New growth in the area is currently limited and also serviced by individual septic systems.

Municipal sanitary servicing and treatment is currently provided to the Komoka-Kilworth settlement area by connection to the Komoka Wastewater Treatment Facility (WWTF) which is located on Komoka Road just north of the Thames River.

Development of the Employment Lands considered under this study will require full municipal sanitary servicing. This area should be considered within the context of a municipal wide Sanitary Master Plan which would look holistically at the entirety of the Municipality and consider future growth lands in the Delaware settlement area in addition to the proposed employment lands to provide appropriate sanitary servicing strategy for the entire community. For the purposes of this study, the Employment Lands were considered on a 'stand-alone' basis.

4.2 DESIGN FLOW

The design criteria used for the purpose of this study are taken from the current design standards for the Municipality of Middlesex Centre. Relevant sections of the standard are summarized below:

Flow Allowance for Light Industrial	20,000 litres/hectare/day
Uncertain Development Factor	1.1
Peaking Factor	0.8 x Harmon peaking factor
Infiltration Allowance	0.100 litres/second/hectare

Based on the design criteria noted and using a developable area of 147 ha, the average day sanitary flow for the study area is calculated to be 52.1 l/s and the peak flow is calculated to be 105.42l/s.

4.3 PROPOSED SERVICING STRATEGY

In order to provide sanitary servicing to the Employment Lands, a sanitary pumping station will need to be constructed to receive flows and to pump those flows to the Komoka WWTF. While there is some topographic relief across the study area, the topography is generally flat and the degree of relief does not lend itself to a pumping station at the lowest point given that this point is at the extreme south east corner of the site. A pumping station in this location would likely be prohibitively deep. This study instead



Sanitary Servicing

proposes a sanitary pumping station more centrally located along Carriage Road central to the employment lands area as shown in Figure 3. This preliminary location appears to provide a depth that would be considered feasible. From this location, flows can be collected by local sewers within the Employment Lands and pumped via 6.1km of forcemain to the Komoka WWTF as outlined in **Figure 3**.

Capacity at the Komoka WWTF will need to be considered as the magnitude of the flows noted will exceed the current capacity of the plant. This study did not review current treatment plant capacity, however, from previous study work, Stantec is aware that additional land is available for expansion of this facility. Expansion of the plant will be triggered as development of the employment lands occur and flows are generated.

4.4 PHASING

The sanitary pumping station and forcemain would need to be constructed in conjunction with the first phase of the Employment Lands. The construction of the pumping station could be phased to allow for a slightly lower initial cost which would also allow the station to be sized for actual flows from the Employment Lands. We do not recommend phasing the forcemain (i.e., installing a smaller diameter forcemain initially) as this would cause redundant costs.

4.5 OPINION OF PROBABLE CONSTRUCTION COST

The following are a high-level Opinion of Probable Construction Cost provided in 2021 dollars and based on historic construction costs of similar works:

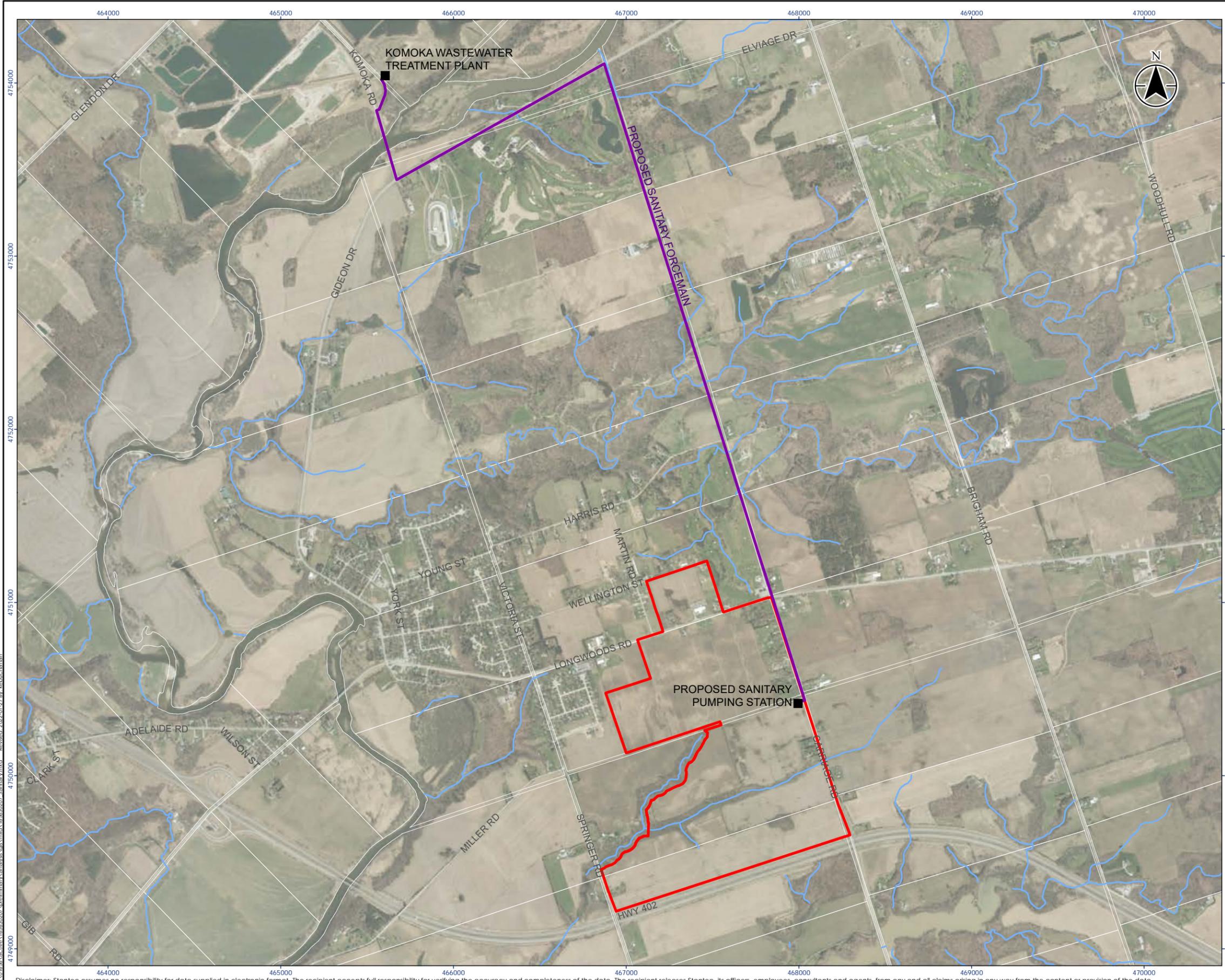
Sanitary Pumping Station	\$ 5.0 M
Sanitary Forcemain	\$ 4.6 M
Sanitary Treatment	\$ 27.0M

Sanitary sewers from the pumping station to the individual development blocks in the Employment Lands have not been considered in this study and are assumed to be part of the cost of the individual blocks as they are developed.

Both the pumping station and forcemain should be considered in conjunction with future servicing of the existing Delaware settlement area and future growth in the area. Consideration of these future needs could allow for some of these costs to be shared by other sources of funding.

The cost of sanitary treatment considers full development of the Employment Lands at the flow rate prescribed by the Middlesex Centre design standards. It should be noted that expansion of the Komoka WWTF will occur based on actual flows so this cost may vary based on the actual sanitary flow generation of the proposed development, and that the increased plant capacity to suit buildout will likely be phased over a period of many years.





Legend
 Approximate Study Area

0 250 500 metres
 1:22,500 (At original document size of 11x17)

- Notes**
1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Produced with data used under Ontario Open Data License.
 3. Orthoimagery © First Base Solutions, 2021. Imagery Date, 2010.

Project Location: Municipality of Middlesex Centre
 165630207 REV B
 Prepared by KDB on 2022-01-27

Client/Project: MIDDLESEX CENTRE FDI
 PROPOSED EMPLOYMENT AREA

Figure No.: **3**
 Title: **Proposed Sanitary Servicing**

V:\0165630207\0165630207_PreliminaryAnalysis\0165630207_Sanitary.mxd - Revised: 2022-01-27 By: kbuchanan

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

5.0 MUNICIPAL WATER SERVICING

5.1 EXISTING SERVICING

The existing settlement area of Delaware is serviced by Municipal water. This system is fed by the Lake Huron Water supply system. Historically this connection came from the City of London through a watermain connection on Gideon Drive. Currently, the Municipality is completing a new connection along Komoka Road that will supply Delaware from the Kilworth-Komoka distribution sub-system which is still fed from the Lake Huron Water Supply System.

Existing watermains are present in Delaware and on Longwoods Road as far east as the intersection of Longwoods Road and Martin Road and on Springer Road as far south as the intersection of Springer Road and Towerline Street.

5.2 DESIGN FLOW

The Middlesex Centre design standards regarding flows from employment lands indicate that the determination of flows should be based on specific uses as the demands can vary greatly based on the use. In the absence of more detailed information the design standard makes reference to the MECP Design Guidelines which recommends an average daily demand of 35 m³/ha/day for light industrial although the standard acknowledges significant variability in actual water demand based on the proposed use.

In determining the design flow for the purposes of this study, this report compares the above standard to the sanitary flow calculation in the previous section with the assumption that water and wastewater demand for industrial uses should generally align. The average day demand using 35 m³/ha/day gives a value of 5,145 m³/day for the entire employment lands whereas the sanitary flow is calculated at 2,938 m³/day (population-based flow only, not considering infiltration). It is worth noting that even the sanitary flow value equates to approximately 8,400 people (using the municipal standard of 350 l/cap/day) which is much greater than the current population of Delaware at approximately 1,590 residents and greater than the projections advanced by Watson at 10 jobs/ha. Given that the employment lands are being studied at a high level and the information required to evaluate the appropriateness of a lower standard is not available, this report uses the Municipal standard. With regards to water supply, however, we feel it is appropriate to use the sanitary flow calculations to determine water supply demands.

5.3 PROPOSED SERVICING STRATEGY

In order to service the proposed employment lands, several works would need to be completed as follows.

The existing watermain feed along Gideon Drive is currently reaching its maximum capacity under current demands. A Class EA was previously completed to enable the required interconnection with the Kilworth-



MIDDLESEX CENTRE FOREIGN DIRECT INVESTMENT – SERVICING FEASIBILITY REPORT

Municipal Water Servicing

Komoka system and to address other required upgrades to suit growth, specifically the need to replace the small diameter incoming watermain in the near-term. Expanding the flow demands to the degree noted above will cause an immediate requirement to replace this watermain.

To service the employment lands, new watermains will need to be constructed as shown on Figure 4. The existing watermain on Springer Road is undersized for the proposed demands and will need to be replaced up to Longwoods Road. In addition, a new watermain will need to be constructed along Longwoods Road to Carriage Road and then along Carriage Road through the employment lands. The watermains on Springer Road and Carriage Road should be connected or 'looped' to provide redundancy to the distribution network. This connection is shown on Figure 4 across undeveloped lands, but should be aligned to any internal road network proposed for the employment lands.

System storage to address peak hour demands and also for fire flow and emergency supply will need to be considered. The existing standpipe was recently replaced and was sized to accommodate existing residential and some planned growth within the OP limits per the approved Class EA, however, the addition of the employment lands would far exceed what the standpipe would provide. For this development only, the Municipality may need to consider additional system storage which could be accommodated on the employment lands or an alternate site. The additional storage required is estimated at 4,000m³.

A new booster pumping station may also be required to boost pressure to the employment lands given the elevation in this area. The station is estimated to require a firm capacity of approximately 97 L/s subject to confirming average flows and appropriate peaking factors. The booster pumping station would need to be located near the new storage facility and ideally within the employment lands. With the introduction of a booster pumping station and potential differing pressures than the existing Delaware water system, the addition of pressure reducing valves will be necessary where the watermains connect back into the existing system thereby creating a separate pressure zone.

Further review of the Komoka Booster Pumping Station and the new Booster Pumping station on Komoka Road that services Delaware should also be undertaken to ensure that both stations have capacity to service the employment lands. Review of the system can be considered through the Master Plan which will also consider new growth needs for the Delaware settlement area.

5.4 PHASING

Per the attached figure, this report proposes the booster pumping station and storage be located on Carriage Road central to the Employment Lands. This would allow an initial phase of development to occur along Carriage Road. This would require the construction of a new watermain on Longwoods Road and an extension on Carriage Road to the Booster station, however, the extension of watermains down Carriage Road to the south limit of the Employment lands along with the extension down Springer Road as well as the proposed loop between Carriage and Springer could be deferred to later development phases.





Legend
 Approximate Study Area

0 250 500 metres
 1:22,500 (At original document size of 11x17)

- Notes**
1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Produced with data used under Ontario Open Data License.
 3. Orthoimagery © First Base Solutions, 2021. Imagery Date, 2010.

Project Location: 165630207 REV B
 Municipality of Middlesex Centre Prepared by KDB on 2022-01-27

Client/Project: MIDDLESEX CENTRE FDI
 PROPOSED EMPLOYMENT AREA

Figure No. **4**

Title: **Proposed Water Servicing**

V:\0165630207\165630207_PreliminaryAnalysis\KDB\165630207_Water.mxd, Revised: 2022-01-27 By: ksbuchanan

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

MIDDLESEX CENTRE FOREIGN DIRECT INVESTMENT – SERVICING FEASIBILITY REPORT

Municipal Water Servicing

Additionally, the proposed storage could be implemented in phases as the employment lands develop and demands increase. This would allow the storage to be 'right-sized' to meet actual water demands.

The majority of the station would need to be constructed with the initial phase of development, however, the ultimate supply capacity could be implemented in phases with pumps sized according to actual demands.

5.5 OPINION OF PROBABLE CONSTRUCTION COST

The following are a high-level Opinion of Probable Construction Cost provided in 2021 dollars and based on historic construction costs of similar works:

Gideon Road Watermain Replacement	\$ 1.8 M
Water Storage (4,000 m ³)	\$ 3.8 M
New Booster Pumping Station (~97 L/s)	\$ 2.8 M (incl. pressure reducing valves)
New Watermains (Springer Road and Carriage Road only)	\$ 1.5 M

For the above noted works, cost sharing with new growth should be considered for the Gideon Road Watermain Replacement. This project services the larger area and would be to the benefit of future growth.



6.0 CONCLUSIONS AND RECOMMENDATIONS

This report provides a high-level analysis of the feasibility and probable construction costs of major infrastructure works to service the proposed Delaware Employment Lands. Key findings of this report are as follows:

- Analysis of Longwoods Road and Carriage Road indicate that through lanes of these two roads are capable to service the proposed employment lands and road widening will not be required. As traffic volumes were not available to assess turning movements at the intersections in the area, no conclusions were made on whether intersection upgrades would be required.
- Stormwater management is considered feasible subject to further study on the watercourse that traverses the site. A combination of at-source controls, low impact measures and end of pipe facilities are recommended for consideration.
- Sanitary servicing is feasible but will require the construction of a new pumping station and forcemain to collect and convey flows to the Komoka Wastewater Treatment Plant.
- Water servicing is feasible with upgrades to the watermain feed from Komoka, construction of a new booster pumping station and storage facility and new watermains in the study area.

The results of the servicing analysis indicate a total cost of \$46.5 million to develop these Employment Lands on the basis of full servicing. It is noted that a more detailed servicing analysis should be provided which would further consider local infrastructure requirements. Additionally, further study should be advanced to develop the stormwater management strategy for the employment lands.

The proposed employment lands will bring a significant amount of new development area and opportunity to the Municipality of Middlesex Centre. The Municipality is concurrently completing their new Official Plan which considers growth in the Delaware area for planning horizon. The servicing strategy for the employment lands should be studied in the context of planned growth in the Delaware settlement area as well as the servicing needs of the existing community. A holistic view of servicing needs is recommended through an update to the Municipality's Water and Wastewater Master Plan. Through this plan, servicing needs for the community as a whole can be considered and costs distributed appropriately between existing needs, the requirements of the employment lands and new growth.

