REGIONAL INFRASTRUCTURE PLAN REPORT

GTA North

Regional Infrastructure Plan Report

GTA North

May 6, 2026

Lead Transmitter:

Hydro One Networks Inc.

Prepared by:

GTA North Technical Working Group

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Disclaimer

This Regional Infrastructure Plan (RIP) Report for GTA North region was prepared for the purpose of developing an electricity infrastructure plan to address electrical supply needs identified in previous planning phases and any additional needs identified based on new and/or updated information provided by the RIP Technical Working Group (TWG).

The preferred solution(s) that have been recommended in this report may be reevaluated based on the findings of further analysis. The load forecast and results reported in this RIP report are based on the information provided and assumptions made by the participants of the RIP TWG at the time.

The cost figures presented are high-level allocations in 2025 dollars and have not been informed by detailed engineering design or development work. Accordingly, these estimates are preliminary in nature, subject to material change, and are intended for options analysis purposes only.

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Executive Summary

Region **GTA North** (the "Region")

Lead Hydro One Networks Inc. ("HONI")

Start Date: November 7, 2025 **End Date:** May 6, 2026

The Regional Infrastructure Plan (RIP) represents the final phase of the Regional Planning Process for the GTA North region. It builds on earlier planning activities, including the Needs Assessment (NA) report published by Hydro One on July 14, 2023, followed by the Scoping Assessment and Integrated Regional Resource Planning (IRRP) reports which were released by the Electricity System Operator (IESO) on October 12, 2023 and on October 10, 2025 respectively.

As the lead transmitter, Hydro One developed the RIP in collaboration with the GTA North Technical Working Group (TWG) for the region and is responsible for publishing the final report. The RIP report consolidates the analysis of options, recommended plans, and preferred wire infrastructure investments identified in earlier planning phases to address the near- and medium-term electricity needs. The load forecast used in this RIP has been adopted from the IRRP report, as no material changes were identified relative to the load forecast submitted during the IRRP Phase. The forecast period covers the 10 years following the completion of IRRP.

The objectives and scope of the RIP are:

- Compile and present a consolidated summary of regional needs and corresponding wires plans to address near and medium-term requirements (2026-2035) identified in previous planning phases (i.e., Needs Assessment, Scoping Assessment, Local Plan, or Integrated Regional Resource Plan).
- Identify any new need(s) that may have emerged over 2026-2035 period.
- Assess and develop wires plans to address these new needs.
- Identify investments in transmission and distribution facilities or both that should be developed and implemented on a coordinated basis to meet the electricity infrastructure needs within the region.
- Consideration of long-term needs identified in the Toronto IRRP, Bulk system studies or as identified by the TWG.

The major infrastructure investments recommended by the TWG in the GTA North region for the next ten years are given below. A single line diagram with the new investments marked is given Appendix G.

Recommendations

Station/Circuit Name	Recommended Plan	Lead	Planned ISD[1]	Section No.
Asset Renewal Needs				
Woodbridge TS	Transformer (T5) refurbishment	Hydro One	2032	8.1.1
Station Capacity Needs				
Kleinburg TS	Adding Kleinburg TS (T3/T4) 230/44kV DESN	Hydro One	2028	8.2.1.1
Vaughan MTS #6	Build Vaughan MTS #6 230/27.6 kV DESN	Alectra	2027	8.2.1.2
Northern York TS #1	Build Northern York TS #1 230/44kV DESN	Hydro One	2031	8.2.2.1
Northern York TS #3	Build Northern York TS #3 230/44kV DESN	Hydro One	2035	8.2.2.2
Richmond Hill MTS #3	Build Richmond Hill MTS #3 230/27.6kV DESN	Alectra	2030	8.2.3.1
Vaughan MTS #5	Build Vaughan MTS #5 230/27.6kV DESN	Alectra	2033	8.2.3.2
Buttonville TS #2 (Previously referred to as Markham MTS #5)	Build Buttonville TS #2 230/27.6kV DESN	Hydro One	2030	8.2.4.1
Markham MTS #6	Build Markham MTS #6 230/27.6kV DESN	Alectra	2034[2]	8.2.4.2
Northern York TS #2	Build Northern York TS #2 230/44kV DESN	Hydro One	2034[2]	8.2.4.3
Transmission Line Capacity Needs				
P45/P46	Upgrade P45/P46 from Parkway TS to Markham MTS #4	Hydro One	2031	8.3.1.1
P45/P46	Upgrade P45/P46 from Markham MTS #4 to Buttonville TS	Hydro One	2034	8.3.1.2
P45/P46	Extend P45/P46 7 km north from Buttonville TS	Hydro One	2034	8.3.1.3
C35P/C36P	Reconnect Markham MTS #4 to C35P/C36P	Hydro One	To be discussed in the next Regional Planning cycle	8.3.1.4

Station/Circuit Name	Recommended Plan	Lead	Planned ISD[1]	Section No.
System Reliability				
Kleinburg TS	Build Kleinburg to Kirby Transmission Link	Hydro One	2031-2032	8.4.1
Kleinburg TS	Bulk Supply - 500/230 kV Transformer Station[3]	Hydro One	2031-2032	8.4.2
York Energy Centre	York Energy Centre – Station Service Upgrade	IESO/Capital Power	2026 (Current)	8.4.3
Holland Marsh SS	Holland Marsh Switching Station	IESO / Hydro One	TBD[4]	8.4.4
New Northern York Transmission Supply	Reinforce transmission supply to Northern York	IESO / Hydro One	TBD[4]	8.4.5
V71P/V75P	In-line breakers New 230kV inline breakers on V71P/V75P circuits	Hydro One	2030	8.4.6
H82V/H83V & B82H/B83H	Claireville to Minden - Over voltages and Under voltage needs.	IESO / Hydro One	TBD[5]	8.4.7
Section of H82V/H83V from Kirby towards Holland	Add new Circuits/Upgrading H82V/H83V circuits from Kirby Jct. to Holland Marsh.	IESO / Hydro One	TBD[5]	8.4.8
Load Security and Restoration				
V43/V44	Load Security on Kleinburg Radial Tap	Hydro One	2031-2032[6]	8.5.1
V71P/V75P	Load Security and Restoration on V71P/V75P	Hydro One	2030[7]	8.5.3
P45/P46	Load Security and Restoration on Buttonville Corridor (P45/P46)	Hydro One	2034[8]	8.5.4

[1] The in-service dates are tentative and subject to change.

[2] The in-service date for Northern York TS #2 and Markham MTS #6 will be coordinated with the P45/P46 Line Extension Project.

[3] This project has been recommended by the IESO's South and Central bulk system study and is part of bulk system reinforcement.

[4] The need, scope and timing of this work will be further discussed in the next planning cycle.

[5] TWG will continue to monitor status.

[6] This issue will be addressed by the Kleinburg TS 500/230kV Station project.

[7] This issue will be addressed by the V71P/V75P in-line breakers project.

[8] This issue will be addressed by reconnecting Markham MTS #4 to circuits C35P/C36P project.

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1 INTRODUCTION

The Regional Infrastructure Plan (RIP) is the final step of the Regional Planning Process. Hydro One as the lead transmitter undertakes the development of a RIP with input from the Technical Working Group (TWG) for the region and publishes a RIP report. The Regional Infrastructure Plan (RIP) is the final step of Regional Planning Process for the GTA North region, preceded by, the publication of Needs Assessment (NA) report in July 14, 2023 by Hydro One, followed by the Scoping Assessment (SA) & Regional Resource Planning (IRRP) which were published in October 12, 2023 and in October 10, 2025 respectively, by the Independent Electricity System Operator (IESO). Typically, an IRRP takes 18 months to complete. However, due to the complex nature of the needs in the region, the IESO requested a six-month extension from the OEB to finalize the plan.

The RIP report includes a common discussion of all the options and recommended plans, and preferred wire infrastructure investments identified in earlier phases to address the near- and medium-term needs.

This report was prepared by GTA North TWG, led by Hydro One Networks Inc. The report presents the results of the assessment based on information provided by Hydro One, the Local Distribution Companies (“LDC”), the Municipalities and the IESO. Participants of the TWG are listed below in Table 1.

Table 1: GTA North Region TWG Participants

No.	Name of TWG Participants
1	Hydro One Networks Inc. (Transmission)
2	Hydro One Networks Inc. (Distribution)
3	Alectra Utilities Inc.
4	Newmarket-Tay Power Distribution LTD (NT Power)
5	Toronto Hydro
6	Independent Electricity System Operator (IESO)
7	Elexicon Energy

2 OBJECTIVES AND SCOPE OF THE REGIONAL INFRASTRUCTURE PLAN

This RIP report examines the needs in the GTA North region. Its objectives are to:

- Provide a comprehensive summary of needs and wires plans to address the needs for the GTA North region.
- Identify new supply needs that may have emerged since previous planning phases (e.g., Needs Assessment, Scoping Assessment, Local Plan, and/or Integrated Regional Resource Plan).
- Assess and develop wires plans to address these new needs.
- Identify investments in transmission and distribution facilities or both that should be developed and implemented on a coordinated basis to meet the electricity infrastructure needs within the region.

The RIP adopted the IRRP provided load forecast, asset renewal for major high voltage transmission equipment, transmission and distribution system capability along with any updates with respect to local plans, conservation and demand management ("CDM") forecasts, renewable and non-renewable generation development, and other electricity system and local drivers that may impact the need and alternatives under consideration.

The scope of this RIP is as follows:

- A consolidated report of the needs and relevant wires plans to address near- and medium- term needs (2026-2035) identified in previous planning phases (i.e., Needs Assessment, Scoping Assessment, Local Plan, or Integrated Regional Resource Plan).
- Identification of any new needs over the 2026-2035 period and wires plans to address these needs based on new and/or updated information.
- Consideration of long-term needs identified in GTA North IRRP, Bulk system studies or as identified by the TWG, are excluded but briefly touched upon.

2.1 Structure

The rest of the report is organized as follows:

- Section 3 provides an overview of the regional planning process.
- Section 4 describes the regional characteristics.
- Section 5 describes the transmission work completed over the last ten years.
- Section 6 describes the load forecast and study assumptions used in this assessment.
- Section 7 describes the adequacy of the transmission facilities in the region over the study period.
- Section 8 discusses the needs and provides the alternatives and preferred solutions.

3 REGIONAL PLANNING PROCESS & RIP METHODOLOGY

3.1 Overview

Bulk System Planning, Regional Planning and Distribution Planning are the three levels of planning for the electricity system in Ontario. Bulk system planning typically looks at issues that impact the system on a provincial level and require longer lead time and larger investments. Comparatively, planning at the regional and distribution levels looks at issues on a more regional or localized level. Typically, the most essential and effective regional planning horizon is the near- to medium-term (1- 10 years), whereas long-term (10-20 years) regional planning mostly provides an outlook with little details about investments because the needs and other factors may vary over time. On the other hand, bulk system plans are developed for the long term because of the larger magnitude of investments.

The regional planning process begins with a Needs Assessment which is led by the transmitter to identify, assess, and document which of the needs that,

a) can be addressed directly between the customer and transmitter along with a recommended plan, and;
b) require further regional coordination and identification of Local Distribution Companies (LDCs) to be involved in further regional planning activities for the region.

At the end of the NA, a decision is made by the TWG as to whether further regional coordination is necessary to address some or all regional needs. If no further regional coordination is required, recommendation to implement the recommended option and any necessary investments are planned directly by the LDCs (or customers) and the transmitter. The region's TWG can also recommend to the transmitter and LDCs to undertake a local planning process for further assessment when needs are:

a) local in nature;
b) require limited investments in wires (transmission or distribution) solutions, and;
c) do not require upstream transmission investments.

If coordination at the regional or sub-regional levels is required for identified regional needs, then the IESO initiates the SA phase. During this phase, the IESO, in collaboration with the transmitter and impacted LDCs, reviews the information collected as part of the NA phase, along with additional information on potential non-wires or resource alternatives, e.g., Conservation and Demand Management (CDM), Distributed Generation (DG), etc., in order to make a decision on the most appropriate regional planning approach including Local Plan (LP), IRRP and/or RIP.

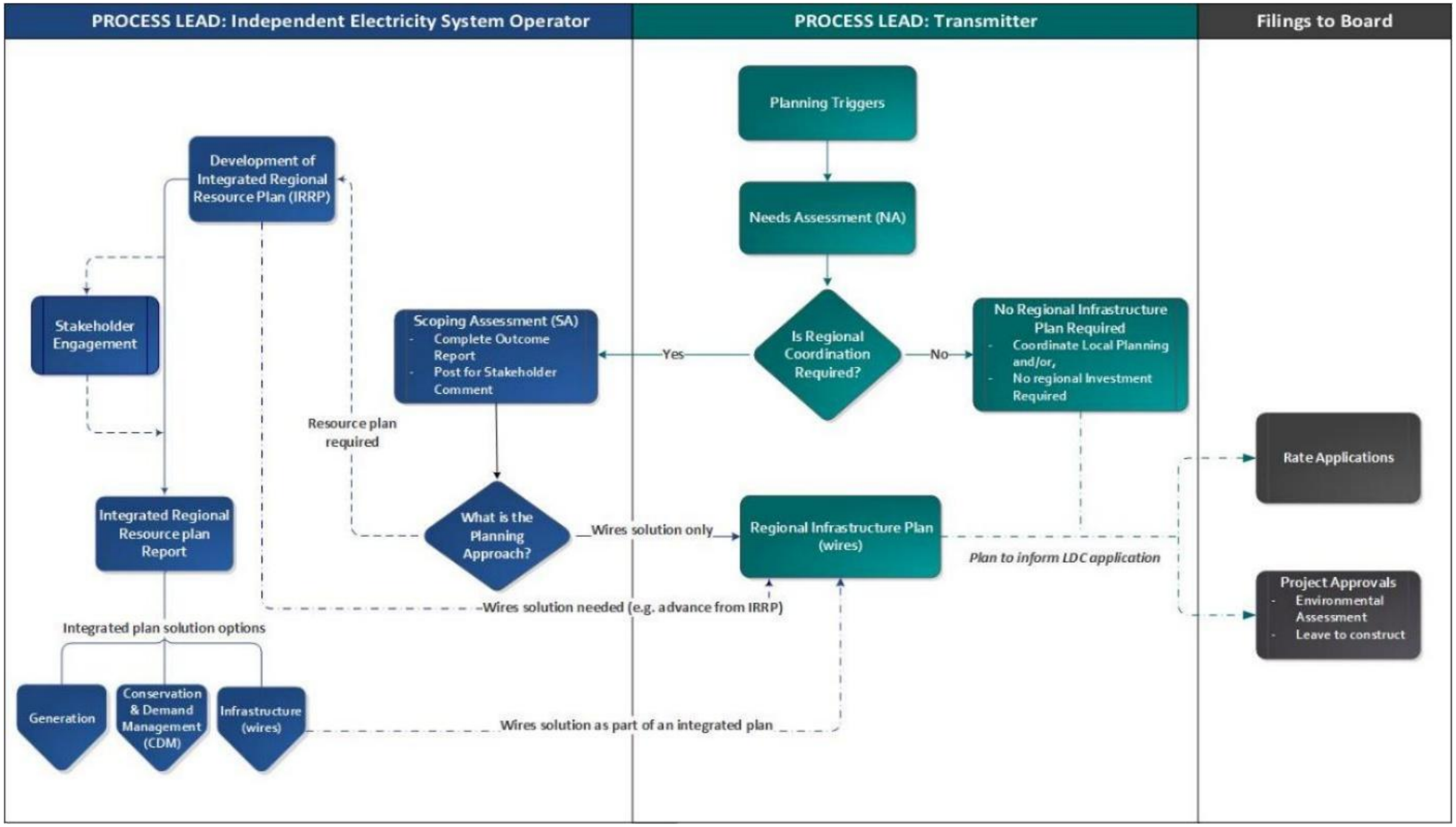
The primary purpose of the IRRP is to identify and assess both resource and wires options at a higher or macro level, but sufficient to permit a comparison of resource options vs. wire infrastructure to address the needs. Worth noting, the LDCs' CDM targets as well as contracted DG plans provided by IESO and LDCs are reviewed and considered at each step in the regional planning process.

If and when an IRRP identifies that resource and/or wires options may be most appropriate to meet a need, resource/wires planning can be initiated in parallel with the IRRP or in the RIP phase to undertake a more detailed assessment, develop specific resource/wires alternatives, and recommend a preferred wires solution.

The RIP phase is the final phase of the regional planning process and involves discussion of previously identified needs and plans; identification of any new needs that may have emerged since the start of the planning cycle; and development of a wires plan to address these needs. This phase is led and coordinated by the transmitter, and the deliverable is a comprehensive and consolidated report of a wires plan for the region. Once completed, this report is also referenced in transmitter's rate filing submissions and as part of LDC rate applications with a planning status letter provided by the transmitter to the LDC(s). Respecting the OEB timeline provision of the RIP, planning level stakeholder engagement is not undertaken during this phase. However, stakeholder engagement at a project specific level will be conducted as part of the project approval requirement.

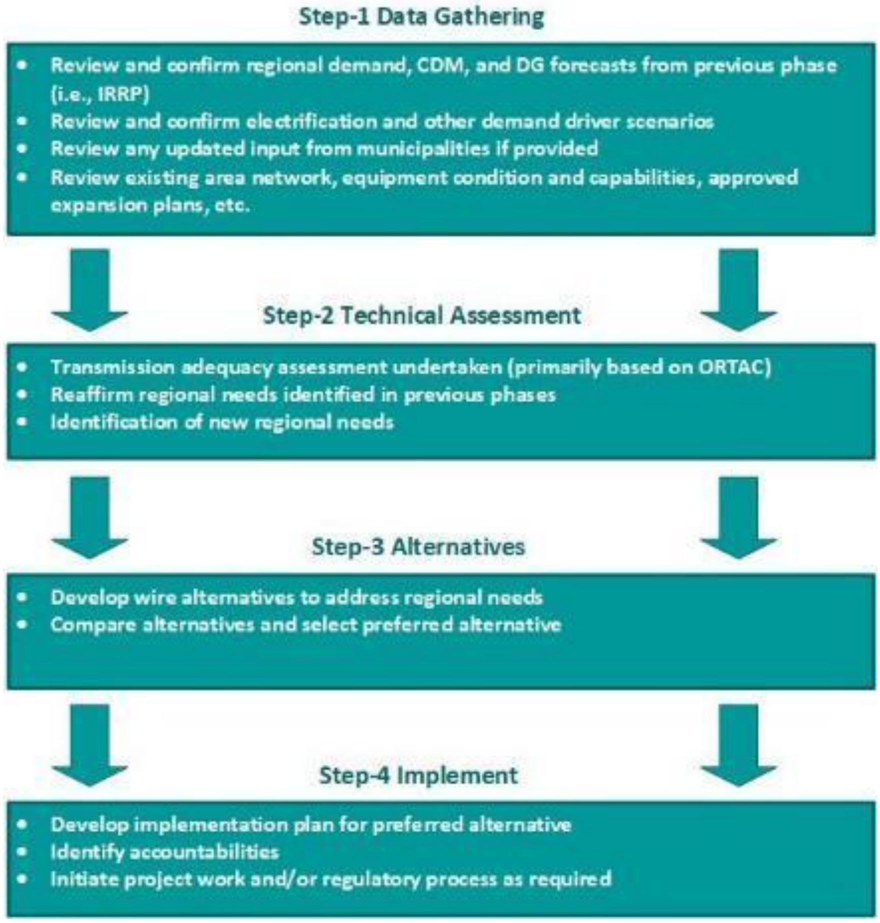
The various phases of Regional Planning Process (NA, SA, IRRP, and RIP) and their respective phase trigger, lead, and outcome are shown below in Figure 1.

Figure 1: Regional Planning Process Flowchart



3.2 Regional Infrastructure Plan Methodology

Figure 2: Regional Infrastructure Plan Methodology



Regional Infrastructure Plan phase is a four-step process which are described below:

3.2.1 Data Gathering:

The first step of the RIP process is the review of planning assessment data collected in the previous stages of the regional planning process. Hydro One collects this information and reviews it with TWG to reconfirm or update the information as required. The data collected includes:

- Net peak demand forecast at the transformer station level. This includes the effect of any distributed generation or conservation and demand management programs. The municipalities were contacted as part of IRRP stakeholder engagement process to get their insight on the future load growth and was translated into the load forecast through inputs provided by their respective LDCs. As agreed by TWG members, the load forecast from the IRRP is to be used for this RIP unless material changes in the load forecast are envisaged.

- Review and confirm electrification and other growth scenarios which affect the projects recommended in previous stages.
- Existing area network and capabilities including any bulk system power flow assumptions.
- Other data and assumptions as applicable such as asset condition, load transfer capabilities, and previously committed transmission and distribution system plans.

3.2.2 Technical Assessment:

The second step is a technical assessment to review the adequacy of the regional system, including any previously identified needs. Additional near and medium-term needs may be identified at this stage.

3.2.3 Alternative Development:

The third step is the development of wires options to address needs and determine a preferred alternative based on an assessment of technical considerations, feasibility, environmental impact, and costs.

3.2.4 Implementation Plan:

The fourth and last step is the development of the implementation plan for the preferred alternative, identifying accountabilities and initiating project work or obtaining permission from the Regulatory Commission, if any.

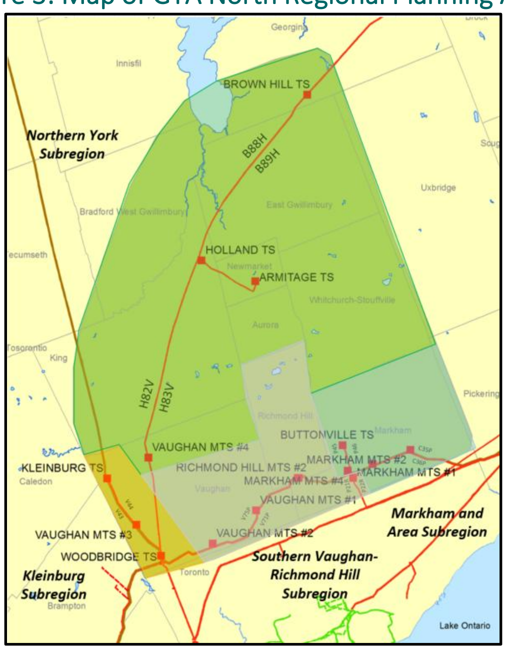
4 REGIONAL DESCRIPTION AND CONNECTION CONFIGURATION

THE GTA NORTH REGION IS COMPRISED OF THE WESTERN AREA, NORTHERN YORK AREA, SOUTHERN VAUGHAN-RICHMOND HILL AREA AND THE MARKHAM AREA. ELECTRICAL SUPPLY TO THE REGION IS PROVIDED FROM SIXTEEN 230 KV STEP-DOWN TRANSFORMER STATIONS. THE 2025 SUMMER PEAK AREA LOAD OF THE REGION WAS APPROXIMATELY 2337 MW.

Electrical supply to the GTA North Region is primarily provided from three major 500/230 kV autotransformer stations, namely Claireville TS, Parkway TS, and Cherrywood TS, and a 230 kV transmission network supplying the various step-down transformation stations in the region. Local generation in the Region consists of the 393 MW York Energy Centre connected to the 230 kV circuits B88H/B89H in King Township. Refer to Appendix A: Net Summer Peak Load Forecast, Appendix B: Lists of Step-Down Transformer Stations, and Appendix C: List of LDC's for further details

The area has been divided into four sub-regions as shown in Figure 3 and described below:

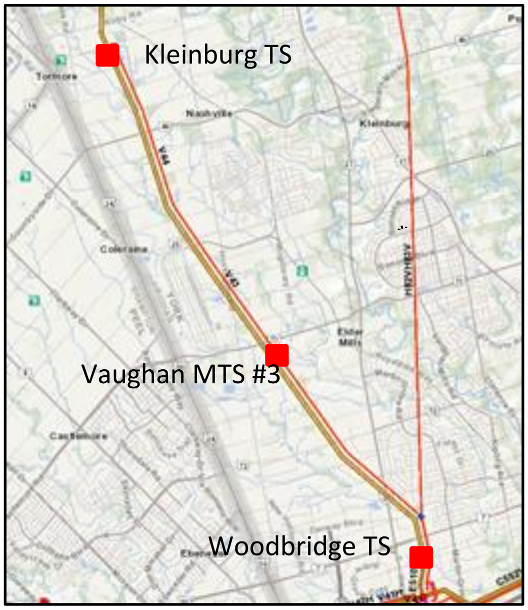
Figure 3: Map of GTA North Regional Planning Area



The **Western Area Subregion** comprises the western portion of the municipality of Vaughan. Electrical supply to the area is provided through Claireville TS, a 500/230 kV autotransformer station, and a 230 kV double circuit line (V43/V44) that supplies three 230 kV transformer stations

(Woodbridge TS, Vaughan MTS#3, Kleinburg TS) stepping down the voltage to 44 kV and 27.6 kV. The Western Sub-region transmission facilities are shown in Figure 4.

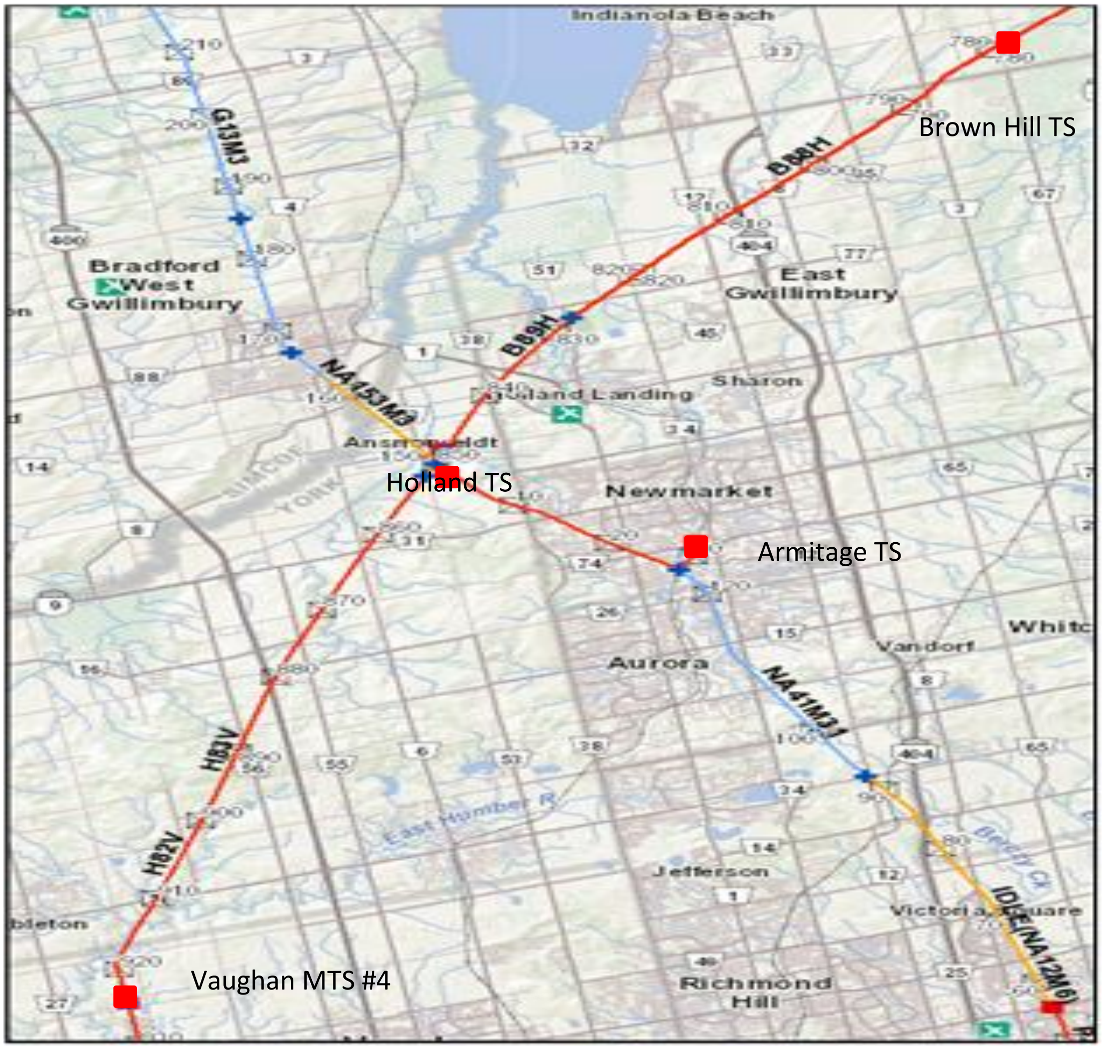
Figure 4: Western Area Subregion



The total 2025 net summer peak demand for three stations was 482 MW. Alectra Utilities is the main LDC that serves the electricity demand for the City of Vaughan. Hydro One Distribution and Toronto Hydro supplies load in the outlying areas of the sub-region. The electricity demand is comprised of residential, commercial, and industrial customers.

The **Northern York Area subregion** covers northern area of the City of Vaughan as well as the Townships of Aurora, Newmarket, King, East Gwillimbury, Whitchurch-Stouffville, Georgina, and includes the Chippewas of Georgina Island. Electricity supply to the sub-region is provided from Claireville TS via a double circuit 230kV transmission corridor extending north to Brownhill TS. The H82V/H83V circuits supply Vaughan MTS #4 and Holland TS along the section between Claireville TS and the Holland Marsh Junction, while the B88H/B89H circuits supply Armitage TS and Brown Hill TS along the section between the Holland Marsh Junction and Brown Hill TS. The York Energy Centre provides a local supply source. The Northern York Area sub-region transmission facilities are shown in Figure 5.

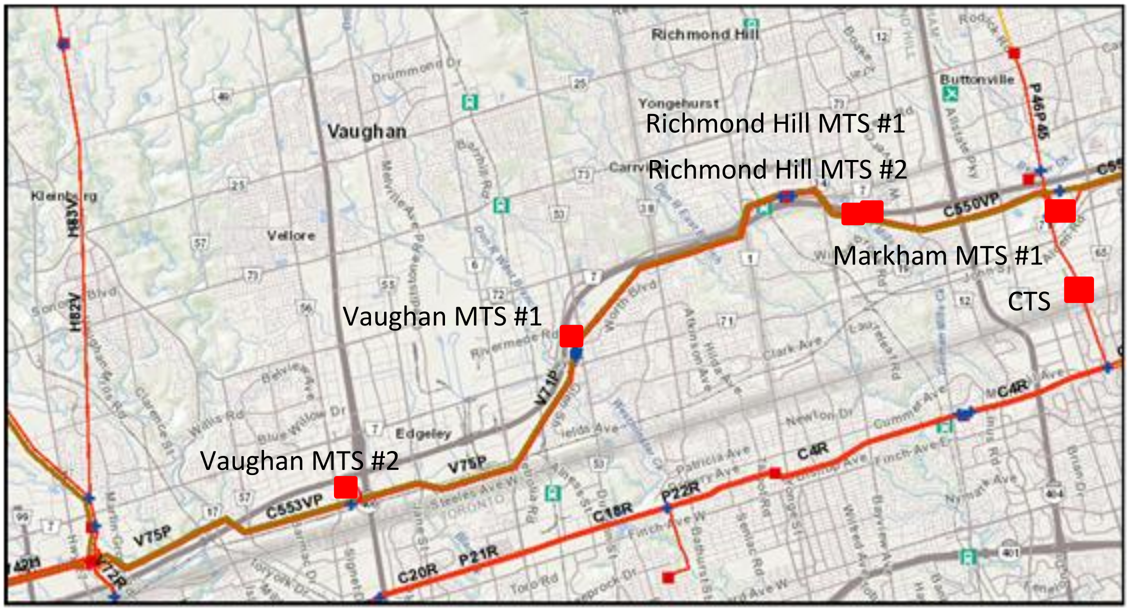
Figure 5: Northern Area Subregion



This area is served by Alectra Utilities, Newmarket-Tay Power Distribution, and Hydro One Distribution. The electricity demand is comprised of residential, commercial, and industrial customers. The total 2025 net summer peak demand for the two stations connected to H82V/H83V circuits was 248 MW and for the two stations connected to B88H/B89H circuits was 360 MW.

The **Southern Vaughan-Richmond Hill Area subregion** encompasses southern parts of the City of Markham, City of Richmond Hill, and the City of Vaughan. The electricity supply to the sub-region is provided through two 230 kV double-circuit transmission corridors: the V71P/V75P circuits supplying Vaughan MTS #1, Vaughan MTS #2, Richmond Hill MTS #1, and Richmond Hill MTS #2, and the P21R/P22R circuits supplying Markham MTS #1 and one direct transmission connected load customer. The Southern Vaughan-Richmond Hill Area sub-region transmission facilities are shown in Figure 6.

Figure 6: Southern Vaughan - Richmond Hill Area Subregion



The area is served by Alectra Utilities, and the electricity demand is comprised of residential, commercial, and industrial customers. The total 2025 net summer peak demand for the stations supplied by V71P/V75P and P21R/P22R circuits was 735 MW and 65 MW respectively.

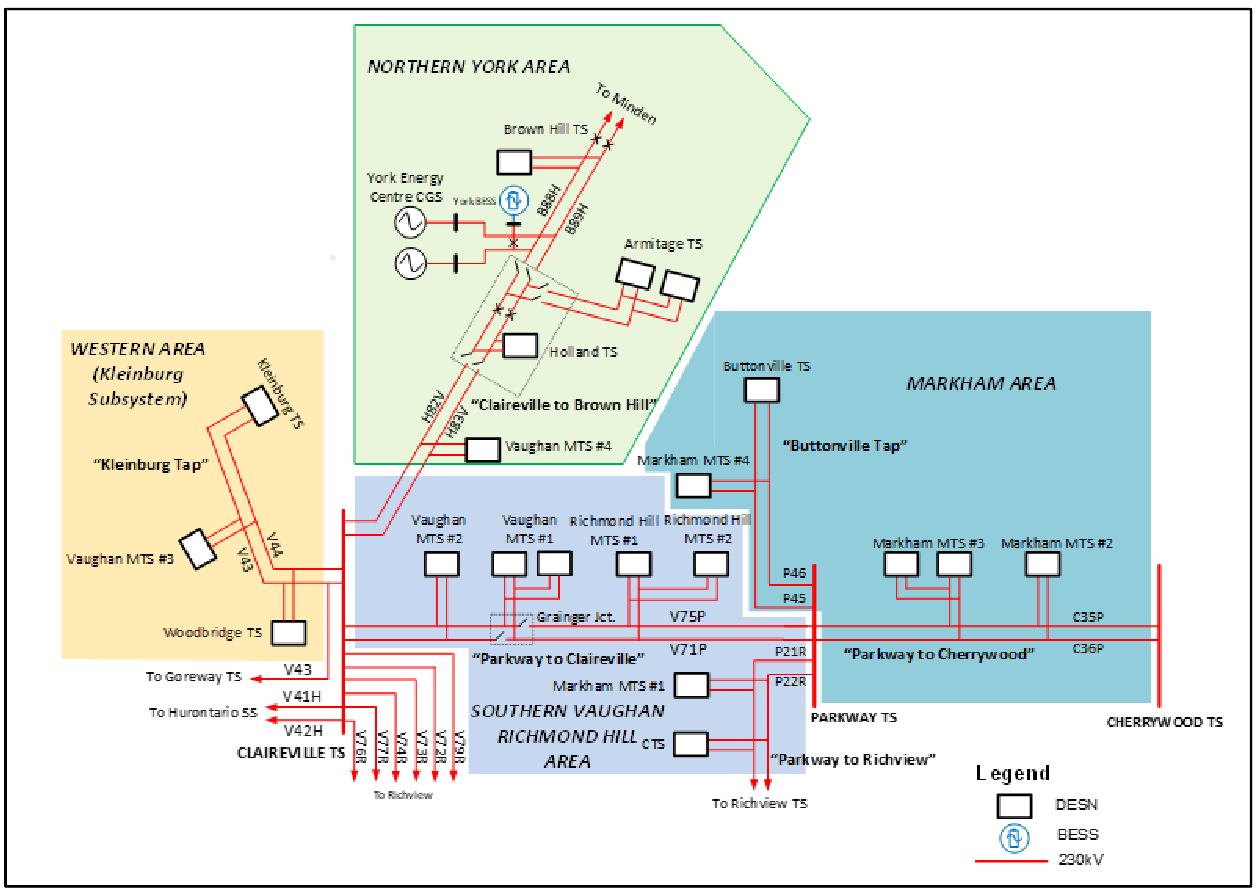
The **Markham Area subregion** encompasses most of the City of Markham. Electricity supply to the Sub-region is provided from Parkway TS by two 230 kV double-circuit transmission corridors, with the P45/P46 circuits supplying Buttonville TS and Markham MTS #4, and the C35P/C36P circuits supplying Markham MTS #2 and Markham MTS #3. The Markham Area sub-region transmission facilities are shown in Figure 7.

The area is served by Alectra Utilities, and the electricity demand mix is comprised of residential, commercial and industrial uses. The 2025 net summer peak demand for the stations on the P45/P46 circuit was 207 MW and was 267 MW for stations on the C35P/C36P circuit.

Figure 7: Markham Area Subregion

The single line diagram of the Transmission Network of GTA North region is shown in Figure 8 below.

Figure 8: GTA North Region Transmission Area Single Line Diagram



5 TRANSMISSION FACILITIES COMPLETED IN THE LAST TEN YEARS AND/OR ARE UNDERWAY

OVER THE LAST TEN YEARS, A NUMBER OF TRANSMISSION PROJECTS HAVE BEEN PLANNED AND UNDERTAKEN TO MAINTAIN THE RELIABILITY AND ADEQUACY OF ELECTRICITY SUPPLY TO THE GTA NORTH REGION.

A summary and brief description of all the projects completed or are currently underway is given below:

5.1 Completed Projects

- Vaughan #4 MTS (2017) – To increase transformation capacity in the City of Vaughan
- Holland breakers, disconnect switches and special protection scheme (2017) – to increase the transmission supply capacity and load restoration capability of the Northern York area.
- Inline switches on the Parkway belt (V71P/V75P) at Grainger Jct. (2018) – to improve reliability for stations in Southern Richmond Hill and Vaughan area.

5.2 Projects initiated and underway.

- Kleinburg TS T3/T4, add two new transformers, and feeder breaker positions (NTD Inservice date) – Increase 44kV transformation capacity at Kleinburg TS
- Vaughan MTS #6: New transformer station – Increase transformation capacity in the City of Vaughan
- Northern York TS #1 (NY-TS#1): New 230/44kV DESN – Increase transformation capacity in Northern York subregion.
- Markham MTS#5/Buttonville TS #2: New 230/27.6kV DESN – Increase transformation capacity in the City of Markham.
- Richmond Hill MTS#3 – New 230/27.6kV DESN - Increase transformation capacity in the City of Richmond Hill

6 LOAD FORECAST AND STUDY ASSUMPTIONS

THIS SECTION PRESENTS THE LOAD FORECAST AND THE STUDY ASSUMPTIONS USED FOR CARRYING OUT THE GTA NORTH REGIONAL PLANNING STUDY.

6.1 Load Forecast

The RIP phase has adopted the load forecast developed during the IRRP which incorporates the impact of the conservation and demand management (CDM), distributed generation (DG) and weather correction factors. The municipalities were contacted as part of IRRP stakeholder engagement process to get their input on future load growth and this has been incorporated into the forecast provided by their respective LDCs. The TWG participants, including representatives from LDC's, the IESO and Hydro One, have reviewed and confirmed the continued use of the IRRP load forecast for this report.

Figure 9 and Figure 10 present the GTA North regional summer and winter net peak load forecasts for the periods 2026 - 2035 and 2036-2043, respectively. Summer peak demand is forecast to grow at an average annual rate of approximately 4.0% between 2026 and 2035, moderating to about 2.0% between 2036 and 2043. Winter peak demand is expected to grow more rapidly due to electrification and is expected to grow at an average growth rate of about 7% between 2026 and 2035 and about 3.85% between 2036 and 2043. The GTA Region is expected to become winter peaking beyond 2030.

Figure 9: GTA North Summer and Winter Net Peak Load Forecast

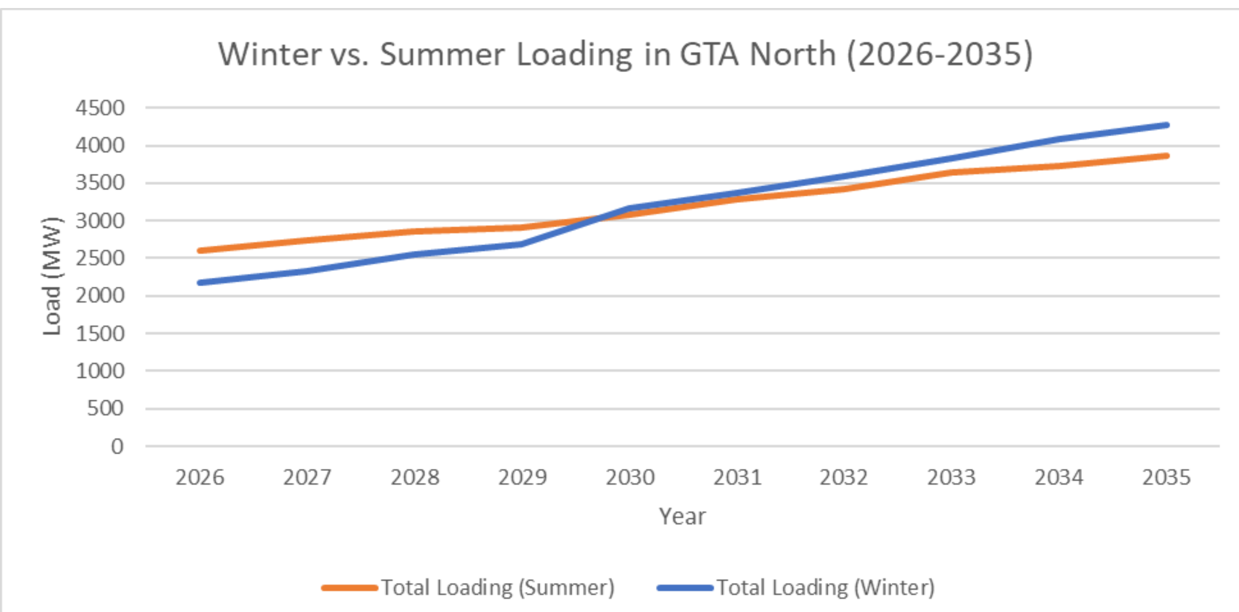
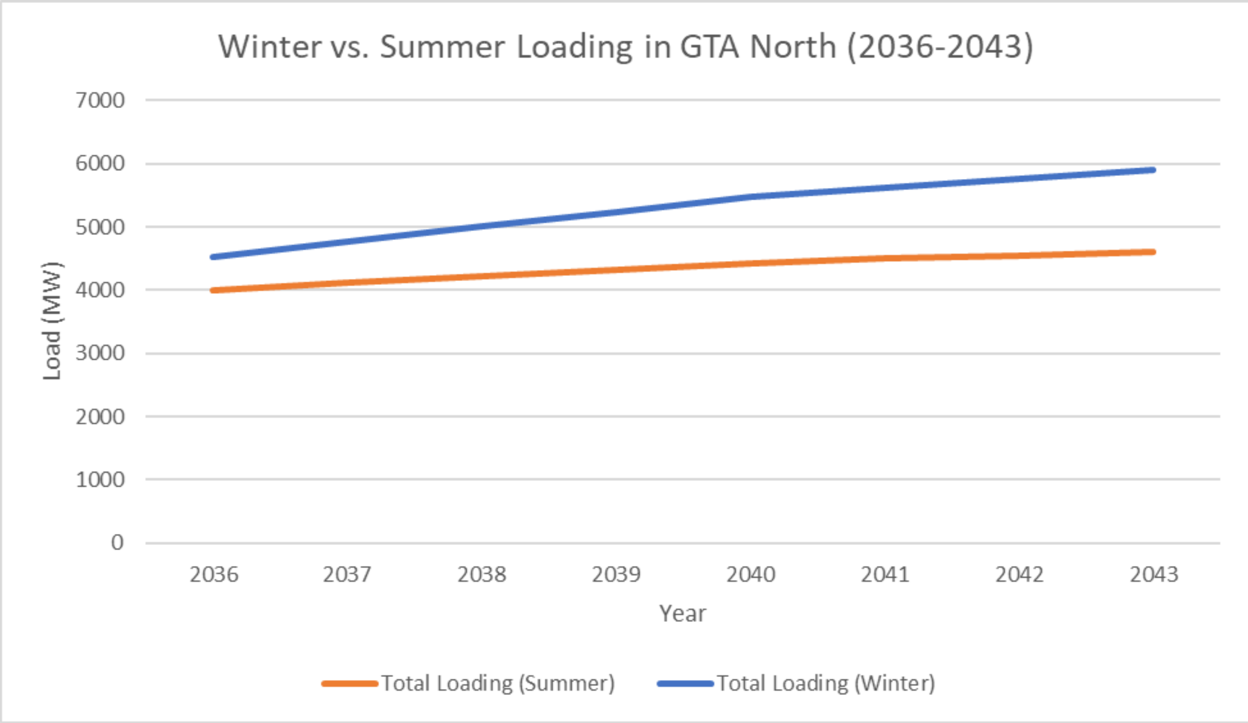


Figure 10: GTA North Summer and Winter Net Peak Load Forecast (2036-2043)



6.2 Other Study Assumptions

The following other assumptions are made in this report.

- The study period for the RIP assessments is 2026-2035.
- While the Region is changing from summer to winter peaking by 2030, summer remains the critical period with respect to line and transformer loadings over the study period of 2026-2035. The assessment is therefore based on summer peak loads.
- Since GTA North stations peak at roughly the same time, the TWG has assumed no difference between the coincident and non-coincident demands, and a single set of load forecast for the RIP purposes has been considered – termed as 'Net Peak Load Forecast'.
- Station capacity adequacy is assessed by comparing the non-coincident peak load with the station's normal planning supply capacity, assuming a 90% lagging power factor for stations having no low-voltage capacitor banks and 95% lagging power factor for stations having low-voltage capacitor banks or based on historical power factor data.
- Normal planning supply capacity for transformer stations in the region is determined by the summer 10-day Limited Time Rating (LTR) based on 35°C ambient temperature.
- Bulk transmission line capacity adequacy is assessed by using net summer peak loads in the area. Capacity assessment for radial lines and stepdown transformer stations uses non-coincident peak loads.

- All Battery storage projects are assumed to only charge during off-peak hours. Any future charging of these battery storage projects may impact LMC (Load Meeting Capability) of some circuits.
- Adequacy assessment is conducted as per Ontario Resource and Transmission Assessment Criteria (ORTAC).

7 SYSTEM ADEQUACY AND REGIONAL NEEDS

THIS SECTION REVIEWS THE ADEQUACY OF THE EXISTING TRANSMISSION SYSTEM AND TRANSFORMER STATION FACILITIES SUPPLYING GTA NORTH REGION OVER THE RIP STUDY PERIOD 2026-2035.

In the current regional planning cycle, the following regional assessments were completed, and their findings were used as inputs to this RIP report:

- GTA North region Third cycle Needs Assessment Report, Completed in September 2022 by Hydro One
- GTA North region Third cycle Scoping Assessment Report, Completed in October 2023 by the IESO
- GTA North region Third cycle Integrated Regional Resource Plan Report, Completed in October 2026 by the IESO

The Technical Working Group identified several regional needs based on the forecasted demand over the near-to-mid-term period in the reports mentioned above. The results of the Adequacy Assessment to define the needs are discussed in sub-sections “7.1 to 7.4” and a detailed description and status of plans to meet these needs are given in “Section 8” of this report.

7.1 Asset Renewal Needs for Major HV Transmission Equipment

Asset Replacement needs are determined by asset condition assessment. Asset condition assessment is based on a range of considerations such as:

- Equipment deterioration due to aging infrastructure or other factors,
- Technical obsolescence due to outdated design,
- Lack of spare parts availability or manufacturer support, and/or
- Potential health and safety hazards, etc.

The list of major HV transmission equipment requiring replacement in the GTA North region is provided in Table 2 below

Table 2: Major HV Transmission Asset assessed for Replacement in the Region

Station/Circuit	Need Description	Planned ISD
Woodbridge TS	Transformer T5 refurbishment	2032

7.2 Station Capacity Needs

Over the 2026-2035 study period, the RIP assessed the capacity of all the 230kV transformer stations in the GTA North region. Previous NA and IRRP studies identified several stations requiring capacity relief within this timeframe. This RIP confirms those findings and, based on the load forecast, identifies the stations requiring capacity relief as summarized in Table 3. The need date represents the point at which forecast peak demand exceeds the most limiting seasonal (summer) Limited Time ratings.

Table 3: GTA North region Station Capacity Needs in the study period

Sr. No.	Station Name	Station LTR(MW) (Summer)	2026 Loading (MW) (Summer)	Need Date
1	Kleinburg TS	180	214	Current[1]
2	Holland TS	168	169	Current[2]
3	Armitage TS	317	317	Current[2]
4	Brown Hill TS	184	177	2027
5	Richmond Hill MTS #1&#2	254	249	2030[2]
6	Buttonville TS	166	151	2030[2]
7	Vaughan MTS #1	306	301	2033

[1] Work is underway to add a new T3/T4 DESN at Kleinburg TS

[2] Work to provide relief has been initiated

The options and preferred solutions to address these needs are discussed further in Section 8 of the report.

7.3 Lines Capacity Needs

The RIP assessed the capacity of all 230kV transmission lines within the GTA North region and confirmed previously identified needs using the transmission lines and confirmed those needs based on the load forecast. Transmission lines requiring capacity relief during the study period are summarized in Table 4 below. The need timeframe represents the point at which the forecast peak demand exceeds the most limiting seasonal (summer) Limited Time Emergency ratings.

Table 4: GTA North region Transmission Line Capacity Needs in the study period

No.	Name of Circuit	Name of Section	Maximum capacity Long Term Emergency (LTE)	Current loading	2035 Loading	Need Date
1	H82V/H83V	Woodbridge Jct. to Vaughan #4 Jct.	1090A	<LTE	> 170%	2030
2	P45/P46	Parkway TS to Markham #4 Jct.	1103A	< LTE	> 120% of LTE	2031
3	P45/P46	Markham #4 Jct. to Buttonville TS	1103A	< LTE	> 150% of LTE	2034

7.4 System Reliability

The RIP reviewed the reliability of the system as per IRRP recommendations provided for the GTA North region. System upgrades required to ensure reliability in the area, and which have been recommended through the GTA North IRRP and South & Central bulk study, are shown in Table 5 below. The need timeframe defines the time when the projects require support from the IESO as part of Bulk system input and need.

Table 5: GTA North region System Reliability Needs in the study period

Station/Circuit	Need Description	Need Date
Kleinburg Kirby Transmission Line K43H/K44H[1]	Provide relief for loading on circuits H82V/H83V	2031-2032
Kleinburg TS – 500/230kV station expansion[2]	Provide additional supply to local area	2031-2032
YEC -Station Service Upgrade	Station Service Upgrade- mitigate load restoration concerns	Immediate
Holland Marsh Switching Station (SS)	Switching station enhances restoration and mitigate load security concerns	TBD[3]
New Transmission Supply corridor	Linking Kleinburg TS or Essa/Barrie to Holland Marsh SS	TBD[3]

[1] Assumed nomenclature for new line.
[2] Bulk system upgrade recommended by South and Central bulk system study.
[3] Option to be reviewed in next planning cycle.

7.5 Load Security and Restoration Needs

Load security and load restoration needs were reviewed as part of the current study. The ORTAC Section 7 requires that no more than 600 MW of load be lost as a result of a double circuit contingency.

Further, loads are to be restored in the restoration times[1] specified as follows:

- All loads must be restored within 8 hours.
- Load interrupted in excess of 150 MW must be restored within 4 hours.
- Load interrupted in excess of 250 MW must be restored within 30 minutes.

Load Security needs for loss of double circuits lines are listed in Table 6. The needs and the TWG recommendations to address the needs are discussed in more detail in Section 8.5.

Table 6: GTA North region System Reliability Needs in the study period

Circuit	Need Description	Need Date
V43/V44	Loads in excess of 250 MW cannot be restored in less than 30 minutes as per the ORTAC restoration criteria.	Current[1]
H82V/H83V	Loads in excess of 250 MW cannot be restored in less than 30 minutes as per the ORTAC restoration criteria.	Current[1]
B88H/B89H	Loads in excess of 250 MW cannot be restored in less than 30 minutes as per the ORTAC restoration criteria.	Current[1]
V71P/V75P	Loading on this line exceeds the 600 MW limit as per ORTAC security criteria.	Current[1]
P45/P46	Loads in excess of 250 MW cannot be restored in less than 30 minutes as per the ORTAC restoration criteria.	2030

[1] Current issue

[1] These approximate restoration times are intended for locations that are near staffed centers. In more remote locations, restoration times should be commensurate with travel times and accessibility

8 REGIONAL PLANS

This section discusses the regional electric supply needs and presents all the wires alternatives considered to address these needs and identifies the best and preferred wires solutions for the GTA North Region. These needs include those previously identified in the NA and IRRP for the GTA North Region as well as any new needs identified during the RIP phase. All estimated costs included in the alternative analysis are considered as planning budgetary estimates and are used for comparative purposes only and may vary. The Needs in the region are summarized below in Table 7 below:

Table 7: Near/ Mid-term Needs Identified in the Region

Sub-Region	Area/ Station/Circuit	Description of Need	Need Date	RIP Report Section
Asset Renewal Needs				
Western Area	Woodbridge TS	Transformer T5 replacement	2032	8.1.1
Station Capacity Needs				
Western area	Kleinburg TS (T3/T4)	New T3/T4 230/44kV DESN as T1/T2 DESN approaching its supply capacity.	2028	8.2.1.1
	Vaughan MTS #6	New Station 230/27.6kV DESN accommodate Customer	2027	8.2.1.2
Northern York Area	Build Northern York TS #1 230/44kV DESN	To meet forecast load	2031	8.2.2.1
	Build Northern York TS #3 230/44kV DESN	To meet forecast load	2035	8.2.2.2
Southern Vaughan - Richmond Hill Area	Build Richmond Hill MTS #3 230/27.6kV DESN	To meet forecast load	2030	8.2.3.1
	Build Vaughan MTS #5 230/27.6kV DESN	To meet forecast load	2033	8.2.3.2
Markham Area	Build Buttonville TS#2 230/27.6kV DESN	To meet forecast load	2030	8.2.4.1
	Build Markham MTS #6	To meet customer load.	2034	8.2.4.2

Sub-Region	Area/ Station/Circuit	Description of Need	Need Date	RIP Report Section
	230/27.6kV DESN			
	Build Northern York TS #2 230/44kV DESN	To meet customer load.	2034	8.2.4.3
Transmission Line Capacity Needs				
Markham Area-Parkway TS to Buttonville TS	Upgrade P45/P46	Upgrade P45/P46 230kV conductors from Parkway to Markham MTS#4 Junction to accommodate Buttonville TS #2	2031	8.3.1.1
	Upgrade P45/P46	Upgrade P45/P46 230kV conductor from Markham MTS#4 Jct. to Buttonville TS, before connecting either Northern York TS#2 or Markham MTS#6, whichever comes first.	2034	8.3.1.2
	Extend P45/P46	Extend the P45/P46 circuits 7 km north of Buttonville TS along the idle 115kV corridor[2].	2034	8.3.1.3
Markham Area-Parkway TS to Cherrywood TS	Re-terminate Markham MTS#4 from P45/P46 to C35P/C36P	Re-terminate Markham MTS#4 from P45/P46 to C35P/C36P to offset the future loading concerns.	To be discussed in the next Regional Planning cycle	8.3.1.4
System Reliability				
Bulk System-Western and Northern Area sub-systems	Build Kleinburg to Kirby Transmission Link	Supply capability of H82V/H83V- Claireville to Holland Marsh Jct. exceeded.	2031-2032	8.4.1
Bulk System	Kleinburg TS: Build new 500/230 kV station	Provide additional supply to local area[3]	2031-2032	8.4.2

[2] The distance varies depending upon the location of the future Markham MTS#6 and Northern York TS#2 Stations.
[3] Bulk system upgrade recommended by IESO's South and Central bulk system study.

Sub-Region	Area/ Station/Circuit	Description of Need	Need Date	RIP Report Section
Northern Area	York Energy Centre – Station Service Upgrade	Mitigate load security issue for loss of Station service.	2026 (Current)	8.4.3
Bulk System	Build Holland Marsh Switching Station	Reinforce supply to Newmarket and Armitage area	To be discussed in the next planning cycle	8.4.4
Bulk System	New Transmission Supply to Holland Jct	Supply capability of H82V/H83V- Claireville to Holland Marsh Jct. exceeded.	To be discussed in next planning cycle	8.4.5
Southern Vaughan - Richmond Hill Area	Add new 230kV inline breakers on V71P/V75P circuits	Mitigate load security issue	2030	8.4.6
Northern Area	H82V/H83V – B88H/B89H-M6E/M7E	Mitigate Claireville to Minden-Over voltages and Under voltage needs. Thermal Overloads-M6E/M7E	Continue to be monitored -No action except for M6E/M7E thermal overloads	8.4.7
Bulk System	Add/Upgrade Kirby Jct to Holland Marsh Jct (23 km)	Upgrade the limiting section	To be discussed in the next planning cycle	8.4.8
Load Security and Restoration Needs				
Western Area	V43/V44	Mitigate Load Security on Kleinburg Radial Tap	2031-2032	8.5.1
Northern Area	H82V/H83V	Load Restoration from Claireville TS to Holland TS Circuits (H82V/H83V)	No Needs identified	8.5.2.1
Northern Area	B88H/B89H	Monitor Load Security Issue	2035	8.5.2.2
Southern Vaughan - Richmond Hill Area	V71P/V75P	Mitigate Load Security concerns on V71P/V75P	2030	8.5.3
Markham Area	P45/P46	Monitor Load Security concerns on Buttonville Corridor (P45/P46)	2034	8.5.4

8.1 Asset Renewal Needs for Major HV Transmission Equipment

The Asset renewal assessment considers the following options for "right sizing" the equipment:

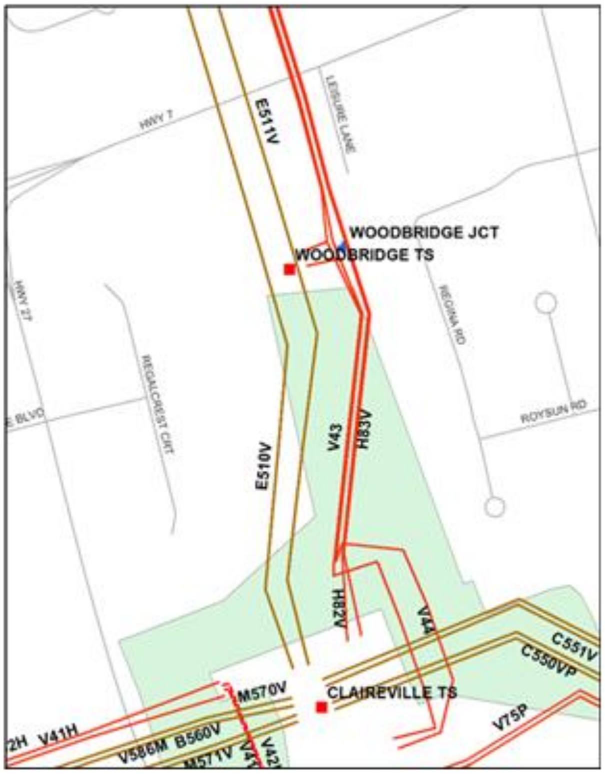
- Maintaining the status quo;
- Replacing equipment with similar equipment with *lower* ratings and built to current standards;
- Replacing equipment with similar equipment with *lower* ratings and built to current standards by transferring some load to other existing facilities;
- Eliminating equipment by transferring all the load to other existing facilities;
- Replacing equipment with similar equipment and built to current standards (i.e., "like-for-like" replacement); and
- Replacing equipment with higher ratings and built to current standards.

From Hydro One's perspective as a facility owner and operator of its transmission equipment, doing nothing is generally not an option for major HV equipment due to safety and reliability risk of equipment failure. This also results in increased maintenance costs and longer duration of customer outages.

8.1.1 Woodbridge TS: T5 End-of-Life Transformer

Woodbridge TS comprises one DESN unit, T3/T5 (75/125 MVA), with two secondary winding voltages at 44 kV and 27.6 kV, each with a summer 10-Day LTR of 80 MW, supplying both Alectra and THESL, having geographic location as shown in Figure 11. The station's 2025 actual peak load was 128 MW. Transformer T5 is currently about 54 years old and is planned for replacement.

Figure 11: Woodbridge TS Project Location



Alternatives and Recommended Plan

The following alternatives were considered to address the Woodbridge T5 end-of-life need:

1. **Maintain Status Quo**: This alternative was considered and rejected as it does not address the risk of failure due to asset condition and would result in increased maintenance expenses and will not meet Hydro One's obligation to provide reliable supply to the customers.
2. **Replace with similar type and size equipment as per current standard:** Under this alternative the existing transformer T5 at Woodbridge TS is replaced with a new 75/125 MVA 230/44-27.6 kV transformer. This alternative would address the need and would maintain reliable supply to the customers in the area.
3. **Re-configure Woodbridge TS as two separate 44 kV and 27.6 kV DESNs:** Hydro One has not considered this option further since there is currently no need for the additional transformation capacity, and there are limitations on the high voltage supply circuits. The cost of rebuilding the station would also be high.

The Working Group has recommended that Hydro One proceed with Alternative 2 and coordinate the replacement plan with affected LDCs. The estimated project cost is to be determined and is work is planned to be completed in 2032.

8.2 Station Capacity Needs

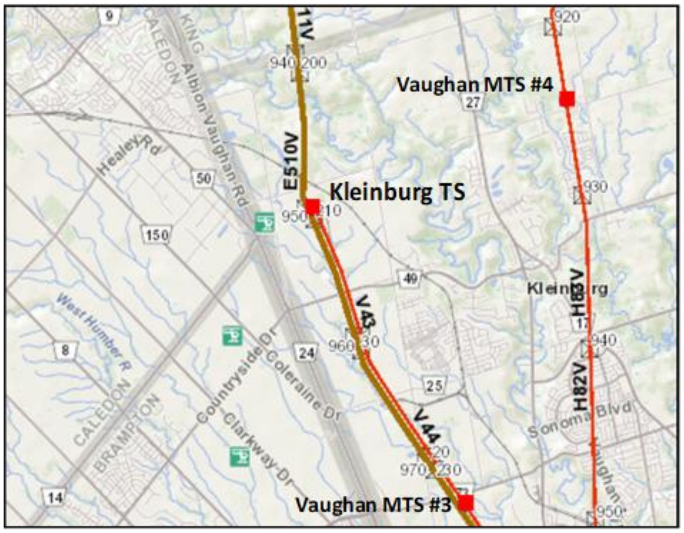
A Station Capacity assessment was performed over the study period 2026-2035 for the 230kV transformer stations in the GTA North region using the net summer peak load forecasts that were provided by the study team. Based on the results, the following Station capacity needs have been identified during the study period:

8.2.1 Western Sub Region

8.2.1.1 Kleinburg TS T3/T4 Addition

Kleinburg TS in King Township (see Figure 12) consists of two existing dual winding 230/44/27.6 kV transformers T1 and T2. The 44kV winding supplies a 44kV LV yard that serves Hydro One Distribution load. The 27.6kV winding supplies a 27.6kV LV yard that serves both Hydro One Distribution and Alectra load. The station 2025 actual 44kV peak load of 105 MW exceeds the 44kV kV winding rating of 99 MW. Hydro One Distribution has asked for additional 44kV supply capacity to support increased demand in the Caledon area.

Figure 12: Kleinburg TS Project Location



Alternatives and Recommended Plan

The following alternatives were considered to address the increased load demand:

1. **Maintain Status Quo**: Existing transformer T1 and T2 assets and 27.6 kV and 44 kV switchyard configurations at the Kleinberg TS are nearing capacity limits. Not addressing these assets needs will result in Hydro One Distribution not being able to meet its customer connection obligations. Therefore, this option is rejected.
2. **Add two new 75/125 MVA, 230kV/44kV transformers and reconnect the 44kV yard supply from the T1/T2 transformers to the new T3/T4**. Under this option the existing 44kV yard together with the new T3/T4 transformers become a separate 230/44kV DESN increasing the 44kV supply capability to 200 MVA.

The Working Group has recommended that Hydro One proceeds with Alternative 2 and coordinates the replacement plan with affected LDCs. The project estimated cost is around $40M and work is currently underway with a planned completion date of 2028.

8.2.1.2 Vaughan MTS #6 TS (T3/T4) 27.6 kV DESN

Vaughan MTS #6 was identified in the NA as triggered by a dedicated Customer need. Alectra has started building a new station to provide supply to a large customer, having geographic location as shown in Figure 13. The new station will have 2 x 75/125 MVA, 230/27.6kV transformers, and a 27.6kV switchgear building. Alectra has requested that Hydro One build a short underground line tap to supply the new station from the 230kV Claireville TS x Kleinburg TS double circuit line V43/V44.

Figure 13: Vaughan MTS #6 Location

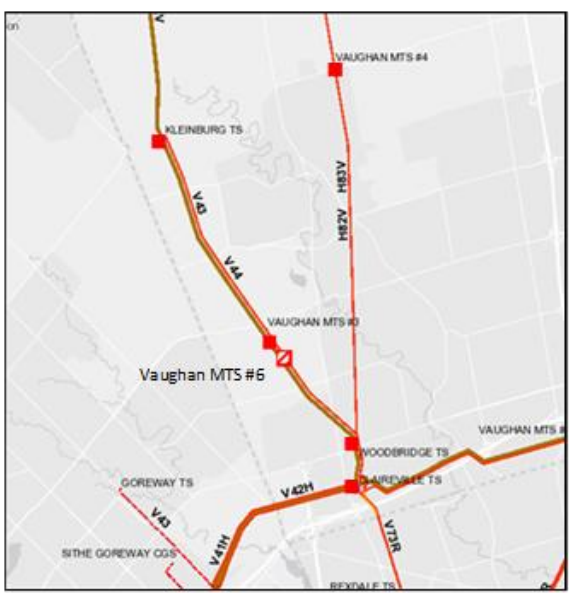


Table 8: Vaughan MTS #6 MW Summer Demand and Forecast Loading on the 230kV Claireville TS x Kleinburg TS line V43/V44

Transformer Station/ Corridor	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Vaughan MTS #6 (28kV)	0	0	30	29	49	48	56	76	92	90
Total Load on V43/V44	522	535	596	607	644	645	656	675	690	687

Table 8 shows the forecast load for Vaughan MTS #6 and the total load connected to the line. There is adequate capacity on the line to supply the loads over the study period.

Feasibility study for the line connection and SIA and CIA for the dedicated customer load have been completed. Hydro One has initiated consultations with Alectra for the design and execution of the Project and planned in-service date for the station is 2027. The project estimated cost is in the range of $55M-$65M.

8.2.2 Northern York Area Sub-Region

8.2.2.1 Northern York TS #1

Additional step-down transformation capacity is needed for the areas supplied by Armitage TS and Holland TS. A new station Northern York TS #1, located south of Holland Marsh Jct., and supplied by the Claireville TS x Holland Marsh Jct. 230 kV circuits H82V/H83V (see Figure 14) is proposed to meet this need. Please refer to Table 9 below for the load forecast and in-service timeline for the Station. While the IRRP had identified the need for the station as immediate, the earliest possible in-service date for the project is 2031.

Figure 14: Northern York TSs #1 and 3

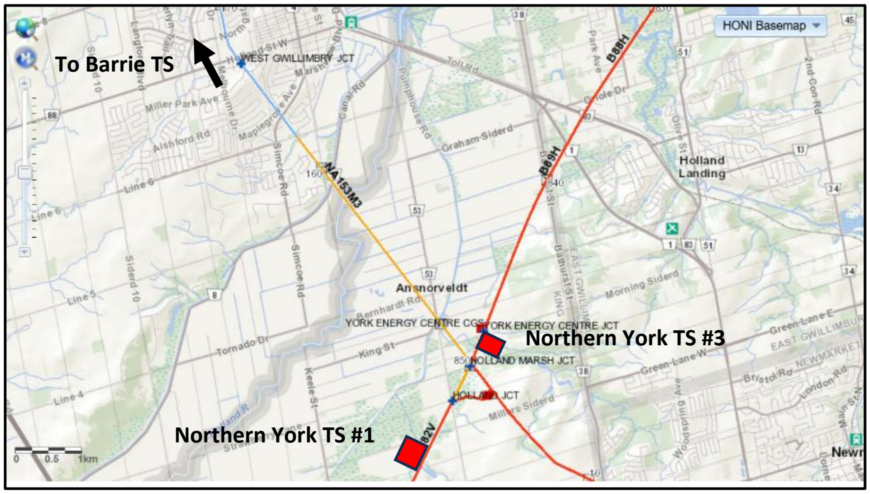


Table 9: Northern York Area MW Summer Demand Forecast

Station	LTR (MW)	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Need for Northern York Region TS #1 and #3											
Holland TS	168	169	169	169	169	169	169	169	169	169	169
Armitage TS	317	317	317	317	317	317	317	317	317	317	317
Northern York TS #1	170	0	0	0	0	0	32	65	92	130	170
Northern York TS #3	170	0	0	0	0	0	0	0	0	0	4

Alternatives and Recommended Plan

Status Quo is not an option as not proceeding with this investment will result in Hydro One not meeting the Customer's in-service date. This alternative presents regulatory and customer risks. With this alternative, Hydro One's obligation to connect load customers upon request would not be met.

The Northern York TS #1 station project is currently in the project development phase. Funding has been released for selecting a suitable site for the new station, and preliminary engineering and initial environmental assessment activities have been initiated, including early engagement to inform and seek input from the affected communities and Indigenous groups. The project estimated cost is in the range of $55M-$65M. The planned in-service date is 2031.

8.2.2.2 Northern York TS#3

By the mid-2030s, electricity demand in Northern York is expected to grow to the point that another new transformer station will be required in northern York region by 2035 (please see Table 9 above). The new station Northern York TS #3 will support the forecasted growth at Northen York TS #1 and future growth at Holland TS and Armitage TS area. The location for the Northern York TS #3 has not yet been confirmed. However, based on projected development patterns, the most suitable area would likely be near the Holland Marsh Junction, where it would be well positioned to supply the communities of King, Newmarket, East Gwillimbury, and Bradford West Gwillimbury.

It is anticipated that the station will connect to Holland Marsh Jct. x Brown Hill TS 230kV circuits B88H/B89H. However, additional transmission reinforcements are expected to be required to support this connection.

One option is to reinforce the existing H82V/H3V circuits that connect into Holland Marsh Jct. A second option, see Figure 14 above, is to build a new 230kV double circuit line from Barrie TS to Holland Marsh Jct. utilizing the existing idle transmission corridor that extends from Holland Marsh Jct., northwest through Bradford West Gwillimbury and into Simcoe County, to Barrie TS. Potential advantages of this option include improved voltage performance and system reliability, and and relief of future loading pressure on the core Northern York transmission path (H82/83V). This option is further discussed in Section 8.4.5.

A switching station at Holland Marsh Jct. may also be required at Holland Marsh Jct. to incorporate the new line from Barrie TS (please see Section 8.4.4 for further discussion on Holland Marsh switching station). The TWG will review and finalize the reinforcement options in the next planning cycle

Alternatives and Recommended Plan

As noted above, it is planned to connect the new station to circuits B88H/B89H. Further coordination between Hydro One and the affected LDCs will be required to confirm the preferred station location and connection point through future planning activities. The TWG will monitor the area growth rate, and the timing of the station in-service date of 2035 will be refined based on need.

The capital cost of the new station is currently estimated to be in the range of $55M-$65M. Any required transmission reinforcements and their associated costs will be determined in the next planning cycle, once the scope and configuration of the work have been further defined.

8.2.3 Southern Vaughan -Richmond Hill Area

8.2.3.1 Richmond Hill MTS #3

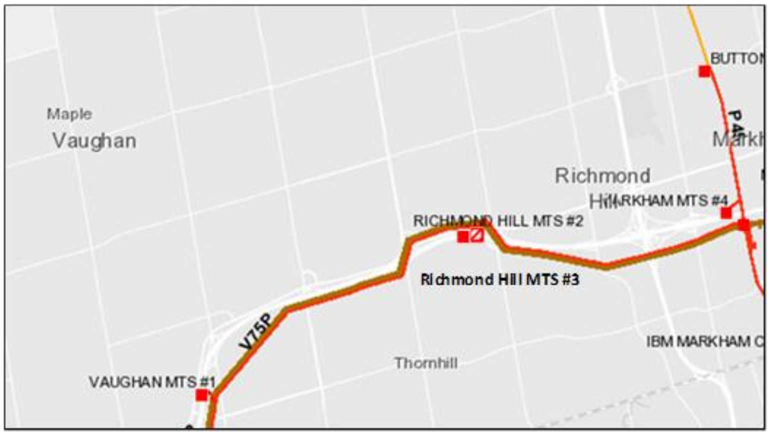
The Richmond Hill South area is seeing significant growth. The existing stations Richmod TS MTS #1 and MTS #2 are operating at capacity limit and additional transformation capacity is required. Alectra plans to develop a new transformer station Richmond Hill MTS #3 adjacent to the existing Richmond Hill MTS #2 to meet forecast growth. Please see Table 10 below for the area forecast.

Table 10: Richmond Hill Area MW Summer Demand Forecast

Station	LTR (MW)	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Richmond Hill MTS #1	153	150	148	153	153	153	153	153	153	153	153
Richmond Hill MTS #2	101	99	98	101	101	101	101	101	101	101	101
Richmond Hill MTS #3	153	0	0	0	0	26	48	61	86	115	129

The proposed station will consist of 2 x 75/125 MVA, 230/27.6kV transformers and a 27.6kV switchyard. Alectra has requested that Hydro One connect the new station to the 230kV Claireville TS x Parkway TS double circuit line V71P/V75P as shown in Figure 15.

Figure 15: Richmond Hill MTS #3 Location



The IRRP has identified load security concerns with the V71P/V75P lines as connected loads exceed the 600 MW limit as per the ORTAC security criteria. The connection of this new station will further increase loading on the line. To connect the station and address the load security need, TWG has recommended the addition of in-line breakers to sectionalize the circuits. The issue is further discussed in the Section 8.4.6 on in-line breakers and Section 8.5.3 on load security assessment

Alternatives and Recommended Plan

The status quo option was eliminated as increasing residential and commercial load growth is driving the need for additional transformation capacity in the area. Accordingly, the TWG recommends proceeding with the development of the new station, with an estimated capital cost of $55M-$65M and a target in-service date of 2030.

8.2.3.2 Vaughan MTS #5

Significant growth is also happening in the Vaughan MTS #1 and Vaughan MTS #2 supply area driven by major commercial and industrial development associated with the Vaughan Metropolitan Center. Both stations operate at capacity limits and additional transformation capacity is required. Please see Table 11 below for the area load forecast.

Table 11: Southern Vaughan Area MW Demand Forecast

Net Summer Peak Demand Forecast- by Station (MW)										
Station	LTR (MW)	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Vaughan MTS #1	306	301	300	306	306	306	306	306	306	306	291
Vaughan MTS #2	153	150	149	153	153	153	153	153	153	153	144
Vaughan MTS #5	153	0	0	0	0	0	0	35	99	33	52

Alectra is proposing to build a new station Vaughan MTS #5 consisting of 2x75/125 MVA, 230/27.6kV transformers and a 27.6kV switchyard and connect it to the V71P/V75P circuits west of Yonge Street. While this would further exacerbate the already existing load security issue; the issue will be mitigated through the installation of in-line breakers as discussed in Section 8.4.6 and the associated load Security assessment in Section 8.5.3.

Figure 16: Vaughan MTS #5 Location

Alternatives and Recommended Plan

There are no alternatives to building a new station to meet the area load growth as all area stations are at their limits. The station location as shown in Figure 16 is an assumption and the exact location of the Station is yet to be determined by the LDC.

The Working group has recommended proceeding with the project with the estimated cost in the range of $55M-$65M. The planned in-service date is 2033.

8.2.4 Markham Area

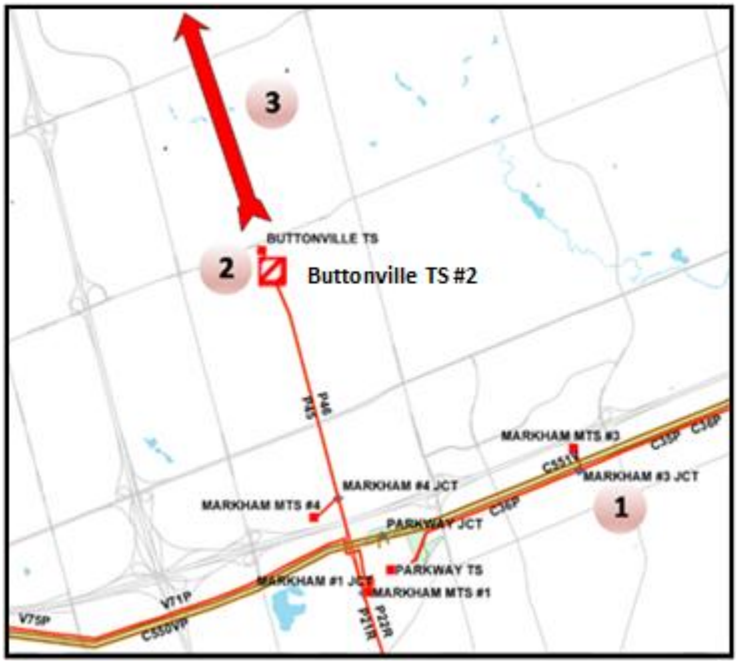
8.2.4.1 Markham MTS #5/Buttonville TS #2

Significant load growth is forecast for the area currently supplied from Buttonville TS and Markham MTS #4 as a result of urban development in the City of Markham. Forecast load is presented below in Table 12 below which shows a need for additional transformation in the area. Alectra proposed building a new Markham MTS #5 station consisting of 2x75/125 MVA, 230/27.6kV transformers and a 27.6kV switchyard supplied from the 230kV circuits P45/P46.

Table 12: Markham Area MW Summer Demand Forecast

Net Summer Peak Demand Forecast- by Station (MW)											
Station	LTR (MW)	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Buttonville TS	166	150	150	149	147	146	146	145	145	145	144
Markham MTS #4	153	111	150	153	153	153	153	153	153	153	153
Markham MTS #5	153	0	0	4	27	63	110	144	146	143	143
Markham MTS #6	153	0	0	0	0	0	0	0	0	40	98

Figure 17: Proposed Locations of Markham MTS #5/Buttonville TS #2



Alternatives and Recommended Plan

As shown in Figure 17, three alternative locations for the new Markham MTS #5 were considered:

Alternative 1 - Building the new station along the Parkway belt and connecting to the C35P/ C36P circuits: The C35P/C36P transmission circuits are capable of supplying the full capacity of the station, but the alternative has been ruled out because the physical location of the station would be far from the area of anticipated growth resulting in high distribution costs. There is also a risk that the capacity of this station will become stranded if it becomes technically infeasible to supply load concentrated along Markham's northern border

Alternative 2 - Building the station at the existing Buttonville TS and connecting to the P45/P46 circuits: This alternative is closer to the area of anticipated load growth than alternative 1, and lesser distribution infrastructure is required as compared to Alternative 1. A 1.1 km section of the 230kV double circuit line P45/P46 between Parkway TS and the Markham MTS #4 Jct. would need to be uprated.

Alternative 3 - Building the station in north Markham and extending circuits P45/P46 from Buttonville TS to connect the new station: This location is nearest to the area of anticipated load growth. However, it requires rebuilding approximately 6 km of a single circuit 115 kV transmission line as a 230 kV double circuit transmission line. A new station property would also need to be acquired.

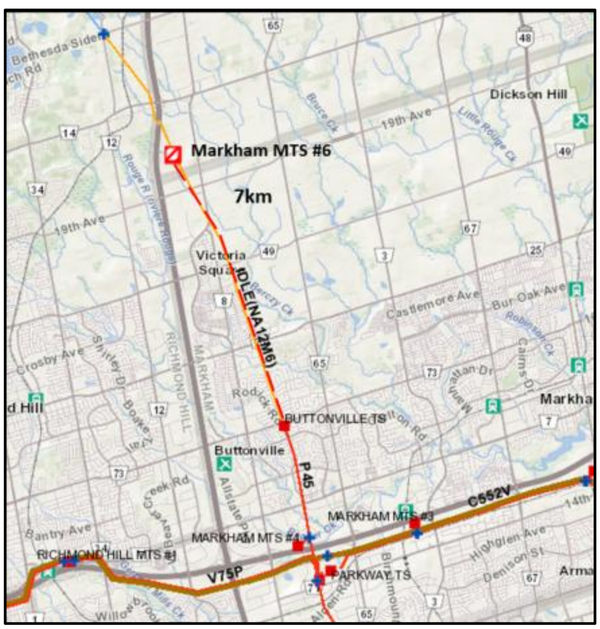
Alternative 1 was not considered further due to the high distribution costs. Of the remaining two alternatives, the study team recommends Alternative 2 - building the new station at Buttonville TS. While the distribution costs are higher under this option compared to Alternative 3, the high costs of extending the transmission line north from Buttonville for Alternative 3 made these two alternatives comparable. Alternative 2 was selected as the preferred option as it also allows the new station to be in service at an earlier date to meet the forecast load requirement.

The TWG has recommended proceeding with the project, with the station capital costs estimated in the range of $55 million to $65 million, and associated line costs estimated at approximately $5 million, as outlined in Section 8.3.1.1. While the identified need date is 2029, the project is expected to be placed in service in 2030. Alectra will be managing the area load till the Station is placed in-service.

8.2.4.2 Markham MTS #6

A second station will be required in the Markham area towards the end of the study period (see Table 12). Alectra's preferred location for this station is about 7 km north of Buttonville TS and would require extending circuits P45/P46 from Buttonville TS to the new station as shown in Figure 18. This option requires replacing approximately 7 km of an idle single circuit 115 kV transmission line with a 230 kV double circuit transmission line.

Figure 18: Proposed Location of Markham MTS #6



Alternatives and Recommended Plan

The status quo option was eliminated. as rising demand driven primarily by increased residential and commercial development necessitates additional transformation capacity. Accordingly, the development of a new station is required. The estimated capital cost of the station is in the range of $55M-$65M, excluding the cost of associated transmission line work which is discussed separately in Section 8.3.1.3. The planned in-service date for the station is 2034.

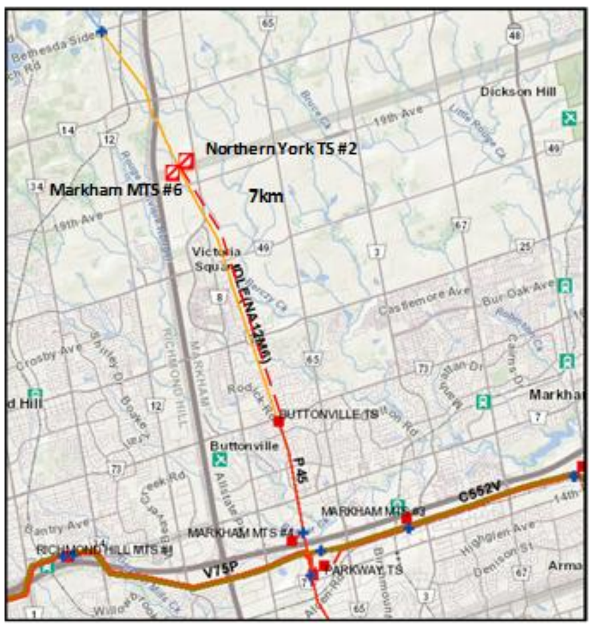
8.2.4.3 Northern York TS #2

Significant load growth is forecast in the eastern portion of Northern York subregion, particularly in Whitchurch-Stouffville. This area currently lacks transmission infrastructure and is primarily served by long distribution feeders, resulting in higher connection costs, and reduced reliability. Hydro One Distribution has identified the need for a new step-down transformer station to meet forecast demand and improve service reliability in this area. The area load forecast is given in Table 13 below.

Table 13: Northern York TS #2 MW Summer Demand Forecast

Station	LTR (MW)	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Northern York TS #2	170	0	0	0	0	0	60	99	142	170	170

Figure 19: Proposed Location for Northern York TS #2



Hydro One Distribution preferred location for the station is shown in Figure 19. The station will be slightly north of Markham MTS #6, and it will be supplied from the 230kV line P45/P46 extension from Buttonville TS.

Alternatives and Recommended Plan

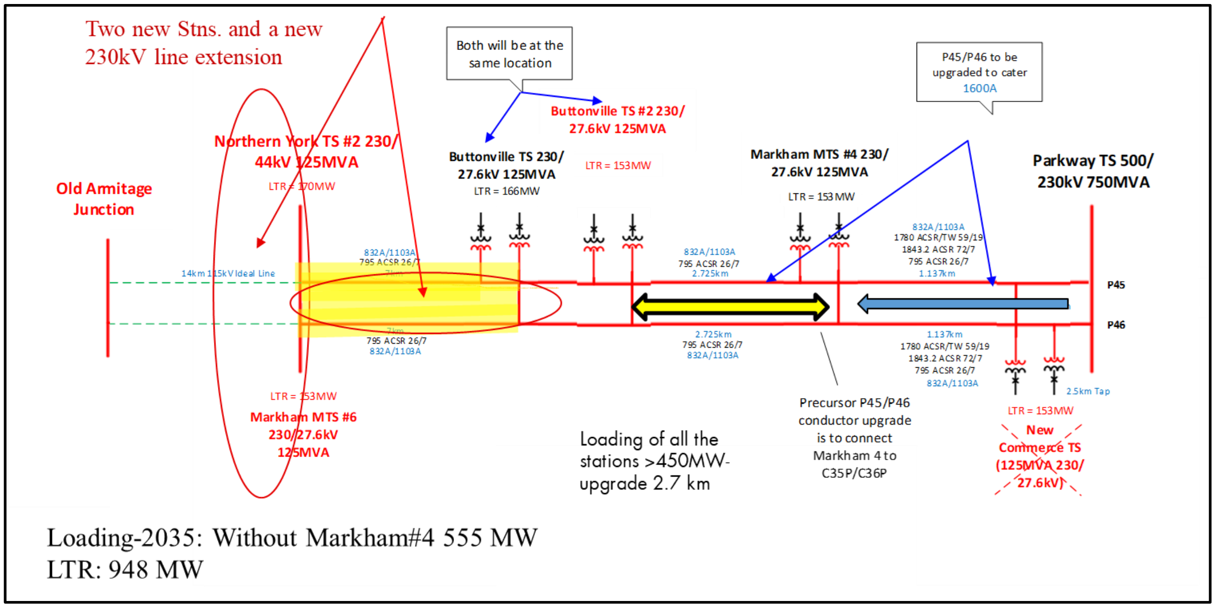
There are no viable alternatives to constructing the new station to address meet the forecast Hydro One Distribution's capacity requirements. The TWG will continue to monitor the load growth and has asked that Hydro One coordinate the station and associate transmission line with the facilities required to connect Markham MTS #6. The estimated project cost for the Station is in the range of $55M-$65M, excluding transmission line costs. Transmission line costs are discussed in Section 8.3.1.3. Given that the earliest possible in-service date for the line is 2034, the station's in-service date will need to be aligned accordingly. In the interim, Hydro One Distribution will manage the area load.

8.3 Line Capacity Needs

8.3.1 Markham Area - Parkway to Buttonville including extension on idle corridor North

Markham area line upgrades, for the recommended projects combined, are shown in the SLD - Figure 20 below displaying each segment length, existing ratings, stations connected including future planned ones and also the preferred circuit upgrade rating[4] for each section.

Figure 20: Future P45/P46 Single Line Diagram



Below are the detailed needs assessments for each of the line segments in Markham area:

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[4] Preferred circuit ratings are subject to change as further studies are done.

8.3.1.1 Upgrade from Parkway TS to Markham MTS #4

The connection of the new Buttonville TS #2 to the Parkway TS x Buttonville TS 230kV double circuit line P45/P46 circuits (see Figure 21 below) will increase the loading on this line. Forecast loading, along with applicable long term emergency line rating is given in Table 14.

Figure 21: Parkway TS x Buttonville TS P45/P46 Limiting Section

The transmission capacity is thermally limited by an approximately 1.1 km long section between Parkway TS and Markham #4 Jct. Loading is expected to exceed the rating by 2031. This section will need to be uprated to at least 1600A loading before 2031 to fully supply Buttonville TS #2.

Table 14: MW Loading on the P45/P46 Circuits

P45/P46	Yearly Loading (MW)										
Station	Line Rating	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Markham MTS #4		111	150	153	153	153	153	153	153	153	153
Buttonville TS		150	150	150	149	147	146	146	145	145	145
Buttonville TS #2		0	0	4	27	63	110	144	146	143	143
Northern York TS #2		0	0	0	0	0	60	99	142	170	170
Markham MTS #6		0	0	0	0	0	0	0	0	40	98

Loading – Parkway TS x Markham MTS #4 Jct.	450	261	299	306	327	363	512	542	587	651	708
Loading – Markham MTS #4 to Buttonville TS	450	150	150	153	174	210	316	389	434	498	555

Alternatives and Recommended Plan

Two alternatives were considered to provide adequate capacity on the P45/P46 circuits:

1. **Increase thermal capability of existing line.** It is expected that the thermally limiting section of this line can be increased by changing the conductor to be capable of supplying the forecasted load with these circuits.
2. **Reduce loading on the P45/P46 circuits by transferring Markham MTS #4 to the Cherrywood TS x Parkway TS C35P/C36P circuits:** This alternative frees up capacity on the P45/P46 circuits to supply Northern York TS #2 or Markham MTS #6. It requires building a new 1.5 km long 230kV double circuit line from Markham MTS #4 Jct. to the C35P/C36P that is discussed in separate section. This alternative was ruled out until Northern York TS #2 or Markham MTS #6 is needed to be supplied.

The Working Group recommends uprating the line from Parkway TS to Markham MTS #4 Jct. to at least minimum 1600A loading before 2031 to fully supply Buttonville TS #2. A high-level estimate for this work is estimated to be around $5M.

8.3.1.2 Upgrade from Markham MTS #4 to Buttonville TS

The connection of the new Markham MTS #6 or Northern York TS-2, whichever comes earlier, to the Parkway TS x Buttonville TS circuit P45/P46 circuits (see Figure 22 below) will further increase the loading on the Markham MTS #4 Jct. x Buttonville section of the line. The forecast loading along with the long term emergency line rating for this section is also provided in Table 14 and Figure 20 above.

Figure 22: P45/P46 Corridor Line Reinforcement Section

The transmission capacity is thermally limited by an approximately 2.7 km long section between Markham #4 Jut to Buttonville TS. Loading is expected to exceed the rating with the addition of Northern York TS #2 and Markham MTS #6. This section will need to be uprated to at least 1600A prior to connecting these two stations.

Alternatives and Recommended Plan

Maintaining the status quo is not a viable option, as loading levels following the in-service of either Buttonville TS #2 or Northern York TS #2 would exceed the existing long-term emergency (LTE) circuit rating.

The need date[5] for this upgrade is triggered when the combined loading of Buttonville TS, Buttonville TS #2, Markham MTS #6, and Northern York TS #2 exceeds the existing rating of the line which is 1103 A/ 450 MW. Upgrading will be done in conjunction with the new stations' construction schedule with in-service date of 2034. The cost of the project is approximately estimated at $10M.

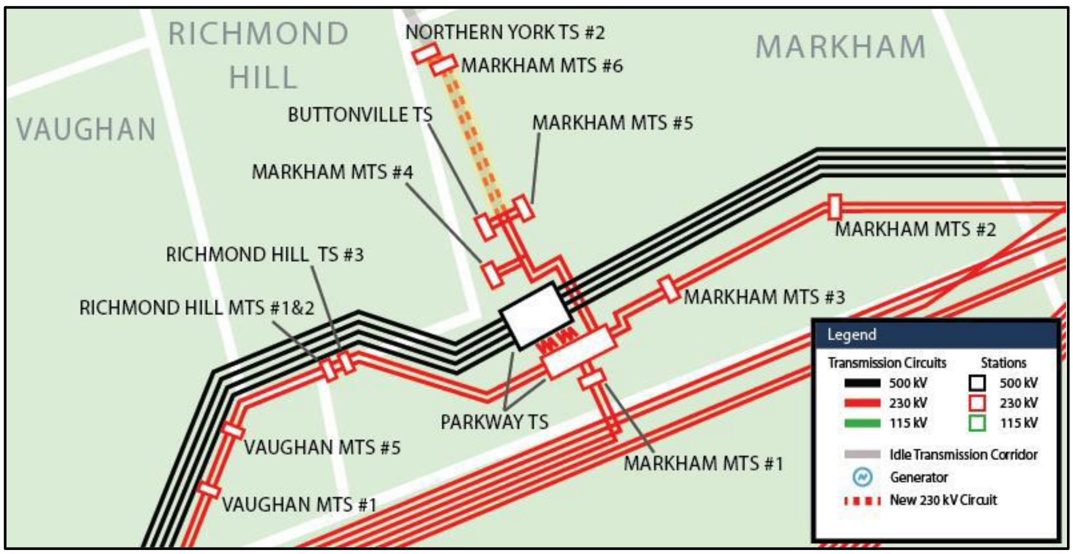
[5] Simultaneously Implementing the two upgrades from Parkway TS to Markham MTS# 4 Jct. and to Buttonville TS concurrently enhance the supply capability of P45/P46. The transmitter may consider uprating these circuits simultaneously to minimize the load at risk during construction-related outages.

8.3.1.3 Extending P45/P46 Circuits - 7 km north from Buttonville TS

The need for extending P45/P46 circuits 7km north of Buttonville TS, on the existing idle corridor, is to be able to supply future Northern York TS #2 and Markham MTS #6 as shown in Figure 23 below.

This work will require rebuilding the existing towers and conductors – which were built to 115kV standards- and ratings, to 230 kV standard. The approximate cost of this work ranges from $50M to $175M depending upon the type of tower structure and overhead conductor or underground cable selection. The cable option is contingent upon the customers' acceptance of the cost, longer outages' duration and expensive repair during contingency with the benefit of aesthetic considerations. The final option for choosing the technology type for the new transmission extension will be dependent upon the outcome of the Environmental Assessment (EA) of the line design.

Figure 23: P45/P46 Circuit extension (Courtesy: IESO)



Alternatives and Recommended Plan

There are essentially no viable alternatives to extending the existing P45/P46 line along the idle corridor. The TWG therefore agreed to extend the line to supply the new stations. The rating of the line extension will be finalized during the next regional planning cycle. The need date is dependent upon the date of either of the two stations' connections. The estimated cost of $50-175M will be refined and revisited during the next planning cycle.

8.3.1.4 Reconnect Markham MTS #4 to C35P/C36P

The need to reconnect Markham MTS #4 from C35P/C46P reduces the loading on the P45/P46 circuits by transferring Markham MTS #4 to the Cherrywood TS x Parkway TS C35P/C36P circuits, hence alleviates the load security concerns at P45/P46 corridor. It requires building a new 1.5 km long 230kV double circuit line from Markham MTS #4 Jct. to the C35P/C36P.

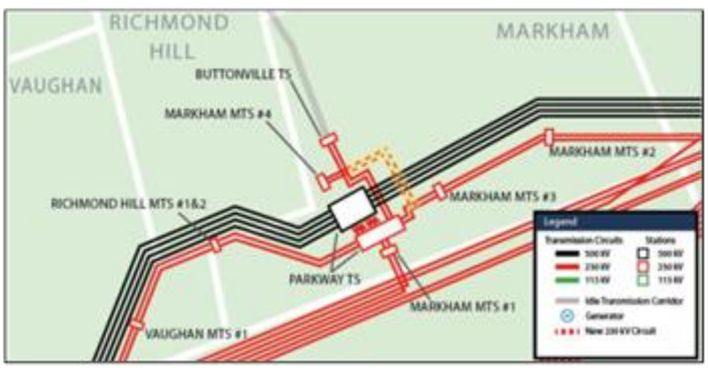
Alternatives and Recommended Plan

1. The status quo of keeping the Markham MTS #4 remain supplied from P45/P4 was not feasible as it will exceed the thermal capacity and ultimately would exacerbate further the already existing load security issues in the long run.

2. Reconnect Markham MTS #4: This alternative frees up capacity on the P45/P46 circuits to accommodate Northern York TS #2 or Markham MTS #6. Several potential connection points are available for this extension, including a direct tie-in at Parkway TS or a tap of the existing C35/36P circuits. The latter is currently the preferred option, as it offers a significantly lower-cost solution. In contrast, establishing a connection within Parkway TS would require extensive upgrades to existing bulk system infrastructure due to space limitations, resulting in substantially higher costs.

The reconnection diagram is shown in Figure 24 below.

Figure 24: Proposed Radial Tap for Markham MTS #4 (Courtesy: IESO)



While working group agreed option 2 was the preferred option, a final decision of the connection will be taken in the next planning cycle. This work will be aligned with the connection of either Markham MTS #6 or Northern York TS #2, whichever is required first, to enable LDCs to fully utilize available connection facilities.

The approximate cost is estimated around $10M.

8.4 System Reliability

8.4.1 Build Kleinburg to Kirby Transmission Link

The Kleinburg–Kirby transmission link is a proposed 230 kV transmission reinforcement designed to increase supply capacity and improve reliability in York Region as electricity demand continues to grow. The project consists of constructing approximately 6 km of new 230 kV transmission line to connect an expanded Kleinburg TS with the H82/83V circuits near Kirby Road, north of Vaughan MTS #4.

The link is intended to relieve loading on the Claireville–Holland Marsh Jct. section of circuit H82V/H83V, which currently carries most of the supply to Northern York Region and is expected to face increasing constraints due to population growth, development activity, and electrification. Establishing this new transmission path would provide an alternative supply route and support the connection and full utilization of future step-down transformer stations required to meet long-term demand.

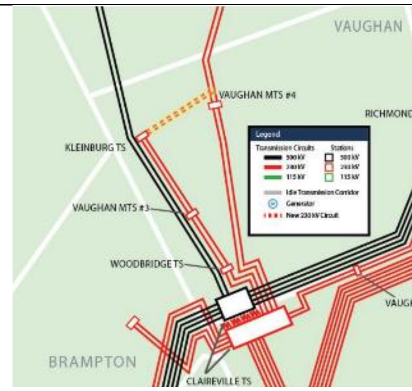
IESO South and Central bulk planning studies have identified the need for adding bulk supply capacity at Kleinburg TS to enable load growth in the area. Because the station is connected to both the regional 230 kV network and is near the provincial 500 kV bulk system, it is well positioned to function as a major supply hub. To accommodate higher power transfers associated with the Kleinburg–Kirby link, additional bulk facilities—such as switching equipment and new autotransformers—are required at Kleinburg TS. These enhancements would add the ability to step down bulk supply and deliver it effectively into the regional system; enable the Kleinburg – Kirby Link and other future supply projects in York and Peel Region. (see Section 8.4.2 for details on the Kleinburg 500/230kV transformer station).

During the regional planning process, several alternatives were evaluated, including reconductoring existing transmission lines to increase thermal capacity, and redeveloping the Buttonville–Armitage corridor to provide additional supply capability into Northern York Region.

While these measures can defer some needs in the near term, studies conclude that additional transmission capacity will still be required to support long-term growth in York Region. As such, the Kleinburg–Kirby link remains a key option.

Together with future upgrades at Kleinburg TS, the Kleinburg–Kirby transmission link is intended to ensure that York Region’s electricity system can reliably accommodate future growth, electrification, and new customer connections

Figure 25: The Kleinburg-Kirby Transmission Link (Map & Conceptual SLD)

<table>
<tr><td>Proposed Highway 413 - Kleinburg-Kirby Transmission Link</td><td>Proposed SLD – Kleinburg-Kirby Transmission Link</td></tr>
<tr><td>
</td><td>
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The IESO has asked Hydro One to proceed with the development work on the project. IESO's March 20, 2026, correspondence to Hydro One regarding the Kleinburg–Kirby 230 kV Transmission Link Project is appended as Appendix F: IESO Letter for Kleinburg-Kirby Transmission Link. The IESO letter confirms the system need, implementation urgency, and the expected project configuration, including the connection between the expanded Kleinburg TS and the H82/83V circuits near Kirby Road. Figure 25 illustrates an approximate transmission line routing along the proposed Highway 413 corridor along with a conceptual single-line diagram of the Kleinburg -Kirby Transmission Link.

The TWG recommends that the proposed Kleinburg–Kirby transmission link be designed to support a minimum LTE rating of 2000A provided that achieving this capacity does not introduce significantly higher additional cost. This higher rating is advisable given the strong likelihood that this section of the network will be utilized in the longer term as part of an independent supply path.

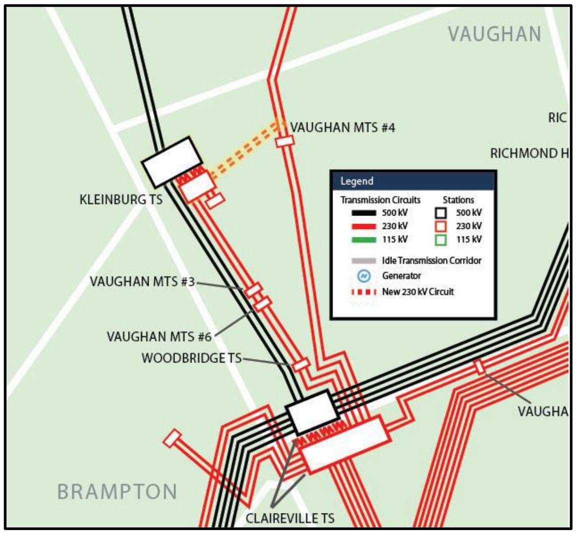
The expected completion date for the Kleinburg -Kirby Transmission corridor is around 2031-2032 with the expected cost range from $40M to $60M.

8.4.2 Bulk Supply – Kleinburg 500/230kV Transformer Station

The in-service of the Kleinburg–Kirby 230kV transmission link will necessitate additional bulk supply capacity at Kleinburg TS to reliably support forecast load growth in Northern York Region. Without a new bulk source, the existing V43/44 radial circuits north of Claireville TS would become thermally constrained as new stations are added and electrification-driven demand materializes. Kleinburg TS was initially envisioned as a 500/230kV station and has access to both the 230kV and 500kV networks. It includes sufficient reserved land and is a suitable and efficient location to advance bulk system capability. The need for the Kleinburg autos has been further described in the South & Central Bulk system study.

Development of Kleinburg TS as a 500/230 transformer station, as shown in Figure 26 below, has been identified as a preferred option to establish a bulk supply node. This would involve integrating the station into the transmission network by building 500kV and 230kV switchyards and installing three 500/230kV autotransformers, with provision for a fourth to accommodate longer-term demand.

Figure 26: Future Kleinburg TS and Kleinburg -Kirby transmission link (Courtesy: IESO)



This expansion would relieve pressure on Claireville TS, improve bulk power flow distribution, and enable effective utilization of the Kleinburg–Kirby link. On the 230kV side, targeted yard expansion would accommodate existing circuits, the new transmission link, and future regional reinforcements, while improving security by reducing reliance on the V43/44 corridor. Detailed configuration and sequencing would be finalized by Hydro One in coordination with IESO once the South and Central Bulk system planning studies are finalized.

Alternative solutions, such as local generation, were assessed but found to be less effective due to short-circuit constraints, operational inefficiencies, and limited bulk system benefits. The estimated capital cost of advancing Kleinburg TS as a bulk supply point is approximately $400 million, representing a cost-effective investment relative to other options. To maximize system benefits, the timing of the bulk expansion should align with the Kleinburg–Kirby link and the in-service date of Northern York TS #1. While early loading of Northern York TS #1 may be possible under constrained conditions, delays in completing the bulk enhancements would increase reliance on remedial action schemes. The working group agreed to initiate the project following the IESO's recommendation on the need, alternatives, and configuration of the Kleinburg autotransformer as part of Central Bulk System Planning with a potential in-service time frame of 2031-2032.

8.4.3 York Energy Centre- Station Service Upgrade

The York Energy Centre (YEC) currently depends on Holland TS for its station service supply. When the H82/83V circuits fail, both Holland TS and YEC lose power, even though YEC's generation path through B88/89H remains unaffected. This forced outage limits the ability to restore load quickly and creates unnecessary capacity and voltage challenges in the local system. Addressing this vulnerability requires a new station service arrangement that allows YEC to stay operational during these contingencies. IRRP suggested possible solutions include adding a second transformer fed from B89H or installing an automatic transfer system that switches between Holland TS and B88H. Fixing this issue would improve local reliability, reduce exposure to load rejection events, and increase system capability by roughly 90 MW without requiring major new transmission infrastructure. Looking ahead, YEC plays a critical role in meeting Northern York's peak demand—about 400 MW.

The working group has considered different alternatives to enhance YEC station service upgrade including adding a second supply via the B89H tap or by implementing an automatic transfer between the Holland TS distribution supply and the existing B88H source during contingencies.

The preferred station service configuration should be determined through a detailed engineering evaluation of technical feasibility and cost.

If YEC retires when its contract expires in 2035, the region would face a large capacity shortfall that cannot be addressed through incremental upgrades alone. Without a comparable replacement (new transmission or new local generation), reliability would significantly decline, and connecting new loads in the area would become severely constrained.

The Working Group concurs that the IESO should formally engage with Capital Power to examine and evaluate potential alternative solutions in the event of a YEC phase-out by 2035, including consideration of a station service upgrade.

8.4.4 Holland Marsh Switching Station

The IRRP has identified the requirement for a Switching Station at the Holland Marsh junction arising from the planned addition of a third Northern York Transformer Station (TS) along the Claireville–Minden transmission corridor. The introduction of this new transformation facility will impose additional system security requirements, irrespective of whether it interconnects with circuits H82/83V or B88/89V. This portion of the transmission network is already operationally complex due to the presence of multiple inline breakers and its interface with the York Energy Centre (YEC).

The establishment of a new Switching Station (SS) at the Holland Marsh junction and sectionalizing the existing circuits at this Holland Marsh location would simplify system operations, facilitate the future integration of Northern York TS #3, and mitigate the most critical breaker failure contingencies that currently constrain system reliability. The proposed configuration would provide dedicated terminations for circuits H82/83V and the modified B88/89H circuits, a new radial supply connection for Armitage TS, and allowance for future radial circuits serving the Bradford–West Gwillimbury area or other long term transmission developments.

Sufficient existing land rights are available to host the proposed facility, and the estimated capital cost for a switching station of this scale is in the range of $200–250 million. Final design and configuration details for the Switching Station will be addressed in the subsequent regional planning cycle.

The TWG will monitor the area loading and need and timing for Holland Marsh switching station will be reviewed in the next planning cycle.

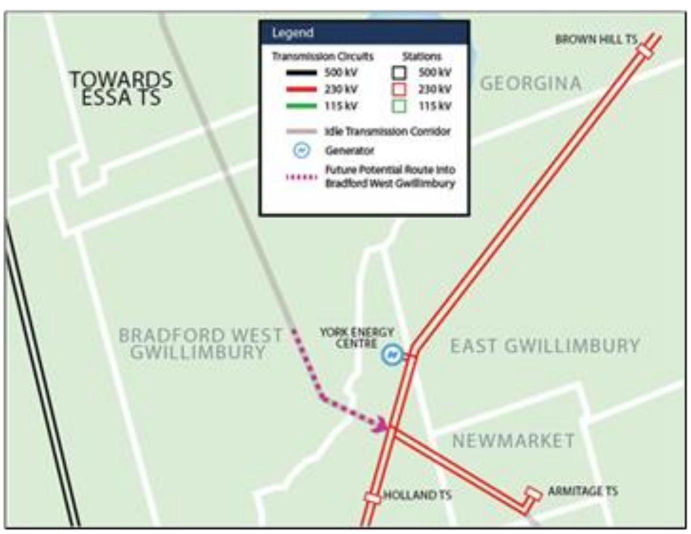
8.4.5 New Northern York transmission supply option connecting Northern York area

In addition to the Holland Marsh switching station described above, incorporating Northern York TS #3 or any other load request around this area beyond the planned Northern York TS #1 will also require additional supply resources. Options could include new transmission or potentially new generation facilities. One transmission option could be via an existing idle transmission corridor that runs from the Holland Marsh junction northwest through Bradford West Gwillimbury and onward into Simcoe County, connecting to Barrie TS and the planned Innisfil TS.

Utilization of this corridor will be assessed as the need date for Northern York TS #3 approaches to determine whether the benefits of positioning transformation capacity closer to emerging load centers outweigh the incremental transmission costs. Such benefits may include lower distribution system build-out costs, reduced connection costs for large customers, and improved reliability and power quality depending on where demand growth ultimately materializes.

Connecting any future station on a separate radial transmission path from Essa TS, as shown in Figure 27 below may help alleviate future capacity limitations on the Northern York circuits (H82/93V and B88/89H).

Figure 27: Conceptual Corridor route between Essa TS and Holland Marsh JCT (Courtesy: IESO)



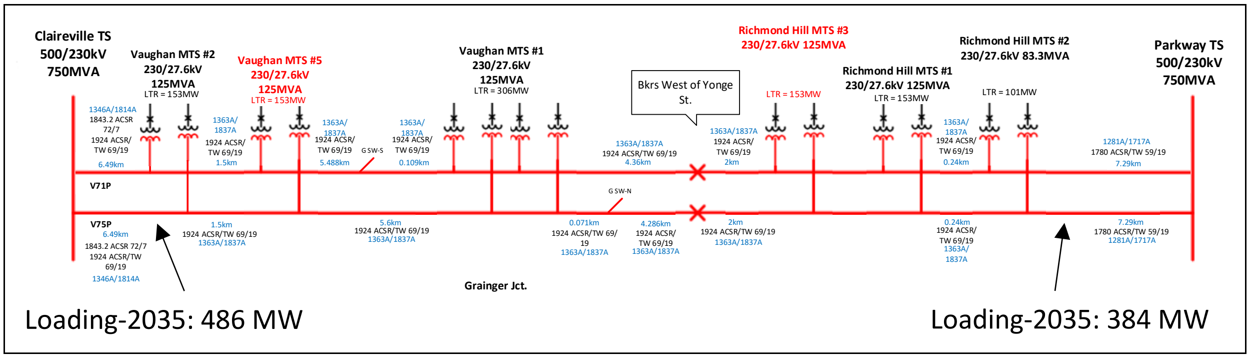
An alternative option would be to upgrade the H82V/H83V circuit between Kirby Jct. and Holland Marsh Jct. The TWG will be further evaluating these options in the next planning cycle as longer-term supply and demand conditions become clearer such as YEC continued operation continuity and its Stations Service upgrade.

8.4.6 V71P/V75P 230kV in-line Breakers

The GTA north IRRP Study concluded that two in-line breakers are needed across that corridor to facilitate the restoration of load and mitigating the load security concerns to comply with Ontario Resource and Transmission Assessment Criteria (ORTAC). Although, the exact location of the in-line breakers will be determined considering the space availability and load distribution on both sides of breakers as per the table below, the working group has so far determined the location of the inline breakers on west of Yonge Street, between the Vaughan MTS #1 and Richmond Hills MTS #1/Richmond Hill MTS #2 as shown in the map (Figure 28) and single line diagram (Figure 29) below. Existing Grainger Jct. location may be utilized for the in-line breakers.

Figure 28: Approximate Location of V71P/V75P In-line Breakers

Figure 29: V71P/V75P 230kV In-line breakers SLD



The timing of this project's in-service is planned as year 2030 and shall be coordinated simultaneously with the addition of new Richmond Hill MTS #3 connection project. The approximate estimate for the cost is around \$30M – \$35M and will take around 3-4 years to complete the work. With the installation of in-line breakers, there will be a quick restoration of the load and load security concerns exceeding 600 MW load interruption will be mitigated.

8.4.7 Claireville to Minden - Over voltages and Under voltage needs.

8.4.7.1 Overvoltages

It is appropriate to mention the previously identified overvoltage concerns for YEC Station Service upgrade as the simultaneous loss of B88H and B89H removes Armitage TS, Brown Hill TS, and YEC from service, resulting in a lightly loaded radial supply from Minden TS to Beaverton TS and Lindsay TS. Due to the long circuit lengths and low load conditions, this configuration can lead to unacceptably high voltages. The risk is further exacerbated by capacitor banks at Beaverton and Lindsay TS, which are designed to support voltage under higher load conditions. Although this issue was identified in the previous IRRP too and mitigation measures have not yet been fully implemented. Unacceptable high voltages have not been observed to date. The working group agrees to continue monitoring the overvoltage issue and left open for discussion for the next planning cycle.

8.4.7.2 Undervoltages and M6E/M7E Thermal Overloads

Following the simultaneous loss of H82V and H83V, the subsystem becomes radially supplied from the north via Minden TS on B88/89H. Due to the long circuit lengths - particularly under high load conditions—voltage drops to unacceptable levels. In this configuration, York Energy Centre is unable to provide voltage support, as its station supply from Holland TS is lost. This contingency also results in overloads on sections of the M6E/M7E[6] circuits between Cooper Falls X Orillia along Essa TS and Minden TS corridor, which

[6] This was flagged as an issue for H82/83V outages which also take YEC out of service. Once the YEC station service issue is resolved this should not be a problem for York region at least.

become a primary remaining supply path into Northern York. While the YEC BESS remains in service and provides limited support, it is insufficient to resolve either the voltage issues or the M6E/M7E overloads. This need will be studied under the South Georgian Bay Muskoka IRRP.

8.4.8 Upgrading H82V/H83V circuits from Kirby Jct. to Holland Marsh Jct.

As discussed below, reconductoring the most constrained portion of circuits H82/83V between Claireville TS and Vaughan MTS #4 is not considered feasible due to the limited width of the existing transmission corridor and the close proximity of surrounding development. These physical constraints significantly limit constructability within this section.

North of the proposed Kleinburg–Kirby connection point development along the H82/83V corridor is substantially less dense. Based on a review conducted by Hydro One, reconductoring the portion of H82/83V as shown in Figure 30 between Kirby Jct. and the Holland Marsh junction is expected to be technically feasible.

Figure 30: Section of H82V/H83V from Kirby Jct. to Holland Marsh (23 km)

Following the completion of the York Energy Centre (YEC) station service project as discussed in Section 8.4.3, and the Kleinburg–Kirby Transmission Link, additional load meeting capability in Northern York is not anticipated to be required until a further step-down station is needed (notionally Northern York TS #3) and/or in the event of a potential retirement of YEC.

The degree of benefit provided by reconductoring this northern section of H82/83V would be dependent on the long-term configuration of the transmission system, including the spatial distribution of future demand and supply, as well as the development of any new infrastructure such as switching facilities. Where thermal limitations on the H82/83V circuits become binding, reconductoring this section could help alleviate those constraints and increase load meeting capability by providing additional capacity into a future Holland Marsh Switching Station as discussed in Section 8.4.4.

Reconductoring the northern portion of H82/83V presents a potential cost-effective means of increasing capacity where corridor constraints are less pronounced and constructability risks are reduced. This option leverages existing infrastructure and rights-of-way, potentially avoiding the need for new corridors. However, its benefits are highly dependent on future system topology, including the timing and location of new step-down stations, changes in load growth patterns, and the availability of complementary infrastructure such as switching stations. As a result, reconductoring should be considered a conditional or enabling measure rather than a standalone solution and will be further discussed further in the next regional planning cycle.

Figure 31: a & b Alternate Route - Section upgrade north of Kirby to Holland Marsh (Courtesy: IESO)

Figure 31-a

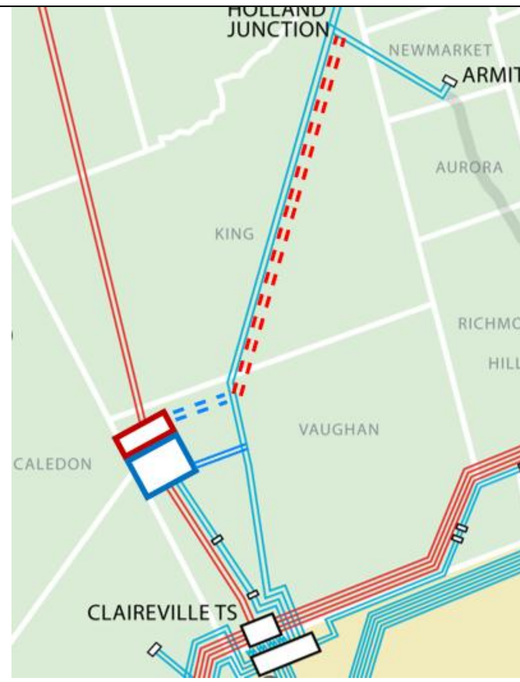


Figure 31-b

Alternatives and Recommended Plan

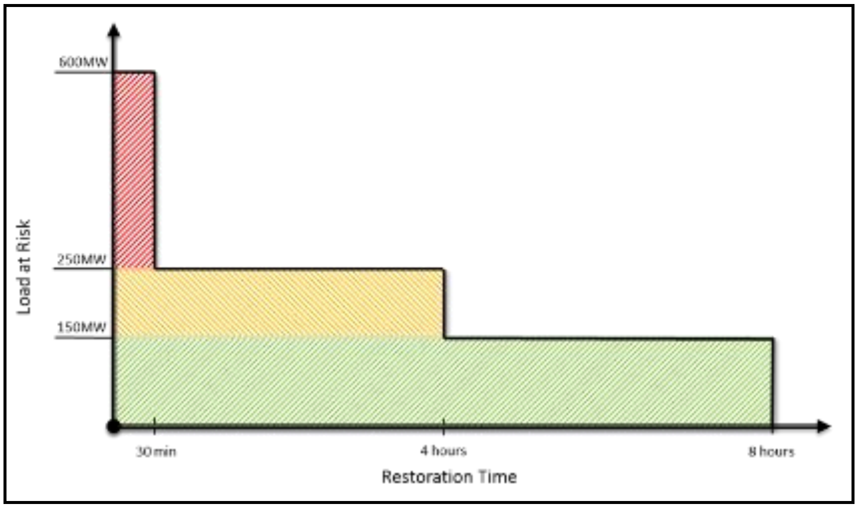
The working group has also considered the alternate route – new 230 kV circuits as shown in Figure 31-a, but not preferred due to the cost, timelines and challenges associated with acquiring new right of way and Environmental Screening. The working group has also explored to run the new line parallel to the existing one as it is easier to widen the existing right of way versus building brand new one as shown in Figure 31-b.

The TWG agreed to examine alternatives in the next regional planning cycle, including reconductoring the H82V/H83V segment north of Kirby Junction or developing a new line parallel to the existing infrastructure and any other options best suited to the needs of the region.

8.5 Load Security and Restoration Needs

Load security describes the total amount of electricity supply that would be interrupted in the event of a major transmission outage. Load restoration describes the electricity system's ability to restore power to a customer affected by a transmission outage within specified time frames. Both transmission and distribution (transfer) measures are considered when evaluating restoration capability. The load restoration criteria is defined in ORTAC and summarized in Figure 32.

Figure 32: ORTAC Criteria



8.5.1 Western Area: Load Security and Restoration on Kleinburg Radial Tap (V43/44)

The Kleinburg Radial tap consists of the two 230kV transmission circuits, V43 and V44, which extend northwest from Claireville TS. These circuits currently supply Woodbridge TS, Vaughan MTS #3, and Kleinburg TS, with ongoing development plans for a new step-down facility, Vaughan MTS #6, intended to serve growing commercial demand in the area. Under normal system conditions, the southern portion of this corridor also provides partial supply support to the adjacent Goreway TS in Brampton.

Peak demand within the Kleinburg radial load pocket is projected to exceed 600 MW by summer 2029 as shown in the Table 15 below.

Table 15: Load Security and Restoration on Kleinburg Radial Tap

V43/V44	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Kleinburg tap Load (MW)	522	534	597	607	644	645	656	676	691	687

Load Security

As described in Section 8.4.2, the proposed Kleinburg 500/230 kV Auto Station will address supply capacity and load security requirements in the Western region. By connecting the Kleinburg DESNs directly to the new 230 kV bus, loading on V43/V44 will be reduced to less than 600 MW, improving overall system performance.Load Restoration

Load restoration was assessed for 230kV radial double circuit line V43/V44 supplying the stations. In case of a double circuit outage of the V43/V44 line, not all loads in excess of 250 MW can be restored within 30 minutes, as per the ORTAC restoration criteria. The V43/V44 line is approximately 12 km long with good accessibility by maintenance crews and Hydro One expects all load to be restored within 4 hours with at least one circuit back into service.

Alternatives and Recommendations

The Working Group agreed that no further action is required at this time. However, the need will be reviewed in the next iteration of the regional planning cycle. The historical reliability of these circuits has been good with no coincidence outages of the two circuits; there have only been two direct outages[7] to circuit V43 since 2008 and no direct outages to circuit V44 since 2009. While there are no short-term plans to address this need, the Kleinburg to Kirby option to address supply capacity needs in the long term would also improve the load restoration capability for these circuits.

8.5.2 Northern Area - Load Security and Restoration[8]

8.5.2.1 Northern Area - Load Restoration from Claireville TS to Holland TS circuits (H82V/H83V)

Load restoration was assessed for 230kV circuits H82V/H83V supplying Vaughan #4 MTS and Holland TS. In case of a double circuit outage of H82V/H83V, not all loads exceeding 250 MW can be restored within 30 minutes per the ORTAC criteria. However, Hydro One expects all loads to be restored within 4 hours with one circuit back in service.

[7] A direct outage is reported whenever a major component is in the outage state due to a condition or equipment failure directly associated with it.

[8] H1-Dx is assessing limited service territory adjustments at the Holland–Armitage and Brown Hill TS boundary to enhance restoration capability. While large-scale load transfers are constrained, targeted boundary changes could provide near-term flexibility and deliver lasting restoration benefits, maintaining value even after a future station enters service.

Alternatives and Recommendations

Following the loss of H82V/H83V, the normal station service supply to YEC generation will also be lost. Holland TS cannot be restored from B88H/B89H until YEC generation is restored. Transferring YEC to an alternate source of station service supply cannot be completed within 30 minutes. Therefore, the Working Group recommends that the IESO identify and consider the possibility of a new station service supply arrangement at YEC to enable faster restoration of load on H82V/H83V, consistent with the load restoration criteria.

8.5.2.2 Northern Area- Load Restoration from Holland TS to Brown Hill TS circuits (B88H/B89H)

Load security issues would arise by the year 2035 where load more than 600 MW could be interrupted as shown in Table 16 below, that will be further discussed in the next planning cycle.

Table 16 Load Security Issue on B88H/B89H

Net Summer Load Forecast										
B88H/B89H	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Holland TS- Brown Hill TS (MW)	494	501	501	501	576	576	576	576	589	636

Load restoration was assessed for 230kV circuits B88H/B89H supplying Armitage TS, Northern York TS-1 and Brownhill TS and the customer Load. In case of a double circuit outage of B88H/B89H, not all loads exceeding 250 MW can be restored within 30 minutes per the ORTAC criteria. However, Hydro One expects all loads to be restored within 4 hours with one circuit back in service.

8.5.3 Southern Vaughan -Richmond Hill Area- Load Security and Restoration on V71P/V75P

The Parkway to Claireville line (V71P/V75P) is located on the Parkway Belt and supplies five load stations with a combined load of approximately 700 MW under current summer peak loading conditions. The load security criteria in ORTAC limits the amount of load that can be interrupted due to the loss of two elements (e.g.: a double circuit line outage) to 600 MW under peak load. On the Parkway to Claireville line, that limit is exceeded.

The load on the corridor already exceeded 600 MW ORTAC Criteria and in the past the transmitter installed in-line switches at Grainger Jct. just outside the Vaughan MTS #1 to mitigate the restoration concerns. But there are existing load security issues that will further exacerbate the load security concerns with the addition of two new transformer stations by 2035. Table 17 below is the summary of the loading on the corridor till 2035.

Table 17: Load Security > 600 MW (V71P/V75P)

Clareville X Parkway	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
V71P/V75P Loading (MW)	700	695	713	713	739	761	809	898	862	870

To address the existing load security issue, working group has recommended the installation of inline breakers as discussed in Section 8.4.6

Load restoration was assessed for 230kV circuits V71P/V75P supplying Vaughan MTS #2, Vaughan MTS #5, Vaughan MTS #1, Richmond Hill MTS #1, Richmond Hill MTS #2, and Richmond Hill MTS #3. In case of a double circuit outage of V71P/V75P, not all loads exceeding 250 MW can be restored within 30 minutes per the ORTAC criteria. However, Hydro One expects all loads to be restored within 4 hours with one circuit back in service.

8.5.4 Markham Area- Load Security and Restoration on Buttonville Corridor (P45/P46)

Load security issues would arise by the year 2034 where load in excess of 600 MW could be interrupted as shown in Table 18 below. Woking group will continue to monitor the load growth in the area and will discuss the potential solutions in the next planning cycle.

Table 18: Load Security on Buttonville Tap (P45/P46)

P45/P46 Corridor	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Total Load (MW)	261	299	306	327	363	512	542	587	651	708

Following reconductoring of P45/P46 to address thermal constraints; the addition of longer-term stations on the P45/46 circuits would still trigger load security needs once total load exceeds 600 MW. To mitigate this, and as discussed in Section 8.3.1.4, a new radial circuit could be extended from the southern transmission corridor near Highway 407 to supply Markham MTS #4, removing it from P45/46. This would increase area load meeting capability by approximately one station's worth of load and simultaneously mitigating the load security issue on P45/46 corridor as shown in Table 19 below, as no ORTAC > 600 MW load security violation observed till year 2035.

Table 19: Load Security on Buttonville Tap (P45/P46)- after Markham MTS #4 off loading

P45/P46- Corridor	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Total Load (MW)	150	150	153	174	210	316	389	434	498	555

Load restoration was assessed for 230kV radial double circuit line P45/P46 supplying Markham MTS #4, and Buttonville TS, and in future Buttonville TS #2, Northern York TS #2 and Markham MTS #6 supplying primarily urban communities in Markham Area.

In case of a double circuit outage of the P45/P46 line, not all loads more than 250 MW can be restored within 30 minutes, as per the ORTAC restoration criteria. The P45/P46 line is approximately 4 km long with good accessibility by maintenance crews of Alectra expect all load to be restored within 4 hours with at least one circuit back into service.

9 CONCLUSION AND RECOMMENDATION

This section concludes the Regional Infrastructure plan Report for GTA North region. The Major Infrastructure investments recommended by the TWG in the near and mid-term planning horizon [2026-2035] are provided in Table 20 below, along with their planned in-service dates (ISD) and budgetary estimates for planning purposes.

Table 20: Recommended Plans over the next 10 Years

Station/Circuit Name	Recommended Plan	Lead	Planned ISD	Budgetary Cost ($M) *
Asset Renewal Needs				
Woodbridge TS	Transformer (T5) refurbishment	Hydro One	2032	TBD
Station Capacity Needs[11]				
Kleinburg TS	Adding Kleinburg TS (T3/T4) — (230/44kV)	Hydro One	2028	$40M
Vaughan MTS #6	Build Vaughan MTS #6 (T3/T4) 27.6 kV DESN	Alectra	2027	$55M-$65M
Northern York TS #1	Build Northern York TS #1 230/44kV DESN	Hydro One	2031	$55M-$65M[12]
Northern York TS #3	Build Northern York TS #3 230/44kV DESN	Hydro One	2035	$55M-$65M
Richmond Hill MTS #3	Build Richmond Hill MTS #3 230/27.6kV DESN	Alectra	2030	$55M-$65M
Vaughan MTS #5	Build Vaughan MTS #5 230/27.6kV DESN	Alectra	2033	$55M-$65M
Buttonville TS #2	Build Buttonville TS #2 230/27.6kV DESN	Hydro One	2030	$55M-$65M

[11] Costs for the new Stations can vary based on location, configuration, layout, environmental issues etc.
[12] Additional cost could incur depending upon the location of the Tx Station and the circuit tap length– overhead / underground required.

Station/Circuit Name	Recommended Plan	Lead	Planned ISD	Budgetary Cost ($M) *
Markham MTS #6	Build Markham MTS #6 230/27.6kV DESN	Alectra	2034	$55M-$65M[13]
Northern York TS #2	Build Northern York TS #2 230/44kV DESN	Hydro One	2034	$55M-$65M[14]
Transmission Line Capacity Needs				
P45/P46	Upgrade P45/P46 from Parkway TS to Markham MTS #4	Hydro One	2031	$5M
P45/P46	Upgrade P45/P46 from Markham MTS #4 to Buttonville TS	Hydro One	2034	$10M
P45/P46	Extend and build P45/P46 Buttonville TS 7km North	Hydro One	2034	$50M
C35P/C36P	Reconnect Markham MTS #4 to C35P/C36P	Hydro One	To be discussed in the next Regional Planning cycle[15]	$9M
System Reliability				
Kleinburg TS	Build Kleinburg to Kirby Transmission Link	Hydro One	2031-2032	$40M - $60M[16]
Kleinburg TS	Bulk Supply - 500/230 kV Transformer Station	Hydro One	2031-2032	$400M
York Energy Centre	York Energy Centre – Station Service Upgrade	Capital Power	2026 (Current)	IESO to coordinate with Capital Power
Holland Marsh SS	Holland Marsh Switching Station	IESO	To be discussed in the next	TBD-Next Planning Cycle

[13] The cost does not include building 230kV line to supply the new TS
[14] The cost does not include building 230kV line to supply the new TS
[15] IRRP recommended that this coincides with connection of Markham#6 or NY-TS2 (whichever is required first)
[16] Refer to Appendix-F for additional reference to the need, recommendation and the cost.

Station/Circuit Name	Recommended Plan	Lead	Planned ISD	Budgetary Cost ($M) *
			Regional Planning cycle	
Essa/Barrie to Holland Marsh	New Northern York Transmission Supply	IESO	To be discussed in the next Regional Planning cycle	TBD-Next Planning Cycle
V71P/V75P	In-line Breakers	Hydro One	2030	$30M-$35M
H82V/H83V-B88H/B89H and M6E/M7E[17]	Claireville to Minden: Over voltages (H82V/H83V); Under voltages (B88H/B89H), and Thermal Needs (M6E)	IESO/Hydro One	TBD/Continued to be monitored	TBD/Continued to be monitored
H82V/H83V	Upgrading the portion of H82V/H83V from Kirby Jct. to Holland Marsh (23km)	IESO /Hydro One	To be discussed next Regional Planning cycle	(To be discussed next Planning Cycle)
Load Security and Restoration				
V43/V44	Load Security on Kleinburg Radial Tap	Hydro One	2031-2032	N/A
H82V/H83V and B88H/B89H	Load Security and Restoration in Northern Area	Hydro One	2031-2032[18]	N/A
H82V/H83V	Load Restoration from Claireville TS to Holland TS Circuits (H82V/H83V)	Hydro One	2031-2032	N/A
B88H/B89H	Load Restoration from Holland TS to Brown Hill TS	Hydro One	2031-2032	N/A

[17] M6E/M7E circuit boundaries are outside of GTA North Region Scope and thermal issues will be dealt by IESO at Bulk level.
[18] YEC Station Service upgrade and Marsh Switching Station would mitigate load restoration and security issue.

Station/Circuit Name	Recommended Plan	Lead	Planned ISD	Budgetary Cost ($M) *
	Circuits (B88H/B89H)			
V71P/V75P	Load Security and Restoration on V71P/V75P	Hydro One	2030	$35M[19]
P45/P46	Load Security and Restoration on Buttonville Corridor (P45/P46)	Hydro One	2034[20]	$9M[21]

* The cost figures presented are high-level allocations in 2025 dollars and have not been informed by detailed engineering design or development work. Accordingly, these estimates are preliminary in nature, subject to material change, and are intended for options analysis purposes only

[19] The $-figure reflects the cost associated with inline breakers at V71P/V75P to mitigate load security issues.
[20] Load Security issue is triggered in year 2034 when LF > 600 MW.
[21] The $-figure reflects the cost associated with Markham MTS#4 re-termination to C35P/C36P

10 REFERENCES

[1] Independent Electricity System Operator, Ontario Resource and Transmission Assessment Criteria (issue 5.0 August 22, 2007)
[2] Ontario Energy Board, Transmission System Code (issue July 14, 2000 rev. August 2, 2023)
[3] Ontario Energy Board, Distribution system Code (issue July 14, 2000 rev. March 27, 2024)
[4] Ontario Energy Board, Load Forecast Guideline for Ontario (issue October 13, 2022)
[5] GTA North 3rd Cycle Needs Assessment (NA) Report (issue July 14, 2023)
[6] GTA North 3rd Cycle Scoping Assessment (issue October 12, 2023)
[7] GTA North region Integrated Regional Resource Planning (IRRP) Report (issue October 10, 2025)

11 Appendix A: Net Summer Peak Load Forecast

Table A.1: GTA North region – Net MW Summer Peak Load Forecast

Station	Summer LTR (MW)	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Kleinburg TS	180	214	225	249	260	276	275	274	273	272	271
Vaughan MTS #3	153	150	149	153	153	153	153	153	153	153	153
Vaughan MTS #6	153	0	0	30	29	49	48	56	76	92	90
Woodbridge TS	160	158	161	164	165	167	169	173	173	173	173
Western Area (V43/V44) Sub-Total	**646**	**522**	**534**	**597**	**607**	**644**	**645**	**656**	**676**	**691**	**687**
Holland TS	168	169	169	169	169	169	169	169	169	169	169
Northern York TS #1	170	0	0	0	0	0	32	65	92	130	161
Vaughan MTS #4	153	99	138	153	153	153	153	153	153	153	153
H82V/H83V Sub-Total	**474**	**268**	**307**	**322**	**322**	**322**	**354**	**387**	**414**	**452**	**483**
Armitage TS	317	317	317	317	317	317	317	317	317	317	317
Brown Hill TS	184	177	184	184	184	184	184	184	184	184	184
The Customer	75	0	0	0	0	75	75	75	75	75	75
Northern York TS #3	170	0	0	0	0	0	0	0	0	13	60
B88H/B89H Sub-Total	**746**	**494**	**501**	**501**	**501**	**576**	**576**	**576**	**576**	**589**	**636**
Northern York Area Sub-Total	**1220**	**762**	**808**	**823**	**823**	**898**	**930**	**963**	**990**	**1041**	**1119**

Station	Summer LTR (MW)	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Richmond Hill MTS #1	153	150	148	153	153	153	153	153	153	153	153
Richmond Hill MTS #2	101	99	98	101	101	101	101	101	101	101	101
Richmond Hill MTS #3	153	0	0	0	0	26	48	61	86	115	129
Vaughan MTS #1	306	301	300	306	306	306	306	306	306	306	291
Vaughan MTS #2	153	150	149	153	153	153	153	153	153	153	144
Vaughan MTS #5	153	0	0	0	0	0	0	35	99	33	52
V71P/V75P Sub-Total	**1019**	**700**	**695**	**713**	**713**	**739**	**761**	**809**	**898**	**862**	**870**
Markham MTS #1	90	81	80	81	81	81	81	81	81	79	79
P21R/P22R Sub-Total	**90**	**81**	**80**	**81**	**81**	**81**	**81**	**81**	**81**	**79**	**79**
Southern York Area Sub-Total	**1109**	**780**	**776**	**794**	**794**	**820**	**842**	**890**	**979**	**941**	**948**
Buttonville TS	166	150	150	149	147	146	146	145	145	145	144
Markham MTS #4	153	111	150	153	153	153	153	153	153	153	153
Buttonville TS #2	153	0	0	4	27	63	110	144	146	143	143
Markham MTS #6	153	0	0	0	0	0	0	0	0	40	98
Northern York TS #2	170	0	0	0	0	0	60	99	142	170	170
P45/P46 Sub-Total	**795**	**261**	**299**	**306**	**327**	**363**	**469**	**542**	**587**	**651**	**708**
Markham MTS #2	101	95	94	101	101	101	101	101	101	101	101
Markham MTS #3	202	190	188	202	202	202	202	202	202	202	202
C35P/C36P Sub-Total	**303**	**285**	**283**	**303**	**303**	**303**	**303**	**303**	**303**	**303**	**303**

Markham Area Sub-Total	**1098**	**546**	**582**	**609**	**630**	**666**	**815**	**845**	**890**	**954**	**1011**

12 Appendix B: Lists of Step-Down Transformer Stations

No.	Transformer Station	Voltage (kV)	Supply Circuits
1	Kleinburg TS T1/T2 27.6	230/27.6	V44/V43
2	Kleinburg TS T1/T2 44	230/44	V44/V43
3	Vaughan MTS #3 T1/T2	230/27.6	V44/V43
4	Woodbridge TS T3/T5 27.6	230/27.6	V44/V43
5	Woodbridge TS T3/T5 44	230/44	V44/V43
6	Armitage TS T1/T2	230/44	B88H/B89H
7	Armitage TS T3/T4	230/44	B88H/B89H
8	Brown Hill TS T1/T2	230/44	B88H/B89H
9	Holland TS T1/T2, T3/T4	230/44	H82V/H83V
10	Buttonville TS T3/T4	230/27.6	P45/P46
11	Markham MTS #1 T1/T2	230/27.6	P21R/P22R
12	Markham MTS #2 T1/T2	230/27.6	C35P/C36P
13	Markham MTS #3 T1/T2	230/27.6	C35P/C36P
14	Markham MTS #3 T3/T4	230/27.6	C35P/C36P
15	Markham MTS #4 T1/T2	230/27.6	P45/P46
16	CTS	230/44	P21R/P22R
17	Richmond Hill MTS #1 T1/T2	230/27.6	V71P/V75P
18	Richmond Hill MTS #2 T3/T4	230/27.6	V71P/V75P
19	Vaughan MTS #1 T1/T2	230/27.6	V71P/V75P
20	Vaughan MTS #1 T3/T4	230/27.6	V71P/V75P
21	Vaughan MTS #2 T1/T2	230/27.6	V71P/V75P
22	Vaughan MTS #4 T1/T2	230/27.6	H82V/H83V

13 Appendix C: List of LDC's

No.	Names of LDCs
1	Hydro One Networks Inc. (Transmission)
2	Hydro One Networks Inc. (Distribution)
3	Alectra Utilities Inc.
4	Newmarket-Tay Power Distribution LTD (NT Power)
5	Toronto Hydro
6	Elexicon Energy

14 Appendix D: List of Municipalities in the region

No.	Name of Municipality
1	Aurora
2	Bradford West Gwillimbury
3	East Gwillimbury
4	Georgina
5	King
6	Markham
7	Newmarket
8	Richmond Hill
9	Simcoe County
10	Vaughan
11	Whitchurch-Stouffville

15 Appendix E: Acronyms

Acronym	Description
A	Ampere
BES	Bulk Electric System
BESS	Battery Energy Storage System
BPS	Bulk Power System
CA	Customer Application
CDM	Conservation and Demand Management
CEP	Community Energy Plan
CIA	Customer Impact Assessment
CGS	Customer Generating Station
CSS	Customer Switching Station
CTS	Customer Transformer Station
DESN	Dual Element Spot Network
DG	Distributed Generation
DS	Distribution Station
GS	Generating Station
HV	High Voltage
IESO	Independent Electricity System Operator
IRRP	Integrated Regional Resource Plan
kV	Kilovolt
LDC	Local Distribution Company
LMC	Load Meeting Capability
LP	Local Plan
LTE	Long Term Emergency
LTR	Limited Time Rating
LV	Low Voltage
MEP	Municipal Energy Plan
MTS	Municipal Transformer Station
MW	Megawatt
MVA	Mega Volt-Ampere

Acronym	Description
MVAR	Mega Volt-Ampere Reactive
NA	Needs Assessment
NERC	North American Electric Reliability Corporation
NGS	Nuclear Generating Station
NPCC	Northeast Power Coordinating Council Inc.
NUG	Non-Utility Generator
OEB	Ontario Energy Board
ORTAC	Ontario Resource and Transmission Assessment Criteria
PF	Power Factor
RIP	Regional Infrastructure Plan
SA	Scoping Assessment
SIA	System Impact Assessment
SPS	Special Protection Scheme
SS	Switching Station
STG	Steam Turbine Generator
TS	Transformer Station
TWG	Technical Working Group
YEC	York Energy Centre

16 Appendix F: IESO Letter for Kleinburg-Kirby Transmission Link

Independent Electricity System Operator
1600-120 Adelaide Street West
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March 20, 2026

Robert Reinmuller

Vice President, Transmission System Planning and Large Customer Accounts Hydro One Networks, Inc.

483 Bay Street, TCT 14

Toronto, ON

M5G 2P5

Dear Robert:

Implementation Update for the Kleinburg-Kirby 230 kV Transmission Link

The IESO is providing this letter to Hydro One Networks Inc. ("Hydro One") in response to

Hydro One's ongoing development of the GTA North (York Region) Regional Infrastructure Plan ("RIP"). The RIP is expected to include a near-term recommendation to proceed with a new double-circuit 230 kV transmission line, the Kleinburg–Kirby Link (the "Project"), consistent with the recommendations in the 2025 IESO's GTA North (York Region) Integrated Regional Resource Plan ("IRRP"). The IESO requests that

Hydro One append this letter to the RIP to identify the IESO's recommendations on the Project's scope, timing, and implementation.

The 2025 GTA North (York Region) IRRP was published on October 10th, 2025. Among its recommendations was the development of the Project, to be co-located with the future Highway 413 corridor, to support growing electricity demand in northern York region. The Project will establish a new connection between the existing 230 kV radial transmission system in Kleinburg (at the proposed expanded Kleinburg TS) and the 230 kV transmission system north of Claireville TS, terminating on the existing H82/83V circuits north of Vaughan MTS #4, close to the intersection with Kirby Rd. This new connection is critical for enabling the full loading of the recommended Northern York TS #1 and was recommended in the 2025 GTA North (York Region) IRRP to come in service in 2032.

Following the publication of the 2025 GTA North (York Region) IRRP, the IESO assessed whether the Project was suitable for development under the Transmitter Selection Framework ("TSF"). The IESO has determined that the Project is not a candidate for the TSF for the following reasons:

1. Project scope and cost: The expected cost of the Project is well below the $100 million proposed eligibility criterion for the TSF. Transmission line construction costs for the Project are projected to be approximately $40 million (2025 dollars). While the IESO recognizes that additional project costs due to factors such as land topography, finalized routing and design, land acquisition, community engagement and system integration are possible, the total cost of the Project, inclusive of these factors, is still expected to remain well below $100 million.
2. Development timeline: Meeting the targeted 2032 in-service date is essential to enabling forecast customer growth and connections throughout northern York region, as identified in the 2025 GTA North (York Region) IRRP. The TSF is not anticipated to launch prior to 2027, so using a TSF procurement process could create a material risk of missing the Project's 2032 targeted in-service date.

For these reasons, the IESO recommends that Hydro One proceed with the necessary development work for this Project. This development work should align with the outcomes of the RIP and remain consistent with the IRRP's recommendations and support achieving the targeted 2032 in-service date.

The IESO looks forward to continued collaboration as Hydro One advances this important infrastructure project.

Yours truly,

Gabriel Adam, P.Eng.

Director, Transmission Integration

cc: Ajay Garg, Hydro One

Michael Xavier, Hydro One

Chuck Farmer, IESO

Beverly Nollert, IESO

IESO Records

17 Appendix G: Ultimate SLD for the Needs/ Recommendations RIP (2026-2035)