

# ATTACHMENT 1: BENEFIT COST ANALYSIS – UPDATED FEB 17 2026

## **Need**

GBE is facing a nondiscretionary system need arising from projected capacity constraints at key transformer stations - Preston TS, Galt TS, and MTS#1 - serving the rapidly growing Cambridge area. By 2027, these stations are forecasted to reach 88% of their capacity, and 99% of their available transmission capacity, primarily driven by accelerating demand from new data centers, commercial developments along major highways, urban densification, residential growth, and transportation electrification. This growth is expected to continue beyond 2027, intensifying strain on the system and limiting GBE's ability to maintain operational flexibility, manage outages effectively, and accommodate new customer connections. The timing of the need is immediate, with significant constraints projected to begin as early as 2026.

While long-term capital investments are ultimately required, GBE currently faces a lack of near-term options to implement such infrastructure in time. Uncertainties remain around the precise pace and location of demand growth, especially in the commercial and data center sectors, but the overall trend is clear and pressing. Accordingly, GBE must take timely action to address this capacity need and ensure system reliability and customer service continuity.

## **Alternatives Considered**

For this non-discretionary need, there are no traditional "poles-and-wires" infrastructure solutions to evaluate as a comparator, as the final solution to the need identified is a traditional solution (i.e. Transformer Station) planned to be in-service in 2028. GBE has identified an NWS Program as a viable and cost-effective means to meet immediate needs and create benefits for customers.

The NWS Program leverages demand response and behind-the-meter distributed energy resources to reduce peak demand, reduce planned and unplanned outages, and reduce transmission charges paid by GBE's customers. In doing so, the NWS enables GBE to maintain reliability, support new customer connections, and preserve system resiliency while the utility plans and executes an enduring capital solution.

## **Cost-Effectiveness Test**

GBE has completed a DST as part of this BCA, in accordance with the OEB's BCA Framework. The DST is intended to assess the cost-effectiveness of a proposed NWS from the perspective of the distribution system and its customers. In this case, the NWS Program represents a non-discretionary reliability investment, and there is no practical alternative to addressing the identified capacity constraints.

Accordingly, the DST has been applied not as a comparative test between multiple options, but as a reasonableness assessment to confirm that the proposed investment delivers net system benefits and is cost-effective. The analysis compares the costs incurred to implement the NWS against quantified benefits. A completed version of the OEB's DST template, modified by GBE to reflect the circumstances of this application, is provided as Attachment 2.

1 **Distribution System Test: Benefits**

2 The DST quantifies the present value difference between total costs and benefits of each option,  
3 to determine the net benefits of selecting one alternative over another. In this instance, the results  
4 of the DST show substantial benefits associated with the NWS program proposed.

5 The avoided costs (benefits) included in the DST are outlined below.

6 Reliability Benefits: Value of Lost Load

7 In order to quantify the benefit of maintained or improved reliability through avoided outages, GBE  
8 first set out to determine the Value of Lost Load (VOLL) applicable to its customers. VOLL is the  
9 economic cost experienced by customers when experiencing an outage, and as such can be used  
10 to quantify the economic benefits of outages which are avoided through the NWS Program. To  
11 calculate VOLL, GBE relied on the U.S. Department of Energy's Interruption Cost Estimator  
12 ("ICE") 2.0, relying on data from New York, Michigan, Ohio, and Iowa as instructed in the OEB's  
13 Vulnerability Assessment and Storm Hardening Report.<sup>1</sup>

14 Through the use of the ICE 2.0, and the provision of GBE-specific inputs, GBE determined the  
15 VOLL for its customers was \$12.99 per kWh for non-residential customers, and \$0.95 per kWh,  
16 in 2023 USD. When converting these values to CAD and escalating by the Consumer Price Index  
17 to 2025, the resulting VOLL values are \$19.05 CAD per kWh for non-residential customers, and  
18 \$1.40 CAD per kWh for residential customers. Future years' VOLL values are determined based  
19 on 2% inflation as per the OEB's BCA Framework.

20 With these figures calculated, GBE determined the economic value of avoided outages.

21 Avoided Unplanned Outages

22 In light of the capacity constraints facing GBE's Preston TS, Galt TS, and MTS#1, the risk of  
23 unplanned outages is heightened for customers served by these stations. Implementation of the  
24 NWS Program will provide GBE the flexibility to avoid unplanned outages by calling on capacity  
25 through the NWS Program.

26 As described in section 4.2.5 above, unplanned events happen at transformer stations due to  
27 factors such as equipment failures, weather conditions, and animal contacts. For example, on  
28 July 4, 2019, the failure of a 27.6kV potential transformer on the "Q" bus at Preston TS resulted  
29 in a one-week outage of the "Q" bus. During this time, approximately half of Preston TS's load  
30 was transferred to Galt TS and MTS#1 to restore power.

31 GBE determined it is reasonable to expect the NWS Program to avoid 1 unplanned outage over  
32 the 3 year period of 2026 to 2028. In order to quantify this benefit, GBE relied on the following  
33 inputs:

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- 35 • The avoided unplanned outage will be 8 hours in duration;
  - 36 • The full NWS Program capacity available in each year (5MW in 2026, 10MW in 2027, and  
37 20MW in 2028) will be leveraged to avoid customer outages; and,
  - 62% of the impacted load will be non-residential, with the remaining 38% residential.

38 With these inputs GBE calculated the total VOLL for each of 2026, 2027 and 2028. Given GBE  
39 anticipates only 1 unplanned outage over the 3 year period, but cannot forecast which year, the  
40 resulting VOLL for each year is discounted to 33%, such that the VOLL associated with avoided

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<sup>1</sup> EB-2024-0199, VASH Report, October 7, 2025, pages 25-26

1 unplanned outages is an average of 2026 to 2028. Finally, GBE is intending for MTS#2 to be in-  
 2 service in advance of the 2028 cooling season during which the NWS Program operates, however  
 3 planning for MTS#2 is in its early stages, and there is risk the station will not be in-service until  
 4 fall of 2028. To represent this uncertainty, 2028 benefits have been further discounted by 50%;  
 5 implying a mid-summer in-service date.

6 Tab 'Benefit 1 – Unplanned Outages' of Attachment 2 – BCA Model details the calculation of  
 7 benefits, while Table 1 below summarizes them.

8 **Table 1 – Avoided Unplanned Outages Benefit**

Benefit 1 - Avoided Unplanned Outages (VOLL)	Residential	Commercial/ Industrial	Total	Present Value of Benefits	Probability Weighting	Probability Weighted PV of Benefits	50% Discount in 2028 only
2026	\$21,459	\$469,460	<b>\$490,920</b>	\$490,920	33%	\$163,640	<b>\$163,640</b>
2027	\$43,777	\$957,699	<b>\$1,001,476</b>	\$962,958	33%	\$320,986	<b>\$320,986</b>
2028	\$89,305	\$1,953,706	<b>\$2,043,012</b>	\$1,888,879	33%	\$629,626	\$314,813
<b>Total</b>	<b>\$154,542</b>	<b>\$3,380,866</b>	<b>\$3,535,408</b>	<b>\$3,342,757</b>	<b>100%</b>	<b>\$1,114,252</b>	<b>\$799,439</b>

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10 Avoided Planned Outages

11 The benefits of avoided planned outages have been calculated in a manner consistent with  
 12 unplanned outages; relying on the same assumptions for VOLL, the use of full NWS Program  
 13 capacity, and the division of customers as between non-residential and residential. The only  
 14 differentiation in the derivation of avoided planned outage benefits is the number and duration of  
 15 occurrences assumed. Based on analysis of upcoming projects, demand and planned  
 16 maintenance, GBE assumes the NWS Program will avoid 2 planned outages of 4 hours in duration  
 17 in each of 2026, 2027 and 2028. Similar to the above, GBE has discounted 2028 benefits by 50%  
 18 to represent uncertainty regarding the precise in-service date of MTS#2.

19 Tab 'Benefit 2 – Planned Outages' of Attachment 2 – BCA Model details the calculation of  
 20 benefits, while Table 2 below summarizes them.

21 **Table 2 – Avoided Planned Outages Benefit**

Benefit 2 - Avoided Planned Outages (VOLL)	Residential	Commercial/ Industrial	Total	Present Value of Benefits	50% Discount in 2028 only
2026	\$21,459	\$469,460	<b>\$490,920</b>	\$490,920	<b>\$490,920</b>
2027	\$43,777	\$957,699	<b>\$1,001,476</b>	\$962,958	<b>\$962,958</b>
2028	\$89,305	\$1,953,706	<b>\$2,043,012</b>	\$1,888,879	\$944,440
<b>Total</b>	<b>\$154,542</b>	<b>\$3,380,866</b>	<b>\$3,535,408</b>	<b>\$3,342,757</b>	<b>\$2,398,318</b>

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23 Avoided Transmission Charges

24 The purpose of the NWS Program is to reduce GBE's peak demand across the Preston TS, Galt  
 25 TS and MTS#1 to manage system constraints. An additional outcome of this will be the reduction  
 26 of transmission charges at these stations, as peak demand reductions in a given month will lower  
 27 the MW charge determinants used to bill Uniform Transmission Rates (UTRs) to GBE and its

1 customers. GBE recognizes that avoided UTR payments will not always represent an absolute  
 2 savings to the broader Ontario electricity system, as in time avoided transmission revenues from  
 3 GBE would need to be absorbed by other transmission customers on a go-forward basis after the  
 4 transmitters' next rebasing application. While this would potentially be relevant to an Energy  
 5 System Test, GBE is completing a DST which is focused solely on costs and benefits to  
 6 distribution customers. Within the context, avoided UTRs are a benefit to GBE's distribution  
 7 customers, and should be included within the DST.

8 GBE conducted analysis to determine the impact on UTR charge determinants as a result of the  
 9 NWS Program, and applied specific reductions to charge determinants in each of 2026, 2027 and  
 10 2028 to calculate avoided transmission charges. Similar to the above, GBE has discounted 2028  
 11 benefits by 50% to represent uncertainty regarding the precise in-service date of MTS#2.

12 Tab 'Benefit 3 – Transmission Charge' of Attachment 2 – BCA Model details the calculation of  
 13 benefits, while Tables 3 to 5 below summarizes them. UTRs relied upon are the most recent OEB-  
 14 approved, and have been increased by 2% inflation for the years 2027 and 2028 per the OEB's  
 15 BCA Framework.

16 **Table 3 – 2026 Avoided Transmission Charges**

2026 (\$ Savings in Transmission Charges)					
	Preston	Galt	MTS#1	Total	Present Value
Jun	-	23,958	10,388	34,346	34,346
Jul	15,246	-	10,388	25,634	25,634
Aug	15,246	23,958	-	39,204	39,204
Sep	15,246	-	-	15,246	15,246
<b>Total</b>	<b>45,738</b>	<b>47,916</b>	<b>20,776</b>	<b>114,430</b>	<b>114,430</b>

17 **Table 4 – 2027 Avoided Transmission Charges**

2027 (\$ Savings in Transmission Charges)					
	Preston	Galt	MTS#1	Total	Present Value
Jun	-	48,874	21,192	70,066	67,371
Jul	31,102	-	21,192	52,293	50,282
Aug	25,548	43,320	-	68,868	66,220
Sep	21,105	-	-	21,105	20,293
<b>Total</b>	<b>77,755</b>	<b>92,195</b>	<b>42,383</b>	<b>212,332</b>	<b>204,166</b>

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19 **Table 5 – 2028 Avoided Transmission Charges**

2028 (\$ Savings in Transmission Charges)						50% Discount
	Preston	Galt	MTS#1	Total	Present Value	To 2028
Jun	-	82,709	31,724	114,433	105,799	\$52,900
Jul	31,724	-	31,724	63,448	58,661	\$29,331
Aug	26,059	45,320	-	71,379	65,994	\$32,997
Sep	22,660	-	-	22,660	20,950	\$10,475
<b>Total</b>	<b>80,443</b>	<b>128,029</b>	<b>63,448</b>	<b>271,919</b>	<b>251,404</b>	<b>125,702</b>

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1 Distribution Capacity (Deferral or Avoidance Benefit)

2 GBE's NWS is not proposed to, or anticipated to, result in the deferral or avoidance of any  
3 distribution investment. As such this benefit is Nil.

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5 **Distribution System Test: Costs**

6 The costs associated with the NWS Program are limited to the operational expenditures required  
7 to launch and operate the program, as well as the capital-related revenue requirement associated  
8 with one-time IT investments to launch the program. These costs are offset by \$0.25 million in  
9 contribution's from NRCan's SREP. The net present value of all costs are \$2,805,431.<sup>2</sup>

10 DER Acquisition Costs

11 The cost of participant payments made as part of GBE's NWS Program are \$1,806,582 on a  
12 present value basis.

13 DER Capital-Related Revenue Requirement

14 The cost of the capital-related revenue requirement for GBE's NWS Program is \$625,864 on a  
15 present value basis.

16 DER OM&A Costs

17 The cost of OM&A expenditures for GBE's NWS Program are \$604,191 on a present value basis.

18 Distribution System Ancillary Services Costs

19 Nil.

20 Risks (Distribution System)

21 Nil.

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23 **Distribution System Test: Results**

24 The net benefits of the NWS program are derived by subtracting the NPV of program costs from  
25 the NPV of program benefits. The DST ratio is determined by dividing the NPV of program costs  
26 by the NPV of program benefits.

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<sup>2</sup> Tab NWS, Attachment 2

**DST Benefits Updated Feb 17, 2026**

*(Add more rows as required)*

Benefit	Benefit Type	NPV
Avoided Unplanned Outages (Probability Weighted)	Reliability (Net Avoided Outage Costs)	\$799,439
Avoided Planned Outages	Reliability (Net Avoided Outage Costs)	\$2,398,318
Avoided Transmission Charges	Other	\$444,298
Nil	Distribution Capacity (Deferral or Avoidance Benefit)	\$0
<b>Total DST Benefit</b>		<b>\$3,642,055</b>

**DST Costs Updated Feb 17, 2026**

*(Add more rows as required)*

Cost	Cost Type	NPV
NWS Capacity Auction: Participant Payments	DER Acquisition Cost	\$1,806,582
NWS Capacity Auction: Capital-Related Revenue Requirement	Other	\$625,864
NWS Capacity Auction: OM&A	DER Operations, Maintenance, and Administrative (OM&A) Costs	\$604,191
NWS Capacity Auction: SREP Offset	Other	-\$231,206
Nil	Distribution System Ancillary Services Costs	0
Nil	Risks (Distribution System)	0
<b>Total DST Cost</b>		<b>\$2,805,431</b>

<b>NPV Net DST Benefit</b>	<b>\$836,624</b>	<b>1.30</b>	<b>DST Ratio</b>
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1 **Other BCA Considerations / Non-Quantified Benefits**

2 Additionally, non-quantified benefits of the NWS include but are not limited to:

- 3 • **Avoided Outage on 230kV Transmission Line:** As described in this evidence, GBE is  
4 required by Hydro One to manage the total demand of its Preston TS, Galt TS and MTS#1  
5 to a combined total of 400MW due to capacity constraints on the 230kV line from which  
6 these stations receive service. The 230kV transmission line is twinned, and the 400MW  
7 limitation is structured to allow for the short-term transfer of all GBE load from the 3  
8 stations onto a single one of the two 230kV lines in the event of a single-line transmission  
9 outage. In the event one of the two lines experiences an outage and GBE is above 400MW  
10 at that time, GBE would be forced to open the 27.6kV tie breaker at MTS#1 whenever load  
11 on the transmission lines exceeds 400 MW. In the event one of the two lines experiences  
12 an outage, half the customers supplied from MTS#1 would experience an outage. Due to  
13 the low probability but high impact to customers, GBE has designated this benefit as  
14 qualitative only and has not included it within the DST calculation or results.
- 15 • **Avoided Delays in Customer Connections:** By addressing grid constraints through  
16 NWS, GBE mitigates significant delays in connecting new customers, ensuring timely  
17 service and supporting broader economic objectives.
- 18 • **Economic Growth:** By managing grid constraints, the program supports new commercial  
19 and industrial development.
- 20 • **Regulatory Alignment:** Aligns with the OEB's framework for cost-effective grid planning,  
21 facilitating a transition to a Distributor System Operator (DSO) model.
- 22 • **Reputation Risk Mitigation:** The NWS Program reinforces GBE's reputation, along with  
23 Ontario's distribution utilities, as proactive enablers of economic growth. It highlights  
24 forward-thinking grid planning and commitment to reliable service delivery.
- 25 • **Customer Empowerment:** The program enables customers to actively participate in  
26 energy management, incenting the use DERs and FR, and enhancing their role in the  
27 clean energy ecosystem.

28 **Conclusion**

29 The results of the BCA and DST indicate the NWS is highly cost-effective, yielding net benefits  
30 to customers and a DST ratio of costs to benefits of 1.30. In addition, the NWS Program yields  
31 substantial non-quantified benefits to customers now and into the future.