



Alberta Electric System Operator  
Needs Identification Document Application

EPCOR Distribution & Transmission Inc.  
Facility Applications

West Edmonton Transmission Upgrade Project

March 12, 2020

**Alberta Utilities Commission**

Decision 23943-D01-2020: West Edmonton Transmission Upgrade Project

Alberta Electric System Operator  
Needs Identification Document Application  
Proceeding 23943  
Application 23943-A001

EPCOR Distribution & Transmission Inc.  
Facility Applications  
Proceeding 23943  
Application 23943-A002 to 23943-A006

March 12, 2020

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**Alberta Electric System Operator**  
**Needs Identification Document Application**

**EPCOR Distribution & Transmission Inc.**  
**Facility Applications**  
**West Edmonton Transmission Upgrade Project**

**Decision 23943-D01-2020**  
**Proceeding 23943**  
**Applications 23943-A001 to 23943-A006**

## **1 Decision summary**

1. In this decision, the Alberta Utilities Commission considers whether to approve a needs identification document application from the Alberta Electric System Operator and facility applications from EPCOR Distribution & Transmission Inc. to construct and operate an 11-kilometre-long, 72-kilovolt transmission line and to alter the Poundmaker, Meadowlark and Garneau substations in west Edmonton. The Commission assessed the need for the transmission line and associated upgrades and the need for upgrades to Garneau Substation as separate developments.

2. For all the reasons set out in this decision, the Commission finds the need for the transmission line and the associated upgrades to be clear and urgent and in the public interest. Although the Commission considers the need for the Garneau Substation upgrades to be less obvious, in light of the forecast increase in load, the resulting load at risk, and the timing to complete the upgrades, it finds the upgrades to be needed and in the public interest.

3. The Commission finds that the construction of the transmission line in an overhead configuration along the preferred route, the fibre optic cable and the alterations to the substations are in the public interest, having regard to the social and economic effects of the project and its effect on the environment.

## **2 Introduction and background**

### **2.1 Needs identification document application**

4. The Alberta Electric System Operator (AESO) filed a needs identification document (NID) application with the Alberta Utilities Commission on October 1, 2018, pursuant to Section 34 of the *Electric Utilities Act*. The application was registered as Application 23943-A001.

5. The AESO prepared its application in response to a system access service request (SASR) submitted by EPCOR Distribution & Transmission Inc. (EDTI) as the legal owner of the electric distribution system in the area. EDTI requested system access service to reliably serve growing demand for electricity in the west Edmonton area. The AESO submitted that the need can be met by adding a 72-kilovolt (kV) transmission line from Poundmaker Substation to Meadowlark Substation, upgrading the Poundmaker and Garneau substations, and modifying Meadowlark Substation.

## 2.2 Facility applications

6. EDTI filed facility applications with the Commission for approval to construct the facilities identified by the AESO in its NID application. The applications, filed pursuant to sections 14 and 15 of the *Hydro and Electric Energy Act*, were registered on October 12, 2018, as applications 23943-A002 to 23943-A006.

7. To meet the need identified by the AESO, EDTI requested approval to:

- Construct and operate a new, approximately 11-kilometre-long, 72-kV transmission line between the existing Poundmaker and Meadowlark substations, to be designated as Transmission Line 72PM25. EDTI's application included a preferred route and an alternate route for the proposed transmission line, as shown in the figure below.
- Construct and operate a new fibre optic line between the existing Poundmaker and Meadowlark substations, to be designated as FO-133, using the proposed Transmission Line 72PM25 structures for the majority of its route.
- Alter and operate the existing Poundmaker, Meadowlark and Garneau substations, by expanding all of the substations' fenced areas and adding new equipment (the project).

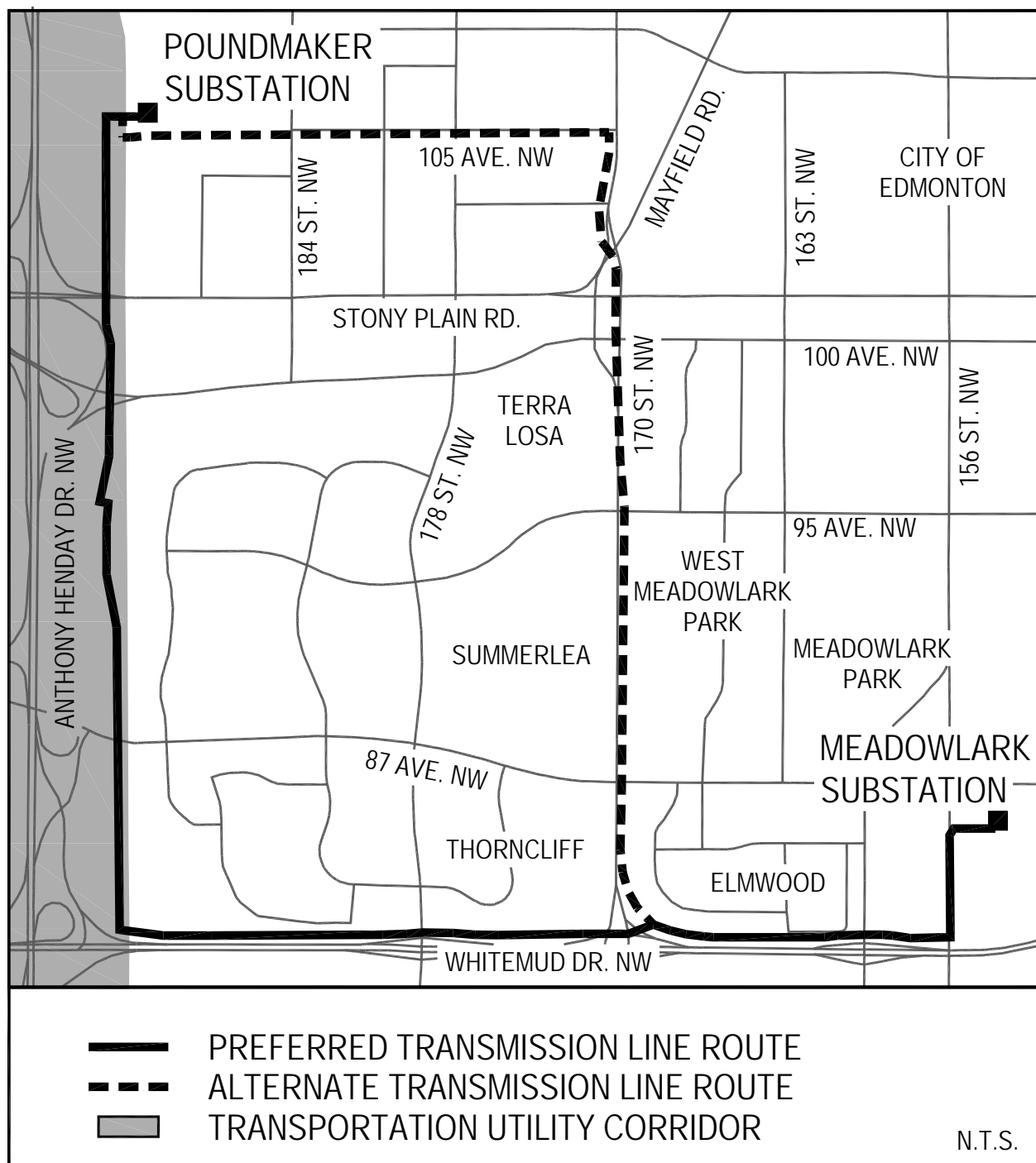


Figure 1. Proposed transmission line routes

### 2.3 Process

8. On November 9, 2018, the Commission issued a notice of applications for this proceeding. The notice was mailed directly to residents, market participants, agencies and other interested parties in the vicinity of the project; it was also published in the Edmonton Journal on November 17, 2018, and on the AUC website.

9. The Commission received more than 100 statements of intent to participate from stakeholders objecting to the facility applications. Four groups of interveners formed, filed evidence and participated in the oral hearing:

- The 190 Street Residents Group, consisting of residents located adjacent to the portion of the preferred route of the transmission line along the transportation and utility corridor (TUC).
- The Aldergrove Residents Group, consisting of residents located adjacent to the portion of the preferred route of the transmission line along Whitemud Drive in the community of Aldergrove.
- The Elmwood Residents Group, consisting of residents located adjacent to the common section of the route along Whitemud Drive and where the preferred and alternate routes meet.
- The Lynnwood Community League (or the League), consisting of residents located adjacent to the common section of the route of the transmission line along Whitemud Drive and within the community of Lynnwood.

10. Boardwalk Rental Communities submitted a statement of intent to participate and made a statement during the oral hearing about the impacts to Whitehall Square, an apartment complex in the community of Lynnwood. In addition, Mark Edey, an Aldergrove community resident who is not part of the Aldergrove Residents Group, submitted a statement of intent to participate and a written statement during the hearing. A number of residents close to the project were granted standing but did not join a group or provide any submissions beyond their statements of intent to participate in which they indicated that the transmission line would result in an adverse impact on themselves, their family, the community and their property.

11. The Commission also received a statement of intent to participate from the Consumers' Coalition of Alberta (CCA) objecting to the AESO's NID application. The CCA was granted standing, filed evidence and participated in the need portion of the oral hearing. The CCA retained Bema Enterprises Ltd. to prepare evidence.

12. A full list of the parties that participated in the proceeding is included in Appendix A. A list of parties that registered appearances at the hearing is included in Appendix B.

13. The AESO requested that the Commission suspend processing the proceeding on April 9, 2019, to respond to guidance, provided by the Commission in a recent decision, on the type of information that should be incorporated into future NID applications pertaining to distribution reliability. The Commission suspended the proceeding and the AESO filed an amendment to its application on May 31, 2019.

14. The Commission issued a notice of hearing on July 24, 2019. The hearing commenced on November 4, 2019, in Edmonton, before a Commission panel of Vice-Chair Anne Michaud and Commission members Neil Jamieson and Kristi Sebalj. The hearing concluded with the written sur-rebuttal argument filed by EDTI on December 23, 2019.

### 3 Legislative framework

15. Except in the case of critical transmission infrastructure, two approvals from the Commission are required to build new transmission capacity in Alberta. First, an approval of the need for expansion or enhancement to the Alberta Interconnected Electric System, pursuant to Section 34 of the *Electric Utilities Act*, is required. Second, a permit to construct and a licence to operate a transmission facility, pursuant to sections 14 and 15 of the *Hydro and Electric Energy Act*, must be obtained.

16. The AESO, in its capacity as the independent system operator established under the *Electric Utilities Act*, is responsible for preparing a NID and filing it with the Commission for approval pursuant to Section 34 of the *Electric Utilities Act*. Section 34 describes the circumstances under which the AESO must file a needs application, as follows:

**34(1)** When the Independent System Operator determines that an expansion or enhancement of the capability of the transmission system is or may be required to meet the needs of Alberta and is in the public interest, the Independent System Operator must prepare and submit to the Commission for approval a needs identification document that

- (a) describes the constraint or condition affecting the operation or performance of the transmission system and indicates the means by which or the manner in which the constraint or condition could be alleviated,
- (b) describes a need for improved efficiency of the transmission system, including means to reduce losses on the interconnected electric system, or
- (c) describes a need to respond to requests for system access service.

17. In brief, the AESO must file a needs application if it determines that an expansion or enhancement of the transmission system is required to meet Alberta's needs and is in the public interest, in three circumstances: there is a system constraint or condition affecting performance, a need to improve efficiency, or a request for system access service from a market participant.

18. In Decision 2004-087, the Commission's predecessor, the Alberta Energy and Utilities Board (the Board), described the NID process as follows:

It is the Board's view that section 34 contemplates a two-stage consideration of an NID. In the first stage, the Board must determine whether an expansion or enhancement of the capability of the transmission system is necessary to alleviate constraint, improve efficiency, or respond to a request for system access...

If it is determined that expansion or enhancement of the system is required to address constraint, inefficiency, system access requests, or any combination thereof, the Board must then assess, in the second stage, whether enhancement or expansion measures proposed by AESO are reasonable and in the public interest.<sup>1</sup>

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<sup>1</sup> Alberta Energy and Utilities Board Decision 2004-087: Alberta Electric System Operator Needs Identification Document – Southwest Alberta 240-kV Transmission System Development Pincher Creek – Lethbridge Area, Addendum to Decision 2004-075, Application 1340849, October 14, 2004, PDF page 17.

19. Under Section 29 of the *Electric Utilities Act*, the AESO must provide system access service “in a manner that gives all market participants wishing to exchange electric energy and ancillary services a reasonable opportunity to do so.”

20. Section 38 of the *Transmission Regulation* requires the Commission to have regard for a number of factors when considering whether to approve a NID, and Subsection 38(e) creates a presumption of correctness in favour of the AESO’s assessment of the need, as follows:

**38** When considering whether to approve a needs identification document under section 34(3) of the Act, the Commission must

...

- (e) consider the ISO’s assessment of the need to be correct unless an interested person satisfies the Commission that
  - (i) the ISO’s assessment of the need is technically deficient, or
  - (ii) to approve the needs identification document would not be in the public interest.

21. When making a decision on a contested needs application, Subsection 34(3) of the *Electric Utilities Act* states that the Commission has three options: it may approve the application, refer the application back to the AESO with directions or suggestions for changes or additions, or refuse to approve the application.

22. The transmission facility owner (TFO)<sup>2</sup> assigned by the AESO prepares and files the facility application for the Commission’s consideration. The Commission may approve or deny the application, or approve the application subject to terms or conditions.

23. Applications to construct and operate a new transmission facility are made under sections 14 and 15 of the *Hydro and Electric Energy Act*. Section 2 of that act sets out its purposes, which include the provision of economic, orderly and efficient development and operation, in the public interest, of generation and transmission of electric energy in Alberta. Section 17 of the *Alberta Utilities Commission Act* requires the Commission to consider the social, economic and environmental effects of a proposed project when determining whether approval of the project is in the public interest. The Commission described its mandate under Section 17 in Decision 2009-028:

In the Commission’s view, assessment of the public interest requires it to balance the benefits associated with upgrades to the transmission system with the associated impacts, having regard to the legislative framework for transmission development in Alberta. This exercise necessarily requires the Commission to weigh impacts that will be experienced on a provincial basis, such as improved system performance, reliability, and access, with specific routing impacts upon those individuals or families that reside or own land along a proposed transmission route as well as other users of the land that may be affected. This approach is consistent with the EUB’s historical position that the public interest standard will generally be met by an activity that benefits the segment of the public to which the

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<sup>2</sup> EPCOR Distribution & Transmission Inc. is the transmission facility owner in the service territory in the Edmonton area.

legislation is aimed, while at the same time minimizing, or mitigating to an acceptable degree, the potential adverse impacts on more discrete parts of the community.<sup>3</sup>

## **4 Procedural matters**

### **4.1 New evidence filed in argument and argument splitting**

24. In its reply argument, the CCA submitted that EDTI introduced new evidence in argument when it stated that a three-year lead time is required for asset construction and that the applied-for facilities would not come into service until 2023. It also submitted that EDTI's statement, that two-thirds feeder loading has saved ratepayers money over the years by proportionately reducing the number of feeders required to serve load, is not supported by any evidence on the record. Lastly, the CCA stated that other than an EDTI witness explaining how costs are balanced against other considerations in the performance-based regulation (PBR) framework, there was no mention of PBR on the record and therefore no reference on which the AESO could rely to make its statements on the rate impact of this project under PBR.

25. Subsequent to filing reply argument, EDTI filed a motion stating that the CCA split its argument in contravention of the Commission's practices and the principles of procedural fairness. EDTI submitted:

[m]ost of the CCA's argument-splitting appears to reflect additional research by the CCA into the record, or into historical proceedings and decisions of the Commission. This research all purportedly supports the CCA's own case, as expressed in its Final Argument, and therefore should have been presented in Final Argument to provide EDTI with a proper opportunity to reply.<sup>4</sup>

26. EDTI submitted that the CCA's improper reply argument added little to its position that EDTI had not already refuted, and if anything, it was insignificant or misguided. EDTI requested an opportunity to file sur rebuttal only in response to specific submissions on the University of Alberta (U of A) and on EDTI's point-of-delivery (POD) loading criteria. On these points, EDTI submitted that the CCA's submissions were factually wrong and not addressed in any of EDTI's arguments.<sup>5</sup>

#### **4.1.1 Commission findings**

27. Upon review of the record, the Commission is satisfied that the arguments of the AESO and EDTI are based on evidence that is on the record.

28. EDTI's undertaking, filed in response to a request by Commission counsel, described the latest construction schedule and in-service dates for the project. It is clear from EDTI's response that construction of the Garneau Substation upgrades would take three years to complete and that the third transformer would not be in-service until 2023.<sup>6</sup> In other words, as the CCA suggested, this is a staged development. However, it is also EDTI's evidence that the system constraint

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<sup>3</sup> Decision 2009-028: AltaLink Management Ltd. - Transmission Line from Pincher Creek to Lethbridge, Proceeding 19, Application 1521942, March 10, 2009, paragraph 33.

<sup>4</sup> Exhibit 23943-X0470, EDTI Letter AUC re CCA Reply Argument.

<sup>5</sup> Exhibit 23943-X0470, EDTI Letter AUC re CCA Reply Argument.

<sup>6</sup> Exhibit 23943-X0410, Exhibit 410 - by Ms. Wagner to Mr. Watson at T51053.

would not be completely resolved until the last transformer is installed.<sup>7</sup> Consequently, the Commission finds that EDTI did not introduce new evidence in argument.

29. The Commission is also satisfied that EDTI's feeder loading was discussed by EDTI's Travis Shmyr at the hearing. While not an in-depth analysis of whether, and if so, how much money may have been saved by EDTI's two-thirds loading practice, the statement below is a sufficient basis for the high-level argument EDTI advanced.

So that two-thirds is historical. It's something that when the system's built out, that's how it was -- it was managed. Are we comfortable there? I'm not comfortable there. It would give us far more flexibility if we could be at 50, but that means expelling even more capital to do that. And so we've -- we've lived with the two-thirds. We've been able to manage so far, but in order to do that, though, we do rely heavily on the transmission system being solid. And so for that reason, and above all, that's why this project really needs to go ahead, is because we're losing that flexibility. We can't -- we've thought about shifting to 50 percent, but it's a very difficult thing to do when the system's been built out this way over so many years.<sup>8</sup>

30. Lastly, concerning PBR, in addition to the CCA-noted reference to PBR, Kirstine Hull of EDTI discussed PBR and how this project will be funded when she appeared on EDTI's facility applications panel.<sup>9</sup> The Commission therefore finds that Ms. Hull's oral testimony provides a sufficient basis for the AESO's arguments. Further, the effect of a PBR framework on distribution facility owner (DFO) incentives and what projects they bring forward was discussed in the majority's findings of the Provost decision, a decision that was referred to many times in this proceeding.

31. In relation to EDTI's motion alleging that the CCA split its argument, the Commission issued a December 16, 2019 ruling in which it agreed with EDTI that the CCA's reply argument introduced and relied on new facts, struck a portion of the argument related to the U of A of Alberta from the record, and allowed EDTI the opportunity to file additional submissions on its POD loading criteria.<sup>10</sup>

#### **4.2 The accuracy and nature of Bema's evidence and timing of corrections**

32. Both the AESO and EDTI raised concerns over the quality and number of errors in Bema's written evidence and the time it took to correct those errors.

33. The AESO stated that the Bema evidence was in a constant state of flux, and that Bema's position remained unclear at the close of the evidentiary phase of the proceeding. The AESO submitted that Bema's initial evidence contained no single-line diagrams, several errors and included submissions pertaining to the U of A's generation that Bema knew was no longer applicable. The AESO stated that instead of proactively correcting its evidence, Bema waited until the AESO and EDTI had reviewed and analyzed the evidence and issued information requests.

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<sup>7</sup> Transcript, Volume 2, page 204, lines 4-8.

<sup>8</sup> Transcript, Volume 2, page 206, line 25 to page 207, line 16.

<sup>9</sup> Transcript, Volume 4, pages 725-728.

<sup>10</sup> Exhibit 23943-X0471, AUC Ruling on EPCOR's request to file further submissions.

34. EDTI stated that despite Bema's witness's ultimate description of its options as "not particularly strong," Bema and the CCA nevertheless chose to include them in their evidence, requiring EDTI and the AESO to expend considerable time and effort analyzing them, drafting related information requests, and responding to them in reply evidence. EDTI estimated that approximately half of its reply evidence was devoted to addressing and refuting Bema's options.

35. EDTI added that it incurred substantial person hours to address Bema's hypothetical proposals that were based on faulty presumptions and ill-conceived from the outset. EDTI submitted that proposing impractical options and withdrawing them at the eleventh hour is, in fact, the antithesis of regulatory efficiency, and that had Bema taken the care reasonably expected of an independent expert witness, it would have properly analyzed and rejected options 1 to 3 at the outset.

36. In response, the CCA stated that transmission planning is an incremental and iterative process that usually starts with several options that are narrowed down as the process and understanding of the technical issues and requirements evolve. It stated that options 1, 2 and 3 were considered and eliminated by Bema as soon as possible to ensure that other parties would not allocate further resources and time to their review and consideration. The CCA concluded that options 1, 2 and 3 were instrumental in the development and evolution of Option 4 and the distribution load-shifting option.

37. The CCA noted that the errors and oversights were admitted by Bema's witness and that the AESO ultimately relied on the correct numbers in its reply evidence. The CCA submitted that the AESO and EDTI also corrected their evidence and that errors are not unusual in complex and highly technical NID applications.

38. The CCA submitted that Bema filed the record of its conversations with the U of A in a timely manner as part of its responses to information requests. It stated that neither the delay in providing those records nor the delay in filing the blacklined evidence resulted in any prejudice to the AESO or EDTI. The CCA stated that if the AESO had an issue with the approach taken, it could have filed a pre-hearing or hearing motion to address its concerns.

39. The AESO submitted that the presumption of correctness granted to the AESO by the *Transmission Regulation* creates an onus on interveners in a NID proceeding to provide a higher standard of evidence than what may be expected of an intervener participating in a facility application.

40. Both the AESO and EDTI referred to Bema's cost estimates as not sufficiently developed and non-compliant with the requirements set out in AUC Rule 007: *Applications for Power Plants, Substations, Transmission Lines, Industrial System Designations and Hydro Developments*. The CCA submitted that these requirements apply to the applicant and not to interveners and that its estimates were reasonable given its limited resources.

#### **4.2.1 Commission findings**

41. The Commission acknowledges that errors can occur and that the CCA, the AESO and EDTI all made corrections to their evidence. It accepts that because the CCA did not receive information from the U of A until the day its evidence was due, it may not have had the time to appropriately amend it.

42. Moreover, the Commission agrees that the process for interveners to review applicant-proposed transmission options is by necessity iterative; interveners do not have the resources or information to provide detailed cost estimates and asking them to do so would not be an efficient use of the resources they do have. As a result, it is appropriate to grant interveners some degree of latitude.

43. That said, the Commission does not consider that this should result in interveners proposing alternatives that are either not feasible or incorrect with the expectation that applicants will do the work to rule them out. The AESO may consider a number of preliminary options that are ruled out at an early stage of its analysis and are therefore not fully discussed in its application. Accordingly, it may be appropriate for interveners to seek and for the AESO to provide information about those preliminary options to ensure that interveners are not re-treading previously considered and rejected alternatives. It is also incumbent upon intervener experts, however, to carefully consider the accuracy and feasibility of any alternatives before proposing them to ensure that the applicant, the parties and the Commission do not expend unnecessary resources considering alternatives that are clearly not viable.

44. In this proceeding, the Commission is ultimately concerned with the time it took for Bema to correct its errors and to update the information it received from the U of A. It is also concerned with the number and significance of the errors in Bema's evidence. While the Commission appreciates the complexity of the issues in this proceeding and the asymmetry of available information between an intervener and an applicant, a level of diligence and accuracy is nonetheless required. Because there remained material errors in Bema's evidence after the filing of a corrected version, and the number and scale of the errors had substantial impacts on the conclusions in its report, the Commission places little weight on a large part of Bema's evidence in this regard.

45. The Commission considers that Bema's options 1, 2 and 3 could have been ruled out based on the information on the record prior to the filing of intervener evidence. These options did not fully resolve the issues, notably the contingency to Jasper T1.

46. Errors in Bema's cost estimates potentially resulted in these options being presented as less costly than the preferred transmission development, while EDTI's evidence is that they are not. Had the experts exercised the level of diligence expected of them in presenting their evidence, these options would likely not have been advanced in the first place. Setting aside the question of whether the three options were less costly than the applicant's proposed transmission development, they also appear to have higher environmental and social impacts. Ultimately, these options were of no assistance to the Commission and required that the applicants devote significant time and resources responding to and refuting them.

47. Bema's Jasper to Meadowlark option was also considered and ruled out by the AESO. In response to Bema's proposal, the AESO provided additional justification for why this option is inferior to the preferred transmission development. Ultimately, the Commission is not satisfied that the effort expended by the AESO in re-assessing Bema's Jasper to Meadowlark option gave any more certainty to the Commission in ruling out that option.

48. The Commission recognizes that transmission planning is an iterative process but notes that in selecting a preferred and potentially one or more alternatives, the AESO has already conducted its own evaluation of the options. It is not the role of interveners to redo this exercise

but rather to identify errors, issues or gaps with the AESO's process; in some cases, this may include providing alternative options. While the Commission does not expect interveners to consider alternative options with the same level of rigour expected of an applicant, possible alternatives must be carefully and diligently considered in terms of accuracy, feasibility and costing before being formally proposed in a proceeding. The Commission does not consider that Bema demonstrated this level of diligence in proposing its alternative options in this case.

#### **4.3 The AESO/EDTI joint witness panel**

49. The CCA took issue with the AESO and EDTI sitting as a joint witness panel in the hearing, stating that as the independent system operator, the AESO should maintain a degree of independence from market participants.

50. The AESO responded that the seating of witness panels was discussed among counsel and representatives for all parties in advance of the hearing. General consensus was reached, including by the CCA's counsel, for the AESO and EDTI to each seat their own witnesses and to sit the AESO and EDTI panels concurrently.

51. The AESO further submitted that each of the AESO witnesses and the EDTI witnesses sat at separate witness tables, were represented by separate legal counsel and adopted separate evidence. It submitted that each applicant responded for itself and the witnesses for each applicant did not confer with the other. In response to a question posed by the CCA's counsel, the AESO's Rob Davidson confirmed that the AESO and EDTI did not have any joint hearing preparation.

##### **4.3.1 Commission findings**

52. The Commission is satisfied that the AESO and EDTI seating a simultaneous witness panel did not result in any procedural unfairness; the parties sat at separate tables, were represented by separate legal counsel, and adopted separate evidence. In addition, the Commission observes that it directed the concurrent sitting of a single panel, parties appeared to agree to this arrangement prior to the hearing, and that no concerns were raised. The Commission is of the view that the concurrent sitting of the AESO and EDTI witnesses resulted in a more efficient and effective hearing process in this case.

## **5 Needs identification document application**

53. The AESO prepared its NID application in response to a SASR submitted by EDTI as the legal owner of the electric distribution system in the area. EDTI requested system access service to reliably serve growing demand for electricity in the west Edmonton area. This request included a Rate Demand Transmission Service contract capacity increase of 20.3 megawatts at the Garneau Substation.

54. The AESO identified that the need can be met by:

- a. Adding one 72-kV transmission circuit to connect the existing Poundmaker Substation and the existing Meadowlark Substation.
- b. Upgrading the Poundmaker Substation, including adding one 240/72-kV transformer, one 240-kV circuit breaker, and one 72-kV circuit breaker.

- c. Modifying the Meadowlark Substation, including adding two 72-kV circuit breakers.
- d. Upgrading the existing Garneau Substation, including replacing three 72/14.4-kV transformers with three 72/14.4-kV transformers of higher capacity.
- e. Adding or modifying associated equipment as required for the above transmission developments.<sup>11</sup>

55. The AESO directed EDTI to file an application with the Commission for the facilities to meet the need identified and to assist the AESO in conducting a participant involvement program for its NID application.

56. The CCA objected to the NID application and specifically requested that the Commission:

- Deny the application in its entirety because the identified N-1 constraints at the Garneau POD and Meadowlark POD could and should be managed by EDTI through distribution load shifting and other distribution and operational measures.
- In the alternative, approve the application only with respect to the Meadowlark POD component (either as filed by the AESO or as Bema's recommended Option 4) and direct the AESO to consider the use of a spare transformer and/or develop an appropriate milestone (e.g., load-specific) with respect to the Garneau POD N-1 contingency issues.
- In the further alternative, refer the application back to the AESO to fully and adequately consider distribution load shifting, dispatch of distribution-connected generation to address N-1 contingencies, provide additional cost-benefit information and refile the application when the distribution-specific information specified in the Distribution Deficiency Report (DDR) Author's Guide has been provided by EDTI and thoroughly considered by the AESO.<sup>12</sup>

## **5.1 Need for the transmission development**

57. In its DDR included with its SASR, EDTI submitted that a contingency to any of a number of different transmission elements in EDTI's system could overload other elements and result in load that EDTI would be unable to serve, referred to as load at risk or unsupplied load. A single-line diagram of EDTI's system in the project area is shown below:

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<sup>11</sup> Exhibit 23943-X0002.01, Transmission Enhancements in the West Edmonton Area NID, PDF pages 2 and 3.

<sup>12</sup> Exhibit 23943-X0456, CCA Argument – 23943, PDF pages 9 and 10.

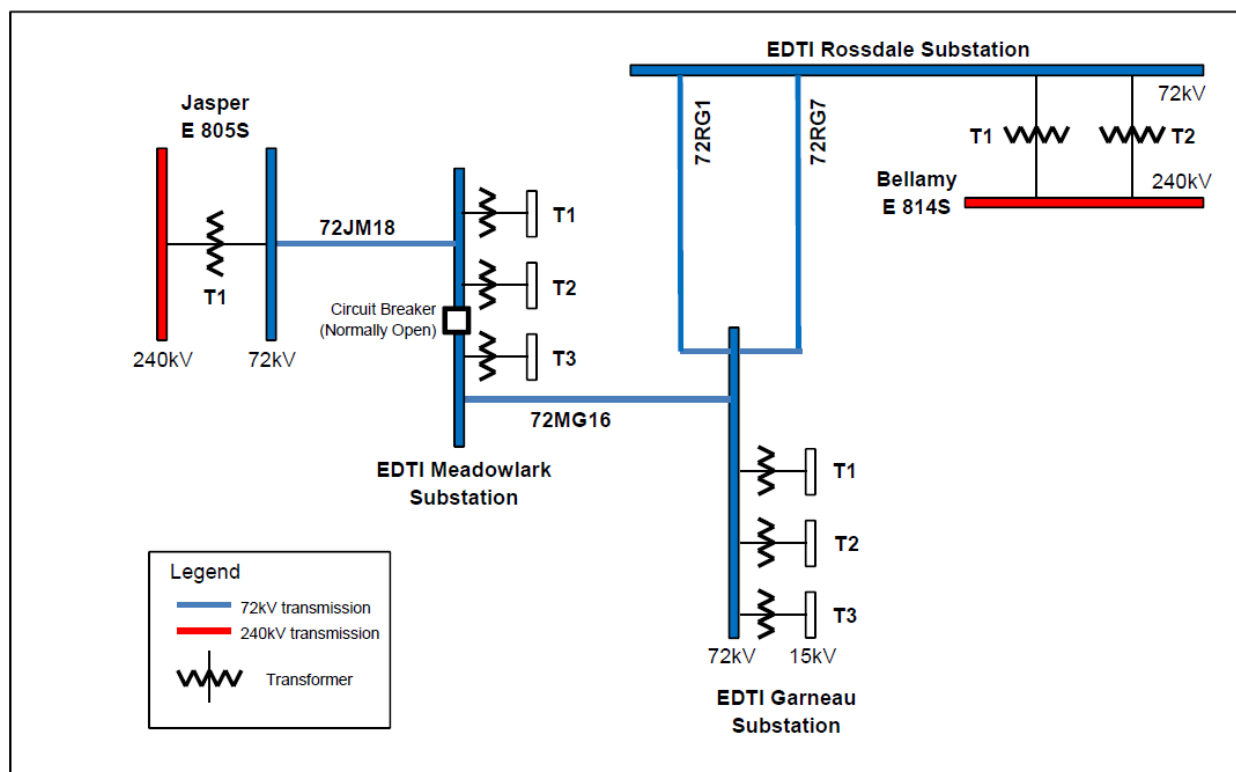


Figure 2. Existing Garneau and Meadowlark area transmission<sup>13</sup>

58. The issues arising from the various contingencies are described as follows:

- a. Garneau Substation is normally served by two underground 72-kV transmission lines, 72RG1 and 72RG7, from Rosssdale Substation, which have summer ratings of 60 megavolt amperes (MVA) and 80 MVA, respectively. EDTI indicated that the peak load in summer 2017 at the Garneau 72-kV bus was 91.3 MVA.<sup>14</sup> EDTI explained that this level of load exceeds the summer capacity of 72RG1 when 72RG7 is out of service, and exceeds the summer capacity of 72RG7 when 72RG1 is out of service. EDTI stated that by 2040, the load on the Garneau 72-kV bus is forecast to reach 115.2 MVA.<sup>15</sup>
- b. Meadowlark Substation contains a normally open breaker such that transformers T1 and T2 are normally served by Transmission Line 72JM18 from Jasper Substation, which is in turn fed by the 240/72-kV transformer at Jasper Substation. Conversely, transformer T3 at Meadowlark Substation is normally served by Transmission Line 72MG16 from Garneau Substation.
  - i. In the event of a contingency to Transmission Line 72MG16, Meadowlark transformer T3 would be restored by closing the normally open breaker on the Meadowlark 72-kV bus which would transfer Meadowlark transformer T3 to Transmission Line 72JM18. EDTI stated that by 2020, the Meadowlark Substation 72-kV summer peak is forecast to reach 63.7 MVA. This would overload Transmission Line 72JM18 by 3.7 MVA. EDTI submitted that the

<sup>13</sup> Exhibit 23943-X0007, Appendix E - DFO Distribution Deficiency Report, PDF page 4.

<sup>14</sup> The 72-kV bus load is a total of the 14.4-kV load plus transformer losses.

<sup>15</sup> Exhibit 23943-X0007, Appendix E - DFO Distribution Deficiency Report, PDF pages 4 and 5.

- Meadowlark Substation 72-kV summer peak is forecast to reach 66.4 MVA by 2040.<sup>16</sup>
- ii. In the event of a contingency to Transmission Line 72JM18 or to transformer T1 at Jasper Substation, the normally open breaker at Meadowlark would have to be closed to restore service to Meadowlark transformers T1 and T2. Based on a forecast of 63.7 MVA in 2020, this would overload Transmission Line 72MG16 by 3.7 MVA. Further, Transmission Line 72MG16 is itself served by transmission lines 72RG1 and 72RG7 meaning the entirety of both Garneau and Meadowlark substations' loads would be served by transmission lines 72RG1 and 72RG7. EDTI submitted that transmission lines 72RG1 and 72RG7 are parallel to each other and have a combined total rating of 130.4 MVA. EDTI stated that by 2020, the Garneau and Meadowlark non-coincident 72-kV summer peak is forecast to reach 157.1 MVA. This would result in an overload of 12.3 MVA to 72RG1 and an overload of 4.8 MVA to 72RG7.<sup>17</sup>
  - c. The Garneau Substation has three 40-MVA transformers. EDTI indicated that the substation's firm transformer capacity, i.e. its N-1 capacity or capacity of the substation to serve load in the event of a contingency to one of those transformers, is 80 MVA. EDTI stated that the peak load that occurred at the substation in the summer of 2017 was 81.6 MVA. Accordingly, if a contingency had occurred to one of the transformers during that time, 1.6 MVA of load would be unable to be served. EDTI submitted that by 2040, load at Garneau is forecast to reach 100.5 MVA which would result in 20.5 MVA of load at risk.<sup>18</sup>
59. These contingencies and the corresponding load at risk, shown as both the likelihood of unsupplied occurring (hours) and the amount of unsupplied load that could occur (average and max MVA), are summarized in the following table:

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<sup>16</sup> Exhibit 23943-X0007, Appendix E - DFO Distribution Deficiency Report, PDF page 6.

<sup>17</sup> Exhibit 23943-X0007, Appendix E - DFO Distribution Deficiency Report, PDF pages 5 and 6.

<sup>18</sup> Exhibit 23943-X0007, Appendix E - DFO Distribution Deficiency Report, PDF page 5.

Table 1. Unsupplied load under contingency by year (assuming no U of A generation available)<sup>19</sup>

Contingency	Limiting Transmission Equipment	Limiting Thermal Rating (MVA)		2014	2015	2016	2017	2018	2021 F
72RG1	72RG7	80	Hours Ave. MVA Max MVA	479 6.77 36.51	443 4.78 20.90	392 6.04 35.28	211 4.60 31.64	115 2.04 6.28	383 4.36 12.72
72RG7	72RG1	60	Hours Ave. MVA Max MVA	2748 11.81 56.51	2690 11.61 40.90	2644 11.37 55.28	2268 9.38 51.64	2129 8.33 26.28	2745 10.75 32.72
72MG16	72JM18	60	Hours Ave. MVA Max MVA	0 0 0	19 1.71 4.88	0 0.00 0.00	0 0.00 0.00	0 0.00 0.00	327 4.42 14.54
72JM18	72RG1 // 72RG7	130.4 (See Note 1)	Hours Ave. MVA Max MVA	101 608 22.34	281 6.23 29.46	76 5.86 22.71	91 4.86 25.46	7 0.99 2.11	584 8.73 27.65
72JM18	72MG16	60	Hours Ave. MVA Max MVA	0 0 0	19 1.71 4.88	0 0.00 0.00	0 0.00 0.00	0 0.00 0.00	327 4.42 14.54
Garneau T1	Garneau T2+T3	80	Hours Ave. MVA Max MVA	112 5.50 20.06	64 2.52 8.54	72 4.90 19.17	23 4.54 16.51	0 0.00 0.00	17 0.98 2.32
Garneau T2	Garneau T1+T3	80	Hours Ave. MVA Max MVA	112 5.50 20.06	64 2.52 8.54	72 4.90 19.17	23 4.54 16.51	0 0.00 0.00	17 0.98 2.32
Garneau T3	Garneau T1+T2	80	Hours Ave. MVA Max MVA	112 5.50 20.06	64 2.52 8.54	72 4.90 19.17	23 4.54 16.51	0 0.00 0.00	17 0.98 2.32
Jasper T1	72RG1 // 72RG7	130.4 (See Note 1)	Hours Ave. MVA Max MVA	101 6.08 22.34	281 6.23 29.46	76 5.86 22.71	91 4.86 25.46	7 0.99 2.11	584 8.73 27.65
Jasper T1	72MG16	60	Hours Ave. MVA Max MVA	0 0.00 0.00	19 1.71 4.88	0 0.00 0.00	0 0.00 0.00	0 0.00 0.00	327 4.42 14.54

\* Note 1: 130.4 MVA is the parallel capacity of 72RG1 and 72RG7. 72RG1 rating is 60 MVA and 72RG7 rating is 80 MVA. However, 72RG1 and 72RG7 are operated in parallel, and under this condition 72RG1 carries ~46% of total load (as dictated by paralleled cable impedances). Consequently, the total load that can be supplied by 72RG1 and 72RG7 in parallel without 72RG1 exceeding its ratings is 130.4 MVA.

60. The AESO concluded that based on the above issues, EDTI does not have a reasonable opportunity to exchange electric energy and ancillary services. The AESO stated that it assessed EDTI's distribution planning criteria and determined that they are not unreasonable and that they align with those of other DFOs. It submitted that the issues identified indicate that EDTI is in violation of its distribution planning criteria, and that load at risk exists, the magnitude of which is predicted to increase over time. The AESO asserted that EDTI cannot reasonably mitigate the violations by load shifting or a distribution-only option. In coming to this conclusion, the AESO also considered that the duration of outages could be significant and that EDTI is restricted in its ability to perform maintenance.<sup>20</sup>

<sup>19</sup> Exhibit 23943-X0185, Appendix G - DFO and TFO Responses, PDF page 36.

<sup>20</sup> Transcript, Volume 1, page 157, line 25 to page 159, line 24.

## 5.2 Urgency of need

61. The AESO submitted that there is a history of unsupplied load and reliability issues in the west Edmonton area dating back to 2010. It stated that the magnitude of unsupplied load that could occur is significant and continues to increase over time. The AESO's Mr. Davidson described the relationship between the amount of unsupplied load and the urgency:

So looking at the urgency of the need, one of the things that we evaluated in the specific Garneau NID is the level of unsupplied load. So that goes to the urgency. So as that unsupplied load drops down -- so as an example, if it's 1 megawatt, maybe the urgency is not quite there. But at 30 megawatts or 50 megawatts, obviously the urgency changes there from a public-interest perspective.<sup>21</sup>

62. EDTI explained that the time to resolve the contingencies could also be significant. It stated that if a fault were to occur to one of the transmission lines at a point under the North Saskatchewan River, repairs would take an estimated minimum of nine to 12 months. EDTI also indicated that it does not have a spare transformer that could be used at Garneau or Jasper substations, and that sourcing a replacement would likely take 12 to 16 months.

63. The Garneau Substation primarily serves the U of A, which operates its own electric distribution system but acts as a customer of EDTI. Included in the university's system are two distribution-connected generators: a 15.5-MVA cogeneration unit and a 31-MVA condensing steam-turbine generator. Because the 15.5-MVA cogeneration unit is tied to the campus heating load, most of the energy from that unit is not available during the summer months.

64. In assessing the existing system and alternatives, the AESO considered the U of A's generators to be the most critical generators to system reliability in the area and consequently assumed that they were offline. This type of assumption is referred to as N-G. EDTI provided justification for the assumption as follows:

... there is no reasonable basis on which to assume that the UofA generation will be available when a transmission constraint occurs, that it could be "spun up" in time to provide support, or that it would remain available for the duration of the transmission constraint. EDTI notes again that a recent failure on EDTI's 72CN10 (a 72 kV underground oil filled pipe type transmission cable of similar construction to the 72RG1 and 72RG7 cables supplying the Garneau substation) took 3,000 hours (125 days) to be resolved and returned to service.<sup>22</sup>

65. The amounts and frequency of unsupplied load under this assumption were shown earlier in Table 1. EDTI also provided estimates for the amount and frequency of load at risk when the U of A units were generating at their historic levels.

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<sup>21</sup> Transcript, Volume 1, page 147, lines 18-25.

<sup>22</sup> Exhibit 23943-X0334.01, EDTI NID Rebuttal Evidence, PDF page 20.

Table 2. Unsupplied load under contingency by year (with actual historically metered U of A generation available)<sup>23</sup>

Contingency	Limiting Transmission Equipment	Limiting Thermal Rating (MVA)		2014	2015	2016	2017	2018	2021 F
72RG1	72RG7	80	Hours Ave. MVA Max MVA	11 1.53 3.69	21 1.59 3.18	34 2.54 4.92	0 0.00 0.00	46 1.30 3.48	231 3.50 9.69
72RG7	72RG1	60	Hours Ave. MVA Max MVA	1192 6.96 23.69	1213 7.32 23.18	1191 7.82 24.92	556 5.52 19.38	1493 7.92 23.48	1959 10.29 29.69
72MG16	72JM18	60	Hours Ave. MVA Max MVA	0 0.00 0.00	19 1.71 4.88	0 0.00 0.00	0 0.00 0.00	0 0.00 0.00	327 4.42 14.54
72JM18	72RG1 // 72RG7	130.4 (See Note 1)	Hours Ave. MVA Max MVA	0 0.00 0.00	45 3.78 10.70	3 0.66 1.32	2 0.98 1.64	0 0.00 0.00	435 8.24 24.76
72JM18	72MG16	60	Hours Ave. MVA Max MVA	0 0.00 0.00	19 1.71 4.88	0 0.00 0.00	0 0.00 0.00	0 0.00 0.00	327 4.42 14.54
Garneau T1	Garneau T2+T3	80	Hours Ave. MVA Max MVA	0 0.00 0.00	0 0.00 0.00	0 0.00 0.00	0 0.00 0.00	0 0.00 0.00	0 0.00 0.00
Garneau T2	Garneau T1+T3	80	Hours Ave. MVA Max MVA	0 0.00 0.00	0 0.00 0.00	0 0.00 0.00	0 0.00 0.00	0 0.00 0.00	0 0.00 0.00
Garneau T3	Garneau T1+T2	80	Hours Ave. MVA Max MVA	0 0.00 0.00	0 0.00 0.00	0 0.00 0.00	0 0.00 0.00	0 0.00 0.00	0 0.00 0.00
Jasper T1	72RG1 // 72RG7	130.4 (See Note 1)	Hours Ave. MVA Max MVA	0 0.00 0.00	45 3.78 10.70	3 0.66 1.32	2 0.98 1.64	0 0.00 0.00	435 8.24 24.76
Jasper T1	72MG16	60	Hours Ave. MVA Max MVA	0 0.00 0.00	19 1.71 4.88	0 0.00 0.00	0 0.00 0.00	0 0.00 0.00	327 4.42 14.54

\* Note 1: 130.4 MVA is the parallel capacity of 72RG1 and 72RG7. 72RG1 rating is 60 MVA and 72RG7 rating is 80 MVA. However, 72RG1 and 72RG7 are operated in parallel, and under this condition 72RG1 carries ~46% of total load (as dictated by paralleled cable impedances). Consequently, the total load that can be supplied by 72RG1 and 72RG7 in parallel without 72RG1 exceeding its ratings is 130.4 MVA.

66. The CCA stated that the proposed facilities would address a relatively rare reliability problem at a very high cost and with major impacts to landowners. It submitted that hours of unsupplied load are poorly understood and interpreted in different ways by different parties. It stated that these are not actual or potential load-shedding events, and that the likelihood of the transmission line failure or of a catastrophic transformer failure is very low. The CCA stated that EDTI has not experienced any catastrophic transmission failures on its system and that despite the fact this project has been in the planning stage since 2010, the impact of doing nothing in the last 10 years appears to have been negligible.

67. The CCA stated that ignoring local generation, both distributed energy resources and the U of A generation in transmission system modelling, creates a worst-case scenario that may be possible, but is highly improbable and unrealistic. Bema submitted that the normal operations of

<sup>23</sup> Exhibit 23943-X0185, Appendix G - DFO and TFO Responses, PDF page 37.

the U of A generators significantly reduce the probability of any lost load and that the AESO and EDTI's assumption that U of A generation is zero is overly conservative.

68. Further, the CCA submitted that the U of A's generation is dispatchable and could be used to address the issues arising from contingencies, and that a contractual agreement, or Transmission Must Run (TMR),<sup>24</sup> could be used to arrange for the U of A to supply generation in the few hours where there might be a shortfall at Garneau. The CCA indicated that neither EDTI nor the AESO had attempted to discuss potential options to alleviate issues with the U of A. EDTI also did not explore opportunities for the U of A to dispatch or voluntarily reduce load.

69. Bema contacted the U of A to discuss the potential for its generators to provide emergency support. Bema spoke with the U of A's manager of electric utility operations who indicated that the U of A was supportive of the NID application and stated that there are times when both generators are unavailable and times when it has had to curtail campus load. The U of A's representative stated that based on this, interest in providing emergency backup was unlikely. Bema also discussed the potential of adding generation at the U of A but the representative indicated this was not something the university was able to pursue.<sup>25</sup>

70. The AESO stated that "TMR can only be used in areas where there is limited potential for load growth and where the cost of the non-wires solution is materially less than the life-cycle cost of the transmission wires solution."<sup>26</sup> It indicated that the west Edmonton area is expected to grow and that there is the potential for large load additions at the U of A. It also submitted that the cost of TMR would be non-competitive because the U of A would be a single-source provider.

71. The CCA stated that the load at Garneau Substation, and therefore the load at risk, had decreased from 2014 to 2018 and that the projected level of growth for natural load in the project area is 0.25 per cent per year. It stated that the primary driver for the Garneau transformer replacements is the discrete load additions at the U of A which are highly uncertain, extend into the mid-2030s, and may not materialize. It added that because the U of A provided no financial or contractual commitments for the proposed load projects, there is no incentive for it to provide an accurate load forecast.

72. EDTI stated that although there is no formal mechanism for EDTI to verify the project load additions made by the U of A, it uses past performance to validate the confidence of projected load additions. EDTI is aware of at least one project, the Dentistry and Pharmacy building, going ahead.<sup>27</sup>

73. EDTI indicated that the decrease in load in 2018 below what it had forecasted was a result of lower than normal temperatures at peak loads. EDTI submitted that it plans needed capacity based on the 90th percentile of ambient temperatures and stated that the ambient

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<sup>24</sup> Generation that is required to be online and operating at specific levels in parts of the province's electricity system to compensate for insufficient local transmission infrastructure relative to local demand. TMR is used to ensure reliability until adequate transmission infrastructure is built in that local area.

<sup>25</sup> Exhibit 23943-X0324, CCA IR Responses to AESO - 23943, PDF pages 18 and 19.

<sup>26</sup> Exhibit 23943-X0458, AESO Written Argument, PDF page 27.

<sup>27</sup> Transcript, Volume 1, page 53, line 22 to page 54, line 1 and page 56, lines 23-25.

temperature at Garneau and Meadowlark substations during peak conditions in 2018 were around the 10th percentile.<sup>28</sup>

74. In its reply evidence, EDTI indicated that peak load at Garneau had increased in 2019 such that there were 61 hours above 80 MVA (the N-1 capacity of the substation), an increase from what is forecast in 2021. EDTI provided the following figure showing load at Garneau Substation from May to August 2019.

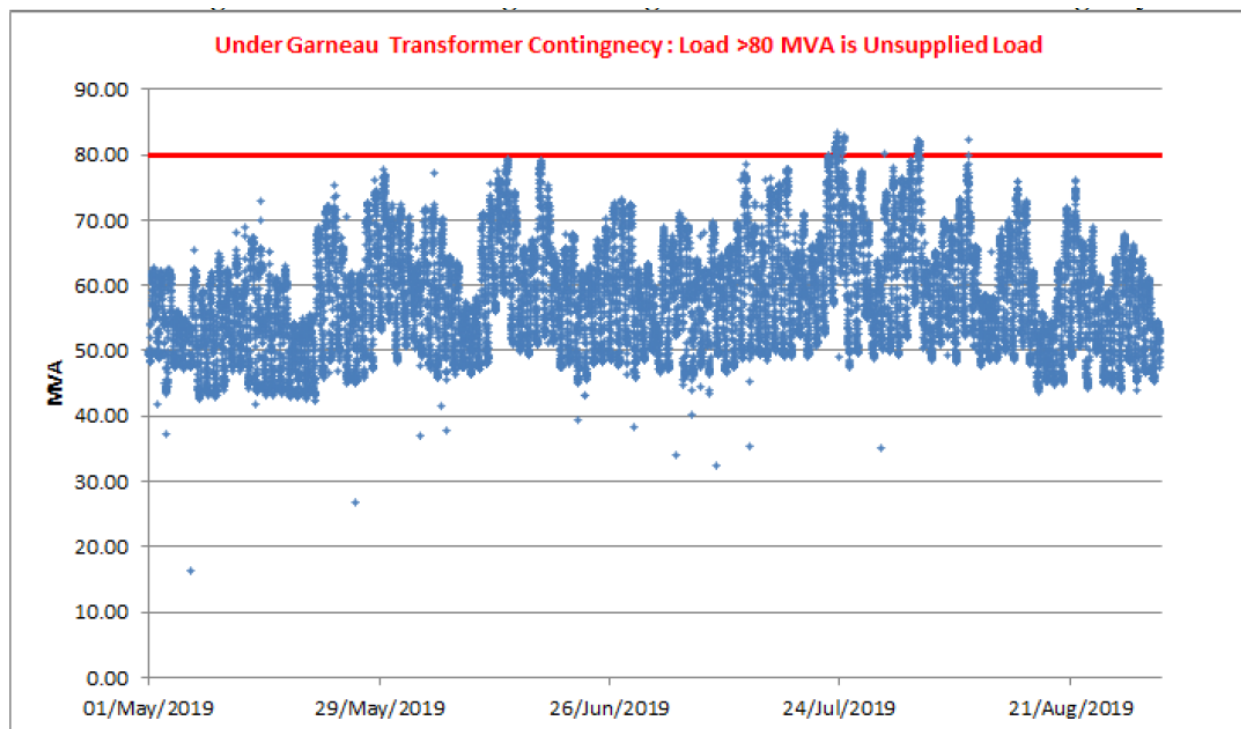


Figure 3. 2019 May to August Garneau 15-kV load (with no U of A generation available) and limiting transmission rating following Garneau transformer contingency<sup>29</sup>

75. EDTI also provided a forecast of the number of hours where load would exceed the N-1 capacity of Garneau Substation in 2023 and 2025.

Table 3. Garneau transformer contingency – hours of exposure to loss of load in 2023 and 2025<sup>30</sup>

Contingency	Limiting Transmission Equipment	Limiting Thermal Rating (MVA)		If No U of A Generation Available		If Historically Metered U of A Generation Available	
				2023 F	2025 F	2023 F	2025 F
Garneau T1	Garneau T2+T3	80	Hours	148	242	66	125

<sup>28</sup> Exhibit 23943-X0185, Appendix G - DFO and TFO Responses, PDF page 72.

<sup>29</sup> Exhibit 23943-X0334.01, EDTI NID Rebuttal Evidence, PDF page 25.

<sup>30</sup> Exhibit 23943-X0334.01, EDTI NID Rebuttal Evidence, PDF page 24.

76. At the hearing, EDTI updated the expected in-service date of its facilities in an undertaking:

Table 4. Updated facility in-service dates<sup>31</sup>

Stage #	Description	Planned In-Service Date as filed	Revised In-Service Date based on receiving P&L by end of February 2020
1	Modifications to the Poundmaker and Meadowlark substations and construction of the new 72PM25 transmission line	June 30, 2020	July 30, 2021
2	Replacement of Garneau transformer #2	June 30, 2020	July 30, 2021
3	Replacement of Garneau transformer #1	September 30, 2021	October 30, 2022
4	Replacement of Garneau transformer #3	September 30, 2022	October 30, 2023

77. EDTI stated that if the project is approved, the third transformer will not come into service until 2023, and that it is not the 2021 unserved load that is relevant, but the forecast unserved load for 2023. EDTI submitted that by that time, load at risk at Garneau Substation is forecast to grow to 8.8 MVA, far in excess of EDTI's load-shifting capabilities. EDTI stated that load at risk would grow to 23.6 MVA by 2040.<sup>32</sup>

78. EDTI indicated that the load served by Garneau includes the U of A, schools, LRT stations, police and EMS stations, and hospitals. EDTI stated that the public safety and environmental sensitivities due to an outage of 72RG1, 72MG16, 72JM18, Jasper transformer T1 or any of the Garneau transformers would be relatively low if the outage lasted less than 36 hours because it could respond to these contingencies using distribution circuit switching and the emergency ratings of feeders. However, the emergency ratings could only be used for 36 hours and a longer transmission outage would result in extended periods of customer load interruption with corresponding impacts to public safety. EDTI submitted that a contingency to 72RG7 would present a greater risk to public safety due to its higher capacity.<sup>33</sup>

79. The CCA submitted that references to critical loads at risk ignore the fact that most of these critical loads have emergency backup options and that the U of A would likely have the flexibility to curtail non-critical loads.

80. As a further example of the urgency of the need, EDTI noted that due to loading restrictions, it is becoming more difficult to plan outages to perform preventative and corrective maintenance on its facilities in the area. It identified specific instances where it had to cancel or delay testing or maintenance, and submitted that reduced maintenance will lead to an increased likelihood of failures.<sup>34</sup> The AESO's Maz Mazadi testified that the fact that EDTI cannot obtain an outage to conduct maintenance, signals that there is a need for development.<sup>35</sup>

<sup>31</sup> Exhibit 23943-X0410, Exhibit 410 - by Ms. Wagner to Mr. Watson at T51053.

<sup>32</sup> Exhibit 23943-X0457, EDTI Final Argument, PDF page 28.

<sup>33</sup> Exhibit 23943-X0185, Appendix G - DFO and TFO Responses, PDF pages 33 and 34.

<sup>34</sup> Exhibit 23943-X0185, Appendix G - DFO and TFO Responses, PDF pages 6 and 13.

<sup>35</sup> Transcript, Volume 2, page 197, line 15 to page 198, line 2.

81. Dr. Mazadi described the need to provide operators with enough flexibility to respond to issues:

So when we talk about operational horizon, we are talking about the matters that happens every day in realtime. An operator, when they are operating the system, they have to have some room available to be able to operate the issues. Let's assume there is an overload or there is a loss, unsupplied load situation, they have to have some room to manoeuvre the loads such that there is no reliability criteria violation or there is no load shed. That room, we have to consider it in our planning time that they need it.<sup>36</sup>

82. Bema's Dan Levson described continual debates between operators and planners, where the operators want more flexibility whereas planners need to be cost conscious. Naval Tauh, also of Bema, testified that the planning and operations hazards are interlinked. He indicated that to optimize costs, operational measures can be used in some cases to defer and delay or even eliminate the need for transmission development.

### 5.2.1 Probabilistic assessment and cost-benefit analysis

83. Mr. Levson testified that Alberta is well above average in costs and that according to SAIDI and SAIFI statistics,<sup>37</sup> Alberta's reliability is also well above average. In his view, this suggests we are not at the optimal point of the cost reliability curve and that one of the key reasons for this is the amount of pre-building that is done in anticipation of growing demand and dealing with operating issues. Mr. Tauh stated that to achieve cost reductions it may be necessary to take on slightly more risk. He submitted that this would not be a lot of risk and in fact would maintain the same level of contingency risk, "just tweaking on the edge to optimize our costs."<sup>38</sup>

84. Bema submitted that EDTI's Distribution Planning Criteria and the AESO's TPL-002 Standard are deterministic approaches and described the advantages and disadvantages of deterministic planning as follows:<sup>39</sup>

Deterministic Planning	
Advantages	Disadvantages
<ul style="list-style-type: none"> <li>Deterministic planning is well understood and widely applied across North America.</li> <li>The only external information required is load requests from customers. Once utilities incorporate this into their load forecasts, they have the necessary data and models to complete the planning.</li> </ul>	<ul style="list-style-type: none"> <li>Deterministic planning does not account for probability; therefore, the decision is based on consequences only and not risk.</li> <li>Deterministic planning has limitations when applying cost/benefit analysis. Consequently, a more expensive alternative may be chosen when the risk is less than an acceptable threshold.</li> </ul>

<sup>36</sup> Transcript, Volume 2, page 194, line 15 to page 195, line 1.

<sup>37</sup> System Average Interruption Duration Index (SAIDI) and System Average Interruption Frequency Index (SAIFI) are reliability indicators commonly used by electric power utilities.

<sup>38</sup> Transcript, Volume 2, pages 329, line 9 to page 330, line 9.

<sup>39</sup> Exhibit 23943-X0294, Proc 23943 West Edmonton NID CCA Evidence - Public – Redacted, PDF page 11.

<ul style="list-style-type: none"> <li>• Deterministic planning identifies the “worst case” contingency and corresponding consequences.</li> <li>• For any recommended alternative, deterministic planning ensures that the “worst case” is accounted for and mitigated.</li> </ul>	<ul style="list-style-type: none"> <li>• Deterministic planning does not account for customer impact (cost) or the mean time to restore the system.</li> </ul>
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85. Bema stated that an alternate approach is probabilistic planning which includes factors such as probability of contingencies, customer impact and cost, as well as customer expectations or regulatory requirements. It described the advantages and disadvantages of probabilistic planning as follows:<sup>40</sup>

Probabilistic Planning	
Advantages	Disadvantages
<ul style="list-style-type: none"> <li>• Probabilistic planning is a more holistic approach that takes into account a wider range of factors.</li> <li>• Probabilistic planning provides a more accurate picture of the risk.</li> <li>• Probabilistic planning incorporates the effects on utility customers providing insight into the cost/benefit crossover point.</li> <li>• Probabilistic planning can address the question, “Is the problem worth solving?”</li> </ul>	<ul style="list-style-type: none"> <li>• Probabilistic planning is more complex and may require more judgement.</li> <li>• Probabilistic planning requires more external information, which many utilities do not presently have processes to collect and that many customers do not know themselves.</li> <li>• Probabilistic planning may show that the risk of the “worst case” contingency is below the set threshold and since the probability of any contingency is not zero, there is a possibility it may happen.</li> </ul>

86. The CCA argued that in response to the Provost and Fincastle decisions,<sup>41</sup> the AESO should have included information on whether the benefit of the proposed upgrades and improvement in reliability are justified given the costs of the proposed transmission development. It stated that despite the AESO revising its application in response to those decisions, the AESO did not include a cost-benefit analysis.

<sup>40</sup> Exhibit 23943-X0294, Proc 23943 West Edmonton NID CCA Evidence - Public – Redacted, PDF pages 11 and 12.

<sup>41</sup> Decision 23339-D01-2019: Alberta Electric System Operator, AltaLink Management Ltd. - Provost Reliability Upgrade Project, Proceeding 23339, Applications 23339-A001 to 23339-A006, January 22, 2019; Decision 23393-D01-2019: Alberta Electric System Operator Needs Identification Document Application and AltaLink Management Ltd. Facility Application – Fincastle 336S Substation Upgrade, Proceeding 23393, Applications 23393-A001 and 23393-A002, February 14, 2019.

87. The AESO submitted that it implemented the guidance of Vice-Chair Michaud in the Provost decision, which stated that the AESO need not conduct a comprehensive probabilistic analysis for every SASR-driven NID, but should use its discretion to assess in what circumstances and to what degree some level of probabilistic analysis should be used in determining whether a project is needed and in the public interest. It stated that it assessed whether to do a detailed cost-benefit analysis and determined that the need for this project is clear and urgent and that the consequences of not proceeding are significant.

88. At the hearing, Dr. Mazadi testified that planners conduct a qualitative cost-benefit analysis even if it is not always obvious:

Cost-benefit is part of it. Looking at the benefit of the project is always part of our alternative selection for a project. And one of the alternative is do nothing. That's one of the alternative. Yes, we may not always put it on the record, but it is one of the things that always we think.<sup>42</sup>

89. The CCA stated that analysis in a planner's head can not be considered or relied on as evidence. Bema's Mr. Levson expressed the issues with this as follows:

First question a good planner always asks is should we be doing anything. Status quo. Dr. Mazadi recognized that. That's the very first question. And interestingly enough on this point, he says that planners are doing this all the time in their head; right? He says we do cost-benefit all the time, we just don't write it down. We don't put it on paper. We don't -- in other words, we don't put our logic down in a way that people can scrutinize it. Well, I don't think that's fair to the rest of us. If it's going on in their heads and they are doing cost-benefit studies, why not share with us the kinds of things that they're looking at and why have they arrived at the conclusions that they have. I really believe that what he said is true by the way. I believe that good planners do exactly that. They are really doing cost benefits in their mind, but they're not necessarily letting it be vetted by others.<sup>43</sup>

90. Bema provided a cost-benefit analysis that indicated that the Garneau upgrades have an extremely low cost-benefit ratio where the costs of the upgrades are 223,804 times the benefits they would provide. The CCA cited that there is no requirement for 100 per cent reliability in the province and suggested that this is a project with significant costs but only minor improvements to reliability. The CCA added that such projects were a focus of the dissenting opinion in the Provost and Fincastle decisions.

91. EDTI took issue with a number of the inputs Bema used in its cost-benefit analyses. It submitted that Bema's numbers were not representative of a true worst-case unplanned outage, that it did not account for age and loading as factors, and that no rationale was provided for some of its numbers.

92. The AESO stated that the high-level cost-benefit analysis conducted by Bema, which Bema itself admitted was illustrative, "is inadequate, simplistic and not fit-for-purpose."<sup>44</sup> The AESO stated that it will launch an initiative in 2020 that will assess the value, merits, impacts and

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<sup>42</sup> Transcript, Volume 1, page 125, lines 4-11.

<sup>43</sup> Transcript, Volume 2, page 333, line 24 to page 334, line 17.

<sup>44</sup> Exhibit 23943-X0458, AESO Written Argument, PDF page 14.

potential framework for probabilistic assessment and quantitative cost-benefit analysis. The AESO stated:

Implementing probabilistic planning and cost benefit analysis are likely to require new or enhanced analytical processes, criteria, measures or performance objectives, data and competencies affecting the Alberta Utilities Commission, DFOs, TFOs and the AESO. As a result, engagement with the industry to determine the value, merits, impacts and appropriate framework for probabilistic planning and cost benefit assessments is required.<sup>45</sup>

93. The AESO argued that it is not appropriate to delay this NID to conduct such analysis as probabilistic planning and cost-benefit analysis are complex issues beyond the scope of this application.

94. According to Mr. Levson, the AESO's initiative is not quick enough, could take two or three years and by then, multiple large projects will have passed by. He suggested:

... start with something now, start with something small and then do your bigger proceeding later, and then you've got maybe some live experience to inform you when you go into that year-long process, as you've got some live cases to be -- to inform you that are real.<sup>46</sup>

95. Mr. Levson indicated that an initial high-level assessment could be done to determine if action is required and that further analysis could be performed if a project's need is in the grey area.

96. The AESO's Mr. Davidson stated that the need for this project is not "on the margin," that the need is clear, and that the consequences of not proceeding or of delaying would be significant to customers in the area.<sup>47</sup>

### 5.3 Alternatives considered

97. In its DDR, EDTI considered distribution alternatives to resolve the issues. EDTI considered distribution upgrades that would shift load from Garneau to Rosedale to reduce Garneau's peak demand below its 60 MVA N-1 transmission capacity limit. This alternative included building new 14.4-kV feeders from Rosedale to Garneau. EDTI indicated that this alternative would resolve the concerns regarding N-1 transmission capacity at Garneau until 2033 but would not provide adequate N-1 72-kV transmission capacity to Meadowlark; i.e., would not resolve the overloads to 72JM18 or 72MG16 under N-1. Further, EDTI stated this would involve serving the U of A main campus from both Garneau and Rosedale which would result in increased short-circuit levels to unsafe conditions and overloads to Garneau feeders. It would also limit the ability of Rosedale to accommodate long-term growth and would strand 24 MVA of existing transformer capacity at Garneau.<sup>48</sup>

98. EDTI also considered a hybrid option that included a third 72-kV transmission line from Garneau to Rosedale and using distribution upgrades to reduce Garneau's peak demand below its 80 MVA N-1 transformer capacity limit. This would also include building new feeders from

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<sup>45</sup> Exhibit 23943-X0333.01, AESO Reply Evidence - 2019-10-21, PDF page 17.

<sup>46</sup> Transcript, Volume 2, page 338, lines 13-18.

<sup>47</sup> Transcript, Volume 1, page 120, lines 1-6.

<sup>48</sup> Exhibit 23943-X0007, Appendix E - DFO Distribution Deficiency Report, PDF pages 27-29.

Rossdale to Garneau but would resolve the Garneau N-1 issues until 2040. However, it would still not provide adequate N-1 72-kV transmission capacity to Meadowlark.<sup>49</sup> At the hearing, EDTI explained that the technical issues in supplying the U of A that would arise for the purely distribution alternative would also be issues for this alternative.<sup>50</sup>

99. In its evidence filed on behalf of the CCA, Bema proposed two transmission development alternatives. It later identified additional options (including what became its preferred alternative) in its information responses and in an amendment to its evidence. At the hearing, Bema rescinded three of the transmission alternatives it had previously proposed. Accordingly, these alternatives are not discussed further. Bema's remaining transmission alternative (Option 4) proposed to:

- a. Construct a 72-kV transmission line from Jasper Substation to Meadowlark Substation.
- b. Install a 240/72-kV transformer, a 240-kV circuit breaker, and a 72-kV circuit breaker at Jasper Substation.
- c. Install a 72-kV circuit breaker at Meadowlark Substation.
- d. Procure a 72/14.4-kV, 40-MVA transformer that would be used as a system spare.

100. EDTI stated that a Jasper to Meadowlark 72-kV transmission line option was one of the first configurations considered by EDTI and the AESO, but was rejected because of the inability to obtain land adjacent to the Jasper Substation and the high costs and system constraints associated with reconfiguration within the substation.<sup>51</sup> In its reply evidence, EDTI provided a cost estimate for the Jasper to Meadowlark transmission line which indicated that it would be more expensive than the proposed Poundmaker to Meadowlark transmission line. EDTI provided further evidence on the congested nature of the substation and stated that adding a new transformer would require "very unorthodox solutions" as the node is currently occupied by a capacitor bank. At the hearing, EDTI's Catherine Wagner stated that it would require an extremely high bus and that she was "not sure how we would even feasibly do it in the substation."<sup>52</sup>

101. The AESO submitted that the use of a system spare transformer to respond to a contingency to one of the Garneau transformers would not adequately respond to the distribution deficiency because there would be potential unsupplied load during the time it would take to replace a failed transformer.

102. EDTI does not consider Bema's proposal of purchasing a spare transformer to be viable because the Garneau transformers have unique impedance ratings and a specific configuration to allow for sound mitigation, and any spare transformer would have to meet those unique technical requirements. To install the spare transformer at Garneau Substation, the failed transformer would have to be removed which would involve removing the sound containment, undressing the transformer, draining the oil and preparing the transformer for transport. The spare transformer would also have to be prepared for transport, transported to Garneau, placed on the pad, dressed,

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<sup>49</sup> Exhibit 23943-X0007, Appendix E - DFO Distribution Deficiency Report, PDF page 30.

<sup>50</sup> Transcript, Volume 2, page 211, line 14 to page 212, line 25.

<sup>51</sup> Exhibit 23943-X0334.01, EDTI NID Rebuttal Evidence, PDF page 43.

<sup>52</sup> Transcript, Volume 2, page 213, lines 23-25.

filled with oil and tested before it could be energized.<sup>53</sup> EDTI initially suggested this would take a minimum of two to three weeks but updated its estimate at the hearing to six to eight weeks, based on communications with EDTI operations and project management staff.<sup>54</sup>

103. The CCA also raised distribution load shifting as an alternative to the proposed transmission developments and took issue with the fact that these options were not more fully considered by EDTI and the AESO.

104. The CCA submitted that removing 6.5 MVA of load from Meadowlark would alleviate load at risk as a result of a Jasper T1 or Transmission Line 72JM18 contingency. It stated that no detailed information was filed on the option of distribution load shifting from Meadowlark.

105. The CCA asserted that EDTI does not appear to understand where and how load would be shifted from Garneau under N-1 contingency conditions, that EDTI failed to conduct a comprehensive distribution assessment, and that there is no information in the application on existing and potential distribution feeders, spare capacity, or where load can and cannot be shifted. It submitted that EDTI may have the capacity to shift load from Garneau to Rossdale using existing or two new distribution feeders that EDTI had contemplated. Mr. Tauh testified that it was not clear whether EDTI only looked at the existing system or whether it explored what distribution lines could be built or what switches could be put in place to redistribute load.<sup>55</sup>

106. EDTI explained that its feeders are designed to be loaded to 66 per cent, which is higher than other DFOs, such as ENMAX, that load their feeders to 50 per cent. As a result, EDTI's feeders are already highly loaded and it has less flexibility to be able to shift load. Where other utilities can shift the entire load of one feeder to another, EDTI requires a feeder's load to be split among two feeders.<sup>56</sup>

107. Trent Loga testified that EDTI explored distribution load shifting from Meadowlark as an option but that the Petrolia and Jasper substations do not have spare capacity. In fact, the proposed transmission developments were intended to allow load to be shifted from Jasper to Meadowlark.<sup>57</sup>

108. The AESO submitted that the CCA neglected to consider the limitations of transmission lines 72RG1 and 72RG7 in its assessment of shifting load from Meadowlark. These limitations would require that 26.7 MVA as of 2020, or 51.2 MVA as of 2040 be shifted from Meadowlark to alleviate overloads to those transmission lines. EDTI noted that these magnitudes of load are typically associated with new POD substations.

109. EDTI submitted that it considered a distribution alternative in its DDR that included shifting load from Garneau to Rossdale, but rejected this alternative for a number of technical reasons. EDTI stated that this alternative was substantially representative of distribution load-shifting options to reduce load at Garneau and that it would have been duplicative to

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<sup>53</sup> Exhibit 23943-X0334.01, EDTI NID Rebuttal Evidence, PDF page 28.

<sup>54</sup> Exhibit 23943-X0457, EDTI Final Argument, PDF page 41.

<sup>55</sup> Transcript, Volume 2, page 324, lines 11-17.

<sup>56</sup> Transcript, Volume 2, pages 200, line 8 to page 201, line 10.

<sup>57</sup> Transcript, Volume 1, page 70, lines 9-18.

include other distribution-only solutions because the effect of other load transfers on Garneau loading would be the same.<sup>58</sup>

110. EDTI stated that maximizing feeder utilization was one of the first actions it took to resolve the issue, as demonstrated by its shifting 10.2 MVA of load from Garneau to Rosedale in 2010, prior to it filing its SASR with the AESO. EDTI explained that Rosedale is the only adjacent substation with available capacity and that there is only a single feeder, with only 1.0 MVA of non-emergency capacity available, that could be utilized for load shifting.

#### **5.4 Distribution planning criteria**

111. The CCA is concerned that EDTI's distribution planning criteria does not align with other DFOs in Alberta by not relying on spare transmission capacity at adjacent PODs, and submitted that this practice resulted in EDTI developing extra capacity at individual PODs. The CCA referenced decisions on ENMAX, FortisAlberta Inc. and ATCO Electric Ltd. applications that made it clear that those DFOs assessed whether service could be restored from adjacent PODs. It added that the installation of the new transformers at Garneau will result in 180 MVA of capacity but that load is forecast to grow to only 103.6 MVA by 2040 which, according to the CCA, would result in 73.7 per cent of extra capacity to address the N-1 contingency.

112. The CCA stated that EDTI's loading of its feeders to 66 per cent also does not align with other Alberta DFOs who utilize 50 per cent loading. It suggested that ENMAX's practice of loading feeders to 50 per cent is specifically designed to allow switching.<sup>59</sup> The CCA submitted that EDTI's higher loading causes it to rely heavily on the transmission system.<sup>60</sup>

113. EDTI stated that its approach is consistent with what other DFOs do in planning their systems and that the record demonstrates that EDTI relies on spare transmission capacity at adjacent PODs. In this regard, EDTI outlined its planning processes in response to a Commission information request:

In the event that the system planning assessment identifies a deficiency related to POD loading, EDTI will first consider the capacity that can be provided from nearby PODs through distribution system switching to address the deficiency. If spare capacity at nearby PODs is available, EDTI will complete distribution load transfer to address the identified deficiency to the extent possible.<sup>61</sup>

114. The CCA also argued that EDTI's DDR submitted to the AESO and filed as part of the NID application does not meet the requirement of the AESO's DDR Author's Guide because it does not include distribution-only options such as load shifting and distribution upgrades which might have resolved the need identified. The CCA said the report does not include a single-line diagram of EDTI's distribution system or information about existing or new distribution feeders such as the maximum or spare capacity, and submitted that the NID application should be considered technically deficient on this basis.

115. The AESO stated that the author's guide was not filed on the record in this proceeding and that the CCA did not question the AESO about the guide in information requests or at the

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<sup>58</sup> Exhibit 23943-X0467, EDTI Reply Argument, PDF page 22.

<sup>59</sup> Exhibit 23943-X0465, CCA Reply Argument - 23943, PDF page 35.

<sup>60</sup> Exhibit 23943-X0456, CCA Argument - 23943, PDF page 38.

<sup>61</sup> Exhibit 23943-X0207, Attachment EDTI - AESO-AUC-2019JUL18-001-004, PDF page 5.

hearing; further, it said that the guide is a guidance document and, as the author of the document, the AESO exercised its discretion and expertise in reviewing EDTI's DDR and sought further information from EDTI as required.

116. EDTI echoed the AESO's concerns with the CCA raising this argument late in the proceeding. It argued that the CCA's arguments are not founded on evidence on the record and as a result EDTI did not have the opportunity to provide rebuttal evidence specific to this issue.

## **5.5 Commission findings**

117. The AESO's preferred transmission solution is comprised of two transmission developments:

- The replacement of three transformers with higher capacity transformers at Garneau Substation (the Garneau upgrades), to respond directly to the load at risk in the event of a contingency to any of the three Garneau transformers.
- The proposed 72-kV transmission line from Meadowlark to Poundmaker, and alterations to Meadowlark and Poundmaker substations, to respond to all the other contingencies (72RG1, 72RG7, 72JM16, 72MG16 and Jasper T1).

118. EDTI took issue with the CCA's suggestion that the two developments address two separate needs. It asserted that the Meadowlark and Garneau substations are adjacent and directly connected to one another and that some contingencies affect both substations.

119. The Commission emphasizes the importance of holistic needs assessment and considers that the long-term public interest is served by a comprehensive assessment of the issues driving need in a particular region. The interrelatedness of the needs identified by the AESO in the west Edmonton area is supported by the evidence that an increase in load at Garneau would exacerbate the issues driving both transmission developments and would accordingly increase their urgency. Because different alternatives considered by EDTI would have resolved different combinations of the contingencies, this is further evidence that the need for these projects is interlinked.

120. Notwithstanding the connection between the two transmission developments, the Commission considers them to be distinct and separable; one could proceed without the other. Based on the amount of load at risk and likelihood of unsupplied load, among other factors, it is also evident that the need for the Meadowlark to Poundmaker transmission line is more urgent than the Garneau upgrades. Before discussing the need for each development, the Commission will first address the reasonableness of the AESO's decision to propose these two projects together in one NID application.

121. In assessing whether an enhancement or expansion of the transmission system is required, the AESO commonly considers two questions: first, whether there is a need to expand or enhance the transmission system and second, the best manner in which to do so.

122. With respect to the first question, it is clear to the Commission that it was appropriate for EDTI's SASR to include, and therefore for the AESO to consider, all related system issues, rather than looking at a single contingency or single substation on a stand-alone basis.

123. Having satisfied itself of the need for system enhancement, the AESO identified two transmission developments as its preferred solution to respond to that need. If the AESO had deemed one of those developments to be less urgent, it could have filed it as a separate NID or assigned a milestone to the less urgent development to better account for the relative urgency of the developments. In this case, the AESO determined both developments to be urgent and filed them together in one NID. As further outlined below, the Commission finds that it was appropriate to do so, that both developments are needed and that the proposed timing of the developments is reasonable.

124. The Commission is nevertheless concerned with the potential for a less urgent project to become accelerated by being attached to a more urgent one. At the hearing, Mr. Shmyr described how EDTI selects which projects move forward:

I think in the context of the PBR framework that we're under, one of the first things we do is we look at all our deficiencies on the system. From there we'll prioritize that or we'll find solutions for a lot of those issues, but they don't necessarily come through as projects.

When we select the ones that are the most critical in our eyes, we weigh that against other factors that we have to deal with under that PBR structure.

And so when you're weighing out lifecycle replacements versus system enhancements and so on, that is looked at very carefully by leadership before we put anything forward as a project.

In this case, this one rose very high to the top when you look at the customers that we're serving and so on.

So we weigh the customers that are affected by this project, the cost of the project, some of the environmental considerations that are tied to it before we move forward as putting -- submitting a SASR to the AESO.<sup>62</sup>

125. While for the most part the Commission finds this to be a prudent approach, at the time EDTI filed its SASR, the proposed transmission developments would not yet have been determined; consequently EDTI would have been unable to appropriately prioritize the individual developments within the context of PBR. It would have greatly assisted the Commission if EDTI had considered these as separate projects and assessed the level of urgency of each development on a stand-alone basis.

126. Moreover, in the several instances where the AESO and EDTI discuss the urgency of the overall project, they generally reference the most urgent issues that would be rectified by the Meadowlark to Poundmaker transmission line rather than the Garneau upgrades. In addition to Mr. Shmyr's comments above, the Commission notes Mr. Davidson's comments about the need for the project not being "on the margin".<sup>63</sup> While the Commission considers that the need for the Meadowlark to Poundmaker transmission line is not "on the margin," it would not describe the Garneau upgrades in the same way.

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<sup>62</sup> Transcript, Volume 1, page 180, line 10 to page 181, line 5.

<sup>63</sup> Transcript, Volume 1, page 120, lines 1-6.

127. The Commission finds that subsequent to determining its preferred transmission solution, the AESO should then have assessed the required timeline for each of the two transmission developments comprising that solution. Given the PBR framework within which the DFO operates, it is important that the AESO include the DFO in this step so that it can contribute to the proper prioritization of projects.

128. The nature of PBR gives the Commission some comfort that DFOs will properly prioritize capital projects. In this regard, EDTI could have raised concerns with moving forward with the Garneau upgrades on the same timeline as the transmission line if it found the capital was better spent elsewhere. EDTI did not do so. Further, as the proceeding and hearing progressed, EDTI and the AESO's attention focused more on the Garneau upgrades, and the need and timing of those upgrades. Based on this evidence and for the reasons that follow, the Commission finds that while the Garneau upgrades are less urgent than the Meadowlark to Poundmaker transmission line development, they are nonetheless required and that moving forward with both transmission developments is warranted.

### **5.5.1 Probabilistic assessment and cost-benefit analysis**

129. The cost-benefit analyses filed by Bema were informative. That evidence gave the Commission some understanding of the potential usefulness of such analysis and insight into the potential risks of not proceeding with the proposed transmission developments. This evidence generally assisted the Commission's understanding of how the risks identified correlated with the costs of the project, and provided helpful context into the level of urgency of the need for the proposed solution's two developments.

130. However, the Commission agrees with the AESO and EDTI that calculating initial inputs is beyond the scope of a single NID proceeding; therefore, it cannot place significant weight on Bema's cost-benefit analyses because of their preliminary nature.

131. The Commission sees significant value in the AESO's timely initiative regarding probabilistic analysis and cost-benefit analysis in 2020 and looks forward to its outcome.

132. While the Commission agrees with the CCA and Bema that it is not appropriate to defer any kind of probabilistic or cost-benefit analysis until the conclusion of that initiative and that interim steps should be taken where appropriate, it recognizes that the AESO took steps to include additional information in this NID application and altered the manner in which it assesses SASRs as a result of the Provost and Fincastle decisions. The Commission appreciates the AESO's willingness to adjourn this application to respond to concerns and directions in these decisions and stresses that the information provided by the AESO and EDTI following the adjournment was important to the Commission's assessment of this NID.

133. The Commission expects that the AESO will continue to evolve and improve the methods used to incorporate and consider enhanced information in its NID applications. It notes Dr. Mazadi's statement that probabilistic and cost-benefit assessments are always being performed in the heads of planners and strongly encourages the AESO to record and document those practices to ensure that the information can be used to review NID applications.

### 5.5.2 Need for transmission development

134. The Commission is satisfied that the need for the Meadowlark to Poundmaker transmission line is clear and urgent. The evidence demonstrates that the project would resolve a number of different contingencies that, if left unaddressed, could result in a significant amount of load that EDTI would be unable to serve, potentially including critical loads such as hospitals, police stations and the LRT. Further, the Commission finds EDTI's current difficulties in scheduling outages to perform maintenance to be a strong indicator of the urgency of the need.

135. While there is a need at Garneau, the urgency of that need is less obvious to the Commission. Unlike the levels of unsupplied load related to the Meadowlark to Poundmaker transmission line development, the amount of load at risk at Garneau does not appear to be as significant. The Commission acknowledges the CCA's submission that EDTI or the U of A may be able to curtail non-critical loads in the event of a contingency, and further, that EDTI would be able to shift some amount of load, for up to 36 hours, to feeders from adjacent substations. That said, the Commission also recognizes that the amount of unsupplied load is forecast to increase and that the amount of load at risk has been as high as 20 MVA in 2014.

136. Given the small amount of load at risk currently at Garneau and forecast for 2021, the Commission must carefully consider whether EDTI would be able to utilize its distribution system to shift load to adjacent substations.

137. The Commission must also consider the likelihood of unsupplied load occurring and observes that unsupplied load would only occur in the event of all three of the following contingencies:

- (i) An outage occurs to any of the three transformers (a table provided by EDTI indicates that the total number of hours of outage for all three transformers from 2014 to 2018 was less than 600 hours<sup>64</sup> out of a total 43,800 hours).<sup>65</sup>
- (ii) Load at Garneau is above 80 MVA (which in 2019 occurred for 61 hours out of the year).
- (iii) The U of A is not generating any power.

138. The Commission finds that individually, the first two events are relatively rare. The probability that all three events would occur at the same time is therefore (at least currently) unlikely, and accordingly the risk of unsupplied load actually occurring appears to be low. Nonetheless, as load at Garneau increases, the likelihood of unsupplied load will also increase.

#### 5.5.2.1 University of Alberta

139. In the Commission's view, it was important for EDTI and the AESO to assess the system under an N-G-1 scenario, where the U of A's generation was assumed at zero. While this scenario is unlikely, it is important for EDTI and the AESO to understand the consequences. EDTI's analysis of the U of A's historic generation levels also provided valuable context. The presence of the U of A generators clearly decreases the likelihood and amount of unsupplied load

<sup>64</sup> Exhibit 23943-X0185, Appendix G - DFO and TFO Responses, PDF page 3.

<sup>65</sup> Further, the longest historical outage for each transformer was related to testing which EDTI would be able to schedule around.

at Garneau. The Commission agrees that ignoring that generation completely may be overly conservative. The requirement for N-G-1 studies at the transmission level is prudent because the risks in worst-case scenarios may be far more significant than at the distribution level, where the consequence of loss of load would be localized.

140. As the AESO moves forward with its initiative on probabilistic assessment, the manner in which distribution-connected generation is incorporated into planning studies would be an important factor to consider. The Commission recognizes that distribution-connected generation is increasing in the province and while that generation may not be as reliable as large-scale, traditional transmission-connected generation, it would be unwise to completely discount the contributions that these facilities can make to reliability in all cases.

141. The general question of whether and to what extent N-G-1 is appropriate for SASR-driven distribution reliability-based NIDs is too broad a question for this proceeding. Notwithstanding, the Commission finds that in this context, Mr. Levson's comments resonate:

[I]t's almost bizarre that we have a large amount of generation right in the centre of this problem, and we are not having a relatively aggressive discussion with them, talking about every opportunity there is to firm up that generation in some way or to bring it to the table to avoid a very expensive project.<sup>66</sup>

142. The Commission accepts the AESO's evidence that TMR can only be used in areas with limited potential for load growth and that this is not the case in the Garneau area. Furthermore, as stated in Bema's evidence, the U of A has no interest in providing emergency backup or in pursuing additional generation at this time. That said, it would have been of assistance to the Commission had EDTI initiated a dialogue with the U of A and filed evidence in this regard so that the Commission could fully understand what, if any, role the U of A generators could play in formulating a preferred solution, rather than leaving it to an intervener's consultant to investigate.

143. It is not in the public interest to construct transmission infrastructure that is not needed. While the AESO is limited by the *Transmission Regulation* in what options it can put forward (and when it can use certain options such as TMR), a DFO does not have the same restrictions. It is able to consider alternatives that the AESO cannot and in so doing may be able to delay or avoid filing a SASR. In this case, the Commission accepts that the U of A is not able to provide guaranteed generation and that there may be times when generation would be unavailable when needed. Nonetheless, a DFO should endeavour to consider a variety of options, such as emergency generation support or voluntary load curtailment, that could reduce the likelihood of unsupplied load to an acceptable level. While the AESO itself may not be able to pursue those options, in assessing whether a DFO has a reasonable opportunity to exchange electric energy it should consider whether the DFO has contemplated all reasonable options before submitting a SASR.

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<sup>66</sup> Transcript, Volume 2, page 296, lines 7-12.

### **5.5.2.2 The AESO's Distribution Deficiency Report Author's Guide, distribution load shifting and EDTI distribution planning criteria**

144. The Commission finds that the CCA's arguments regarding the DDR Author's Guide were new and not based on any evidence adduced or tested in the proceeding. In any event, the Commission agrees that the document is a guideline and that the AESO has the discretion to determine what information has to be included in a DDR. The Commission is also satisfied that the AESO obtained and filed the necessary information to consider whether distribution alternatives were feasible or superior options through information requests and the hearing process. The Commission therefore finds that, contrary to the CCA's assertions, the NID application was not deficient in this regard.

145. The Commission finds, however, that had EDTI provided a single-line diagram of its distribution system and information on the spare capacity of its feeders, this would have clearly and succinctly answered questions on the ability of EDTI to address the problems via load shifting, which in turn would have mitigated the need for many information requests and hearing questions, potentially alleviated some of the CCA's concerns, and generally saved the time and resources of many of the parties involved. Although the absence of single-line diagram does not constitute a deficiency in the AESO's application, the Commission highlights the usefulness of receiving this type of information as part of a NID application and requests that the AESO include it in future NID applications, where appropriate. The Commission emphasizes the AESO's discretion and expertise in determining when this information is required and recognizes that the level of detail may vary from one NID application to another.

146. The Commission acknowledges that based on the amounts of unsupplied load of some of the contingencies not related to the Garneau upgrades, the AESO may have considered EDTI's initial elimination of distribution options to be sufficient. However, upon further assessment and determination of the Meadowlark to Poundmaker transmission line as the preferred transmission development to address the most critical issues, the Commission finds that the AESO should have re-examined the need to upgrade the Garneau transformers so that it could have more clearly demonstrated the urgency of the need and that distribution alternatives were not feasible.

147. While the Commission agrees with the CCA that EDTI's practice of loading its feeders at 66 per cent does not align with that of other DFOs who load their feeders at 50 per cent, it is not satisfied that this difference results in negative effects; the effects to ratepayers may in fact be positive. The Commission finds that this practice results in a trade-off where EDTI may have less capability to transfer load on feeders and may require transmission developments sooner, but that fewer feeders are constructed, which in turn results in savings to ratepayers. Yet, it is not clear whether the costs of advancing transmission developments exceed the savings of building fewer feeders.

148. In its DDR, EDTI provided the POD Loading Policy of its Distribution Planning Criteria:

The Firm Capacity of a POD is an important parameter that EDTI DFO considers for distribution planning purposes. EDTI DFO defines a POD's firm capacity as the maximum load that the POD can supply without overloading any transmission equipment under an N-1 contingency. N-1 contingencies include, but are not limited to, the loss of a

single transmission line supply to a POD or the loss of a single transformer at a POD. All PODs should operate at or below their firm capacity.<sup>67</sup>

149. The Commission agrees with the CCA that this policy lacks any explicit reference to the ability of adjacent substations to provide backup capability in the event of a contingency. While the lack of an explicit reference does not indicate that EDTI could not incorporate capability from adjacent substations, the values provided for firm capacity by EDTI at the Garneau, Meadowlark and Rossdale substations strongly suggest that EDTI is only relying on capacity at each individual substation.<sup>68</sup>

150. Nevertheless, it is clear that EDTI's practice is to attempt to resolve issues first through distribution load shifting. The fact that EDTI shifted load from Garneau to Rossdale in 2010 is clear evidence of this practice. This shifting of load between PODs ahead of potential contingencies ensures that EDTI will be able to serve load in the event of a contingency and also that EDTI more efficiently uses the firm capacity at area substations before adding capacity.

151. In the Commission's view, it is important to bear in mind that proactive shifting of load in the planning horizon is not the same as reactive shifting of load in the operations horizon when a contingency occurs. While EDTI's practice of proactively shifting load allows it to get as close as possible to firm capacity at each area substation, it does not maximize overall area capacity. Under EDTI's policy, a transformer contingency could occur at each and every area substation and no unsupplied load would occur. This achieves a level of reliability greater than N-1 as it does not properly account for capacity that could be provided by a nearby substation in the event of a contingency. Under other DFOs' reliability criteria, a POD's firm capacity would add capacity from adjacent substations. The amount of firm capacity would be limited by the amount of transformer capacity at nearby substations and by the amount of capacity on the feeders connecting the substations. The Commission finds that EDTI's POD loading criteria does not align with that of other DFOs and has the potential to unnecessarily accelerate transmission development.

152. There is some indication that EDTI would transfer load between substations in the event of a contingency but it is less clear to what extent the AESO or EDTI planners accounted for the ability of operators to do so in determining that additional capacity was needed. While the Commission appreciates the hesitation of planners to limit operators' flexibility, the cost of doing so must also be weighed.

153. In this instance, however, the Commission is satisfied that while there is adjacent and unused transformer capacity at Rossdale that could provide support to Garneau, there is no available capacity on the feeders that connect Rossdale and Garneau and therefore no way to utilize Rossdale's available transformer capacity. To access that capacity, new distribution feeders would be required to be constructed as outlined by EDTI in the distribution alternatives considered.<sup>69</sup> The Commission accepts EDTI's evidence on the costs and technical issues associated with those alternatives and finds that they are not superior to the proposed transmission development. Although the Commission is satisfied in this case that the transformer replacements are in the public interest, it expects that EDTI will review its POD loading criteria

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<sup>67</sup> Exhibit 23943-X0007, Appendix E - DFO Distribution Deficiency Report, PDF page 8.

<sup>68</sup> Exhibit 23943-X0007, Appendix E - DFO Distribution Deficiency Report, PDF page 10.

<sup>69</sup> Exhibit 23943-X0007, Appendix E - DFO Distribution Deficiency Report.

to assess how it can be more aligned with other DFOs, and specifically to account for the capability that adjacent feeders and substations can provide in the operational time frame.

154. It may be that the lack of available feeder capacity is the reason the AESO or EDTI did not discuss load shifting as an option in a contingency. If that is the case, it was not clearly stated and this option was not clearly eliminated in EDTI's DDR. The Commission considers that there is a level of overlap between the planning and operational horizons and to completely separate them can only result in greater costs and inefficiencies.

155. While the Commission agrees with EDTI's evidence that operators must have the ability to respond to contingencies and planners must provide them with the infrastructure to do so, what operators require to respond and how much infrastructure is required is not always clear and may vary depending on many factors such as area and type of load. The Commission agrees with Bema that operational measures can and should be used when possible to defer transmission projects. The Commission advises against the practice of over-relying on transmission solutions and encourages the AESO and DFOs to attempt to find innovative means to delay the need for transmission projects, where it is prudent and appropriate to do so. Importantly, in evaluating whether it is in the public interest to approve a transmission solution, the Commission requires a full analysis of what operational measures were considered and why such measures were eliminated in favour of new infrastructure as a solution.

### 5.5.2.3 Conclusion

156. Having considered all of the evidence before it, and having regard for the principles and matters set out in Section 38 of the *Transmission Regulation*, the Commission finds that no interested person has demonstrated that the AESO's assessment of the need for proposed transmission upgrades in west Edmonton is technically deficient or that approval of the NID would not be in the public interest.

157. The Commission is not satisfied that Bema's option of a Jasper to Meadowlark transmission line is feasible given the space constraints at Jasper Substation and accepts EDTI's evidence that if it were feasible, the configuration required would be more costly than the preferred transmission development.

158. In the present case, the Commission finds that distribution load shifting is not a reasonable option to address the system issues identified by the AESO and EDTI in the long term. In the case of Meadowlark, there is insufficient transformer capacity at nearby substations to permit a load-shifting solution. In the case of Garneau, although there is available transformer capacity at Rosedale Substation, there is insufficient feeder capacity to transfer the load to it. While the AESO and EDTI have sufficiently demonstrated this to be the case, the Commission finds that more transparent and timely information with respect to this analysis would have greatly improved the review of the NID application and the hearing process in respect thereof.

159. The Commission acknowledges Mr. Tauh's statements about the potential to accept slightly more risk to better optimize costs, a concept reflected in the Commission's Provost and Fincastle decisions where it articulated a desire to examine and potentially utilize probabilistic analysis. Based on the minimal load at risk at the Garneau Substation and the low likelihood that unsupplied load would occur, the Commission may have been prepared to accept the associated level of risk of not upgrading Garneau were it not for the forecast increases in demand. The forecast suggests that in the near term, the level of risk will increase to a level the Commission is

not prepared to accept. The fact that unsupplied load could occur as of 2023 even when the U of A is generating at historical levels is a significant factor. Importantly, the three-year time frame to replace the transformers accelerates the need to begin construction so that facilities are in place by the time they are needed.

160. The Commission also recognizes the CCA's concerns that forecast load may not materialize at the rate predicted, and that the forecast load at Garneau is based on a number of different projects at the U of A. While not all of those projects outlined on the schedule may go forward, the Commission finds that the need for the Garneau upgrades is not dependant on all of them moving forward and that it is reasonable to assume that some of them will. The Commission finds that a small amount of additional load will increase the level of risk to the point where additional capacity is needed.

161. Although the Commission considered whether a system spare transformer could be used in combination with the Meadowlark to Poundmaker transmission line instead of the Garneau upgrades, it finds that the specific requirements and constraints of the Garneau Substation make this option less appealing because it would require a spare transformer specific to the Garneau Substation. Further, additional time would be required to install the spare transformer, which increases the likelihood of a contingency, unsupplied load, and impacts to load customers.

162. Additionally, the forecast load in the Garneau area suggests to the Commission that in the near term, the risk of unsupplied load increases to a point sufficient to justify the replacement of all three transformers. It therefore makes little sense to purchase a spare transformer now only to have to replace all three transformers a few years later.

163. Based on the foregoing, the Commission finds that EDTI does not currently have a reasonable opportunity to exchange electric energy, that expansion of the transmission system is required, and that the preferred transmission developments are in the public interest.

164. While the Commission reiterates the importance of a holistic approach, it cautions the AESO to carefully consider the need and urgency of individual developments within that broader scope. The Commission continues to see merit in incorporating probabilistic analysis into these types of NID applications and values the work of the AESO and EDTI in considering and providing additional information in this NID application. The Commission found this information and analysis to be useful in making its determination and expects that the AESO will continue to evolve the information it requests from DFOs and how it assesses that information. As discussed above, it would have assisted the Commission to have greater detail on distribution alternatives, including load shifting. Moreover, the AESO and DFOs should consider how to properly assess the potential reliability contributions of distributed generation, and EDTI should examine its POD loading policy given the apparent misalignment of its distribution planning criteria with other DFOs. The Commission appreciates the AESO's commitment to further pursue probabilistic and cost-benefit analyses with the industry in the future and expects that this will prove beneficial in addressing the types of informational gaps identified above.

## **6 Facility applications**

165. To meet the need identified by the AESO, EDTI filed facility applications to:
- Construct a new approximately 11-kilometre-long, 72-kV transmission line between the existing Poundmaker and Meadowlark substations, to be designated as Transmission Line 72PM25. EDTI's application included a preferred route and an alternate route for the proposed transmission line.
  - Construct a new fibre optic line between the existing Poundmaker and Meadowlark substations, to be designated as FO-133, using the proposed Transmission Line 72PM25 structures for the majority of its route.
  - Alter the existing Poundmaker Substation by adding one 240/72-kV, 100/133-MVA transformer, one 240-kV circuit breaker and one 72-kV circuit breaker.
  - Alter the existing Meadowlark Substation, located in the community of Lynnwood, by adding two 72-kV circuit breakers.
  - Alter the existing Garneau Substation by replacing three 72/14.4-kV, 40-MVA transformers with three 72/14.4-kV, 60-MVA transformers.

### **6.1 Consultation**

#### **6.1.1 Views of the parties**

166. EDTI completed two separate participant involvement programs for the project: one relating to upgrades to the Garneau Substation and one relating to the proposed transmission line, fibre optic line and alterations to the Poundmaker and Meadowlark substations. The two participant involvement programs underwent similar overall processes. Given that no parties objected to the Garneau Substation upgrades, only details of the latter participant involvement program are discussed below.

167. EDTI notified local area occupants, residents, landowners and other interested parties through project-specific information packages. This included notifying 14,200 parties within 350 metres of the Poundmaker and Meadowlark substations and of the proposed route options. EDTI issued the first information package in September 2016 and subsequent information packages in September and December 2017. The latter two packages were also reissued in August 2018.

168. EDTI conducted personal consultation with 982 participants (as of the time of application filing) who are located directly adjacent to the substation alterations or to the proposed transmission line routes. It also held two open houses in October 2016.

169. EDTI stated that its program addressed many of the concerns raised by participants. Feedback from participants was recorded and where possible, considered and reflected in decision making. EDTI stated that the inclusion of the costs of an underground configuration in its application was directly in response to stakeholder feedback asking for the transmission line to be routed underground. Where stakeholders expressed concerns, EDTI held additional meetings to answer questions and to attempt to resolve concerns as was the case with

representatives of the Lynnwood Community League and some members of the 190 Street Residents Group.

170. EDTI also outlined its notification and consultation of municipal and provincial agencies, most notably the City of Edmonton and Alberta Infrastructure.

171. The Lynnwood Community League expressed concerns with EDTI's consultation efforts, in particular, that responses given were inadequate or dismissive. It submitted that while members of the group attempted to engage in dialogue with EDTI, EDTI did not satisfactorily deal with their issues and concerns. Its members said that information packages issued by EDTI were confusing and lacked clarity, and that at one meeting EDTI representatives were unprepared and did not have experts in attendance to respond to specific issues or concerns.

172. The Elmwood Residents Group did not find that its members' concerns were addressed; when its members asked for further information, they found EDTI staff friendly but unable to answer specific questions, instead directing members to the application or websites.<sup>70</sup> The group submitted that certain members were not aware of the project until informed by a neighbour, stating that they were never contacted directly by EDTI and that while they may have received an information package, they disregarded it as a mass mail out or did not properly understand its importance. The group stated that EDTI did not ask about specific health concerns, and as a result was unaware of a landowner's pacemaker, and further, that EDTI did not provide accurate, comprehensible maps of the project in relation to group members' residences until the oral hearing.

173. The Aldergrove Residents Group found communication from EDTI inadequate. The group submitted that approximately 20 per cent of the residents they spoke with reported that they were contacted by EDTI and 50 per cent reported that they received a mail out.

174. The 190 Street Residents Group submitted that in its information packages to members, EDTI used unrepresentative cartoon images of the transportation and utility corridor (TUC) and maps that were not large enough to see where structures would be located, and argued that it was not that difficult to provide comprehensible maps.<sup>71</sup>

175. Mr. Ackerman, a member of the 190 Street Residents Group, indicated that at the outset of the process, EDTI representatives were "very cooperative" about explaining the project and "showed a desire" to listen to landowner concerns.<sup>72</sup> However, as time went on Mr. Ackerman came to believe that EDTI was merely doing its due diligence for AUC requirements and that it had no intention of accommodating or mitigating landowners' concerns. He submitted:

All our time, effort, clearly was for nothing. It was incredibly disheartening to see that all of the concerns and issues that we raised at the public meetings, in our further meetings, in all my emails, had no impact on EPCOR and [there] were no changes or revisions were made addressing our concerns. EPCOR did nothing to address the concerns raised by the public. Was it a charade? Was it meant to be a distraction so we got tired of this meet and greet process after a few years.<sup>73</sup>

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<sup>70</sup> Exhibit 23943-X0271, Submissions of Elmwood Residents Group - September 13, 2019, PDF page 4.

<sup>71</sup> Transcript, Volume 8, page 1978, lines 20-25.

<sup>72</sup> Transcript, Volume 7, page 1617, lines 7-15.

<sup>73</sup> Exhibit 23943-X0267, Submissions of the 190 Street Residents Group - September 13, 2019, PDF page 34.

176. Mark Edey, a resident of Aldergrove and a member of the Aldergrove Community League Board, described his participation in consultations for a number of civic or provincial projects or initiatives, and how other members of the community had expressed to him their disillusionment over a lack of engagement with processes that lead to development in their community. Mr. Edey stated that he personally spent over 100 hours in 2018 being consulted, organizing responses to requests, reviewing materials for engagement or attending meetings in relation to EDTI's applications. He described his engagement with EDTI on a number of subject matters related to the project, and submitted that the community was not consulted as a part of this process but was instead "handled" to ensure the efficient administration of land, title and civic utilities.

### **6.1.2 Commission findings**

177. The Commission described how it assesses the effectiveness of a public consultation program in Decision 2011-436, the Heartland decision:

The Commission acknowledges that even a very effective consultation program may not resolve all intervenor concerns. This is not the fault of the applicant or the intervenor; it merely reflects the fact that the parties do not agree. With this in mind, the Commission will consider a consultation program to be effective if it meets AUC Rule 007 requirements and has allowed intervenors to understand the project and its implications for them, and to meaningfully convey to the applicant their legitimate concerns about the project.<sup>74</sup>

178. The Commission finds that the participant involvement programs undertaken by EDTI meet the requirements of Rule 007. The Commission recognizes that many stakeholders had concerns about the participant involvement program for the proposed transmission line. In fact, counsel for EDTI recognized that there was room for improvement.<sup>75</sup> The Commission is of the view, however, that the participant involvement programs were sufficient to communicate to potentially affected parties the nature, details and potential impacts of the project. It is also satisfied that the participant involvement programs gave potentially affected parties an opportunity to ask questions and to express their concerns.

179. The Commission finds that the notification materials EDTI distributed to stakeholders were adequate. While it appreciates the concerns of intervenors that images could have been more realistic or informative, and expects that EDTI will take those concerns into consideration for future projects, the Commission recognizes that just as materials can contain too little detail, they can also contain too much information. Carolyn Raiche, of the 190 Street Residents Group stated as much when she said:

It seems like EPCOR intentionally puts so much information so that people are lost in the information, they get confused and they give up.<sup>76</sup>

180. The Commission acknowledges that there must be a delicate balance, as some stakeholders will inevitably want more information than others; and further, that the level of detail required will evolve throughout the consultation process as the project specifics are

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<sup>74</sup> Decision 2011-436: AltaLink Management Ltd. and EPCOR Distribution & Transmission Inc., Heartland Transmission Project, Proceeding 457, Application 1606609, November 1, 2011, paragraph 284.

<sup>75</sup> Transcript, Volume 8, page 2022, lines 12-18.

<sup>76</sup> Exhibit 23943-X0267, Submissions of the 190 Street Residents Group - September 13, 2019, PDF page 21.

determined and the various alternative proposals are better defined. Most importantly, these materials must allow for a dialogue to begin and, at the option of the participants, to continue. Parties must first have the opportunity to be alerted to the project and have the ability to ask questions and receive more information. More detailed information becomes available as the process moves from notification to consultation.

181. In that regard, the Commission acknowledges the concerns raised by interveners that they were not satisfied with the answers to their questions, and that EDTI was essentially going through the process, checking boxes, rather than fully engaging with them.

182. The Commission stresses that consultation must be meaningful. Merely directing parties to a website or to an application that may be hundreds of pages long is not sufficient; parties that may be affected should not have to go out of their way to find answers to questions.

183. Parties also indicated that EDTI directed them to file their concerns with the Commission. For example, in the opening statement of Darrell and Marilyn Kammer:

We understand that EPCOR should have made efforts to meet with the members of the community on a one to one basis and provide answers to many of the concerns. All we received was a somewhat confusing pamphlet in the mail, a phone call in 2016 before EPCOR had any answers on the Application and then another call in 2018 where EPCOR told us that if we didn't agree with their proposal we should participate in the hearing. This does not see[m] to me to be consultation where we are told after the fact that the Application will be submitted and if we don't like it we can go [to]the hearing.<sup>77</sup>

184. The hearing process is not a substitute for consultation. While the Commission accepts that at some point, an impasse may be reached at which time the Commission's role is to make a decision, it considers that the purpose of consultation directly between the applicant and potentially affected parties is intended to more effectively resolve concerns. The Commission further underscores that applicants developing and maintaining positive relationships with potentially affected members of the communities in which they propose to site projects is essential to a properly constituted participant involvement program. The Commission recognizes that in congested areas, where there is little room to manoeuvre a route, there may be few options to mitigate stakeholders concerns. It nevertheless considers that EDTI could have made better efforts to meaningfully consider the requests of the stakeholders affected by the project prior to the hearing. In these types of circumstances, the manner in which information is conveyed to parties is vitally important. Providing clear reasons for rejecting landowners' requests is essential when concerns are not able to be resolved or mitigated to the satisfaction of the landowners in question.

185. During EDTI's cross-examination, it became clear that Mr. Ackerman was unaware that Alberta Infrastructure had originally identified a route closer to residences in the TUC and that EDTI had advocated for and achieved a route further to the west.<sup>78</sup> He was also unaware of Alberta Infrastructure's position that 72-kV power lines are designated uses of the municipal services component of the TUC, which parallels the inside boundary.<sup>79</sup> In the Commission's view, these are clear instances where EDTI could have better communicated with an intervenor.

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<sup>77</sup> Exhibit 23943-X0436, Opening Statements of the Elmwood Residents Group, PDF page 12.

<sup>78</sup> Transcript, Volume 7, page 1666, lines 1-25.

<sup>79</sup> Transcript, Volume 7, page 1672, line 25 to page 1676, line 17.

Where stakeholders, such as Alberta Infrastructure or the City of Edmonton, are influencing the siting of a route option, the Commission considers it essential that EDTI clearly and comprehensibly communicate that information to all affected stakeholders. Similarly, the Commission expects that EDTI will inform stakeholders such as Alberta Infrastructure and the City of Edmonton about landowner concerns so that these stakeholders fully understand the balance that must be achieved.

186. That said, while some parties indicated that they were not notified or consulted, EDTI's records demonstrate that the parties received notification, the dates that they were consulted, and the outcomes of those consultations. The Commission is therefore satisfied that EDTI attempted to consult with all potentially affected parties.

187. Furthermore, the Commission considers that the inclusion of underground costs in the application is evidence that EDTI listened to concerns raised by parties and attempted to resolve them. Although EDTI admitted that the underground costs provided were high-level estimates only and interveners may not have been satisfied with its ultimate response, it is clear that EDTI heard their concerns and considered options to address them.

188. In summary, while the Commission accepts that the participant involvement programs were sufficient and met the requirements of Rule 007, it concurs with interveners, and EDTI's counsel, that there was room for improvement. The Commission expects that EDTI will strive to make improvements in future applications.

## **6.2 Visual impacts**

### **6.2.1 Views of the parties**

189. While EDTI recognized that the visual impact of an overhead line will be greater than that of an underground line, it submitted that an overhead configuration will not result in any significant adverse visual effects.<sup>80</sup> EDTI indicated that the Commission has previously found that visual impacts caused by transmission lines can be mitigated by carefully choosing structure locations,<sup>81</sup> paralleling existing infrastructure,<sup>82</sup> and using monopole structures.<sup>83</sup> It also noted the Commission's previous statement that visual impacts are subjective and cannot be readily measured.<sup>84</sup> In EDTI's view, the proposed line does not represent a significant incremental visual impact given its location in, or in close proximity to, major forms of existing linear infrastructure such as the TUC, Whitemud Drive, existing overhead distribution lines, sound barrier walls, roadways and alleyways.<sup>85</sup>

190. EDTI provided information on structures in the Lynnwood area where a distribution line is proposed to be understrung, which showed that the proposed poles will be between

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<sup>80</sup> Transcript, Volume 8, page 1764, line 6 to page 1765, line 12.

<sup>81</sup> Decision 2012-303: ATCO Electric Ltd. - Eastern Alberta Transmission Line Project, Proceeding 1069, Applications 1607153 and 1607736, November 15, 2012.

<sup>82</sup> Decision 21030-D02-2017: Alberta PowerLine General Partner Ltd. - Fort McMurray West 500-Kilovolt Transmission Project, Proceeding 21030, Applications 21030-A001 to 2130-A015, February 10, 2017.

<sup>83</sup> Decision 2011-436, AltaLink Management Ltd. and EPCOR Distribution & Transmission Inc. - Heartland Transmission Project, Proceeding 457, Application 1606609, November 1, 2011.

<sup>84</sup> Decision 2012-303: ATCO Electric Ltd. - Eastern Alberta Transmission Line Project, Proceeding 1069, Applications 1607153 and 1607736, November 15, 2012, paragraph 384.

<sup>85</sup> Exhibit 23943-X0335.01, EDTI FA Rebuttal Evidence, PDF pages 27-28.

70 and 75 feet tall and have a diameter of between 0.811 metres and 1.225 metres.<sup>86</sup> EDTI stated that existing distribution poles in the Elmwood area are 55 feet tall and 0.5 metres in diameter at the base. EDTI also provided a table of structure heights proposed for the Aldergrove area, where there are no existing structures and there would therefore be no distribution line understrung. The poles in the Aldergrove area would vary in height from 65 to 75 feet.<sup>87</sup>

191. Each of the intervenor groups expressed concerns with the visual impact of the proposed transmission line in close proximity to their residences and in their neighborhood. In addition to associating a negative visual impact with the transmission facilities themselves, some intervenors are also concerned that the project would result in the removal of mature trees and vegetation, further exacerbating visual impacts.

192. With respect to 156th Street specifically, the Lynnwood Community League submitted that replacing the existing 15-kV distribution line with the proposed transmission line would result in a significant increase in pole diameter and result in certain of its members (i.e., John and Grace Pasma, Craig and Katrina Donner, and Allan and Susan Powles) having transmission structures within one metre of their front property lines.<sup>88</sup>

193. The Aldergrove Residents Group disagreed with EDTI's assertion that the proposed overhead line does not represent a significant incremental visual impact on the landscape because EDTI is proposing to locate the line in close proximity to major forms of existing linear infrastructure such as the TUC and Whitemud Drive. In the view of the group, EDTI's proposal to locate the transmission line on the crest of a berm in the Aldergrove community to provide visual separation from Whitemud Drive will transform the berm into a platform that elevates the proposed transmission facilities.<sup>89</sup> The group submitted that given the elevation and proximity of the transmission line to property lines, locating the transmission line as proposed renders any visual impact mitigation impossible.

#### **6.2.1.1 Visual simulations**

194. EDTI retained Truescape Ltd. to prepare visual simulations of the proposed transmission line in various locations along the preferred and alternate routes.

195. The Lynnwood Community League retained CanACRE Ltd. to prepare visual simulations of the proposed transmission line. It submitted that CanACRE's visual simulations are reasonable and a better representation of the transmission line structures than the Truescape renderings and should therefore be given significant weight.<sup>90</sup> The Lynnwood Community League, Elmwood Residents Group and 190 Street Residents Group also retained the services of Veritas Litigation Support to provide aerial drone footage of EDTI's proposed routing.

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<sup>86</sup> Exhibit 23943-X0215, EDTI-LCL-2019JUL18-001-022, PDF pages 4-5.

<sup>87</sup> All height measurements referenced in this paragraph are above grade.

<sup>88</sup> Exhibit 23943-X0417, Exhibit 417 – Map of Craig and Katrina Donner's property; Exhibit 23943-X0418, Exhibit 418 – Map of John and Grace Pasma's property.

<sup>89</sup> Transcript, Volume 8, page 1991, line 11 to page 1992, line 10.

<sup>90</sup> Transcript, Volume 8, page 1871, lines 5-18.

196. Truescape responded to the visual simulations prepared by CanACRE, stating that they contain various methodological flaws that compound and result in images that fail to portray how the new facilities would appear and be perceived.<sup>91</sup>

197. Truescape utilized the primary field of view in its simulations which it stated is a recognized value within the scientific and medical professions and is used within the visualization industry. It stated that the CanACRE images do not incorporate the proper field of view (i.e., 124 degrees) but are instead based on slightly more than half of the horizontal primary field of view. EDTI submitted that CanACRE gave no rationale for its departure from accepted and best practices of incorporating the primary field of view. EDTI submitted that because the CanACRE images represent only a portion of the primary field of view, they overstate the visual impact by focussing the viewer's attention on the subject matter, without the full context of the landscape.

198. Truescape also stated that the facilities themselves are not accurately represented in CanACRE's images and in many cases are oversaturated, overly contrasted or improperly shadowed. Truescape explained that these methodological flaws result in the facilities appearing brighter and more prominent than they would in reality and in comparison to other nearby elements. It stated that CanACRE's images contain other methodological errors such as failing to use camera equipment consistent with industry best practice, which compounds to further distort the accuracy and appearance of the facilities in the visual simulations.

199. EDTI submitted that Truescape's visual simulations are of better quality and accuracy than the CanACRE simulations and, unlike the CanACRE simulations, provide an accurate, reliable basis for judging the aesthetic effects of the new facilities.

200. CanACRE utilized a direct field of view of 64.5 degrees which it stated is obtainable using a camera lens representative of what the human eye can see looking directly ahead and does not include the peripheral field of view.<sup>92</sup> The Lynnwood Community League disagreed with EDTI that the primary field of view is an industry standard and widely used<sup>93</sup> and stated that Truescape's use of a peripheral field of view involved stitching various images together which reduces visual effects.<sup>94</sup> The League further submitted that CanACRE's use of colour and contrast more accurately represents the proposed transmission structures, compared to the Truescape renderings which downplay visual impacts.<sup>95</sup>

201. The Lynnwood Community League expressed concern with Truescape's choice of viewpoints, including some where a proposed transmission pole is partially obstructed by a street pole, some that show the midsection and base rather than the full height of the closest pole, and some that present the poles far off in the distance, not clearly visible and, in at least one case, obstructed by a tree in the foreground.<sup>96</sup> The League submitted that the Commission should attribute little or no weight to Truescape's evidence.

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<sup>91</sup> Exhibit 23943-X0351, Appendix F – Reply Evidence of Truescape Ltd, PDF page 1.

<sup>92</sup> Transcript, Volume 6, page 1275, lines 8-25.

<sup>93</sup> Transcript, Volume 8, page 1879, lines 4-11.

<sup>94</sup> Transcript, Volume 8, page 1872, lines 11-18.

<sup>95</sup> Transcript, Volume 8, pages 1874-1876.

<sup>96</sup> Transcript, Volume 8, pages 1874-1876.

202. Michelle Smith, area coordinator of Whitehall Square Boardwalk Rental Communities, testified that there are no Truescape simulations depicting the addition of a gantry at Garneau Substation and that neither the Commission nor the Lynnwood community can visualize how the proposed project will affect the neighbourhood. The Aldergrove Residents Group also commented on the lack of visual simulations in its area, submitting that there was only one simulation along Whitemud Drive, and none showing what the structures would look like facing south from the residences.

### **6.2.2 Commission findings**

203. The Commission considers that the assessment of visual impacts is inherently subjective, and finds the simulations prepared by both Truescape and CanACRE to be helpful in some respects but flawed in others. The Commission is satisfied that the visualizations prepared by Truescape provide a reasonable representation of the proposed transmission line and accepts Truescape's use of the primary field of view as a recognized standard. It also finds that the CanACRE visualizations provide a reasonable representation of the proposed transmission line, albeit using a different, but plausible field of view depending on the position of the viewer from the structure in question. Despite its findings above, in general, having competing visual renderings and considerable hearing time spent on arguments on the minutiae of the visual renderings (e.g., whether the structures were light grey versus dark grey versus white) was of very little assistance to the Commission. Hence, the Commission strongly encourages parties to co-operate in the creation of any visual renderings in the future, to avoid becoming mired in disputes about the best methodology for creating the renderings in the first instance.

204. Although the Commission recognizes that the project will change the viewscape along the proposed route, how that change will be perceived is subjective and site specific.

205. The portion of the proposed line from the Poundmaker Substation to Whitemud Drive runs along a TUC, the purpose of which is to host these types of facilities. While the Commission accepts that the proposed alignment will result in a change in visual aesthetic along this portion of the proposed route, the presence of an existing transmission line and Anthony Henday Drive will mitigate the visual impacts. Further, the barrier of trees bordering properties backing on to the TUC will provide some mitigation. In light of the above, the Commission is satisfied that any visual impact associated with the proposed line in the TUC is sufficiently mitigated.

206. The portion of the proposed line paralleling Whitemud Drive up to 170th Street will have transmission structures set on top of berms which may result in increased visual impacts. However, the Commission finds that such impacts will be mitigated by the pre-existence of Whitemud Drive and the fact that affected properties will back on to the proposed line.

207. For the portion of the proposed line between 170th Street and 156th Street, transmission structures will replace approximately every other distribution structure. The Commission finds that any impact to this portion of the line will be incremental and mitigated by siting structures in alignment with common property boundaries and in similar locations as existing distribution poles.

208. The Commission acknowledges that there will be some incremental visual impact to the residences along 156th Street and 84th Avenue given that the proposed transmission line will parallel the front yards of residences and, in the case of 156th Street, run directly adjacent to the

front of property lines. However, the Commission finds that these impacts are mitigated by and incremental to the presence of the existing distribution line. While the transmission poles will be taller and wider than existing poles, and may therefore be visible from further away, it is also the case that the transmission conductors will be strung higher on the poles and therefore likely cause less visual impact than the existing distribution lines. In any event, the Commission considers that the visual impact along 156th Street and 84th Avenue will be incremental to, and not substantially different from what currently exists. The Commission also accepts that EDTI's commitment to site monopoles in approximately the same location as the distribution poles and in alignment with common property boundaries, will further aid in mitigating visual impacts.

## **6.3 Property value**

### **6.3.1 Views of the parties**

209. EDTI submitted that an overhead configuration for its proposed transmission development would not result in any significant adverse effects to property value.<sup>97</sup> In EDTI's view, the Commission's assessment of property value impacts should be examined from the perspective of, "Determining which route option is likely to result in the least potential overall impact to property value."<sup>98</sup> EDTI noted the Commission has stated that while property value is subjective, this subjectivity can be partially dispelled through a project-specific comparison report.<sup>99</sup>

210. EDTI retained Serecon Inc. to evaluate the potential effects of 72-kV transmission lines on residential property values in the city of Edmonton. Serecon conducted a literature review of previous studies and utilized a paired sales analysis of similar properties along similar existing 72-kV transmission lines in Edmonton. The study resulted in unanimous findings that indicate no impact, both on a project-wide basis and in more defined subgroups.<sup>100</sup>

211. EDTI submitted that while some properties analyzed by Serecon were not identical to those, for example, in the Elmwood and Lynnwood communities, they were sufficiently similar to provide a valid basis for assessing the potential property value impacts of the proposed transmission line.

212. During the hearing, Serecon's representative, Donald Hoover, testified that proximity of a transmission line, while important, is one of many considerations when assessing potential property value impact. Mr. Hoover explained that visibility is also a key factor and does not necessarily correlate with proximity; the location of the line and structures in relation to the property and buildings on the property can provide visual barriers, reducing the visual effects of a transmission line.<sup>101</sup>

213. Mr. Hoover distinguished between transmission line structures that are in direct view of residences and those in a lateral view out of the main viewpoints from the property including from within buildings on the property.<sup>102</sup> He noted that the existing poles in the Lynnwood area,

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<sup>97</sup> Transcript, Volume 8, page 1764, lines 6-12.

<sup>98</sup> Transcript, Volume 8, page 1780, lines 17-22, citing Decision 21030-D02-2017 at para 506.

<sup>99</sup> Transcript, Volume 8, page 1780, line 23 to page 1781, line 6, referencing Decision 2014-219 at paragraph 149; Decision 21030-D02-2017 at paragraph 500.

<sup>100</sup> Exhibit 23943-X0227, Appendix 4 – 72kV Transmission Lines and Residential Property Values, PDF page 3.

<sup>101</sup> Transcript, Volume 3, page 566, line 5 to page 567, line 5.

<sup>102</sup> Transcript, Volume 3, page 580, lines 14-22.

whether on 156th Street or in the alley along Whitemud Drive, are not in the centre of lots but on the side, in alignment with common property lines. Mr. Hoover concluded that because these views would be lateral rather than straight on, there would be lower potential impacts.<sup>103</sup> EDTI confirmed that it would place its poles in alignment with common property boundaries rather than in front of houses, including along 156th Street,<sup>104</sup> and as a result submitted that it has reduced the visual impact of the proposed poles.<sup>105</sup>

214. Mr. Hoover also stated that the increased height of the transmission wires themselves, being 65 to 85 feet above ground or 25 per cent higher, is not a meaningful factor for comparing the poles on the subject and comparator properties. Mr. Hoover explained that the proposed conductors would be above the existing distribution line and unless a person is looking straight up, would remain out of the line of sight from the property.<sup>106</sup>

215. Mr. Hoover confirmed that while the Serecon study considered property value impacts for the project as a whole rather than for specific communities or specific properties, residences along 156th Street, 84th Avenue and those backing on to Whitemud Drive that would have transmission lines in the adjacent alley would be most affected by the proposed project from a property value perspective.<sup>107</sup> Mr. Hoover also stated that property value impacts would be greater in circumstances where a transmission line is located in the front as opposed to the back of a residence.<sup>108</sup>

216. Each of the intervenor groups, as well as many individual intervenors expressed concerns with property values being negatively impacted as a result of the proposed project. Many intervenors stated that they chose to reside in their respective communities because of their quietness, mature vegetation, the presence of green spaces that accommodate active lifestyles, proximity to schools and other amenities, and for the prospect of future increases in property values. A number of intervenors stated that had they known about the proposed development prior to buying their homes, they would not have proceeded with their purchase.<sup>109</sup>

217. Brian Gettel of Gettel Appraisals Ltd. was retained by the Lynnwood Community League, Elmwood Residents Group and 190 Street Residents Group to prepare a real estate impact assessment report and testify at the hearing.<sup>110</sup> Mr. Gettel assessed the proposed project's impact on real estate values to properties in the Lynnwood, Belmead and Elmwood communities. He conducted his analysis of impacts for both an overhead and an underground configuration.

218. Mr. Gettel concluded that of the three communities surveyed, the property value impacts to the Lynnwood community would be the most significant should the preferred route be approved. In the event the alternate route is approved, Mr. Gettel concluded that the Elmwood community would suffer the greatest property value impact. In his report, Mr. Gettel attributed a property value impact of zero to 10 per cent for residential properties adjacent to or within 100 feet of an overhead transmission line. Mr. Gettel concluded that property value losses as high as 10 per cent would apply to properties within four to five metres of the proposed line,

<sup>103</sup> Transcript, Volume 3, page 581, lines 5-9.

<sup>104</sup> Transcript, Volume 5, page 1072, lines 19-21.

<sup>105</sup> Transcript, Volume 8, page 1786, lines 22-23.

<sup>106</sup> Transcript, Volume 3, page 582, lines 9-16; Transcript, Volume 3, page 594, lines 5-12.

<sup>107</sup> Transcript, Volume 5, page 1068, line 22 to page 1069, line 9.

<sup>108</sup> Transcript, Volume 5, page 1071, lines 4-13.

<sup>109</sup> Exhibit 23943-X0295, Appendix C – Lynnwood Members Submissions Revised, PDF page 138.

<sup>110</sup> Exhibit 23943-X0291, Appendix O – Gettel Report & CV.

with value impacts dropping off markedly after 100 feet. He concluded that there would be no real estate impact in the event of an underground configuration. To avoid incremental impacts with neighbourhoods along the TUC such as Belmead, Mr. Gettel recommended locating the line as far west as possible. Comparing the preferred and alternate routes, Mr. Gettel stated that the preferred route would have the least potential negative impact on property values given its routing through the TUC.<sup>111</sup>

219. The Lynnwood Community League submitted that while the existing distribution line along 156th Street and 84th Avenue is not causing any property devaluation issues on its own, areas where there will be a combination of transmission poles and distribution poles, along the alley adjacent to Whitemud Drive and 156th Street for example, will suffer maximum property value loss. The League noted that the transmission lines used by Mr. Hoover in the subject areas examined in his paired sales analysis are not the same configuration as that proposed for the alley adjacent to Whitemud Drive. It stated that alternating transmission and distribution poles in the alley along Whitemud Drive will create a clutter of lines, exacerbating visual impacts.<sup>112</sup>

220. While the League did not disagree with the use of a paired sales analysis to identify the impact of a transmission line on property values in principle, it submitted that significant flaws in Serecon's analysis make it unreliable for determining property value impacts from the proposed transmission line.

221. In the League's view, Serecon's analysis failed to effectively isolate the property value impacts of a 72-kV transmission line by not excluding properties adjacent to major roadways and within proximity to green space, not appropriately considering distance between the transmission lines and subject properties and failing to appropriately account for differences in height between structures.<sup>113</sup> The League submitted that Serecon's paired sales analysis is not applicable to properties in the Lynnwood community given that the transmission poles will be located in the front yard of properties along 156th Street and 84th Avenue unlike the subject properties.<sup>114</sup>

222. The League also disagreed with Mr. Hoover's assertion that visibility is largely determined by line location in relation to property and maintained that it is also determined by a resident's use of their property and how they view the lines on a continual basis in addition to the height of the lines. The League stated that the increased height and width of the proposed transmission structures will have a significant visual impact regardless of their location in relation to one's property, thereby affecting property values.

223. As a result of these flaws, the League submitted that Mr. Hoover's analysis in the Serecon report is unreliable in determining property value impact and that Mr. Gettel's evidence is the most credible and should be given significant weight. It further submitted that significant weight be placed on Mr. Hoover's statement that there would be property value impacts on some properties in the Lynnwood and Elmwood communities.

224. The Elmwood Residents Group emphasized that based on Mr. Gettel's evidence, there could be up to a 10 per cent decrease in property value on Elmwood Residents Group members' homes. The Elmwood Residents Group stated that the cumulative property value impact on

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<sup>111</sup> Exhibit 23943-X0291, Appendix O – Gettel Report & CV, PDF pages 19-20.

<sup>112</sup> Transcript, Volume 8, page 1883, lines 7-21.

<sup>113</sup> Transcript, Volume 8, pages 1889-1892.

<sup>114</sup> Transcript, Volume 8, pages 1893, line 20 to page 1894, line 2.

residences in the Elmwood community along the preferred route could amount to \$1,937,650 assuming a 10 per cent loss in property value<sup>115</sup> and in their view, this information has not been used to undertake an overall cost-benefit analysis for the project.

225. Because of their close proximity to the proposed lines, the Elmwood Residents Group submitted that the impact on its members is the same whether the lines are placed in the front or back of a home.<sup>116</sup> The group agreed with the Lynnwood Community League's criticisms of the Serecon report and noted that Mr. Hoover's approach diluted the results of the study by looking at homes further away than those in the Elmwood and Lynnwood communities. The group also noted that Mr. Hoover's testimony that properties along 156th Street and those backing on to Whitemud Drive with structures in the back alley would be affected more than properties further west,<sup>117</sup> would include its members.

226. The Elmwood Residents Group disagreed with Mr. Hoover's view that there is a distinction between the 138-kV transmission line studied in the Cooking Lake report (where Mr. Hoover assessed a seven to 10 per cent property value impact for properties 41 metres from the line), and the proposed 72-kV transmission line, where properties in the Elmwood community are between seven and 20 metres away.<sup>118</sup>

227. The 190 Street Residents Group submitted that burying or moving the proposed transmission line as far west as possible within the TUC would mitigate, or completely eliminate negative impacts to property values.<sup>119</sup>

228. The Aldergrove Residents Group stated that the proposed project will result in a significant reduction in property values for the Aldergrove community given the magnitude of change from no above-ground power lines to an industrial, overhead, high-voltage transmission line elevated on an existing berm in close proximity to property lines. The group submitted that demand for real estate in the community will not only be reduced by the visibility of transmission lines from within property boundaries, but also as prospective buyers drive through the community and the perception of electric and magnetic fields associated with transmission lines generally, regardless of whether such concerns are scientifically supported.<sup>120</sup>

229. In the Aldergrove Residents Group's view, the Serecon study has weak applicability to the affected communities in general, and no applicability to the Whitemud Drive portion of the Aldergrove community. The group differentiated the properties examined in the Serecon study on the basis that each had pre-existing above-ground 15-kV distribution lines and pre-existing above-ground 72-kV transmission lines on wooden poles. In contrast, the group stated that while some of the communities along the preferred route have existing distribution lines, none have existing 72-kV transmission lines on any type of pole. It also submitted that the Serecon study does not include a comparison of property values before installation of an overhead transmission line with the value of the same properties after installation of an overhead 72-kV line.<sup>121</sup>

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<sup>115</sup> Exhibit 23943-X0327, Elmwood Residents Group Responses to AUC's Information Requests, PDF page 4.

<sup>116</sup> Transcript, Volume 8, page 1917, lines 2-6.

<sup>117</sup> Transcript, Volume 5, page 1068, lines 22-25.

<sup>118</sup> Transcript, Volume 8, page 1925, lines 2-11.

<sup>119</sup> Exhibit 23943-X0267, Submissions of the 190 Street Residents Group – September 13, 2019, PDF page 20.

<sup>120</sup> Transcript, Volume 8, page 1996, lines 9-25.

<sup>121</sup> Transcript, Volume 8, page 1994, lines 5-8.

230. Boardwalk's Ms. Smith is concerned that the curb appeal of the rental property and neighbourhood will be negatively impacted by the proposed transmission poles and the addition of a gantry structure at the adjacent Meadowlark Substation. In her view, the existing substation already affects the rentability of approximately 66 east-facing units in Tower C and the addition of the proposed project will further affect the rentability and property values of Whitehall Square.

231. In response to criticisms that the Serecon report was not representative of the proposed project area, Mr. Hoover stated that comparability does not require that all characteristics of each property be identical. In his view, the subject properties are very similar and provide the best judgment of what the market says about 72-kV power lines adjacent to residential properties.<sup>122</sup> Mr. Hoover noted that both lines considered in the Serecon report were 72-kV transmission lines with underbuilt distribution lines<sup>123</sup> and in both the subject properties and properties that would be adjacent to the proposed line, the poles would be similarly visible despite small differences in proximity. While Mr. Hoover did not consider proximity to green space to be a significant valuation factor, he stated that traffic volumes on roads adjacent to the subject properties are in the same range as the roads along which the proposed transmission line will run. Mr. Hoover also noted that proximity to a major road does not always negatively impact property value.<sup>124</sup>

232. EDTI submitted that the Falconer Heights study relied upon by Mr. Gettel is readily distinguishable from the proposed project on the basis that the study dealt with taller structures, more visually-imposing designs (i.e., lattice and H-frame structures, 240-kV lines), had a larger footprint and examined newer homes in a newer area.<sup>125</sup> EDTI stated that Mr. Gettel's report focuses only on the distance from the line to a given property and fails to account for the location of the poles in relation to the property and views from the property, as well as other potentially mitigating factors.<sup>126</sup>

233. In EDTI's view, Serecon's paired sales analysis is a more reasonable and reliable approach to quantifying property value impact than Mr. Gettel's report which is based on generic information referencing prior studies that have little relevance to the specific circumstances under consideration in this proceeding.<sup>127</sup> EDTI submitted that the Commission should not put any weight on Mr. Gettel's report and should prefer the project-specific approach adopted by Serecon.<sup>128</sup>

234. In response to EDTI's assertion that Mr. Gettel relied primarily on the Falconer Heights study in his report, the Lynnwood Community League stated that this was inaccurate and that in coming to his conclusions, he relied on a number of studies examining transmission line impacts on urban properties which demonstrated a minimum property value loss of zero to 10 per cent and a maximum of 15 to 25 per cent.<sup>129</sup> Of the studies he reviewed, Mr. Gettel considered the Falconer Heights study to be most similar to the proposed development despite differences in

<sup>122</sup> Transcript, Volume 4, page 631, lines 4-8.

<sup>123</sup> Transcript, Volume 4, page 614, line 9 to page 615, line 21.

<sup>124</sup> Transcript, Volume 3, page 591, lines 1-2.

<sup>125</sup> Exhibit 23943-X0350, Appendix E – Reply Evidence of Serecon Inc, PDF pages 3-4.

<sup>126</sup> Exhibit 23943-X0350, Appendix E – Reply Evidence of Serecon Inc, PDF page 5.

<sup>127</sup> Transcript, Volume 8, page 1782, lines 13-17; Transcript, Volume 8, page 1791, lines 17-23.

<sup>128</sup> Transcript, Volume 8, page 1794, lines 6-9.

<sup>129</sup> Transcript, Volume 8, page 1883, line 25 to page 1884, line 1.

size, structure heights and voltage.<sup>130</sup> The League submitted that Mr. Gettel's methodology is appropriate and should be given considerable weight.

### **6.3.2 Commission findings**

235. Two expert reports were filed to address the impact that a transmission line has on property values. Serecon's study resulted in unanimous findings that indicate no significant impact. Mr. Gettel attributed a property value impact of zero to 10 per cent, with the upper end of the range pertaining to properties within four to five metres of the proposed line and value impacts dropping off markedly after 100 feet.

236. While the Commission acknowledges the property valuation concerns raised by individual interveners, including the impact of perceived electric and magnetic field levels on property value, the Commission continues to be of the view that concerns with property value impacts require specialized expertise and evidence for it to conclude that a given project will have an adverse effect on land and property values.<sup>131</sup> Such evidence must be specific to a particular project rather than general in nature.

237. The Commission examines the property value impact from two perspectives. First, in the context of weighing alternate route options, it seeks to approve the route that will keep the combined impact of such effects to a minimum. Second, it considers site-specific impacts that may occur for an individual property owner; and in doing so, considers the efforts made by the applicants to reduce or mitigate any effects.

238. The Commission agrees with the experts that a key determinant of the level of property value impact is the distance of a residence from the transmission line as the level of impact diminishes with increased distance. It also agrees with Mr. Hoover that visibility of the proposed line is a key factor and that visibility can be effectively mitigated by siting transmission structures in alignment with common property lines rather than in the centre of a property, through the existence of visual barriers such as tree coverage or height of land variations that affect the line of sight, and by paralleling existing electrical or transportation infrastructure.

239. With respect to weighing alternate route options, the Commission agrees with Mr. Gettel's conclusion that the preferred route would result in the least impact on property values in terms of the overall project. As mentioned earlier, a significant portion of the preferred route follows a TUC as well as existing linear infrastructure such as Whitemud Drive.

240. For the segment of the proposed line that runs along the TUC, the Commission reiterates that the purpose of the TUC is to host these types of facilities. Although the distance between the proposed transmission line and adjacent property lines in this segment will be as close as 40 metres, the Commission notes Mr. Gettel's conclusion that property value impacts are reduced markedly after 100 feet, and is satisfied that there will be no measurable property value impact associated with this segment of the proposed line. Moreover, any potential impact will be sufficiently mitigated by paralleling existing linear infrastructure such as Anthony Henday Drive

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<sup>130</sup> Exhibit 23943-X0291, Appendix O – Gettel Report & CV, PDF page 5; Transcript, Volume 6, page 1294, lines 11-21; Transcript, Volume 6, page 1287.

<sup>131</sup> Decision 2011-436: AltaLink Management Ltd. and EPCOR Distribution & Transmission Inc., Heartland Transmission Project, Application 1606609, Proceeding 457, November 1, 2011, PDF page 24.

and the existing transmission line, siting the transmission facilities behind adjacent properties, and the presence of the barrier of trees bordering properties backing on to the TUC.

241. The portion of the proposed line paralleling Whitemud Drive from the TUC to 170th Street would have transmission facilities as close as 10 metres to adjacent property lines. While the Commission acknowledges that in this segment, the transmission structures would be set on top of berms which may increase visibility, it is nonetheless satisfied that by paralleling existing linear infrastructure such as Whitemud Drive and siting structures behind adjacent properties, any potential property value impact will be mitigated.

242. In the segment of the proposed line along Whitemud Drive between 170th Street and 156th Street, almost every other distribution structure would be replaced by a transmission structure. While the proposed transmission facilities would be located along the back alley of adjacent residences, the Commission finds that any potential property value impact will be mitigated by the presence of pre-existing distribution structures, and by EDTI's commitment to siting structures in alignment with common property lines, in similar locations as existing distribution poles, and behind adjacent properties.

243. The Commission finds that there may be a property value impact to certain residences along 156th Street, and in particular, to properties on which poles will be directly adjacent to the front yard. There are four such residences. Although there are two additional residences with poles at the side of the house, the Commission recognizes the evidence of Mr. Hoover that property value impacts are greater where a structure is located in the front of a residence as opposed to the back or sides of the house and that visibility is a key factor in assessing impacts to property value. The Commission is satisfied that any potential property value impacts to residences along 156th Street are mitigated by the presence of an existing double-circuit distribution line. As noted in Section 6.2.2, the visual impact along 156th Street will not be substantially different than what currently exists and the siting of monopoles in approximately the same location as existing distribution poles, and in alignment with common property boundaries, will provide additional mitigation.

244. Along 84th Avenue, the proposed transmission line would run in front of the Whitehall Square apartment complex owned by Boardwalk. The Commission is satisfied that any property value impact will be mitigated by the presence of the existing distribution line and the Commission's finding in Section 6.2.2 that any visual impact along 84th Avenue will be incremental to, and not substantially different from what currently exists.

## **6.4 Health and safety**

### **6.4.1 Electric and magnetic fields**

245. As previously described in the Heartland decision,<sup>132</sup> electric and magnetic fields, (also known as electromagnetic fields or EMFs) are present wherever electricity flows. Sources of electric and magnetic fields include electric transmission and distribution lines, household appliances, power tools, office equipment, computers and any other electrical devices. EMFs also occur naturally on the earth.

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<sup>132</sup> Decision 2011-436: AltaLink Management Ltd. and EPCOR Distribution & Transmission Inc. – Heartland Transmission Project, Proceeding 457, Application 1606609, November 1, 2011.

246. EMFs associated with transmission lines are sometimes referred to as extremely low frequency (ELF) EMF because electric power is transmitted at 60 cycles per second (or 60 hertz or Hz), which is at the very low end of the frequency spectrum.

247. Electric fields are produced by voltages applied to electrical conductors and equipment. The strength of an electric field is directly related to voltage, and will increase as voltage increases. Electric fields may be shielded or blocked by intervening objects such as trees or buildings, and are measured in volts per metre (V/m) or kilovolts per metre (kV/m).

248. Magnetic fields, on the other hand, are created by the flow of electricity (the current). The strength of a magnetic field is directly related to the current; the higher the current, the higher the magnetic field. Unlike electric fields, magnetic fields are not easily shielded. They are generally measured in gauss (G) or milligauss (mG).

249. The intensity of both electric and magnetic fields from transmission lines decreases with distance from the source.

#### **6.4.1.1 Views of the parties**

250. Exponent Inc., retained by EDTI, filed a report entitled “Status of Health Research on Power Frequency Electric and Magnetic Fields – 2019”<sup>133</sup> that referenced a 2007 publication of the World Health Organization (WHO) with the results and conclusions of a comprehensive review and assessment of the scientific literature regarding ELF EMF and the WHO’s statement that “current evidence does not confirm the existence of any health consequences from exposure to low level electromagnetic fields.”<sup>134</sup> Exponent further referenced the WHO’s recommendation that only measures with no or very low cost be applied to reduce EMF exposure, because any potential benefit from these measures is uncertain.<sup>135</sup>

251. Exponent noted that the opinion of Health Canada mirrors these conclusions:

Health Canada states that “exposure in Canadian homes, schools and offices present no known health risk.” Health Canada also states that “[t]here have been many studies on the possible health effects from exposure to EMFs at ELF. While it is known that EMFs can cause weak electric currents to flow through the human body, the intensity of these currents is too low to cause any known health effects[,]” including “physical and/or psychological symptoms ... termed ‘electromagnetic hypersensitivity’ or EHS.” With respect to exposure reduction options and precautions, they state that “Health Canada does not consider that any precautionary measures are needed regarding daily exposures to EMFs at ELF. There is no conclusive evidence of any harm caused by exposures at levels found in Canadian homes and schools, including those located just outside the boundaries of power line corridors.”<sup>136</sup>

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<sup>133</sup> Exhibit 23943-X0222, Appendix 1 - Status of Health Research on Power Frequency Electric and Magnetic Fields – 2019.

<sup>134</sup> Exhibit 23943-X0222, Appendix 1 - Status of Health Research on Power Frequency Electric and Magnetic Fields – 2019, PDF page 6.

<sup>135</sup> Exhibit 23943-X0222, Appendix 1 - Status of Health Research on Power Frequency Electric and Magnetic Fields – 2019, PDF page 6.

<sup>136</sup> Exhibit 23943-X0222, Appendix 1 - Status of Health Research on Power Frequency Electric and Magnetic Fields – 2019, PDF page 17.

252. Exponent submitted that scientific research published since the WHO's assessment has not materially changed the overall weight of evidence on potential effects of EMF with the European Union's Scientific Committee on Emerging and Newly Identified Health Risks concluding in 2015 that there are no confirmed health effects of EMF exposure.

253. Exponent stated that there are currently no federal exposure limits for 60-Hz electric and magnetic fields in Canada and no provincial exposure limits in Alberta. However, the International Commission on Non-Ionizing Radiation Protection (ICNIRP) and the International Committee on Electromagnetic Safety (ICES) of the Institute of Electrical and Electronics Engineers (IEEE) have set exposure standards and guidelines to protect members of the public and workers from established short-term effects. The guidelines set by these organizations are summarized here:

Table 5. Guideline to limit exposure to 60-Hz electric and magnetic fields for the general public<sup>137</sup>

Organization (Year)	Magnetic Field Limit Value	Electric Field Limit Value
ICES (2002) – General public	9,040 mG	5 kV/m*
ICNIRP (2010) – General public	2,000 mG	4.2 kV/m
*10 kV/m on transmission line rights-of-way.		

254. Exponent modelled<sup>138</sup> EMF levels along each of the proposed preferred and alternate route segments, compared these levels to applicable limits, and concluded that all calculated levels of EMF are far below the limits on public exposure set by the ICNIRP and ICES. A summary of the calculated field levels at nearby locations along the preferred and alternate routes is found in Table 6 and Table 7, respectively.

Table 6. Calculated EMF levels along the preferred route for average loading<sup>139</sup>

Cross Section	Assessment Location	Distance from proposed 72PM25 centerline (m)*	Magnetic Field (mG)	Electric Field (kV/m)
XS-1	Edge of ROW	7.5	13	0.3
	Nearest Residence	34	1.6	< 0.1
XS-2	Edge of ROW	7.5	82	3.3
	Nearest Residence	101	1.4	< 0.1
XS-3	Nearest Residence	20	4.1	< 0.1
XS-4	Nearest Residence	18	5.1	< 0.1
XS-5	Nearest Residence	11	4.9	< 0.1
XS-6	Nearest Residence	32	1.3	< 0.1
	Lynnwood Community Hall	35	1.3	< 0.1
	Lynnwood Community Playground	38	1.1	< 0.1
XS-7	Nearest Residence	25	2.3	< 0.1
	Lynnwood School	65	0.4	< 0.1

\* With the exception of the edge of ROW, distances are measured to the approximate center of each location. Calculated EMF levels at the near and far edge of each location are summarized in Appendix B, Table B-6.

<sup>137</sup> Exhibit 23943-X0222 - Appendix 1 - Status of Health Research on Power Frequency Electric and Magnetic Fields, PDF page 32.

<sup>138</sup> Exponent stated that it modelled the EMF levels using computer algorithms developed by the Bonneville Power Administration and that these levels were calculated and reported in accordance with IEEE standards.

<sup>139</sup> Exhibit 23943-X0223, Appendix 2A - Assessment of EMF, Audible Noise, and Radio Noise – Preferred Route, PDF page 18.

Table 7. Calculated EMF levels along the portion of the project exclusive to the alternate route for average loading<sup>140</sup>

Cross-Section	Assessment Location	Distance from proposed 72PM25 centerline (m)*	Magnetic Field (mG)	Electric Field (kV/m)
XS-8	Nearest Residence	> 100	< 2	< 0.1
XS-9	Nearest Residence	> 100	< 1	< 0.1
XS-10	Nearest Residence	23	2.4	< 0.1
XS-11	Nearest Residence	26	2.5	< 0.1
	Misericordia Community Hospital	127	0.1	< 0.1
	Jasper Place Child and Family Resource Centre	79	0.3	< 0.1
	Jasper Place Child and Family Resource Centre Playground	27	2.3	< 0.1

\* Distances are measured to the approximate center of each location. Calculated EMF levels at the near and far edge of each location are summarized in Appendix B, Table B-6.

255. Exponent submitted that an underground configuration of the transmission line would produce higher magnetic field levels directly over the line compared to those directly under an overhead line configuration, but that levels would decrease more rapidly with distance. As such, levels at the nearest residences and facilities would be lower in an underground configuration. Exponent stated that due to shielding from the earth and cable layers, the proposed underground configuration would not be a source of electric fields above ground.

Table 8. Calculated magnetic field levels along the preferred route for average loading<sup>141</sup>

Cross Section	Assessment Location	Distance from 72PM25 centerline (m)*		Calculated magnetic field level (mG)	
		Overhead	Underground	Overhead	Underground
XS-1	Edge of ROW	7.5	--	13	--
	Nearest Residence	34	--	1.6	--
XS-2	Edge of ROW	7.5	--	82	--
	Nearest Residence	101	--	1.4	--
XS-3 / XS-3U	Nearest Residence	20	19	4.1	1.1
XS-4 / XS-4U	Nearest Residence	18	17	5.1	0.8
XS-5 / XS-5U	Nearest Residence	11	21	4.9	2.3
XS-6 / XS-6U	Nearest Residence	32	21	1.3	0.7
	Lynnwood Community Hall	35	46	1.3	0.5
	Lynnwood Community Hall Playground	38	49	1.1	0.4
XS-7 / XS-7U	Nearest Residence	25	26	2.3	1.0
	Lynnwood School	65	66	0.4	0.2

\* With the exception of the edge of ROW, distances are measured to the approximate center of each location. Calculated EMF levels at the near and far edge of each location are summarized in Appendix B, Table B-5 and Table B-6 for the overhead and underground configurations, respectively.

<sup>140</sup> Exhibit 23943-X0224, Appendix 2B - Assessment of EMF, Audible Noise, and Radio Noise – Alternate Route, PDF page 19.

<sup>141</sup> Exhibit 23943-X0225, Appendix 2C - Assessment of EMF, Audible Noise, and Radio Noise – Underground Configuration, PDF page 14.

256. Dr. Anthony Miller was retained by the Lynnwood Community League to review EDTI's application for possible health impacts arising from proximity of the transmission line and infrastructure to the Lynnwood school, daycare and community park. Dr. Miller stated that the International Agency for Research on Cancer (IARC) found that there was an increased risk of leukemia when homes are sited within 50 metres of a transmission line and noted that many homes would be within 50 metres of the proposed transmission line. Dr. Miller concluded that when transmission lines are sited near homes, daycare centres or schools, a 50-metre exclusion rule should be used and that cost considerations should not be a deterrent in placing these transmission lines underground where human lives are concerned. Dr. Miller indicated in his evidence that the IARC placed ELF magnetic fields in Category 2B, possibly carcinogenic to humans.<sup>142</sup>

257. While Dr. Miller confirmed during his testimony that the EMF levels calculated by Exponent are below the levels indicated in the guidelines published in the British Journal of Cancer in 2000, he stated that if the line were placed underground, the exposure would be much less.<sup>143</sup>

258. The Lynnwood Community League also retained Dr. Paul Héroux to review and opine on the electromagnetic effects arising from the proposed project.

259. Dr. Héroux submitted that scientific evidence today confirms the existence of health risks associated with exposure to electromagnetic field radiation, particularly magnetic fields from power lines. He stated that the majority of exposure to electromagnetic fields comes from electrical distribution and transmission systems with strong occasional fields supplied by electrical appliances used in homes. He submitted that in the long term, levels much below those currently tolerated will be the norm as homes are equipped with updated equipment that emit low or no emissions and stated that there is a need for modification in the way that electrification is implemented by utilities. Dr. Héroux noted that the health risk arising from exposure to magnetic field levels occurs at levels much lower than those believed to be safe in the past and that it would take a long time before this knowledge, developed by scientists such as the BioInitiative group and others, is accepted by Health Canada and the WHO.<sup>144</sup>

260. Dr. Héroux examined the magnetic fields calculations from EDTI in relation to the Lynnwood school, daycare and community hall and concluded that a number of epidemiological studies have reported increases in leukemia rates, or worse recovery from leukemia, with lower electromagnetic field exposures.

261. Dr. Héroux recommended burying the proposed line along segments that come in proximity to sensitive areas (daycares, schools, homes), and to design the cable for minimum magnetic field emissions.

262. In addition to the expert evidence of Dr. Miller and Dr. Héroux, the Commission also heard from several interveners concerned about the potential health effects associated with EMF from the proposed transmission line. These interveners are fearful about the possible health effects of EMF. Some referenced studies in support of their concerns, while others simply noted

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<sup>142</sup> Exhibit 23943-X0287, Appendix K – Evidence of Dr. Miller, PDF page 1.

<sup>143</sup> Transcript, Volume 6, page 1254, lines 13-23.

<sup>144</sup> Exhibit 23943-X0289, Appendix M – Paul Héroux Report, PDF page 7.

that precautionary measures, such as burying the line, are warranted because the debate on EMF health effects is ongoing.

263. Both the 190 Street Residents Group and the Aldergrove Residents Group noted that while EDTI stated that there is no proof that there are adverse health effects, no governing body, health authority or regulatory body has stated with 100 per cent certainty that there are no health risks associated with high-voltage line EMFs. The Aldergrove Residents Group went on to say that, until a recognized health body states definitively that there is no health concern associated with living in proximity to above-ground high-voltage transmission lines, such concern will remain and current and prospective residents will be rightfully leery of living in proximity to the lines. Members of the Lynnwood Community League submitted that the only safe mitigation is to bury the transmission lines proposed for the common route within the Lynnwood community.

264. In its rebuttal evidence, EDTI included expert reports from Dr. Gabor Mezei and Dr. Benjamin Cotts of Exponent responding to interveners' submissions on the health impacts of EMF.

265. At the hearing, Dr. Mezei discussed his interpretation of the WHO's conclusions that EMFs are possibly carcinogenic.

What they mean is that there is some statistical association in some of these studies, but the causal effect cannot be established because chance, bias, and confounding as an explanation could not be ruled out for these observed associations. And in addition to that, they also made a statement that there is no laboratory support in terms of -- behind the carcinogenic effect, and there is no currently known biophysical mechanism that may explain the cancer-causing effect of EMFs at these environment levels.<sup>145</sup>

266. When asked to comment on the *in vitro* studies referenced by Dr. Héroux,<sup>146</sup> Dr. Mezei stated:

Well, first of all, I would like to point out that invitro studies cannot be used to draw causal inference to actual health effects because cells in petri dishes in laboratory environment behave very differently than cells behave in a human body -- in our body. So there might be many explanation for that. And then you cannot rely on a single study. You have to look at the totality of the evidence. And the evidence overall does not indicate any adverse human health effects in association with environmental exposure to EMF below scientifically-established guidelines.<sup>147</sup>

267. Dr. Mezei also commented on Dr. Héroux's comparison of the magnetic field levels calculated by Exponent for specific locations to estimates of long-term exposure to magnetic fields reported in several epidemiological studies. He submitted that Dr. Héroux's comparison ignores that epidemiologic studies of diseases like cancer typically focus on long-term exposure using estimates of time-weighted average (TWA) exposure of study subjects. He submitted that calculated magnetic-field levels at specific locations do not represent TWA exposure levels of an

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<sup>145</sup> Transcript, Volume 5, page 1079, lines 8-20.

<sup>146</sup> Transcript, Volume 6, page 1187, lines 16-24.

<sup>147</sup> Transcript, Volume 4, page 682, line 20 to page 683, line 7.

individual, as people do not typically stay in one place all day, and instead spend time at multiple locations for varying time periods.<sup>148</sup>

268. Dr. Cotts conducted a TWA analysis of three separate configurations: the existing configuration of distribution lines; the proposed transmission line combined with the existing distribution lines; and an underground transmission line combined with the existing distribution lines. The TWA estimates for each of these configurations compared to the TWA values obtained from a survey commissioned under the EMF Research and Public Information Dissemination Program (RAPID)<sup>149</sup> are shown in Table 9.

Table 9. Results of TWA analysis for RAPID baseline with comparison to TWA exposure at Lynnwood school and adjacent playground for Existing, Proposed Overhead, and Underground configurations at average line loadings and summarized as geometric mean (GM) and arithmetic mean (AM)<sup>150</sup>

	Magnetic field (mG)			
	RAPID*	Existing	Proposed Overhead	Underground
TWA GM	0.78	0.65	0.81	0.68
TWA AM	1.1	0.91	1.10	0.95

\* The results for the RAPID column here were calculated using the same methodology and population (of 94 children under the age of 14) as for the Existing, Proposed Overhead and Underground models. The 'School' and 'Other' exposures that are used to determine the TWAs are taken from the RAPID survey's reported distributions of these 94 children with a mean of 0.94 mG and 1.1 mG, respectively.

269. Dr. Cotts noted that the TWA for both the existing and proposed calculations is similar to or less than the average 24-hour TWA exposure reported in the RAPID study for the general population and well within the range of measured exposure levels (0.18 mG to 6.16 mG) reported in a 1998 survey. Dr. Cotts further noted that these calculated TWA levels are well within the normal range of personal magnetic-field exposure previously reported for children in Canada in a 1999 study.<sup>151</sup>

270. Dr. Cotts concluded that the calculated EMF levels along the preferred and alternate routes as well as from the underground configuration are well below ICNIRP and ICES limits on exposure. The TWA exposure analysis demonstrates that the proposed project, whether constructed overhead or underground, would result in very small changes to the existing TWA magnetic-field levels at the critical locations described by Dr. Héroux.

271. Dr. Mezei concluded that Dr. Cotts' evidence showed that while power lines, both before and after installation of the project, contribute to magnetic-field exposures of children at the Lynnwood school and the adjacent playground, at typical line loadings, the TWA exposures of children would be comparable to existing TWA values. He also stated that the TWA estimates, both before and after project installation, are well within the normal range of magnetic-field exposure as reported for children in Canada.<sup>152</sup>

272. Dr. Mezei further stated that burying the line may reduce the magnetic fields at a distance away from the lines, but there is no proven health benefit of doing so."<sup>153</sup>

<sup>148</sup> Exhibit 23943-X0347, Appendix B - Reply Evidence of Dr. Gabor Mezei of Exponent, PDF page 10.

<sup>149</sup> Exhibit 23943-X0346, Appendix A - Reply Evidence of Dr. Benjamin Cotts of Exponent, pages 8 and 9.

<sup>150</sup> Exhibit 23943-X0346, Appendix A - Reply Evidence of Dr. Benjamin Cotts of Exponent, PDF page 11.

<sup>151</sup> Exhibit 23943-X0346, Appendix A - Reply Evidence of Dr. Benjamin Cotts of Exponent, PDF page 11.

<sup>152</sup> Exhibit 23943-X0347, Appendix B - Reply Evidence of Dr. Gabor Mezei of Exponent, PDF page 10.

<sup>153</sup> Transcript, Volume 4, page 686, lines 3-6.

273. Concerning the effects of magnetic-field levels from transmission lines on pacemakers, EDTI indicated that modelling of electric fields in the body under the highest voltage transmission lines suggests that levels above 5.4 kV/m may be more likely to affect the performance of unipolar pacemakers, which are more sensitive than the more common bipolar lead pacemakers. EDTI noted that the electric field calculated at the nearest residences for all segments of the proposed transmission line is less than 0.1 kV/m, and approximately 0.2 kV/m directly under the transmission line for the segment in Elmwood. EDTI indicated, however, that it would engage in a discussion with any concerned persons regarding their pacemaker and the effects of the proposed transmission line.<sup>154</sup>

274. EDTI concluded that no public health agency has found EMF to be the cause of any disease, nor has any public health agency recommended any long-term exposure limits. It asserted that the calculated level of magnetic fields produced by the proposed transmission line at residences, schools and daycares is indistinguishable from existing magnetic field levels. EDTI also noted that it plans to locate the conductors on the west side of the transmission poles for the proposed transmission line along 156th Street in the Lynnwood neighbourhood to maximize their distance from the residential properties.<sup>155</sup>

#### **6.4.1.2 Commission findings**

##### **6.4.1.2.1 Electric and magnetic field levels**

275. The Commission accepts the results of EDTI's modelling of the EMF levels associated with the proposed 72-kV transmission line along the preferred and alternate route. Exponent's modelling was performed in accordance with IEEE standards and using Bonneville Power Administration algorithms, and no interveners challenged the modelling or the results.

276. EDTI estimated the electric fields at the edge of the right-of-way of the proposed transmission line to be 0.3 kV/m or less for the proposed transmission line along the preferred route, except for the portion of the route within the TUC, where existing 240-kV lines are the primary contributor to local electric fields. For those portions of the project that are exclusive to the alternate route, EDTI estimated electric field levels to be 0.3 kV/m or less at the edge of the right-of-way. For the underground configuration, the transmission line would not be a source of electric fields.

277. Based on this evidence, the Commission accepts that the estimated electric fields will be lower than the ICNIRP guideline of 4.2 kV/m and similar to calculated levels that currently exist along the preferred route.<sup>156</sup>

278. EDTI also estimated the magnetic field levels at the nearest residences or facilities for the proposed transmission line to be:

- 5.1 mG or less along the preferred route
- 2.5 mG or less for portions of the project exclusive to the alternate route
- 2.3 mG for the underground configuration

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<sup>154</sup> Exhibit 23943-X0335.01, EDTI FA Rebuttal Evidence, PDF page 87.

<sup>155</sup> Exhibit 23943-X0335.01, EDTI FA Rebuttal Evidence, PDF page 36.

<sup>156</sup> Exhibit 23943-X0435, Exhibit 435 - by Dr. Cotts to Mr. Watson at T51077, Table 1.

279. These levels are considerably lower than the ICNIRP guideline of 2,000 mG and are not dissimilar to the calculated levels that currently exist along the preferred route.<sup>157</sup>

#### **6.4.1.2.2 Electric and magnetic fields and health**

280. In addition to the experts retained by EDTI and Lynnwood Community League, many individuals gave their personal opinion on the potential health effects associated with exposure to EMF. The Commission cannot give any weight to opinion evidence about the health effects of EMF from lay witnesses on this complex topic. However, personal opinions shared with the Commission effectively demonstrate that many potentially affected parties are apprehensive about EMF and its possible effects on human health.

281. The Commission places significant weight on the WHO's conclusion that, based on available research data, exposure to electromagnetic fields is unlikely to constitute a serious health hazard, and also on Health Canada's conclusion that exposure to EMF from transmission lines is not a demonstrated cause of any long-term adverse effect to human or animal health.

282. The Commission finds that the evidence of Dr. Héroux and Dr. Miller regarding the health risks associated with ELF magnetic fields and the precautionary measures they advocate are inconsistent with the conclusions of the WHO, Health Canada and other national and international organizations. It also finds that neither Dr. Miller nor Dr. Héroux provided sufficient evidence to displace the conclusions of those organizations. Many of the studies Dr. Héroux and Dr. Miller relied upon predate the stated positions and, in the Commission's view, would therefore have been assessed by or incorporated into the studies and reviews of the WHO and Health Canada. In any event, the Commission finds that the studies in question have otherwise been sufficiently rebutted.

283. Although the Commission accepts that burying the proposed transmission line would reduce magnetic-field levels, it finds Dr. Cotts' evidence to be persuasive. That evidence, shown in Table 9, predicts that the TWA exposures for the proposed project, whether constructed overhead or underground, will result in very small changes to the existing TWA magnetic-field levels. More specifically, the estimated magnetic-field levels for both the underground configuration (2.5 mG) and the overhead configuration (5.1 mG) are within the range of exposure levels measured in previous studies, consistent with background levels of EMF<sup>158</sup> and well below the limits established by both ICNIRP (2,000 mG) and ICES (9,040 mG).

284. The Commission accepts Dr. Cotts' TWA analysis as a reliable method for assessing the potential long-term magnetic-field exposures and the potential health effects associated with the magnetic fields produced by the proposed transmission line. The Commission notes that no parties took issue with this methodology.

285. The Commission finds that the difference in EMF levels between the preferred and alternate routes applied for by EDTI is negligible, and would not create different impacts on affected stakeholders.

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<sup>157</sup> Exhibit 23943-X0435, Exhibit 435 - by Dr. Cotts to Mr. Watson at T51077, Table 1.

<sup>158</sup> Exhibit 23943-X0222, Appendix 1 - Status of Health Research on Power Frequency Electric and Magnetic Fields - 2019, PDF page 8.

286. Given the predicted EMF levels, the Commission finds that the evidence before it does not support a conclusion that there will be health effects attributable to the EMF produced by the proposed transmission line at the nearest residences, schools or daycares. Therefore, there is no need to mitigate the effects of EMF, and in particular, there is no need to bury the transmission line on the basis of impacts from EMF.

## **6.4.2 Safety and other health impacts**

### **6.4.2.1 Views of the parties**

287. Intervenors also expressed concerns with other health impacts and the safety of the proposed transmission line.

288. The 190 Street Residents Group stated that whether or not the adverse health impacts are real or perceived, EDTI's proposed project imposes stress on its members which will negatively affect their health and wellbeing.

289. A number of the 190 Street Residents Group members identified stress as a result of EDTI's proposed project. For instance, Rosabelle Daugela expressed concern about the impact of the transmission line on her health. She stated that it is "not fair that someone else can build something that can affect me without my authorization. Even thinking about this makes me worried and stressed."<sup>159</sup> Michelle Jones and Gerald Lavoie stated that having a peaceful backyard was particularly important to them because of previous health issues.

290. The 190 Street Residents Group concluded that given the uncertainty of the risk and the real stress experienced by its members because of the project, it is in the public interest to bury the line, or at a minimum, move it as far away from its members as possible.

291. The Lynnwood Community League raised concerns about the safety risks that the project poses especially to children who attend Lynnwood's school, daycare and use its park. These concerns include the risk of electric shock, electrocution and possibly, death, from children flying kites that contact a transmission wire or from touching or climbing the transmission poles. David Arnold submitted that children could be shocked because galvanized steel and fibre glass transmission poles conduct electricity.<sup>160</sup>

292. The League stated that the Canadian Standards Association (CSA) document, Space Requirements for Recommended Play Activities, prohibits the siting of playgrounds adjacent to high-voltage lines. It questioned why EDTI should be allowed to install its above-ground transmission lines adjacent to an existing playground and school and stated that posting warning signs on the base of transmission structures and information online would be ineffective as young children are unlikely to read warning signs or EDTI's website.

293. The League noted that of the 81 schools and playgrounds with adjacent or crossing transmission facilities, 71 of those schools and playgrounds have the transmission facilities buried. It questioned the appropriateness of an overhead placement of the transmission line near the playground, school and parks in Lynnwood and concluded that the only safe mitigation is to bury the proposed transmission line within the Lynnwood community.

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<sup>159</sup> Exhibit 23943-X0267, Submissions of the 190 Street Residents Group - September 13, 2019, PDF page 17.

<sup>160</sup> Exhibit 23943-X0276, 2019-09-13 LCL Group Submissions, PDF page 13.

294. The Aldergrove Residents Group expressed concern over the possibility of an unplanned event causing downed power lines which is magnified by the height of the structures and proximity to their residences.

295. EDTI stated that transmission line infrastructure is designed to effectively mitigate the types of safety risks identified by the interveners. For example, EDTI explained that conductors are attached to poles using insulators that are designed and maintained to ensure that the electricity flowing on the line does not contact the pole or otherwise find a conducting pathway to the pole. EDTI explained that in the Lynnwood community, conductors would be installed on the sides furthest from houses and that it would trim trees and vegetation to maintain a clearance of at least 3.5 metres from conductors and may trim up to one metre around the poles, further reducing safety risks to residents.<sup>161</sup> EDTI also indicated that poles are grounded to ensure that in the event electricity flowing on a conductor finds a pathway to the pole, that the electricity will safely flow through the ground line into the ground. Further, EDTI submitted that in the highly unlikely event of a ground fault from an aerial conductor, high-speed protective relaying is employed to minimize the duration of any fault.

296. EDTI stated that it searched for instances of persons (public or utility employees) experiencing significant electric shock from transmission and distribution poles in Alberta from 2012 onwards and determined that there have been no such instances in the province during that time frame.

297. In addressing the CSA document, EDTI stated that the playground equipment is located approximately 16 metres from the existing distribution lines and the proposed transmission line. EDTI submitted that while the playground fence is adjacent to and within one metre of the existing and proposed lines, there are other existing overhead transmission lines within EDTI's service area that are adjacent to or that cross Edmonton's parks and schools.

298. EDTI disagreed with the Lynnwood Community League's assertion that the referenced CSA document prohibits the siting of playgrounds adjacent to transmission lines. It stated that the section of the CSA standard referenced by the League is described as an "informative (non-mandatory) part of this Standard."

299. EDTI assessed the potential hazards posed to playground users in an attempt to better understand the basis for the statements in the CSA standard, and to confirm that there are no potential hazards associated with the proposed transmission line such that the line should not be located as proposed. EDTI submitted that the standard likely contemplates the following hazard risks from adjacent power lines:

- Climbing – in the case of an adjacent power line, children may be tempted to climb the structures. EDTI notes that the proposed structures will continue to be separated from the play area by a fence and that no climbing fixtures will be installed on the proposed structures.
- Induction – although induced voltages are typically a nuisance rather than a hazard and are similar to the shock that may be received after shuffling across a carpet. Prior to construction, EDTI will retain a qualified independent consultant to complete an

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<sup>161</sup> Exhibit 23943-X0215, EDTI-LCL-2019JUL18-001-022, PDF pages 19 and 20.

induction study to identify any location along the approved route, including playgrounds and fences, where induced voltages may occur. EDTI will address the findings and any recommendations arising from this work, including implementing any mitigation measures that might be identified. EDTI is also committed to working with stakeholders post-construction to address any induction issues that might arise.

- Downed line – Fallen transmission lines on EDTI's system are exceedingly unlikely events, having occurred only once (during the 1987 tornado) in the past 35 years. Nevertheless, the potential impacts of a fallen transmission line conductor are mitigated by employing industry best practices in protective functions.<sup>162</sup>

300. EDTI submitted that the types of concerns that may have influenced the development of the annex to the CSA standard have been effectively addressed.

#### **6.4.2.2 Commission findings**

301. The Commission recognizes that many people have concerns about the health effects associated with the EMFs produced by the proposed transmission line. These concerns, coupled with the uncertainties inherent in the development of a transmission line project and the associated regulatory process, have undoubtedly created stress for many people who have been involved in the process.

302. The Commission also acknowledges that some of that stress could be reduced by an approval of the underground option. However, to the extent that the stress experienced is directly related to concerns about the health effects associated with EMFs, the Commission finds that there would be no material difference between the expected magnetic fields produced by an overhead versus an underground line at the nearest homes, schools, daycares and playgrounds. It also accepts that the expected EMFs produced by the proposed line, whether underground or overhead, will be very low, and well below recognized standards as noted by the expert witnesses for both the applicants and the interveners.<sup>163</sup>

303. Many landowners living close to the proposed line expressed genuine concerns about their own safety and the safety of their children at playgrounds and schools if the line were approved. Given these concerns, EDTI assessed the potential hazards posed to users of the playground and provided an explanation of what EDTI would do to mitigate the risks associated with the potential hazards of the proposed transmission line.

304. The Commission accepts EDTI's assessment of the risks to playground users and recognizes that the lack of climbing fixtures, the separation of the playground by a fence, maintaining adequate clearance from trees and vegetation and the grounding measures proposed to address induction will effectively mitigate many of the risks. In addition, the Commission considers that most, if not all of the potential hazards associated with the proposed transmission line also apply to the existing distribution line. Accordingly, the Commission is satisfied that there will be no additional hazards to the playground as a result of the proposed transmission line.

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<sup>162</sup> Exhibit 23943-X0335.01, EDTI FA Rebuttal Evidence, PDF pages 56 and 57.

<sup>163</sup> Transcript, Volume 6, page 1254, lines 13-23.

## 6.5 Noise

### 6.5.1 Views of the parties

305. EDTI retained SLR Consulting (Canada) Ltd. to conduct a noise impact assessment at the Poundmaker and Garneau substations. In its assessments, SLR concluded that the addition of a transformer to the Poundmaker Substation and the replacement of three transformers at the Garneau Substation would comply with Rule 012: *Noise Control* provided that the new transformers are consistent with its recommendations. EDTI confirmed that the recommendations were included in its transformer procurement specifications.

306. EDTI did not complete a noise impact assessment for the Meadowlark Substation because it is not proposing to add any noise-emitting equipment at that substation.

307. Boardwalk, the owner of the Whitehall Square apartment complex located adjacent to the Meadowlark Substation, submitted that the substation is audible from several of the buildings. Ms. Smith described being able to clearly hear a constant hum from the 15th floor balcony of one of the buildings. She submitted that the west side of the substation features a chain-link fence instead of a noise barrier wall and requested that the noise barrier be upgraded regardless of the outcome of this hearing.

308. The Lynnwood Community League's Olga McBride, who resides next to the substation, submitted that she can hear noise from the Meadowlark Substation inside her home and that her house vibrates at certain times. The League agreed with Boardwalk that the noise barrier should be upgraded.

309. The League retained James Farquharson, of FDI Acoustics, to complete a comprehensive sound survey at Ms. McBride's residence. Mr. Farquharson conducted a noise monitoring survey for 10 days in the summertime and filed a report in which he concluded that the substation complies with daytime and nighttime permissible sound levels. However, in its report, FDI also discussed Ms. McBride's concerns about low frequency noise. FDI indicated that the substation produces an elevated sound level at 125 hertz which supports the complaint by Ms. McBride. FDI submitted that "the tonal aspect of the substation sound is most likely enhanced inside the residence as mid and high frequency noise is reduced to greater effect by the construction of the home as compared to low frequency energy that would pass through the walls of the home."<sup>164</sup> The League noted that the substation was not operating at full load during the time of the survey and in its report, FDI indicated that substation load may affect the measured sound level.

310. Many interveners expressed concerns about noise from the proposed transmission line. Some indicated that they can hear noise from the existing distribution lines and are worried that a higher voltage line would be louder. Intervenors also conveyed concerns about noise from construction of the project.

311. Exponent, retained by EDTI to assess noise from the proposed transmission line, produced reports to assess audible noise for the preferred and alternate routes, as well as an underground configuration. Exponent concluded that for the preferred and alternate routes, audible noise levels would be below the City of Edmonton's Community Standards Bylaw, and that an underground configuration would not be a source of audible noise above ground. Exponent submitted that for both the preferred and alternate routes, the proposed transmission

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<sup>164</sup> Exhibit 23943-X0292, Appendix H - Evidence of James Farquharson, PDF page 4.

line and existing distribution lines are calculated to have a negligible effect on audible noise levels. It also stated that audible noise from transmission lines is most pronounced directly underneath the conductors and decreases with distance.

### **6.5.2 Commission findings**

312. The Commission has reviewed the noise impact assessments prepared for the Poundmaker and Garneau substations and finds that the proposed and existing facilities will comply with the requirements of Rule 012. It is also satisfied that the proposed transmission line will not be a significant source of audible noise.

313. The Commission is satisfied with EDTI's commitments to comply, during construction of the line, with the requirements of Rule 012 and with applicable City of Edmonton bylaws as those pertain to construction noise. The Commission does not favour either the preferred or alternate route or an underground configuration in this regard because there will be noise from any construction activity.

314. The Commission recognizes the concerns of Boardwalk and Ms. McBride regarding the noise at Meadowlark Substation. It finds, however, that because no noise-emitting equipment is being added to the substation as part of this application, this matter is outside the scope of this proceeding. Furthermore, the evidence of Mr. Farquharson indicates that sound levels at the substation adjacent to Ms. McBride comply with permissible sound levels. The Commission encourages EDTI, which is now aware of the concerns, to work towards addressing them to the extent practicable.

## **6.6 Environment**

### **6.6.1 Views of the parties**

315. EDTI retained Maskwa Environmental Consulting Ltd. to complete an Environmental Evaluation,<sup>165</sup> including project-specific environmental mitigation measures to ensure the project is undertaken in an environmentally responsible manner, as well as to ensure compliance with applicable environmental legislation.

316. The project is located in a highly developed urban area comprised of a wide variety of land uses and developments, including residential communities, commercial corridors, industrial areas, transportation corridors, schools, parks and recreation areas.

317. EDTI stated that to meet the Rule 007 requirements associated with the project, the Environmental Evaluation was completed in parallel with the West Edmonton Transmission Upgrade Project Siting Technical Report.<sup>166</sup> The Environmental Evaluation is based on the Siting Technical Report summation of findings and the determination of a preferred route and alternate route for the project. EDTI further stated that in the siting report, transmission line alternatives were compared based on the potential relative effects from environmental, social and economic perspectives, among other perspectives. The preferred route is located within the TUC and the Whitemud Drive corridor. The alternate route utilizes existing transmission structures along 105th Avenue and follows an existing distribution line along 170th Street. Both routes

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<sup>165</sup> Exhibit 23943-X0036, Appendix M Part 1 Environmental Evaluation.

<sup>166</sup> Exhibit 23943-X0028, Appendix G-2 Siting Technical Report.

leverage other existing linear developments (roads, existing distribution power lines, TUC, existing transmission structures) to reduce fragmentation and visual impacts.

318. EDTI explained that the Environmental Evaluation assessed the preferred and alternate routes based on the effects of potentially affected valued ecosystem components. The evaluation concluded that based on the effects assessment and because of the urbanized setting, there is no environmentally preferred route.

319. Maskwa also completed individual environmental reviews for the Poundmaker and Meadowlark substations and a separate Environmental Evaluation for Garneau Substation.

320. EDTI stated that the mitigation measures recommended by Maskwa will be incorporated into the Environmental Management Plan to be prepared by the engineering, procurement and construction contractor with the successful bid, and will be implemented prior to and during construction. Regular site inspections will be conducted by the engineering, procurement and construction contractor to ensure that the plan is being adhered to and remains effective.

321. EDTI stated that it would complete the following cleanup and landscaping:

- a) Restore the landscaping around newly installed poles to pre-construction conditions or other condition as specified by the City of Edmonton;
- b) Restore the landscaping in the area around the expanded Meadowlark, Poundmaker and Garneau substation fenced areas to pre-construction conditions; and
- c) Other items as required by the Environmental Evaluation.<sup>167</sup>

322. EDTI stated that it submitted applications to Alberta Culture and Tourism for *Historical Resources Act* approval for the proposed preferred transmission line, and to amend its existing approvals for the Poundmaker, Meadowlark and Garneau substations to accommodate the proposed fenceline amendments. EDTI stated it does not anticipate that Alberta Culture and Tourism will impose any conditions for this project.

323. The 190 Street Residents Group stated that when the TUC lands were acquired, the province cut all the trees in the TUC and turned productive farmland into empty green space. The loss of trees resulted in a negative impact to the wildlife and general serenity of the area. The group submitted that there are only a few trees remaining which provide some natural habitat for the remaining wildlife and provide some audial and visual barrier from traffic and industrial activity in the TUC.<sup>168</sup> According to Rose Bullock and Martin Mesman, the small stand of trees that remains today was only made possible through a quickly-assembled petition by the neighbourhood and that these trees would now be cleared for the preferred route.<sup>169</sup>

324. The 190 Street Residents Group submitted that the plan to further cut a significant portion of the remaining trees goes against best routing practices and that it is in the public interest to bury the line or follow the existing transmission line to avoid these impacts.

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<sup>167</sup> Exhibit 23943-X0011, EDTI West Edmonton Transmission Upgrade Project, PDF page 49.

<sup>168</sup> Exhibit 23943-X0267, Submissions of the 190 Street Residents Group - September 13, 2019, PDF page 20.

<sup>169</sup> Exhibit 23943-X0267, Submissions of the 190 Street Residents Group - September 13, 2019, PDF page 101.

325. EDTI disagreed that a significant portion of the remaining trees would be removed and stated that while some tree removal within the 15-metre-wide right-of-way would be required within the TUC, the preferred route avoids nearly all of the existing TUC trees near residential areas.

326. EDTI noted that burying the transmission line would also require clearing trees within a right-of-way. EDTI addressed the relative environmental impacts of an overhead versus underground configuration. It submitted that overhead lines can pose a hazard to wildlife during operation but that the environmental effects associated with underground lines would generally only occur during construction of the line and the time it takes for vegetation to re-establish afterwards.

### **6.6.2 Commission findings**

327. The environmental effects predicted for the project are consistent with transmission line development in the TUC and an urban setting. The Commission expects that with the diligent application of the proposed mitigation and monitoring measures put forward in the Environmental Evaluation, the environmental effects from construction and operation of the proposed transmission line will be adequately mitigated.

328. The Commission finds that the environmental effects are not a material factor in terms of which route to approve for this project. Moreover, for a significant portion of its right-of-way, the preferred route would utilize the TUC, a corridor created so that utility infrastructure could be grouped together with other linear features.

## **6.7 Routing of Transmission Line 72PM25**

### **6.7.1 Routing criteria and methodology**

329. EDTI stated that it implemented a project-specific siting methodology based on industry best practices to identify low-impact routes for the project and that it took steps to eliminate or mitigate potential social, economic and environmental effects on the community. EDTI said that this process incorporated land use planning principles, technical project requirements, and information and feedback provided by subject-matter experts, government and regulatory agencies, and other stakeholders. EDTI retained Maskwa Environmental Consulting to assist in reviewing and confirming EDTI's siting work and to help complete the final stages of the route selection process. Maskwa's vice-president of regulatory and business development, Hudson Foley, participated in the hearing as part of EDTI's facility applications witness panel.

330. EDTI explained that its siting methodology used a funnel approach to identify routes that posed lower levels of overall impact.<sup>170</sup>

331. The first stage in EDTI's route design was the conceptual route/site development stage, which included evaluating and selecting technical solutions that would meet the identified need.<sup>171</sup> This primarily involved using existing information sources to establish a project study area, identify and evaluate potential land impacts of the technical solutions being considered and make findings and recommendations on the potential land impacts posed by each of those solutions.

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<sup>170</sup> Exhibit 23943-X0027, Appendix G-1 Siting Methodology, PDF page 8.

<sup>171</sup> Exhibit 23943-X0027, Appendix G-1 Siting Methodology, PDF page 12.

332. The objective of the second stage, preliminary route development, was to identify viable routing or sites that had undergone some degree of evaluation and vetting before being used for broader stakeholder engagement during the next detailed route and site development stage.

333. In this stage, EDTI identified initial route corridors for which a transmission line would be viewed as generally more compatible using a compatibility matrix. EDTI identified five categories of impacts for use throughout the project siting methodology: residential, environmental, visual, technical considerations and special constraints which it said were intended to mirror the considerations outlined in Rule 007 and in previous Commission decisions.<sup>172</sup>

334. EDTI added the City of Edmonton's land use zoning designations to the compatibility matrix results, in order of compatibility, until connectivity was achieved between the project's termination points. This initial routing corridor was further refined by considering additional constructability factors.<sup>173</sup> Following completion of this assessment, EDTI established a final routing corridor to focus routing in areas that were both compatible with and constructible for overhead transmission lines.

335. EDTI then used a comparative metric analysis to identify and retire segments that posed relatively higher potential impacts, and to identify and retain segments with relatively lower impacts, until the retained segments formed an interconnected route grid that had been reviewed, evaluated and refined from several perspectives and was found to meet general engineering, construction and operations criteria.<sup>174</sup> The resulting interconnected segments formed the preliminary routes, depicted below, that EDTI used to engage with stakeholders.

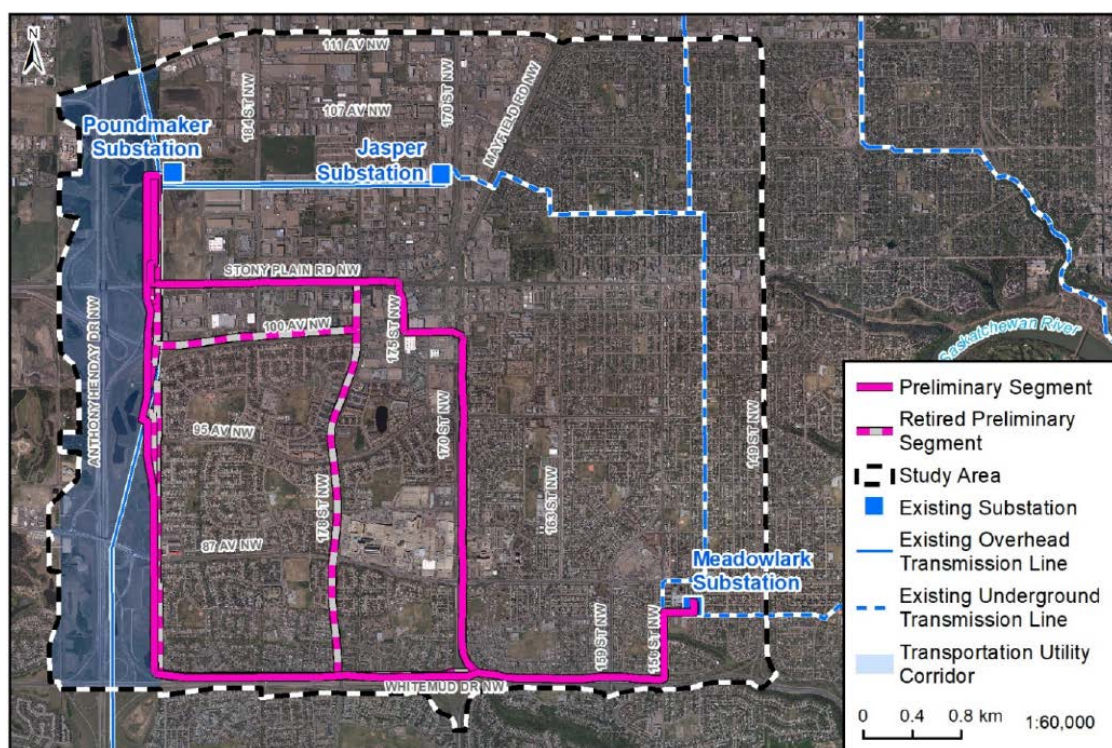


Figure 4. Preliminary route segments<sup>175</sup>

<sup>172</sup> Exhibit 23943-X0027, Appendix G-1 Siting Methodology, PDF page 22.

<sup>173</sup> Exhibit 23943-X0027, Appendix G-1 Siting Methodology, PDF page 23.

<sup>174</sup> Exhibit 23943-X0027, Appendix G-1 Siting Methodology, PDF page 29.

<sup>175</sup> Exhibit 23943-X0028, Appendix G-2 Siting Technical Report, PDF page 49.

336. In the next stage, detailed route development, EDTI began collecting stakeholder feedback and refined routing options by shifting preliminary routing segments, modifying placement or alignment of structures and incorporating new potential route segments.

337. EDTI indicated that it had ongoing discussions with Alberta Infrastructure about the potential placement of the transmission line in the TUC that drove multiple modifications intended to minimize potential impacts on stakeholders within and adjacent to the TUC. EDTI's evidence is that routing refinements also resulted from discussions with the City of Edmonton on the potential placement within transportation road allowances, and with TELUS about potential conflicts with its underground and overhead facilities.

338. In the final route development stage, EDTI consolidated changes resulting from the previous stage to identify the preferred route and comparable alternative routes that would eventually form the basis of the facility applications to the Commission.<sup>176</sup> Maskwa stated that routes A, B and C, depicted in the figure below, were identified for consideration in the final route development stage and were presented to the public in a second EDTI mail out.<sup>177</sup>

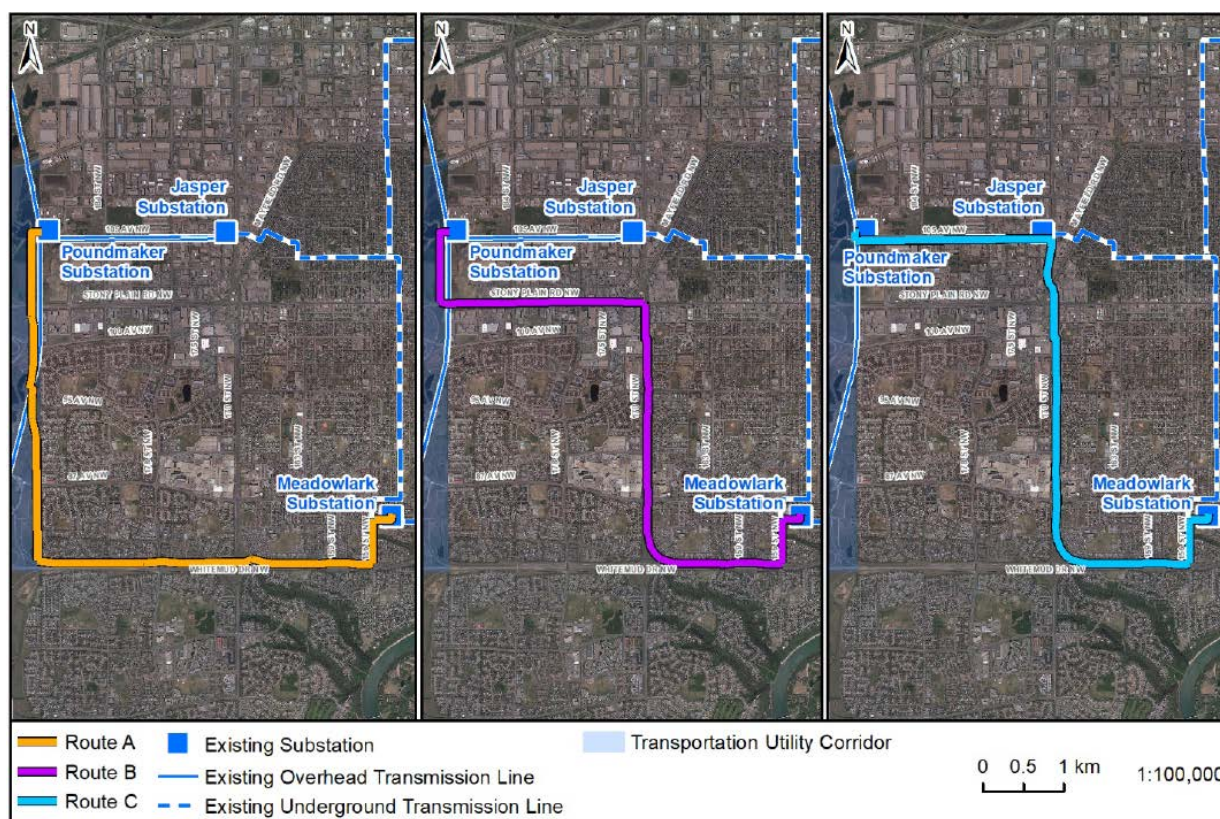


Figure 5. Routes A, B and C<sup>178</sup>

<sup>176</sup> Exhibit 23943-X0027, Appendix G-1 Siting Methodology, page 28.

<sup>177</sup> Exhibit 23943-X0028, Appendix G-2 Siting Technical Report, page 49.

<sup>178</sup> Exhibit 23943-X0028, Appendix G-2 Siting Technical Report, PDF page 59.

339. EDTI eventually retired Route B from further consideration because it offered no potential for a lower impact,<sup>179</sup> determined that the two remaining routes would be compatible and constructible, and identified Route A as the preferred route and Route C as the next best alternate route for the transmission line.

340. EDTI examined other potential routes going east from the Poundmaker Substation; for example, a route running east from 170th Street along 87th Avenue that coincided with the planned LRT extension,<sup>180</sup> and concluded that the preferred and alternate routes were the only viable low-impact routes. The other routes it considered offered less opportunity to parallel existing infrastructure and would result in higher overall impacts compared to the route along Whitemud Drive. Early in its routing analysis, EDTI concluded that other potential means of reaching the Meadowlark Substation would either not be viable or would have greater impacts. This was later confirmed by Maskwa.

341. Some of the intervenor groups argued that the Commission should return the application to EDTI for additional routing work because EDTI did not carefully consider transmission routing and, in particular, that it did not propose a route along 83rd Avenue. EDTI responded that it had proposed two approvable overhead configurations that are lower impact and substantially less expensive than underground routes. EDTI added that it is not obligated to advance other potential routes proposed by intervenors that, in its view, have a higher overall impact.

#### **6.7.2 Preferred and alternate routes**

342. EDTI described the transmission line route selection process for the project as a challenging task. Maskwa characterized the project area as a highly developed urban area comprised of a wide variety of land uses and development that included several residential communities, commercial corridors, industrial areas, transportation corridors, schools, parks, and recreation areas.<sup>181</sup> EDTI stated that it was aware of these constraints very early in its route selection process and that it began by seeking to find low-impact routes that could accommodate a new overhead 72-kV transmission line and thereby avoid the need for a markedly more expensive underground configuration.

343. EDTI ultimately proposed two project routes for the Commission's consideration: a preferred route and an alternate route. It considered each route to be feasible and to have comparatively low impacts on stakeholders and the environment; however, EDTI concluded that the preferred route would have lower overall impacts.

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<sup>179</sup> Exhibit 23943-X0028, Appendix G-2 Siting Technical Report, page 55.

<sup>180</sup> Exhibit 23943-X0011, EDTI West Edmonton Transmission Upgrade Project, pages 18 and 19; Exhibit 23943-X0028, Appendix G-2 Siting Technical Report, pages 28 and 29.

<sup>181</sup> Exhibit 23943-X0028, Appendix G-2 Siting Technical Report, PDF page 3.

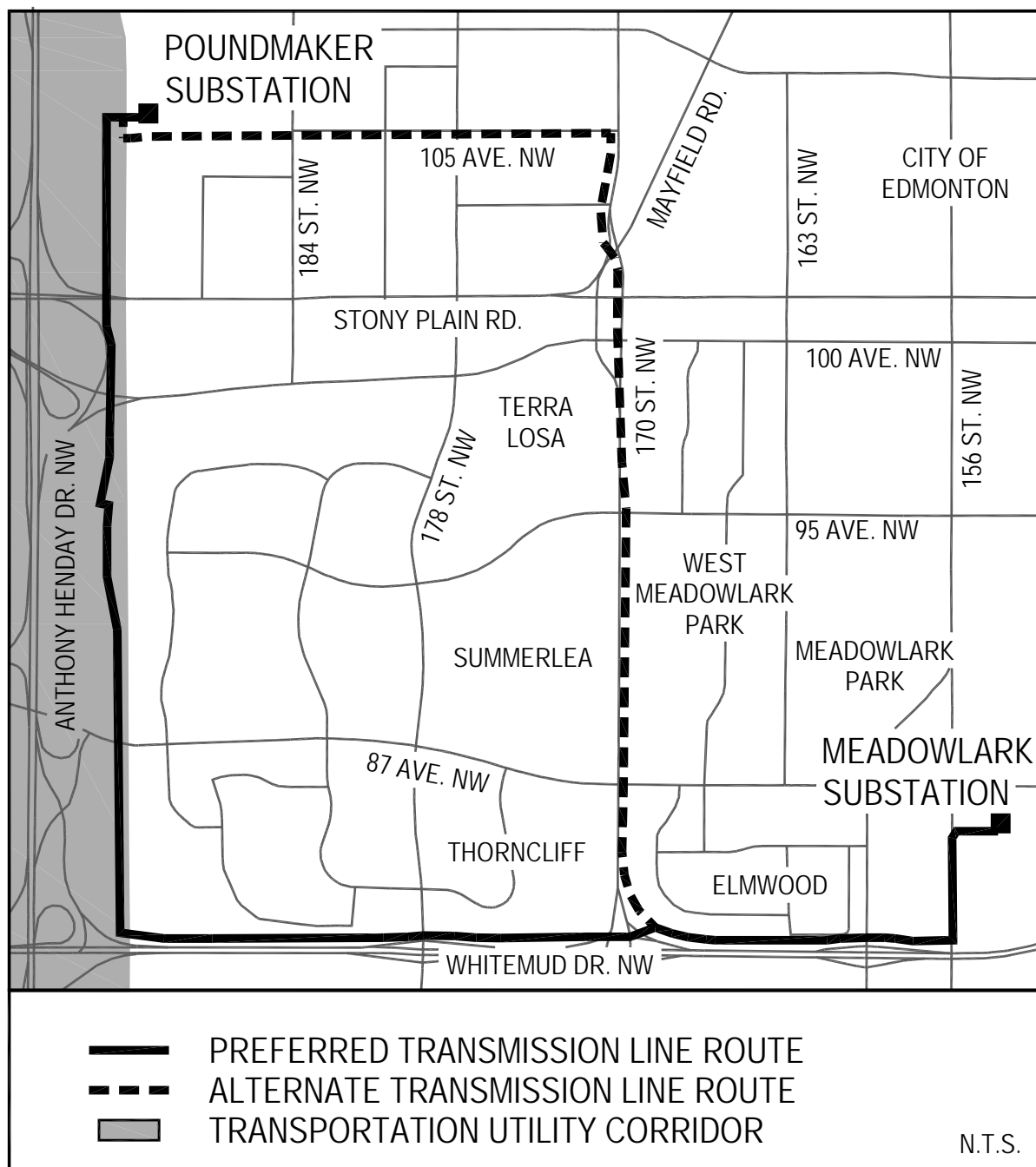


Figure 6. Preferred and alternate routes

#### 6.7.2.1 Preferred route

344. EDTI identified the combination of the TUC, located adjacent to the Poundmaker Substation, and the Whitemud Drive corridor, running from the TUC to 156th Street, as providing a low-impact route that would cover approximately 95 per cent of the distance from the Poundmaker to Meadowlark substations. The location of the line in the eastern portion of the Whitemud Drive corridor (from just east of 170th Street to 156th Street) coincides with and incorporates an overbuild of an existing distribution line and shares the same routing and configuration as EDTI's alternate route.

345. The final segment of the preferred route, from the intersection of Whitemud Drive and 156th Street to the Meadowlark Substation also shares the same routing and configuration as the alternate route. EDTI stated that although siting principles would encourage avoiding this type of route, this configuration would provide an opportunity to use and rebuild the existing double-circuit distribution line and would therefore represent an incremental, rather than a new or greenfield impact.

346. EDTI and Maskwa stated that the preferred route was selected because it:

- a. Maximizes use of the provincially-designated TUC and Alberta Infrastructure has confirmed the alignment within the TUC.
- b. Is preferred by the City of Edmonton, the municipal planning authority, and the City of Edmonton has confirmed the alignment within the Whitemud Drive corridor.
- c. Leverages other existing linear developments (roads, distribution lines, sound walls and alleyways) to reduce fragmentation and visual impacts.
- d. Parallels existing transmission lines more than other options.
- e. Has the lowest construction risks associated with overbuilding distribution lines and congested land uses.
- f. Has more available construction space than other routes and lower workspace requirements, resulting in fewer road closures or disruptions.
- g. Is primarily located on public lands and has the lowest required private land rights-of-way.
- h. Has the lowest fragmentation of land.
- i. Has the lowest overall expected removal of municipally planted/maintained trees, and it poses no major or unmitigable environmental impacts.<sup>182</sup>

347. EDTI added that the preferred route is similar to the alternate route in overall length and potential environmental effects. It estimated the cost of the preferred route to be \$14.09 million, submitted that it is the lowest-impact route of the two alternatives and should be approved in the configuration it proposed.

#### **6.7.2.2 Alternate route**

348. EDTI's alternate route would begin in the TUC adjacent to the Poundmaker Substation, and turn east where it would use existing 240-kV transmission structures along the south side of 105 Avenue up to 170 Street, just south of the Jasper Substation, where the existing transmission line terminates. It would then turn south along 170 Street until it joined the preferred route as it entered the Whitemud Drive corridor. The alternate route would then share the same route and configuration as the preferred route.

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<sup>182</sup> Exhibit 23943-X0011, EDTI West Edmonton Transmission Upgrade Project, PDF page 22; Exhibit 23943-X0028, Appendix G-2 Siting Technical Report, PDF pages 3 and 5.

349. EDTI and Maskwa stated that the alternate route was the next best route because it:

- a. Utilizes existing 240-kV transmission structures and EDTI rights-of-way along 105th Avenue.
- b. Leverages other existing linear developments (roads, existing distribution power lines, TUC, existing transmission structures) to reduce fragmentation and visual impacts, including that it provides the most opportunities to use existing distribution and transmission facilities.
- c. Is the alternate route preferred by the City of Edmonton, the municipal planning authority.
- d. Has low construction risks associated with congested land uses.
- e. Is located primarily on public lands and the only private land that may be required is already owned by EDTI.
- f. Follows an existing distribution line along 170th Street, which allows linear infrastructure to be grouped and eliminates the need for taller overbuild structures.
- g. Has minimal residentially-zoned lands.
- h. Poses lower overall environmental impacts, including a low overall expected removal of municipally planted/maintained trees.<sup>183</sup>

350. EDTI stated that the alternate route is comparable in length to the preferred route and has similarly low potential for environmental impacts. EDTI estimated the cost of the alternate route to be \$13.95 million.

### 6.7.3 Underground routing

351. EDTI stated that its practice is to propose overhead transmission lines unless an underground option is warranted, having regard to the factors outlined in Section 17 of the *Alberta Utilities Commission Act*. It generally considers underground configurations to be a higher overall impact option when an overhead configuration is technically feasible, constructible and would not result in unacceptable incremental social, economic and environmental effects.

352. EDTI gave the following examples of the specific types of factors it assesses when it considers whether an underground option is warranted:

- a. The relative cost of the underground configuration, which it stated is typically substantially more expensive than an overhead configuration.
- b. The availability of physical space and land to accommodate an overhead configuration.
- c. Electrical and operational clearances available for an overhead configuration.

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<sup>183</sup> Exhibit 23943-X0011, EDTI West Edmonton Transmission Upgrade Project, pages 22 and 23; Exhibit 23943-X0028, Appendix G-2 Siting Technical Report, page 5.

- d. The relative technical constraints associated with an overhead versus underground configuration.
- e. Incremental stakeholder impacts associated with an overhead configuration, including whether the project is a new transmission line or the replacement or rebuilding of an already constructed transmission or distribution line.<sup>184</sup>

353. Based on its assessment of all relevant factors, EDTI concluded that the preferred route installed in an overhead configuration would be the alternative with lowest overall impact.

354. EDTI stated that although it did not propose an underground configuration in its application, it was prepared to install any portion of the line underground if the Commission determined that such a configuration should be approved. However, EDTI clearly stated in its evidence, that there are no engineering constraints that would make an overhead configuration unworkable or unfeasible, and that after considering all relevant factors, it concluded there was no justification for installing the line underground.

355. EDTI acknowledged a difference in the magnitude and extent of certain effects of an underground versus overhead option; for example, impacts on neighbourhoods during construction of an underground configuration are greater than for an overhead configuration, and visual impacts of an overhead transmission line are greater than for an underground line. However, EDTI submitted that neither an overhead nor underground configuration would result in significant adverse effects and that there is little to differentiate between the potential effects of an overhead configuration and an underground configuration except for their respective cost.

356. Although it understood that a number of interveners preferred that the transmission line be installed underground, EDTI stated that it is required by the applicable legislation to consider the basis for that preference in the context of the potential social, economic and environmental effects of the transmission line. It submitted that prior Commission decisions have confirmed that to be the case, and referred to the following passage in the Heartland decision as an example:

1081. The question the Commission must consider is whether the additional costs required to place the line underground are justified by the extent to which doing so would mitigate health effects, visual impacts, effects on property values, environmental impacts and safety issues. The costs of the transmission line and any additional costs of placing the lines underground would be paid by all electricity customers in the province, and a significant portion of those costs would be borne by commercial and industrial customers in the province. Some of those customers appeared before the Commission to express their concerns about the negative economic effects on the competitiveness of their businesses of the significant increases in their electricity costs that would result from the construction of critical transmission infrastructure projects. In the Commission's view, consideration must be given to minimizing the economic effects of the Heartland project on electricity costs in the province while mitigating social, economic and environmental effects where and to the extent justified by the evidence.<sup>185</sup>

357. In its application, EDTI provided a preliminary estimate (+30 per cent/-30 per cent) of the additional cost of an underground configuration for each segment comprising the preferred

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<sup>184</sup> Exhibit 23943-X0335.01, EDTI FA Rebuttal Evidence, pages 21 and 22.

<sup>185</sup> Decision 2011-436: AltaLink Management Ltd. and EPCOR Distribution & Transmission Inc., Heartland Transmission Project, Application 1606609, Proceeding 457, November 1, 2011, paragraph 1081.

and alternate routes.<sup>186</sup> The estimates indicated that the total additional cost to place the preferred route underground would be \$51.7 million and the total additional cost to place the alternate route underground would be \$50.0 million.

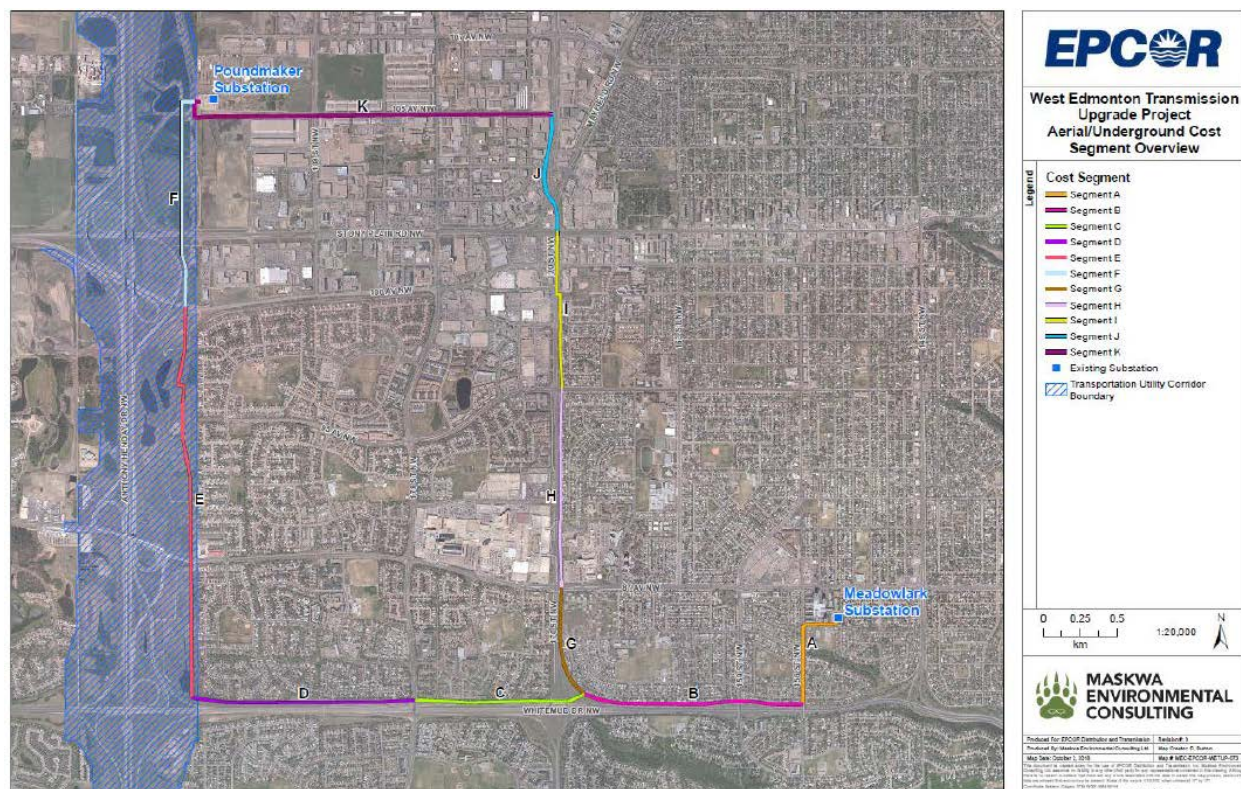


Figure 7. Underground route segments<sup>187</sup>

Table 10. Cost estimates for underground route options<sup>188</sup>

Line Segment	Line Length (km)	Additional Cost for Underground Option (Segment) (\$ million)	Additional Cost for Underground Option (Cumulative) (\$ million)
<b>Preferred Route</b>			
A	0.83	\$2.9	\$2.9
B	1.49	\$6.1	\$9.0
C	1.12	\$6.9	\$16.0
D	1.55	\$9.7	\$25.6
E	2.71	\$16.8	\$42.4
F	1.50	\$9.3	\$51.7
<b>Alternate Route</b>			
A	0.83	\$2.9	\$2.9
B	1.49	\$6.1	\$9.0
G	0.78	\$4.9	\$13.9
H	1.35	\$8.5	\$22.4
I	0.87	\$5.25	\$27.6
J	1.05	\$6.5	\$34.1
K	2.57	\$15.9	\$50

<sup>186</sup> Exhibit 23943-X0011, EDTI West Edmonton Transmission Upgrade Project, PDF page 33.

<sup>187</sup> Exhibit 23943-X0335.01, EDTI FA Rebuttal Evidence, PDF page 14.

<sup>188</sup> Exhibit 23943-X0335.01, EDTI FA Rebuttal Evidence, PDF page 14.

358. EDTI submitted that its estimates demonstrated that an underground configuration would cost significantly more than an overhead configuration. It added that with the exception of higher vegetation management costs for overhead configuration, operation and maintenance costs are similar for overhead and underground transmission lines but that repair costs are much higher for an underground configuration.

359. Also on the matter of costs, EDTI stated that many interveners appeared to believe that EDTI was trying not to spend money on the proposed facilities so that ultimately it would be better off financially. EDTI explained that under cost-of-service utility regulation, EDTI would earn more net income and profits if it spent more on utility infrastructure and other capital projects, and so the incentive for it (as a TFO) would actually be to spend more on the proposed facilities rather than less in order to increase its earnings. EDTI added, however, that it takes very seriously its obligation to operate and maintain a safe, reliable, and economic transmission system and that it is committed to its obligation to bring projects forward for approval that are in the public interest, having regard to all of the factors that the Commission considers. It reiterated that one such factor is minimizing the economic effects of the project on electricity costs in the province, while mitigating social, economic, and environmental effects where and to the extent justified by the evidence.

360. EDTI addressed the difference in visual impacts between an overhead and underground configuration, submitting that visual renderings provided by its consultant showed that the proposed overhead line would not represent a significant incremental visual impact on the landscape. EDTI stated that it does not consider the visual effects of the proposed line to be significant, either on a stand-alone basis or when considering the proximity of the line to existing linear infrastructure.

361. EDTI submitted that on an objective assessment of the potential social, economic and environmental effects of an overhead versus an underground configuration for the proposed transmission line, and considering prior Commission decisions addressing the issue, one must conclude that an overhead configuration would have the lowest overall impact and that the additional costs of constructing an underground configuration for each segment of the proposed transmission line are not outweighed by the benefits. EDTI reiterated that there are no engineering constraints that make an overhead configuration unworkable or unfeasible and that an overhead configuration will not result in any significant adverse electrical, health, visual, property value, noise, construction, obstruction, or environmental effects. It also emphasized that many of the preferred and alternate route segments involve rebuilding or reusing an existing primary distribution circuit alignment. EDTI added, however, that it would not be opposed to constructing all or any portion of the line in an underground configuration if the Commission determined that to be in the public interest.

#### **6.7.4 Detailed routing**

##### **6.7.4.1 Views of the parties on routing within the transportation and utility corridor**

362. EDTI stated that the segment of the preferred route running in the TUC from the Poundmaker Substation south to the Whitemud Drive corridor would make up slightly less than half of the total distance of the preferred route. It added that by using the TUC, it could avoid developed areas, including residential areas, over that portion of the route.

363. EDTI emphasized that the TUC is comprised of land purchased by the Province of Alberta and set aside for major transportation and utility infrastructure, and that it exists for the very purpose of accommodating power lines and other linear transportation and utility infrastructure. EDTI added that the location of the preferred route within the TUC is satisfactory to the administrator of the TUC lands, Alberta Infrastructure, and complies with the City of Edmonton's preference that EDTI use the TUC for transmission lines.

364. EDTI noted that Alberta Infrastructure has authority over specific siting within the TUC and that although the Commission ultimately retains jurisdiction to approve a transmission line route within the TUC, the line cannot be built unless the Minister of Infrastructure provides consent. EDTI explained that it began working with Alberta Infrastructure very early in the process to attempt to shift the line location further west in the TUC, to gain separation from residences, in anticipation that local residents would have concerns about the line being situated to the west of their properties. It stated that this resulted in an alignment that ranged from approximately 40 metres to 90 metres away from the properties owned by the members of the 190 Street Residents Group.

365. The 190 Street Residents Group submitted that EDTI's request for approval of the preferred route should be denied because EDTI's application contained "fatal errors," three of which related directly to EDTI's proposed transmission line routing or route selection process. The group requested that the application be denied and returned to EDTI to address its failures. The first alleged routing error was that EDTI's preferred route offended well-established routing principles, because it:

- a. Maximizes impacts with area residents.
- b. Has the highest number of newly exposed first-row residents within 200 metres.
- c. Has the highest amount of wetland crossings.
- d. Has the highest amount of historically listed species habitat observations within one kilometre.
- e. Has the highest amount of vegetation trimming or clearing required and the highest amount of greenfield development.

366. The 190 Street Residents Group also stated that the preferred route would not utilize existing linear disturbances to minimize new disturbances and clearing, and would not follow existing power lines or road allowances. It submitted that the preferred route is the longest and most expensive route identified in the application.

367. The 190 Street Residents Group submitted that EDTI should have routed the line adjacent to the existing overhead 240-kV transmission line located to the west of the preferred route, closer to Anthony Henday Drive. The group proposed alternate routes along that alignment, and filed the following depiction of the routes:



Figure 8. 190 Street Residents Group proposed routes<sup>189</sup>

368. The 190 Street Residents Group stated that its proposed alignment would be superior to EDTI's preferred route because it would reduce vegetation clearing, eliminate land sterilization between the existing 240-kV line and EDTI's preferred route, and most importantly, minimize impacts on residents along the east boundary of the TUC. It submitted that EDTI had a duty to provide the Commission with sufficient information about a routing alternative that parallels the existing overhead line or the existing Anthony Henday freeway. The group added that EDTI also failed to provide the Commission with sufficient evidence about an alternate underground route, and that because of this, the Commission could not possibly conclude that EDTI's preferred route is superior to all others.

369. The group also alleged that EDTI misunderstood the role and authority of Alberta Infrastructure in the siting and approval of transmission lines within the TUC. It disagreed that Alberta Infrastructure has the final say on where a transmission line can be located in the TUC, submitting that although Alberta Infrastructure manages the TUC, the Commission makes the final decision on where a particular transmission facility will be situated and that no legislation or policy dictates the location of the line.

<sup>189</sup> Exhibit 23943-X0267, Submissions of the 190 Street Residents Group - September 13, 2019, PDF page 10.

370. In response to EDTI's evidence that Alberta Infrastructure had designated part of the TUC for a future roadway and, referring to the Heartland decision,<sup>190</sup> the 190 Street Residents Group argued that in 1976 the Energy Resources Conservation Board established the principle that a speculative or uncertain future use of the TUC cannot be considered by the Commission when it makes decisions on facility applications proposing to use the TUC.<sup>191</sup> The group further submitted that EDTI "turn[ed] a blind eye to the repeated requests to move the line further away from homes, while wholeheartedly listening to Alberta Infrastructure/Transportation for their wishes and desires for an imaginary road."<sup>192</sup> It added that the future road is relatively small in size, and in any event would not go further north than 87th Avenue and so would not conflict with the part of the route it proposed.

371. The 190 Street Residents Group submitted that the preferred route's alignment within the TUC would create land use conflicts contrary to the reason that the TUC Policy Program was developed in 2004. It argued that although Alberta Infrastructure had acquired a swath of land over 500 metres wide for the TUC, EDTI's position is that the only area available to accommodate the proposed transmission line is within 40 metres of a well-established urban area, leaving 400 metres of untouched green space within the TUC.

372. According to EDTI, the record demonstrates that Alberta Infrastructure's initial position was that the transmission line, being a 72-kV line, should be located in the municipal services component of the TUC, a 20-metre-wide strip of land on the east side of the TUC, immediately adjacent to residential properties. The municipal services component of the TUC was described in an email message from an Alberta Infrastructure official:

Within the TUC, planning for Anthony Henday Drive (TUC Ring Road and Buffer Components) is given paramount consideration over other primary uses such as power lines, pipelines and municipal services (water, sanitary, storm and telecom)....

Generally, the Municipal Services Component parallels the inside TUC boundary around the City. There is an existing underground power line and telecommunications line within the Municipal Services Component along the inside (east) boundary of this part of the TUC. Minor 69/72kV power lines are designated uses of the Municipal Services Component, while the major transmission lines 138kV and above, are designated uses of the Power Line Component.

The above noted Components have been carefully planned to ensure that TUC primary uses are accommodated in an orderly, effective and efficient manner. I hope this information is useful.<sup>193</sup>

373. EDTI stated that it worked collaboratively with Alberta Infrastructure over a period of years to identify an acceptable route within the TUC, and that it advocated for an alignment as far from the east boundary of the TUC as possible. Early in the process, it was able to work with Alberta Infrastructure to move the alignment outside of the municipal services component and into the power line component further from residences. However, Alberta Infrastructure eventually made it clear that EDTI's preferred route alignment is as far west as Alberta Infrastructure would

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<sup>190</sup> Contained in the Commission's reasons in Decision 2011-436.

<sup>191</sup> Transcript, Volume 8, page 1965, lines 4-24.

<sup>192</sup> Transcript, Volume 8, page 1961, lines 13-16.

<sup>193</sup> Exhibit 23943-X0220, EDTI-190SG-2019JUL18-003 Attachment 1 Part 2, PDF page 41.

allow.<sup>194</sup> EDTI stated that a large portion of the segment that interveners suggested would be sterilized is intended for a future 87th Avenue/Anthony Henday interchange development.

374. EDTI stated that the 190 Street Residents Group's arguments were simply not supported by the evidentiary record and were not based on a correct interpretation and application of the 1976 Energy Resources Conservation Board decision, or of Alberta Infrastructure's authority under the *Edmonton Restricted Development Area Regulations*.

375. The third routing error alleged by the 190 Street Residents Group was that EDTI had mischaracterized the line as a minor transmission line so as to have Alberta Infrastructure locate the line within the municipal services component near the eastern boundary of the TUC, closest to residences.

376. As an alternative to a denial of EDTI's application, the 190 Street Residents Group requested that the Commission either direct EDTI to bury the line along the preferred route or construct an overhead line further west in the TUC along the group's proposed route. It submitted that burying utilities in the municipal services corridor of the TUC aligns with Alberta Infrastructure's Policy Program and that this preference was reflected in the same email from Alberta Infrastructure, which stated "[t]here is an existing underground power line and telecommunications line within the Municipal Services Component along the inside (east) boundary of this part of the TUC."<sup>195</sup> The group submitted that burying the line would avoid land use conflicts and be consistent with the established purposes of the TUC and greenbelts in urban areas.

377. In response, EDTI compared the estimated cost to construct the TUC segment of the preferred route in an overhead configuration of \$4.01 million<sup>196</sup> to a cost of \$30.1 million to construct the same segment underground, resulting in a difference of \$26.09 million or a 7.5 times cost increase.<sup>197</sup>

#### **6.7.4.2 Views of the parties on routing from the transportation and utility corridor to 170th Street**

378. EDTI stated that the segment of the preferred route running east from the TUC along the north side of Whitemud Drive to 170th Street would be located within the established Whitemud Drive transportation corridor on land owned by the City of Edmonton, that this portion of the proposed route parallels existing linear facilities, including a heavily travelled freeway, and is therefore consistent with key route selection criteria. EDTI described the alignment within the route as generally being ten metres into the freeway right-of-way, measured from the boundaries of the adjacent residential properties, with that separation distance increasing at certain points. The line would be installed on new transmission poles located on or near the existing berm.

379. EDTI stated that the specific alignment was selected for two main reasons: there are underground utility facilities in the freeway right-of-way that require the alignment to be placed to the north, and the City of Edmonton and Alberta Infrastructure plan to widen Whitemud Drive

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<sup>194</sup> Exhibit 23943-X0220, EDTI-190SG-2019JUL18-003 Attachment 1 Part 2, PDF page 52.

<sup>195</sup> Exhibit 23943-X0220, EDTI-190SG-2019JUL18-003 Attachment 1 Part 2, PDF page 41.

<sup>196</sup> Exhibit 23943-X0217, EDTI-ELMWOOD-2019JUL18-001-006, PDF page 3.

<sup>197</sup> Exhibit 23943-X0335.01, EDTI FA Rebuttal Evidence, PDF page 14.

west of 170th Street.<sup>198</sup> EDTI also stated that the City of Edmonton's preference is for a route in the Whitemud Drive corridor.

380. The Aldergrove Residents Group expressed concerns about the project's effect on lifestyle, noise, safety, health, sightlines and property values. The group submitted that if the transmission line is approved along the preferred route it should be built underground for the benefit of the residents in the area. Sony Leonard summarized the group's position by stating that although the residents understood burying the proposed line would increase construction costs, these costs would be offset by other savings and economic prospects that included preserved property values and a preserved tax base for EDTI's sole shareholder, the City of Edmonton. She stated that this is an opportunity to have the costs of burying the line shared equitably by all EDTI ratepayers in the city of Edmonton and surrounding area, instead of having a few hundred homeowners bear the direct impacts of an overhead line.

381. At the hearing, the group's members described how their families used the berm along the preferred route as a recreational space. David Leonard stated that in addition to the recreational opportunities it provides, the berm functions as effective sightline mitigation from Whitemud Drive and the vehicles on it. He disagreed with EDTI's assertion that the proposed overhead line would not be a significant incremental visual impact on the landscape, stating that although the berm was intended to mitigate visual impacts of Whitemud Drive, it would instead act as a shelf to elevate the transmission line.

382. In response, EDTI stated that the evidence demonstrated that the proposed transmission line would not interfere with anyone's use of the green space in the freeway right-of-way, and provided several examples of urban green spaces containing transmission lines that are used for recreational purposes.<sup>199</sup>

383. EDTI estimated that the cost to construct the portion of the preferred route from the TUC boundary on Whitemud Drive to the intersection of 178th Street and Whitemud Drive (the portion adjacent to the south boundary of Aldergrove in an overhead configuration) would be \$1.44 million,<sup>200</sup> and estimated that the cost to construct the same portion underground would be \$11.08 million. This results in a cost increase of \$9.65 million or a 7.5 times cost increase.<sup>201</sup> EDTI estimated that the cost to construct the remainder of the segment, from 178th Street to just east of 170th Street in an overhead configuration, would be \$1.07 million,<sup>202</sup> and the cost to underground that portion would be approximately \$8.0 million.<sup>203</sup>

#### **6.7.4.3 Views of the parties on routing from 170th Street to 156th Street**

384. The segment of the preferred route running east of 170th Street to 156th Street would continue along the Whitemud Drive corridor, using land on the north side of Whitemud Drive owned by the City of Edmonton. This segment would be similar to the preferred route west of 170th Street, but the alignment would move north of the berm and sound wall and into the laneway adjacent to the south boundary of residential properties in the Elmwood and Lynnwood communities. Except for approximately 150 metres between the centreline of 170th Street and

<sup>198</sup> Exhibit 23943-0217, EDTI-ELMWOOD-2019JUL18-001-006, PDF page 18.

<sup>199</sup> Exhibit 23943-0352.01, Appendix G - Reply Evidence of Maskwa, PDF pages 118 to 135.

<sup>200</sup> Exhibit 23943-X0217, EDTI-ELMWOOD-2019JUL18-001-006, PDF page 3.

<sup>201</sup> Exhibit 23943-X0335.01, EDTI FA Rebuttal Evidence, PDF page 14.

<sup>202</sup> Exhibit 23943-X0217, EDTI-ELMWOOD-2019JUL18-001-006, PDF page 3.

<sup>203</sup> Exhibit 23943-X0335.01, EDTI FA Rebuttal Evidence, PDF page 14.

proposed pole number 64 located east of 170th Street, this segment of the preferred route is also part of the alternate route.

385. EDTI described the alignment within this segment as generally being five metres across the alleyway from residential properties, with most of the transmission line installed as an overbuild of the existing double-circuit distribution line. It stated that beginning with pole number 66, it would replace roughly every second or third distribution pole with a new transmission pole and would remove the existing overhead distribution circuit M12 and place it underground.<sup>204</sup> EDTI submitted that the proposed construction would be an incremental rather than a greenfield impact, that would result in the same number of overhead circuits but would have larger and taller poles that placed the transmission circuit higher off the ground. EDTI added that the proposed alignment in this segment represents a low-impact route that would not impede residents' access to or use of their properties.

386. In response to concerns from the Elmwood Residents Group that the alignment west of pole number 66 would have both the existing distribution poles and new transmission poles, EDTI stated that the new transmission poles were needed to maintain alignment within the transportation corridor and that they would be located well into the green space of the road allowance for Whitemud Drive.

387. EDTI estimated that the cost to construct the portion of the preferred route from pole number 64, just west of where the distribution line overbuild would start, to the intersection of 156th Street and Whitemud Drive would be \$4.58 million (including \$2.39 million to underground existing overhead distribution circuit M12).<sup>205</sup> EDTI's estimated cost to construct the transmission line underground over the same portion of the preferred route would be \$10.65 million, resulting in a cost increase of \$6.07 million or a 2.3 times cost increase.<sup>206</sup> EDTI stated that overhead distribution circuit M12 would not be relocated if the proposed transmission line were installed underground.

388. During the hearing, the Elmwood Residents Group and the Lynnwood Community League questioned EDTI about constructing the proposed transmission line underground along 83rd Avenue, generally from Meadowlark Substation to the intersection of 83rd Avenue and 170th Street, with the remainder of the line to the Poundmaker Substation constructed overhead on the alternate route. Although the 83rd Avenue route was identified by EDTI as the intended underground alignment for distribution circuit M12, during the hearing the Elmwood Residents Group asked whether the proposed transmission line could be constructed in that underground alignment instead. EDTI named this route Option UT-07, which is depicted in Figure 9 later in this decision.

389. EDTI stated that the high-level preliminary cost estimate (+30 per cent/-30 per cent) to construct the transmission line in the underground portion of the Option UT-07 alignment would be \$16.37 million. It estimated that the cost to construct the entire transmission line, from Meadowlark to Poundmaker substations, in the combined underground and overhead

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<sup>204</sup> The overbuild would begin behind the property at 16743 – 79A Avenue. See Exhibit 23943-X0438, Exhibit 438 - Map of Richard and June Ennis' property.

<sup>205</sup> Exhibit 23943-X0217, EDTI-ELMWOOD-2019JUL18-001-006, PDF page 3.

<sup>206</sup> Exhibit 23943-X0335.01, EDTI FA Rebuttal Evidence, PDF page 14.

configurations of Option UT-07 would be \$22.57 million, whereas the cost to construct the entire preferred route in an overhead configuration is \$14.09 million.<sup>207</sup>

390. The preferred route would run along the south boundary of the Elmwood community between 170th Street and 159th Street, and along the south boundary of the Lynnwood community between 159th Street and 156th Street. Members of both the Elmwood Residents Group and the Lynnwood Community League own properties adjacent to this portion of the preferred route and expressed concerns about the overhead alignment proposed by EDTI.

391. The Elmwood Residents Group stated that approving the overhead configuration in EDTI's preferred route is not in the public interest because of the substantial impacts the transmission line would have on Elmwood residents. It submitted that the Commission should direct EDTI to develop an underground alignment, either within the preferred route or along 83rd Avenue as described in Option UT-07, and return to the Commission when it had finalized an underground route and consulted with residents. Alternatively, the group submitted that EDTI should be required to develop an overhead configuration in an alignment further south and further from residences in the Whitemud Drive corridor.

392. The Elmwood Residents Group described how pedestrians use the laneway adjacent to the preferred route as a walking path and how children use the laneway to go to school. The group's members stated that they enjoy the green space near 170th Street behind their homes, as well as the time they spend outdoors in their backyards. Although they are concerned about the proposed transmission line interfering with those activities, one of their main concerns is the close proximity of new transmission poles to their properties. The group stated it had identified 52 homes in Elmwood, including many properties belonging to group members, that would have a new transmission pole located five or six metres from the property if the preferred route is approved. The group added that some of its members living near 170th Street whose properties are west of the distribution circuit overbuild segment, including Tim Horbasenko and Ken and Marilyn Huff, would have both new transmission poles and the existing distribution poles behind their properties.

393. The Elmwood Residents Group questioned EDTI's assertion that the preferred route would actually use an existing linear disturbance, and that repurposing the existing distribution line's wooden poles, some of which are patched and burned, and replacing other poles with larger and taller transmission poles is not a meaningful use of the existing infrastructure. The group submitted that the project is in fact a greenfield construction project and not one that uses an existing linear disturbance, and asked the Commission to assess the impacts of the project on that basis.

394. The Elmwood Residents Group stated that the Commission has a duty to mitigate project impacts on discrete parts of a community when the project itself benefits the larger community. It submitted that the Commission acknowledged this duty in Decision 2009-28, where it stated "the public interest standard will generally be met by an activity that benefits the segment of the public to which the legislation is aimed, while at the same time minimizing or mitigating, to an acceptable degree, the potential adverse impacts on more discrete parts of the community."<sup>208</sup> The group also submitted that if the Commission finds that underground routing is appropriate to

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<sup>207</sup> Exhibit 23943-X0409, Exhibit 409 - by Ms. Hull to Ms. Bishop at T5977, PDF page 2.

<sup>208</sup> Decision 2009-028: AltaLink Management Ltd., Transmission Line from Pincher Creek to Lethbridge, Application 1521942, Proceeding 19, March 10, 2009, paragraph 33.

address the concerns of residents affected by EDTI's proposed overhead configuration, it could require EDTI to construct the transmission line underground.

395. The Elmwood Residents Group submitted that of the \$9 million estimated incremental costs to underground the transmission line from Meadowlark Substation to 170th Street, \$4.4 million is attributable to undergrounding the line in the Elmwood neighbourhood.<sup>209</sup> It further submitted that the appraisal evidence indicated that homeowners in the Elmwood and Lynnwood communities would experience the highest negative impact on property values from the proposed overhead alignment, and that an underground configuration would mitigate that impact. The group stated that the incremental cost to construct an underground alignment is not out of line with costs that the Commission has required market participants to bear in other proceedings to mitigate project impacts on affected parts of a community.

396. According to the Elmwood Residents Group, the record of discussions between EDTI and the City of Edmonton does not support EDTI's evidence that the City preferred the proposed overhead configuration in the alleyway north of Whitemud Drive. It stated that the City's actual advice to EDTI was that it would not provide specific guidance on transmission line routing; that EDTI agreed during the hearing that it was a reasonable assumption that the City would prefer an underground alignment if the City was not made responsible for the incremental costs of constructing the line underground; and that in a letter<sup>210</sup> to the City, EDTI stated it would advocate for an underground route before the Commission.

397. The Elmwood Residents Group stated that if the Commission were not prepared to direct EDTI to develop an underground route through the community, it should require EDTI to investigate an overhead route that is closer to Whitemud Drive than the proposed alignment and situated on the south side of the sound wall, away from the Elmwood residences. The group referred to a photo in EDTI's reply evidence,<sup>211</sup> which it submitted showed that substantial room exists in that portion of the Whitemud Drive corridor to construct a transmission line south of the sound wall. The group stated that EDTI did not investigate that option or prepare a cost estimate for it, but instead simply asserted that the City of Edmonton preferred the proposed overhead configuration within the alleyway.

398. EDTI stated that the City of Edmonton preferred an overbuild alignment in the alleyway north of the sound wall rather than south of the sound wall. EDTI referred to the minutes of a meeting in which the City of Edmonton's representative identified that an alignment south of the sound wall would result in significant traffic impacts on Whitemud Drive, vegetation removal, and greater construction impacts and would likely require existing retaining walls to be rebuilt.<sup>212</sup>

399. The Lynnwood Community League also requested that the Commission direct EDTI to develop underground options for the proposed transmission line and return to the Commission when they were developed and consultation was complete. Many of the League's concerns were focused on the proposed overhead alignment along 156th Street and 84th Avenue, discussed in more detail later. However, its concerns also apply to the routing in the alleyway north of Whitemud Drive, between 159th Street and 156th Street. Specific to that segment, the League is

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<sup>209</sup> Exhibit 23943-X0217, EDTI-ELMWOOD-2019JUL18-001-006, PDF page 5.

<sup>210</sup> Exhibit 23943-X0401, Exhibit 401 - by Ms. Wagner to Ms. Bishop.

<sup>211</sup> Exhibit 23943-X0352.01, Appendix G - Reply Evidence of Maskwa, PDF page 16.

<sup>212</sup> Exhibit 23943-X0340, Attachment 5 – ERG, page 70; Exhibit 23943-X0029, Appendix G-3 Route Revision Log, pages 102-105.

concerned that placing larger poles and a higher voltage power line in the alleyway (in addition to the existing distribution lines) would make it more difficult for residents to navigate the alleyway to access their properties, especially in slippery winter conditions. Its members are also concerned about access to their properties from the alleyway being restricted during construction and maintenance operations, and about noise from construction.

400. The Lynnwood Community League noted that the estimated incremental cost to bury the proposed transmission line underground from the intersection of 159th Street and Whitemud Drive to the intersection of 156th Street and Whitemud Drive is \$1.77 million.<sup>213</sup> It submitted that this cost, together with the estimated \$2.94 million incremental cost to bury the line in the remaining segment within Lynnwood to Meadowlark Substation, is justified in the circumstances.

#### **6.7.4.4 Views of the parties along 156th Street and 84th Avenue**

401. EDTI submitted that the segment of the preferred route running north from the intersection of 156th Street and Whitemud Drive to 84th Avenue and then east along 84th Avenue to Meadowlark Substation, was the lowest-impact route from Whitemud Drive to the substation. It stated that this alignment also followed an existing double-circuit distribution line and would be constructed on publicly-owned land within the City of Edmonton's road allowance.

402. In this segment, EDTI proposed to rebuild one component of the existing distribution circuit and bury another component, similar to the configuration proposed for the alleyway between 170th Street and 156th Street. However, in contrast to that segment, the proposed transmission line on 156th Street would replace nearly every distribution pole rather than every other pole and would be located in front of the residential properties situated on the east side of 156th Street, instead of in the rear laneway. EDTI stated that the new transmission poles on 156th Street would be located in alignment with front to rear property lines, thereby minimizing visual impacts for residents. EDTI submitted that the location of the poles would not affect landowners or interfere with access to their properties.

403. EDTI stated that the proposed transmission line in this segment would cause incremental rather than greenfield impacts because it would involve reusing the existing distribution alignment. It added that the purpose of burying the M12 distribution circuit on the existing distribution poles would be to reduce impacts on 156th Street residents by limiting the number of overhead lines to two: one existing distribution line and the proposed 72-kV transmission line. EDTI also stated that the City of Edmonton does not object to the proposed alignment and confirmed that it has no bylaws or policies that prevent the proposed overhead transmission line from being constructed on 156th Street and 84th Avenue.

404. EDTI disagreed with the Lynnwood Community League's statement that 72-kV lines in residential areas of Edmonton are only located on bike paths, and that the proposed alignment is therefore in conflict with established siting criteria. EDTI referred to a photograph of the Athlone and Wellington communities that showed a 72-kV line adjacent to residences in those areas as only one example of transmission line routing adjacent to homes in a residential community.<sup>214</sup>

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<sup>213</sup> Exhibit 23943-X0335.01, EDTI FA Rebuttal Evidence, PDF page 16.

<sup>214</sup> Exhibit 23943- 23943-X0227, Appendix 4 - 72 kV Transmission Lines and Residential Property Values, PDF page 29.

405. EDTI and Maskwa both acknowledged that from a siting methodology perspective one would generally avoid routing a transmission line through a residential neighbourhood, especially if the line is a greenfield project. However, because the termination point of the proposed transmission line is an existing substation within the well-established Lynnwood community, Maskwa indicated that it is impossible to avoid a route through that neighbourhood. Mr. Foley of Maskwa stated:

...we generally try to avoid residential areas as much as possible; but in this area, we can't. The substation is located in the midst of it, and the attempt was then to try to find routing that would minimize overall impacts.<sup>215</sup>

406. In response to the Lynnwood Community League's request that the proposed transmission line be constructed underground, either along the 83rd Avenue route identified as Option UT-07 or for the portion of the preferred route that is within the Lynnwood community, Mr. Foley stated that consideration of underground construction typically only arises if an evaluation of overhead solutions identifies factors that drive an applicant to an underground solution.<sup>216</sup> EDTI's witness, Ms. Hull, stated that EDTI's evaluation of the proposed transmission line determined that an overhead alignment on 156th Street and 84th Avenue is both feasible and constructible, and that EDTI's preliminary consideration of an underground configuration near the Lynnwood school and playground indicated that the area is very congested and that detailed engineering would be required to confirm if it is even feasible to construct the proposed line underground in that area.<sup>217</sup>

407. In response to the League's concerns about removal or trimming of trees and other vegetation along 156th Street, EDTI said that it would trim trees or vegetation to maintain a clearance of at least 3.5 metres from the 72-kV conductors and may trim up to one metre around the power poles, but that it did not expect any greater vegetation trimming than what is currently required to accommodate the overhead distribution lines.

408. EDTI stated that the estimated cost to construct the portion of the preferred route from the intersection of 156th Street and Whitemud Drive to Meadowlark Substation would be \$2.99 million (which includes \$1.47 million to underground existing distribution circuit M12).<sup>218</sup> EDTI's estimate to construct the new transmission line underground over the same portion of the preferred route would be \$5.93 million, resulting in a cost increase of \$2.94 million or slightly less than double the cost.<sup>219</sup> EDTI reiterated its position that the additional costs of an underground configuration for this and every other segment of the proposed transmission line are not justified by the reduction in potential impacts of an overhead configuration.

409. The Lynnwood Community League submitted that when all of the social, economic, and environmental effects of the project are considered, and the routing and cost considerations of the preferred route are weighed, the Commission ought to conclude that an overhead placement of the proposed transmission line through the Lynnwood community is not in the public interest. It argued that the only overhead transmission line in EDTI's study area that is within a residential

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<sup>215</sup> Transcript, Volume 3, page 421, line 25 and page 422, lines 1-6.

<sup>216</sup> Transcript, Volume 3, page 421, lines 17-24.

<sup>217</sup> Transcript, Volume 3, page 409, line 9 to page 410, line 13.

<sup>218</sup> Exhibit 23943-X0217, EDTI-ELMWOOD-2019JUL18-001-006, PDF page 3.

<sup>219</sup> Exhibit 23943-X0335.01, EDTI FA Rebuttal Evidence, PDF page 14.

area is the 240-kV line located in the TUC adjacent to Anthony Henday Drive<sup>220</sup> and that the only 72-kV transmission lines in the study area are the 72JM18 and the 72MG16 transmission lines, constructed underground in the Lynnwood community over 40 years ago.

410. The League also noted that under the routing criteria used by EDTI and described in Maskwa's Siting Technical Report, residential zoning is considered to be the land use designation that is least compatible with transmission facilities.<sup>221</sup> The League requested that the Commission either direct EDTI to develop an underground route through the community for the Commission's consideration or that it require EDTI to construct the Lynnwood portion of the preferred route underground.

411. John Pasma and David Arnold stated that according to the City of Edmonton Bylaw 15100, the City is to advocate for transmission lines to be installed underground. Mr. Arnold added that although the bylaw is not mandatory, it does contradict EDTI's evidence that the City of Edmonton supports the overhead configuration proposed by EDTI.<sup>222</sup>

412. The Lynnwood Community League expressed concerns that new poles would be placed at the back of the sidewalk in what was essentially the front garden of houses along 156th Street, with some homes being less than 4.8 metres from the base of a pole. The League is also concerned about the size of the poles in comparison to the existing distribution poles. Santwana Carstensen-Sinha stated that instead of seeing a skinny tree-like pole that measures 36 centimetres in diameter, Lynnwood residents would see taller poles with a diameter of 81.4 centimetres.

413. In addition to visual impacts, the League raised concerns about the new transmission poles affecting the use and development of their properties. Its members stated that if the preferred route is constructed, residents would always have to be conscious of the conductors and ensure that safety clearances are observed. Mr. Donner indicated that the proposed location of a new transmission pole approximately 10 metres from his home could prevent him from building a loft suite. Mr. Arnold submitted that the house wall of one property along 156th Street is 4.8 metres from the edge of the existing distribution pole, with the roof-to-pole separation being approximately 4.5 metres. He stated that the distance to the larger transmission structure would be less, and the safe zones depicted by EDTI would actually be above the roof of that residence.<sup>223</sup> The League added that residents would have to deal with the obstruction created by the new poles, for example when mowing their lawns or planting shrubs and hedges.

414. The League raised other safety concerns about the preferred route, particularly in relation to the proximity of the transmission line to the Lynnwood school, daycare and playground, including the risk of electric shock to children flying kites in the playground or touching and climbing the transmission poles.

415. The League stated there were at least two underground options from the Meadowlark Substation to 170th Street that were not investigated in much detail by EDTI, and that there has been no public consultation on any underground options. In this regard, it referred to the option

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<sup>220</sup> Exhibit 23943-X0011, EDTI West Edmonton Transmission Upgrade Project, PDF page 17.

<sup>221</sup> Exhibit 23943-X0028, Appendix G-2 Siting Technical Report, PDF page 33.

<sup>222</sup> Transcript, Volume 6, page 1340, lines 20-25.

<sup>223</sup> Exhibit 23943-X0295, Appendix C - Lynnwood Members Submissions Revised, PDF page 9.

(depicted below) of putting the transmission line underground in the 83rd Avenue route, referred to in the hearing as Option UT-07, which is designated for the relocation of distribution circuit M12:

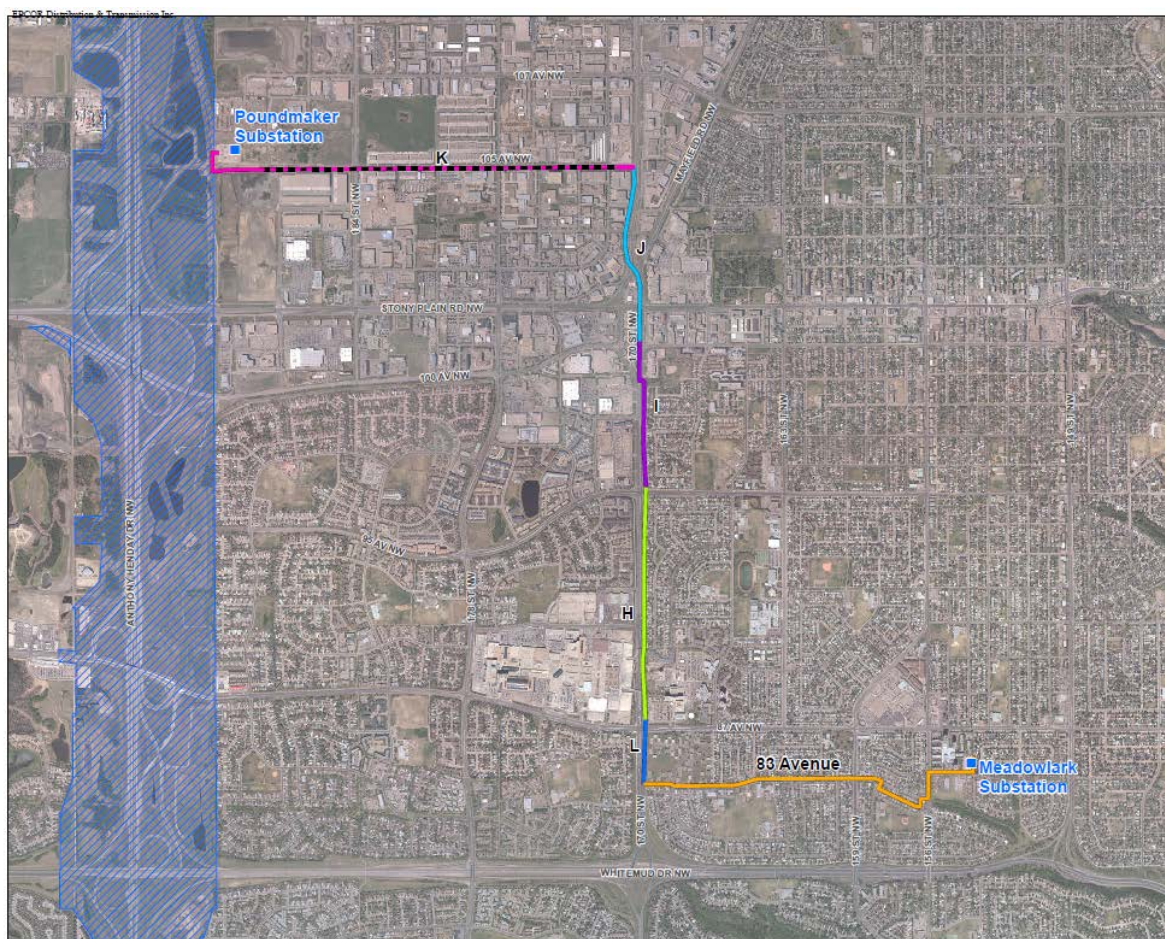


Figure 9. 83rd Avenue route<sup>224</sup>

416. In relation to the 83rd Avenue route, the League noted that the 2.57-kilometre segment K along 105th Street already has an existing overhead transmission line. It stated that the only new overhead transmission lines that would be needed for this route would be for segments J, I, H and L, which total 3.63 kilometres in length, and would be much shorter than the 9.2-kilometre preferred route. It added that there appeared to be little opposition to overhead construction on those segments and that no person who attended the hearing was opposed to an overhead route along 170th Street. The League requested that the Commission deny EDTI's applications and direct EDTI to consider possible underground routing options from Meadowlark Substation to 170th Street, and to consult with residents on those options.

417. According to the League, EDTI provided no evidence about any efforts it made to ascertain the underground facilities and their actual location or to show any obstacles encountered in assessing these underground facilities. It submitted that EDTI is attempting to deflect attention from the fact that it did not explore an underground option because of its desire to limit the costs of the project, even though EDTI planned to bury distribution line M12.

<sup>224</sup> Exhibit 23943-X0409, Exhibit 409 - by Ms. Hull to Ms. Bishop at T5977, PDF page 3.

418. The League requested, in the alternative, that if the Commission decided to approve the preferred route, it also direct EDTI to construct the preferred route underground through Lynnwood from the Meadowlark Substation to the intersection of 159th Street and Whitemud Drive. It noted that the incremental costs to bury this portion of the line are estimated at \$2.94 million from the substation to the intersection of 156th Street and Whitemud Drive, and \$1.77 million from the intersection of 156th Street and Whitemud Drive to the intersection of 159th Street and Whitemud Drive, for a total incremental cost of \$4.71 million.<sup>225</sup> In the further alternative, it submitted that the Commission direct EDTI to bury the transmission line from Meadowlark Substation to the intersection of 156th Street and Whitemud Drive, so as to mitigate impacts on the Lynnwood school, the daycare, the Lynnwood Community League building, the playground and residents on 156th Street. To the League, the increase in project costs of \$2.94 million to do so is not a significant amount when compared to the estimated \$14.09 million total cost of the project.

#### **6.7.4.5 Views of the parties on the alternate route**

419. The Commission received only a few statements of intent to participate from parties affected by the alternate route. With the exception of select members of the Elmwood Residents Group who are near the intersection of the preferred and alternate routes, no party that could be affected by the alternate route participated in the hearing or filed evidence in this proceeding.

420. In its statement of intent to participate, Crestwell Realty, the property manager for a shopping centre along 170th Street, stated that construction of the alternate route would significantly affect its tenants and may affect accessibility to the property. It submitted that the route along the TUC will minimize impacts of the project.

421. In her statement of intent to participate, Fay Stankov raised similar concerns to other landowners, including property value and safety and submitted that the transmission line should be placed underground.

#### **6.7.5 Commission findings**

##### **6.7.5.1 Routing criteria and methodology**

422. No party disputed that EDTI's facility applications met the need identified by the AESO. The need, stated succinctly, is to connect the Poundmaker and Meadowlark substations with a 72-kV transmission line. The challenge in this case, which EDTI acknowledged throughout the proceeding, was how to make that connection through a highly developed urban area in a way that best avoids or minimizes impacts to landowners and land users.

423. The Commission accepts that the final routing corridors and preliminary routes developed by EDTI were generally compatible with transmission line development, based on the project siting methodology adopted by EDTI, and that it appropriately took into account other factors such as: maximizing the use of existing linear developments, minimizing construction impacts and risks and avoiding construction impediments, minimizing private land acquisition requirements and avoiding major or unmitigable environmental impacts. The Commission also accepts EDTI's decision to retire certain of its preliminary route segments and its assessment that a route running east from 170th Street along 87th Avenue, coinciding with a potential but not

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<sup>225</sup> Exhibit 23943-X0335.01, EDTI FA Rebuttal Evidence, PDF page 16.

finally confirmed LRT expansion, was not a viable low-impact route compared to other alternatives.

424. EDTI's use of a compatibility matrix based on the five categories of potential impacts<sup>226</sup> selected by EDTI and Maskwa was also reasonable and consistent with guidance provided by Rule 007 and previous Commission decisions. None of the interveners disagreed with the factors EDTI used in its compatibility matrix; rather, the dispute was about how EDTI applied those factors to assess potential impacts and make route selection decisions; whether EDTI properly considered or evaluated potential underground routing options, and the extent to which EDTI relied on advice from the City of Edmonton and Alberta Infrastructure about its preference for and against potential routes. The Commission addresses those issues in the following sections.

#### **6.7.5.2 Routing within the transportation and utility corridor**

425. From the point where the preferred route exits the Poundmaker Substation to where it turns east into the Whitemud Drive corridor, it is wholly contained within the TUC. The members of the 190 Street Residents Group who participated in the hearing asked the Commission not to approve an overhead transmission line along the preferred route because it would maximize impacts on first-row residents. This group also submitted that this segment would have some of the highest environmental impacts and involves the most greenfield development compared to the other routing options identified by EDTI.

426. The TUC is land owned by the Government of Alberta that is designated for linear facilities including transmission lines. The TUC is also subject to the *Edmonton Restricted Development Area Regulations* and therefore no transmission line can be constructed or operated within it unless the Minister of Infrastructure has granted his or her consent. The Commission reviewed the history and purpose of TUCs and restricted development areas (RDA) extensively in the Heartland decision, and made the following findings.

683. The Commission finds that, since their inception, the restricted development areas were intended to be used, at least in part, to accommodate various types of utility infrastructure, including overhead transmission lines.

...

694. Regarding the existence of a transportation and utility corridor within the restricted development areas, the evidence before the Commission is that the plans for formal transportation and utility corridors were completed in 1979. Those initial plans allotted space within the transportation and utility corridor for "major power lines, pipelines, municipal services and other related facilities." [footnote omitted]

...

704. Based on the foregoing, the Commission finds that one of the purposes for establishing the restricted development areas was to use them for siting utility infrastructure, including transmission lines. Indeed, as early as 1979, space was allotted in the restricted development areas for "major power lines," and every official reference to the restricted development areas and transportation and utility corridors since the early 1970s has included reference to use as a utility corridor.

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<sup>226</sup> The categories are listed in Exhibit 23943-X002, Appendix G-1 Siting Methodology, page 18 as: residential, environmental, visual, technical considerations and special constraints.

705. The Commission understands that one of the underlying motivations for establishing the restricted development area was to contain environmentally harmful activities. That purpose, as reflected in the 1977 amendments to the legislation and regulations, has been found to be valid by both levels of Alberta's courts.

706. In accordance with this purpose, the government of Alberta has obtained title to almost all of the lands within the restricted development areas at considerable expense. Additionally, since 1979 the government of Alberta has engaged in an ongoing planning process for establishing a transportation and utility corridor within the restricted development area. Highways have been constructed in accordance with those plans, as have a large number of pipelines and five high voltage overhead transmission lines.<sup>227</sup>

427. The Commission determined in Heartland that approval of the proposed 500-kV transmission line within the RDA would be consistent with the Government of Alberta's TUC Policy Program and with the fact that five high-voltage transmission lines already existed within an RDA. It noted that there is no existing legislation or government policy that required the proposed line to be located within the RDA, and that it retained jurisdiction to decide the matter. The Commission considers that the findings on the use of RDAs and TUCs made in 2011 in Heartland remain valid today. Although it is not required to locate a proposed transmission line within an RDA, it has authority to do so, subject to the Minister of Infrastructure granting his or her consent.

428. The Commission finds that EDTI's proposal to locate almost one-half<sup>228</sup> of the proposed transmission line in the TUC will reduce the impacts of the transmission line, given that the Government of Alberta acquired the TUC land for the purpose of providing a corridor within which utility infrastructure could be grouped with other linear features. As such, an applicant proposing transmission development within an RDA must have regard for both Commission requirements and any constraints or requests made by Alberta Infrastructure. Planning transmission development within an RDA is, in a sense, a collaborative exercise in which an applicant must try to accommodate the desires of stakeholders while subject to the consent and approval authority, respectively, of Alberta Infrastructure and the Commission and the parameters associate therewith.

429. As mentioned earlier, the 190 Street Residents Group requested that the Commission deny EDTI's applications and instead direct EDTI to develop an underground configuration or alternative overhead routing options within the TUC, further from their properties, that would minimize or mitigate potential adverse impacts on nearby residents.

430. The Commission has reviewed the extensive record of discussions between EDTI and Alberta Infrastructure concerning the proposed transmission line's alignment within the TUC.<sup>229</sup> It is satisfied that EDTI made Alberta Infrastructure aware of the concerns of landowners adjacent to the TUC and their desire to have the proposed line located further west in the TUC, away from their properties. The Commission acknowledges Alberta Infrastructure's concern that

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<sup>227</sup> Decision 2011-436: AltaLink Management Ltd. and EPCOR Distribution & Transmission Inc., Heartland Transmission Project, Application No. 1606609, Proceeding ID No. 457, November 1, 201, paragraphs 683, 694, 704 to 706.

<sup>228</sup> See Exhibit 23943-X0011, EDTI West Edmonton Transmission Upgrade Project, Table 7.1.8-1 on page 29. The TUC portion represents 4.21 km of the 9.2 km-long preferred route, or approximately 45 per cent.

<sup>229</sup> Exhibit 23943-X0219, EDTI-190SG-2019JUL18-003 Attachment 1 Part 1; Exhibit 23943-X0220 EDTI-190SG-2019JUL18-003 Attachment 1 Part 2.

the TUC is “extremely congested with existing and planned infrastructure,”<sup>230</sup> and its initial position that for planning purposes, the line should be located within the municipal services component of the TUC. It further notes Alberta Infrastructure’s letter of non-objection to EDTI for the preferred routing and alignment within the TUC.<sup>231</sup>

431. As indicated earlier, the Commission does not find that the transmission line will result in any significant visual, property value, health and safety or environmental impacts and recognizes that routing within the TUC in itself mitigates many of these impacts. The Commission considers that the proposed routing within the TUC would have minimal impacts to the residences along the TUC and would not interfere with residents’ access to or use of the TUC lands, except for the need to use caution during activities that could bring a person into contact with any type of energized infrastructure regardless of where it is located. Moreover, after discussion of this specific alignment within the TUC with EDTI, Alberta Infrastructure stated that it did not object to the proposed routing. Given the foregoing, the Commission finds that EDTI’s preferred route within the TUC, which is publicly-owned land that has been designated for transmission lines and other utility infrastructure, will not result in significant impacts. The Commission finds that the routes proposed by the 190 Street Residents Group are not feasible as they are not supported by Alberta Infrastructure, which must consent to any disturbance or location within the TUC — and which has indicated that the lands in the area of those routes are designated for planned infrastructure.

432. The Commission also considered the 190 Street Residents Group’s request that EDTI be required to develop an underground configuration for the proposed transmission line, whether in the preferred route or at a different location within the TUC. EDTI gave five examples of the considerations that factor into its decision about whether an underground transmission line option is warranted: the relative cost of the underground configuration, construction, operational and technical constraints that might make an overhead configuration difficult, and the incremental impact of an overhead configuration on stakeholders. Maskwa stated that an applicant should only be driven to an underground option when an overhead configuration may not be feasible and constructible. EDTI and Maskwa confirmed that an overhead configuration in the preferred route, including within the TUC, was both feasible and constructible.

433. In the Heartland decision, the Commission indicated that the question to be considered when underground transmission line construction is proposed or requested is whether the additional costs to do so are justified by the extent to which impacts to landowners, environmental impacts and safety issues would be mitigated.<sup>232</sup> EDTI estimated that the cost to construct the proposed line underground in the TUC segment of the proposed route is \$30.11 million. This amount represents a 7.5 times cost increase in the estimated \$4.01 million cost to construct an overhead line in the segment. Considering that the overhead alignment is proposed for the TUC, an area created for utility infrastructure and other linear development, the Commission considers that the substantial additional cost that ratepayers would incur to construct the line underground is not an economic impact that is justified by similarly substantial benefits in terms of mitigating the impacts of an overhead transmission line on adjacent landowners. The Commission therefore finds that EDTI’s proposal to construct an overhead line

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<sup>230</sup> Exhibit 23943-X0219, EDTI-190SG-2019JUL18-003 Attachment 1 Part 1, PDF page 45.

<sup>231</sup> Exhibit 23943-X0030, Appendix H - AI Letter of non-objection.

<sup>232</sup> Decision 2011-436: AltaLink Management Ltd. and EPCOR Distribution & Transmission Inc., Heartland Transmission Project, Application No. 1606609, Proceeding ID No. 457, November 1, 201, paragraph 1081.

in the TUC segment of the route is reasonable and acceptable, and will not require EDTI to develop an underground option for this segment.

### **6.7.5.3 Routing from the transportation and utility corridor to 170th Street**

434. The portion of preferred route that runs east of the TUC to the east side of 170th Street would be located within the Whitemud Drive road allowance, on land owned by the City of Edmonton and approximately 10 metres or more south of residential properties on the southern boundaries of the Aldergrove and Thorncliff communities.

435. The members of the Aldergrove Residents Group stated that their decision to purchase a home in Aldergrove was based partly on the fact that distribution lines in the area were buried and there were no overhead power lines. They are also concerned about the proposed overhead transmission line affecting their use or enjoyment of the berm and the green space surrounding it. All of the members stated that they do not want to look in the direction of the berm and see transmission poles and conductors, and requested that the line be buried if the preferred route were approved.

436. If the transmission line were approved, new transmission poles would be located 10 metres or more south of the Aldergrove residential properties bordering the Whitemud Drive road allowance<sup>233</sup> and at least 13 metres from the residential properties bordering the road allowance in the community of Thorncliff.<sup>234</sup> In the Commission's view, none of the proposed poles, nor the conductor would interfere with a property owner's use of or access to their property, or create a constraint or impediment to new construction or other types of development that are normally permitted in residential areas. In addition, the new poles would not be expected to affect existing public access to or use of the green space within the Whitemud Drive road allowance, including the berm.

437. As discussed in previous sections, the Commission does not find that the transmission line will result in any significant visual effects or impacts to property value and health, and that any such effects are mitigated by routing this segment of the proposed line within the Whitemud Drive corridor.

438. The Commission considers that EDTI's selection of the Whitemud Drive corridor for the preferred route is consistent with its siting methodology, one aspect of which is a preference for the use of major transportation corridors that are outside residential communities. The Whitemud Drive corridor and the green space north of the freeway appear to provide more available construction space than any other alternate west-east roadway in the area that might be used to make a connection between the TUC and Meadowlark Substation.

439. The City of Edmonton, which owns the Whitemud Drive road allowance, has indicated that it does not object to the proposed alignment, and that, in fact, it prefers it over other routes discussed with EDTI, including the alternate route.<sup>235</sup> Although the Commission is responsible for final approval of transmission line routing, the City's support for the route is an important consideration given that it is the landowner and is responsible for managing development within the transportation corridor, including protecting existing City infrastructure and planning for

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<sup>233</sup> Exhibit 23943-X0024, Appendix E-3 Strip Map, PDF pages 4-6.

<sup>234</sup> Exhibit 23943-X0024, Appendix E-3 Strip Map, PDF pages 3 and 4.

<sup>235</sup> Exhibit 23943-X0340, Attachment 5 – ERG, PDF pages 73 and 80.

future roadway development. Moreover, during discussions between EDTI and the City of Edmonton, the City indicated that for safety reasons transmission poles should be located away from the roadway<sup>236</sup> and that it has future plans to widen Whitemud Drive west of 170th Street as part of alterations to the interchange with Anthony Henday Drive.<sup>237</sup> In the Commission's view, these factors support locating the transmission line further away from the roadway.

440. EDTI estimated that the cost to construct the proposed line underground in this segment of the proposed route is \$19.09 million, 7.6 times the estimated \$2.51 million cost to construct an overhead line. The Commission considers that this substantial additional cost to ratepayers to construct the line underground is not justified by similarly substantial benefits in terms of mitigating the impacts on landowners of an overhead transmission line, and will therefore not require EDTI to construct the line underground in this segment.

#### **6.7.5.4 Routing from 170th Street to 156th Street**

441. The preferred route crosses 170th Street north of the Whitemud Drive intersection and continues east in the Whitemud Drive road allowance on land owned by the City of Edmonton, similar to the routing west of 170th Street. There are, however, differences in the transmission line's proposed configuration and alignment that bear on the Commission's decision whether to approve the preferred route in this segment. As previously indicated, there is no alternate route for this segment.

442. The alignment proposed by EDTI here would locate the transmission line approximately five metres south of residential properties situated along the south boundary of the Elmwood and Lynnwood communities, on the south side of a paved laneway in which a double-circuit distribution line presently exists. EDTI proposed to remove one distribution circuit and install it underground and overbuild the second distribution circuit with the transmission line, using a combination of existing distribution poles and new larger and taller transmission poles.

443. The Elmwood Residents Group and Lynnwood Community League both stated that poles and conductors are proposed to be placed closer to their properties than is necessary or desirable in the alignment in this segment. They indicated that the larger poles would interfere with residents using the laneway to access rear driveways and garages and would potentially increase the risk of vehicle collisions with poles and pedestrians. They questioned why EDTI did not propose an alignment south of the laneway and adjacent sound wall, and have asked the Commission to direct EDTI to develop an alternate route in the Whitemud Drive road allowance that would be further from their properties.

444. The Commission understands the residents' desire to have new transmission infrastructure located further from their properties than the distribution poles that are now in place; however, the evidence in this proceeding indicates that EDTI was constrained by existing development and features in the Whitemud Drive road allowance.<sup>238</sup> Maskwa's reply evidence identified these constraints, which include two retaining walls to stabilize the slope between 156th Street and 159th Street, existing underground utility lines and a steeper embankment between 159th Street and 170th Street. The Commission also accepts that the concerns identified by EDTI and the City of Edmonton about locating the line closer to the roadway restricted

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<sup>236</sup> Exhibit 23943-X0217, EDTI-ELMWOOD-2019JUL18-001-006, PDF pages 16 and 17.

<sup>237</sup> Exhibit 23943-X0340, Attachment 5 – ERG, PDF page 26.

<sup>238</sup> Exhibit 23943-X0352.01, Appendix G - Reply Evidence of Maskwa, PDF pages 14-17 and PDF pages 113-114.

EDTI's ability to develop an alignment south of the paved laneway and sound wall. Most of these concerns were summarized in the minutes of a meeting between EDTI and City of Edmonton representatives, as follows:

- [City of Edmonton] explained that while the [City of Edmonton] would not provide specific guidance, there were a number of additional factors associated with the Whitemud Drive road corridor routing that would need to be considered in comparison to the alley route:
  - Significant impacts to traffic on one of the busiest roadways in the city (>30K vehicles/day), as a lane would likely need to be closed during construction and during longer-term maintenance activities
  - Crews would likely need to work outside of rush hour, which would drive the need for evening/night construction, which would require additional permits for noise past 11 pm
  - There are two retaining walls present that would likely need to be partially or completely re-built to accommodate any structure placement
  - There were multiple trees and other city-owned vegetation that would need to be trimmed or removed
  - This area has a significant side-slope that would likely result in greater construction impacts, time and other considerations.<sup>239</sup>

445. The Commission finds that the overhead configuration and alignment in the preferred route in this segment as proposed by EDTI is reasonable, given the routing constraints imposed by existing features and other development in the Whitemud Drive road allowance, and by safety and lane closure concerns during construction work occurring closer to the roadway. In addition, the proposed routing uses an existing distribution line alignment and would rebuild and remove some of the existing infrastructure along that line, which mitigates impacts and makes impacts incremental rather than new. In terms of impacts on residents using the laneway adjacent to the sound wall, the Commission finds that only a minor incremental impact arises in each location where an existing distribution pole is to be replaced with a new larger transmission pole or where a new pole is to be added. The Commission considers that the incremental nature of this impact on residents or on vehicles and pedestrians using the laneway is not significant. As stated earlier, the Commission finds that the presence of the existing distribution line and the location of the proposed structures behind residences, in alignment with common property boundaries and in the same location as the existing distribution structures, sufficiently mitigates any visual or property value effects.

446. The Commission also considered the respective requests of the Elmwood Residents Group and Lynnwood Community League that EDTI be directed to bury the transmission line in this segment or along 83rd Avenue (Option UT-07) if the preferred route is approved.

447. EDTI estimated that the cost to construct the proposed line underground in this segment of the proposed route is \$10.7 million. This amount is 2.3 times the estimated \$4.58 million cost to construct an overhead line in the segment (which includes the cost to bury one distribution

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<sup>239</sup> Exhibit 23943- 23943-X0340, Attachment 5 – ERG, PDF page 80.

line). The Commission considers that this substantial additional cost to construct the transmission line underground is not justified by similar substantial benefits in terms of mitigating the impacts on landowners of an overhead transmission line. As stated above, the incremental benefit for landowners and other members of the public of not overbuilding the existing distribution line is small: the double-circuit poles and conductors would remain in place and only the appearance of larger poles and the placement of transmission conductors higher overhead would be avoided. The Commission will therefore not require EDTI to construct the line underground in this segment. The request to underground the line using Option UT-07 is addressed in Section 6.7.5.6 of this decision.

#### **6.7.5.5 Routing on 156th Street and 84th Avenue**

448. The preferred route would run on the east side of 156th Street, initially on the side or in front of residential properties and then further north, next to the playground lands that are near the school, daycare and community facilities. The route then turns east to the Meadowlark Substation on the north side of 84th Avenue.<sup>240</sup>

449. The alignment proposed by EDTI in this segment would locate the transmission line in the 156th Street and the 84th Avenue road allowance, which is land owned by the City of Edmonton, on the same alignment as an existing double-circuit transmission line. EDTI proposed to remove one distribution circuit and install it underground and overbuild the second distribution circuit with the transmission line on new larger and taller poles. Six new poles (poles numbered 89 to 94) would be located near the front or side yards of seven residences adjacent to 156th Street.<sup>241</sup> Pole number 95 would be located approximately where the Lynnwood ravine ends at 156th Street north of 81st Avenue, and poles 96 and 97 would be adjacent to the Lynnwood Community League's land.<sup>242</sup> The line would then cross to the north side of 84th Avenue, in front of the Whitehall Square apartment block, and would run east into Meadowlark Substation.

450. EDTI and Maskwa acknowledged that locating this segment of the preferred route in a residential area is something that was generally viewed as incompatible with siting criteria and therefore should be avoided where possible. They added, however, that because the existing Meadowlark Substation is one of the termination points for the proposed transmission line, routing the line through Lynnwood could not be avoided in this situation. EDTI and Maskwa stated that developing routing to connect the Meadowlark Substation was the most challenging siting task for the project.

451. The Commission finds that EDTI's decision to use the existing overhead distribution alignments along 156th Street and 84th Avenue is consistent with its siting criteria and methodology for this segment, where routing through the Lynnwood community cannot be avoided. The Commission accepts the following rationale for this alignment provided by Maskwa:

The proposed route leverages an existing facility that has been in place for as long as the neighbourhood has, with an established right-of-way and adjacent developments that have already incorporated its presence. Further, EPCOR will be replacing the majority of the poles with new structures that will relocate the conductors away from the adjacent

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<sup>240</sup> Exhibit 23943-X0024, Appendix E-3 Strip Maps, PDF page 1.

<sup>241</sup> Exhibit 23943-X0426, Exhibit 426 - Map of Randy and Pat MacDonald property.

<sup>242</sup> Exhibit 23943-X0432, Exhibit 432 - Map of Denise and William Mann's property.

residential properties to the street side, which will result in some reduction of impacts to adjacent vegetation and other developments.

Maskwa maintains that when all factors are considered collectively, the proposed common route represents the lowest overall impact route to connect to the Meadowlark substation. The key reasons for this include:

- It leverages an existing, established facility;
- It connects the route to the Preferred Route located in the WMD and TUC corridors; and
- All associated impacts, post construction, will be incremental in nature given the new line will be in the same location with structures being taller than the current structures.<sup>243</sup>

452. One concern raised by the Lynnwood Community League was the impact that larger and taller transmission poles would have on residential property owners. As stated above, EDTI's proposed alignment includes new poles being constructed adjacent to seven residential properties along 156th Street. Transmission pole number 93 is one example where a new pole would be built in the place of an existing distribution pole. The owners of the two properties nearest that pole location participated in the hearing. The property owned by John and Grace Pasma would have the pole adjacent to the southwest corner of their property, and the property owned by Craig and Katrina Donner would have the same pole adjacent to the northwest corner of their property.

453. Although Mr. Donner acknowledged that he does not own the land where the pole would be, he is concerned with the magnitude of the increase in pole diameter and height compared to the size of the existing distribution pole. He is concerned about the size of the proposed transmission pole, which he described as a "huge new monopole,"<sup>244</sup> and its visual impact when viewed from the front window of his home. He indicated that he was considering adding a loft suite to his home and wondered if the new transmission line would affect his ability to do that or would create a safety risk in terms of lightning strikes or individuals accidentally coming into contact with the conductor. Mr. Pasma stated that he measured the distance from the front of his house to the existing distribution pole as 26 feet, or approximately eight metres.

454. The Commission has considered these concerns in light of the evidence on property impacts and safety risks potentially associated with the transmission line configuration proposed by EDTI. Similar to the segment in the Whitemud Drive corridor from 170th Street to 156th Street, EDTI's decision to use the existing distribution line alignment limits the impact of new infrastructure on landowners. In both cases, the incremental impact consists of the increased pole diameter and height over the current distribution lines. For the residential property owners that would have a transmission pole adjacent to their property, the Commission considers that the increase in pole diameter would not materially affect access to or use of their property. The Commission notes in this regard that EDTI intends to locate new transmission poles numbered 92 and 93 on the boundary line between the adjacent residential properties that face 156th Street, and in the location of the current distribution poles, to reduce the visual impact of the pole when viewed from nearby residences. EDTI also stated that the transmission conductor would be

<sup>243</sup> Exhibit 23943-X0352.01, Appendix G - Reply Evidence of Maskwa, PDF page 19.

<sup>244</sup> Transcript, Volume 6, page 1465, line 21.

installed on the street-side of the pole, so as to move the conductor further from residential properties and thereby minimize interference with residential construction or development plans as well as reduce safety risks to individuals on rooftops or ladders.

455. The Commission finds that the overhead configuration and alignment in the preferred route in this segment proposed by EDTI is the most reasonable option available in the circumstances, given the unavoidable need to terminate the proposed transmission line at the Meadowlark Substation and the lack of a lower-impact alternate route to the substation. In addition, the proposed routing uses an existing distribution line alignment and would rebuild infrastructure along that line. Given the existence of the primary distribution line, the Commission finds that the impact is incremental in each location where a new transmission pole would be constructed. It is satisfied that EDTI has taken steps to minimize that impact by locating transmission poles along property boundaries and locating transmission poles in the same location as the existing distribution structures.

456. The Commission has also considered the Lynnwood Community League's request that if the preferred route is approved EDTI be directed to bury the transmission line in this segment or in route Option UT-07.

457. EDTI estimated that the cost to construct the proposed line underground in this segment of the proposed route is \$5.93 million. This amount is slightly less than twice the estimated \$2.99 million cost to construct an overhead line in the segment (which includes the cost to bury one distribution line).

458. The Commission considers that the additional cost to construct the line underground in this segment is not justified by similar substantial benefits in terms of mitigating the impacts on landowners of an overhead transmission line. As with the east portion of the Whitemud Drive corridor segment, the incremental benefit for landowners and other members of the public of not overbuilding the existing distribution line is modest: the double-circuit distribution poles and conductor will remain in place. The incremental cost to essentially preserve the existing distribution infrastructure, \$2.94 million, is substantial. The evidence is clear that an overhead configuration along 84th Avenue and 156th Street in the current distribution line alignment is both feasible and constructible at approximately one-half the estimated cost to underground the proposed transmission line. The Commission will therefore not require EDTI to construct the line underground in this segment or to develop an underground configuration for the Commission's consideration.

#### **6.7.5.6 Route Option UT-07**

459. During the hearing, EDTI was questioned by the Elmwood Residents Group and the Lynnwood Community League about constructing the transmission line underground in a route that EDTI assessed for the relocation of distribution line M12. EDTI called the route Option UT-07 and described it as an underground line configuration from the Meadowlark Substation to the intersection of 170th Street and 83rd Avenue, and an overhead configuration from that point to the Poundmaker Substation that would run along 170th Street and 105th Avenue. EDTI stated that it only investigated the underground portion of Option UT-07 for the purpose of relocating distribution circuit M12, and did not conduct an assessment of either the feasibility or constructability of an underground transmission line.

460. EDTI provided a preliminary cost estimate of \$22.57 million to construct Option UT-07, the underground portion of the route accounting for \$16.37 million of that estimate. EDTI also provided the following cost estimate comparisons between the preferred, alternate and Option UT-07 routes.

Table 11. Cost estimate comparison

Option	Line Length (km)	Cost of Transmission Line (\$ million)
Preferred Route	9.2	14.09
Alternative Route	8.94	13.95
Option UT-07	8.49	22.57

461. The estimated cost to construct Option UT-07 is substantially more than the cost of either the preferred or alternate route. In fact, it is more than 50 per cent greater than the cost of either of those routes. The estimated cost of the Option UT-07 underground segment alone, \$16.37 million, is more than the estimated cost to construct the entire project in either the preferred or alternate route; yet, it only represents 2.29 kilometres of the full 8.49-kilometre-long Option UT-07, or approximately 27 per cent of the route. The Commission considers that the benefits that may result from undergrounding 27 per cent of the line do not justify incurring additional costs equivalent to more than half the estimated cost to construct the entire project in an overhead configuration.

462. Furthermore, the Commission finds that the route itself is inferior to the preferred route. Option UT-07 does not use the TUC and Whitemud Drive corridor, whereas by making use of the TUC for almost half the length of the entire project, the preferred route avoids the more congested work areas, greater construction impacts and other land-use conflicts that are associated with the alternate route between the Jasper Substation and the Whitemud Drive corridor. Option UT-07 is also inferior to the preferred route because of its use of the portion of the alternate route that runs along 170th Street instead of the TUC, and the higher overall impacts associated with routing along 170th Street.

463. Given the foregoing, the Commission finds that the substantial additional cost to ratepayers to construct conceptual Option UT-07 would not be justified by similarly substantial reduced impacts on landowners. The Commission will therefore not require EDTI to undertake any further assessment of that route.

#### 6.7.5.7 Preferred route and alternate route

464. The Commission accepts EDTI's evidence that the potential impacts associated with the preferred and alternate routes are similar and reflect the highly developed urban area within which the project is proposed. Each route uses existing linear developments to minimize incremental impacts and is located primarily on public land with minimal private land acquisition requirements. In particular, the Commission finds that the preferred route's use of the TUC for slightly less than one-half of its length is the primary consideration in its favour, and that it is superior in this regard to the alternate route, which makes almost no use of the TUC.

465. The Commission also accepts that the preferred and alternate routes have similarly low potential for environmental impacts, including a reduced need to remove trees and other foliage owned and maintained by the City of Edmonton. However, the Commission finds that the preferred route's extensive use of the TUC provides the lowest construction risks and impacts

and affords the least congested workspace, particularly when compared to the 170th Street portion of the alternate route. In addition, the TUC is publicly-owned land that was created to provide a corridor within which utility infrastructure, including pipelines and transmission lines, could be grouped together with other linear features. The TUC is therefore an obvious and superior routing choice for the proposed transmission line.

466. The preferred and alternate routes are similar in length, at 9.2 and 8.9 kilometres respectively, and their cost estimates are almost identical at approximately \$14.09 million and \$13.95 million, respectively.

467. Based on the foregoing, the Commission finds that the preferred route will result in lower impacts than the alternate route.

## **7 Approved route and concluding findings**

468. The Commission finds that the facility applications to construct Transmission Line 72PM25 and Fibre-Optic Cable FO-133 and to alter the Poundmaker, Meadowlark and Garneau substations meet the requirements of Rule 007 and are consistent with the need identified in the NID application.

469. No parties objected to the alterations to the Poundmaker, Garneau or Meadowlark substations. Although some interveners expressed concern about existing noise levels at the Meadowlark Substation, no noise-producing equipment is proposed to be added to the Meadowlark Substation. The Commission therefore considers that concerns about existing noise levels are not related to the facility applications.

470. The Commission finds that the incremental impacts of the preferred route are not significant and are mitigated by the use of the TUC and existing linear infrastructure, such as Whitemud Drive and distribution lines. It also finds that these incremental impacts are not significant enough to warrant the costs of undergrounding all or any part of the transmission line. That said, the Commission acknowledges the City of Edmonton's Bylaw 15100 which indicates that the City will advocate for underground transmission lines. In the event that the City of Edmonton is prepared to fund the incremental costs to bury any part of the proposed line, the Commission would consider such an application under Section 17 of the *Hydro and Electric Energy Act*.

471. The Commission is satisfied that there are no environmental, social or economic impacts from the project that would indicate it is not in the public interest.

472. Given the above considerations, the Commission finds the project and its preferred route to be in the public interest pursuant to Section 17 of the *Alberta Utilities Commission Act*.

## **8 Decision**

473. Pursuant to Section 34 of the *Electric Utilities Act*, the Commission approves the need outlined in Application 23943-A001 and grants the Alberta Electric System Operator the approval set out in Appendix 1 – Needs Identification Document Approval 23943-D02-2020 – March 12, 2020.

474. Pursuant to sections 14, 15 and 19 of the *Hydro and Electric Energy Act*, the Commission approves Application 23943-A004 and grants EPCOR Distribution & Transmission Inc. the approval set out in Appendix 2 – Permit and Licence 23943-D03-2020 – March 12, 2020, to alter and operate Poundmaker Substation.

475. Pursuant to sections 14, 15 and 19 of the *Hydro and Electric Energy Act*, the Commission approves Application 23943-A005 and grants EPCOR Distribution & Transmission Inc. the approval set out in Appendix 3 – Permit and Licence 23943-D04-2020 – March 12, 2020, to alter and operate Meadowlark Substation.

476. Pursuant to sections 14, 15 and 19 of the *Hydro and Electric Energy Act*, the Commission approves Application 23943-A006 and grants EPCOR Distribution & Transmission Inc. the approval set out in Appendix 4 – Permit and Licence 23943-D05-2020 – March 12, 2020, to alter and operate Garneau Substation.

477. The appendices will be distributed separately.

478. Pursuant to sections 14, 15 and 19 of the *Hydro and Electric Energy Act*, the Commission approves applications 23943-A002 and 23943-A003. These applications include facilities that will be located within the TUC. The Commission cannot issue permits and licences for the construction and operation of facilities within the TUC without the written consent of the Minister of Infrastructure. The permits and licences for these parts of the project will therefore be issued once the written consent of the Minister of Infrastructure has been filed with the Commission.

Dated on March 12, 2020.

### **Alberta Utilities Commission**

*(original signed by)*

Anne Michaud  
Vice-Chair

*(original signed by)*

Neil Jamieson  
Commission Member

*(original signed by)*

Kristi Sebalj  
Commission Member

**Appendix A – Proceeding participants**

Name of person or group counsel or representative	Group (If applicable)
190 Street Residents Group E. Chipiuk	190 Street Residents Group
Ackerman, L. E. Chipiuk	190 Street Residents Group
Adeghe, H.	
Alberta Electric System Operator L. Estep F. Shariff	
Aldergrove Residents Group D. Leonard	Aldergrove Community League
Arnold, D. I. Okoye R. Secord	Lynnwood Community League
Badach, G. D. Bishop	Elmwood Residents Group
Barakat, D. I. Okoye R. Secord	Lynnwood Community League
Barth, C. D. Bishop	Elmwood Residents Group
Beitel, S. I. Okoye R. Secord	Lynnwood Community League
Bellerose, R. D. Bishop	Elmwood Residents Group
Benedictson, G. D. Bishop	Elmwood Residents Group
Bentley, K. I. Okoye R. Secord	Lynnwood Community League
Bly, L.	
Boardwalk Rental Communities M. Smith	
Bonilla, G. D. Bishop	Elmwood Residents Group

Name of person or group counsel or representative	Group (If applicable)
Bottos, D. I. Okoye R. Secord	Lynnwood Community League
Carstensen-Sinha, S. I. Okoye R. Secord	Lynnwood Community League
Chambers, C. I. Okoye R. Secord	Lynnwood Community League
Chisholm, M. I. Okoye R. Secord	Lynnwood Community League
Clouston, J. D. Bishop	Elmwood Residents Group
Consumers' Coalition of Alberta N. Bryanskiy J. Wachowich	
Creller, S. I. Okoye R. Secord	Lynnwood Community League
Cuffe, M.	
Cui, T. I. Okoye R. Secord	Lynnwood Community League
Damron, K. D. Bishop	Elmwood Residents Group
Demeriez, B. and D. I. Okoye R. Secord	Lynnwood Community League
Depot 170 Crestwell Realty	
Donner, C. I. Okoye R. Secord	Lynnwood Community League
Edey, M.	
Elmwood Residents Group D. Bishop	

Name of person or group counsel or representative	Group (If applicable)
Ennis, R. D. Bishop	Elmwood Residents Group
EPCOR Distribution & Transmission Inc. J. Liteplo J. Hulecki T. Crotty-Wong	
Fitzsimmons, J. and G. I. Okoye R. Secord	Lynnwood Community League
Giles, J. I. Okoye R. Secord	Lynnwood Community League
Glenwood Community League J. Post	
Grange Homeowners Association B. Warkentin	
Griffins, R. I. Okoye R. Secord	Lynnwood Community League
Hamilton, H. I. Okoye R. Secord	Lynnwood Community League
Heiland, V. I. Okoye R. Secord	Lynnwood Community League
Hogstead, C. and B. D. Bishop	Elmwood Residents Group
Horbasenko, T. D. Bishop	Elmwood Residents Group
Huff, K. D. Bishop	Elmwood Residents Group
Hyde, N. D. Bishop	Elmwood Residents Group
Jahner, J. and M. I. Okoye R. Secord	Lynnwood Community League
Jessome, G. I. Okoye R. Secord	Lynnwood Community League

Name of person or group counsel or representative	Group (If applicable)
Joudrie, J. I. Okoye R. Secord	Lynnwood Community League
Kammer, M. D. Bishop	Elmwood Residents Group
Kerridge, D. E. Chipiuk	190 Street Residents Group
Kirkland, J. I. Okoye R. Secord	Lynnwood Community League
Kluthe, M. I. Okoye R. Secord	Lynnwood Community League
Koprulu, A. D. Bishop	Elmwood Residents Group
Lalonde, D. and W. I. Okoye R. Secord	Lynnwood Community League
Lambert, A. I. Okoye R. Secord	Lynnwood Community League
Lavoie, G. E. Chipiuk	190 Street Residents Group
Leask, C. D. Bishop	Elmwood Residents Group
LeCorre, M. I. Okoye R. Secord	Lynnwood Community League
Lee, L. and D. I. Okoye R. Secord	Lynnwood Community League
Legault, M. D. Bishop	Elmwood Residents Group
Leitch, R. and Bevan, M. D. Leonard	Aldergrove Residents Group
Leonard, D. D. Leonard	Aldergrove Residents Group

Name of person or group counsel or representative	Group (If applicable)
Lynnwood Community League I. Okoye R. Secord	Lynnwood Community League
MacAndrew, T. and K. I. Okoye R. Secord	Lynnwood Community League
MacDonald, R. and P. I. Okoye R. Secord	Lynnwood Community League
Mann, D. and W. I. Okoye R. Secord	Lynnwood Community League
Masoud, R. I. Okoye R. Secord	Lynnwood Community League
Mazurek, M.	
McAthey, M. and L. I. Okoye R. Secord	Lynnwood Community League
McBride, O. I. Okoye R. Secord	Lynnwood Community League
McBride, S. and T. I. Okoye R. Secord	Lynnwood Community League
McCarthy, D. I. Okoye R. Secord	Lynnwood Community League
Meunier, A. and J. I. Okoye R. Secord	Lynnwood Community League
Midbo, J. I. Okoye R. Secord	Lynnwood Community League
Moonen, L. I. Okoye R. Secord	Lynnwood Community League
Motamedi, M.	

Name of person or group counsel or representative	Group (If applicable)
Nixon, B. and K. I. Okoye R. Secord	Lynnwood Community League
Noujaim, J. E. Chipiuk	190 Street Residents Group
O'Connor, P. and M. I. Okoye R. Secord	Lynnwood Community League
Pailer, S.	
Parsons, K. D. Bishop	Elmwood Residents Group
Pasma, J. and G. I. Okoye R. Secord	Lynnwood Community League
Pedersen, K. I. Okoye R. Secord	Lynnwood Community League
Phillips, A.	
Phinney, W. D. Bishop	Elmwood Residents Group
Powles, A. and S. I. Okoye R. Secord	Lynnwood Community League
Ranz, D. I. Okoye R. Secord	Lynnwood Community League
Reguma, C. and J. I. Okoye R. Secord	Lynnwood Community League
Russell, C. I. Okoye R. Secord	Lynnwood Community League
Sajedi, S.	
Schmuland, N. and N. I. Okoye R. Secord	Lynnwood Community League

Name of person or group counsel or representative	Group (If applicable)
Seeman, B. D. Bishop	Elmwood Residents Group
Snidal, B. and D. I. Okoye R. Secord	Lynnwood Community League
Spencer, G. and K. D. Bishop	Elmwood Residents Group
Stang, M., I. and J. I. Okoye R. Secord	Lynnwood Community League
Stankov, E.	
Stevens, D. I. Okoye R. Secord	Lynnwood Community League
Sutton, R. E. Chipiuk	190 Street Residents Group
Thompson, I. E. Chipiuk	190 Street Residents Group
Timeus, S. I. Okoye R. Secord	Lynnwood Community League
Toth, J. D. Bishop	Elmwood Residents Group
Toth, R. D. Bishop	Elmwood Residents Group
Turner, R. D. Bishop	Elmwood Residents Group
Valois, D. and M. I. Okoye R. Secord	Lynnwood Community League
van Delden, A.	
Vanthuyne, N. I. Okoye R. Secord	Lynnwood Community League
Warkentin, B.	

Name of person or group counsel or representative	Group (If applicable)
Weiers, R. E. Chipiuk	190 Street Residents Group
White, M.	
Willms, J. and Pointen-Willms, M. I. Okoye R. Secord	Lynnwood Community League
Winters, J. D. Bishop	Elmwood Residents Group
Yin, S. I. Okoye R. Secord	Lynnwood Community League
Zapach, J. and I. I. Okoye R. Secord	Lynnwood Community League

**Appendix B – Oral hearing – registered appearances**

Name of organization counsel or representative	Witnesses
EPCOR Distribution & Transmission Inc. J. Liteplo J. Hulecki T. Crotty-Wong	B. Cotts H. Foley D. Hoover K. Hull T. Loga M. MacBeath N. Maybee G. Mezei G. Newton E. Payne T. Shmyr C. Wagner
Alberta Electric System Operator L. Estep F. Shariff	R. Davidson M. Mazadi C. Simpson-Laird
Consumers' Coalition of Alberta N. Bryanskiy J. Wachowich	D. Levson T. Greenwood-Madsen N. Tauh
Lynnwood Community League I. Okoye R. Secord	D. Arnold S. Beitel S. Carstensen-Sinha A. Charenko S. Creller B. Demeriez D. Demeriez C. Donner B. Gettel H. Hamilton P. Héroux C. Jensen D. Lalonde R. MacDonald D. Mann L. McAthey M. McAthey A. Miller G. Pasma J. Pasma M. Pointen-Willms A. Szeligowski S. Timeus K. Williams C. Wright D. Wright E. Wilson

Name of organization counsel or representative	Witnesses
Elmwood Residents Group D. Bishop	R. Bellerose J. Ennis R. Ennis B. Gettel C. Hogstead T. Horbasenko K. Huff M. Huff G. Spencer K. Spencer J. Toth E. Wilson
190 Street Residents Group E. Chipiuk	J. Ackerman L. Ackerman G. Acordon R. Bullock B. Gettel T. Haak M. Mesman I. Thompson E. Wilson
Aldergrove Residents Group D. Leonard	M. Bevan R. Chomiak J. Jichita R. Leitch D. Leonard S. Leonard P. Quinn
Boardwalk Rental Communities M. Smith	

<p>Alberta Utilities Commission</p> <p>Commission Panel</p> <p>A. Michaud, Vice-Chair N. Jamieson, Commission Member K. Sebalj, Commission Member</p> <p>Commission Staff</p> <p>G. Perkins (Commission counsel) R. Watson (Commission counsel) T. Richards L. Osanyintola C. Geddes</p>
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## Appendix C – Abbreviations

Abbreviation	Name in full
AESO	Alberta Electric System Operator
AltaLink	AltaLink Management Ltd.
AM	arithmetic mean
AUC or the Commission	Alberta Utilities Commission
Bema	Bema Enterprises Ltd.
Boardwalk	Boardwalk Rental Communities
CanACRE	CanACRE Ltd.
CCA	Consumers' Coalition of Alberta
CSA	Canadian Standards Association
DDR	Distribution Deficiency Report
DFO	distribution facility owner
DTS	Demand Transmission Service
EDTI or EPCOR	EPCOR Distribution & Transmission Inc.
EHS	electromagnetic hypersensitivity
ELF	extremely low frequency
EMF	electric and magnetic fields
ENMAX	ENMAX Power Corporation
Exponent	Exponent Inc.
GM	geometric mean
IARC	International Agency for Research on Cancer
ICES	International Committee on Electromagnetic Safety
ICNIRP	International Commission on Non-Ionizing Radiation Protection
IEEE	Institute of Electrical and Electronics Engineers
km	kilometre
kV	kilovolt
kV/m	kilovolt per metre
LRT	Light Rail Transit
Maskwa	Maskwa Environmental Consulting Ltd.
mG	milligauss
MVA	megavolt amperes
MW	megawatts
NID	needs identification document
PBR	performance-based regulation
POD	point-of-delivery
RAPID	Research and Public Information Dissemination Program
RDA	restricted development area
SASR	system access service request
Serecon	Serecon Inc.
SLR	SLR Consulting (Canada) Ltd.
STS	Supply Transmission Service
TELUS	Telus Communications
TFO	transmission facility owner
the Board	Alberta Energy and Utilities Board

the League	Lynnwood Community League
TMR	Transmission Must Run
Truescape	Truescape Ltd.
TUC	transportation and utility corridor
TWA	time-weighted average
U of A	University of Alberta
WHO	World Health Organization
WMD	Whitemud Drive