6.0 Impacts and Mitigation Measures for Specific Regions / Segments

The impacts of ITC Midwest LLC's (ITCM's) project are anticipated to be similar to those of a large construction project, and, as discussed in Section 5.0, many of these impacts are relatively independent of the route selected for the project. However, in specific areas of the project, the resources involved, human and natural, and the potential routing options analyzed interact so that impacts and mitigation measures are not always independent of the route selected for project. These impacts and mitigation measures are discussed here.

As noted in Section 3.0, and for the purposes of this environmental impact statement (EIS), a route alternative represents a complete connection from the Lakefield Junction substation to the Huntley substation or from the Huntley substation to the Iowa border. A route variation, on the other hand, is a shorter section of route A or B that is designed to mitigate a specific local impact. Route variations use a prefix to designate the area in which they occur, e.g., "FL" for the Fox Lake area. All of the route alternatives from the Lakefield Junction substation to Huntley substations follow, to varying extents, Interstate 90 (I-90) and are thus labeled as "I90 alternatives." The suffix "LH" is used to designate routes, route alternatives and route variations in the Lakefield to Huntley segment of the project; the suffix "HI" is used for the Huntley to Iowa border segment of the project.

Modified route A (MRA) is route A with modifications in select areas of the project. These modifications are very similar to certain route variations and are analyzed in the specific route variation area in which they occur. A suffix is used denote the route variation area; for example, MRA-FL is modified route A in the Fox Lake area.

This section first discusses the Lakefield to Huntley segment of the project, and then the Huntley to Iowa border segment.

ITCM's proposed route A follows, for most of its length, the existing Lakefield to Border 161 kilovolt (kV) line. This sharing of existing right-of-way (ROW) – and the areas where routes A and B do not share this existing ROW – is at the root of most all of the project's impacts and routing options to avoid these impacts.

Impacts to human settlements are anticipated to be minimal with aesthetic impacts and impacts to private airstrips being the only impacts that could be mitigated by routing. Because of their relatively greater transmission line ROW sharing, route A-LH and route alternatives I90-1 and I90-2 in the LH segment and route A1-HI and route alternative A2-HI in the HI segment are anticipated to minimize aesthetics impacts. Route variations in both segments further minimize aesthetic impacts of these routes and route alternatives. In the LH segment, route variation JA-2 **and modified** route A **(MRA**-JA**)** are anticipated to minimize aesthetic impacts near the Jackson Municipal Airport. The route variations that cross Fox Lake and Lake Charlotte (FL-1 and LC-4, respectively) are anticipated to minimize aesthetic impacts near these lakes. In the HI segment, route variations HI-2 and HI-5 are anticipated to minimize aesthetic impacts.

Impacts to transportation and public services are anticipated to be minimal for the project. However, route A-LH as well as select route variations near Fox Lake and Lake Charlotte would impact two, private airstrips. The route and route variations would significantly impact an airstrip in Fox Lake Township, and impact to an uncertain degree an airstrip in Rutland Township, both in Martin County.

Impacts to public health and safety are anticipated to be minimal for all routes, route alternatives and route variations. **Impacts to archaeological and historic resources** are anticipated to be minimal except for discrete sections of (1) route A-LH and route alternatives I90-1 and I90-2, (2) route alternative I90-4 and (3) route A1-HI. In these sections there are known archaeological resources within the ROWs of these routing options, and potential impacts to these resources would require mitigation measures.

Impacts to land-based economies are almost exclusively impacts to agricultural operations. The project proceeds through an area that is, by land cover, approximately 98 percent agricultural. Thus, impacts to agricultural operations cannot be avoided; however, they can be mitigated and primarily by following existing transmission line ROW. In the LH segment, route A-LH is anticipated to minimize impacts on agricultural operations, as is route alternative I90-2. In the HI segment route A1-HI and route alternative A2-HI are anticipated to minimize agricultural impacts. Route variations in the LH segment further minimize agricultural impacts. In this segment, route variation JA-2 and **modified** route **(MRA**-JA**)** are anticipated to minimize agricultural impacts near the Jackson Municipal Airport. The route variations that cross Fox Lake and Lake Charlotte (FL-1 and LC-4, respectively) are anticipated to minimize agricultural impacts

near these lakes. Route variations in the HI segment typically have greater agricultural impacts than those sections of route A1-HI that they would replace. The route variations trade off greater agricultural impacts for fewer aesthetic impacts (HI-2, HI-5) and fewer impacts to the natural environment (HI-1, **MRA-HI1,** HI-4).

Impacts to the natural environment cannot be avoided, but these impacts are anticipated to be minimal. All surface waters in the project would be spanned. All wetlands can be spanned except for one wetland in the LH segment and one in the HI segment. Impacts to flora are anticipated to be minimal. Direct impacts to fauna are anticipated to be minimal. Indirect impacts – collisions of avian species with transmission line conductors – would occur but can be mitigated by limiting these impacts to incremental impacts and by structure design and the use of bird flight diverters. In the LH segment, the route variations that cross Fox Lake and Lake Charlotte (FL-1 and LC-4, respectively) would likely minimize avian impacts near these lakes. **Impacts to rare and unique natural resources** are anticipated to be minimal across the project.

Impacts to electrical system reliability are anticipated to be minimal (and, in general, positive for south central Minnesota) with the exception of route alternatives I90-4 and I90-5 Option 2. These alternatives place several transmission lines in close proximity such that the risk of a multiple-line outage is likely higher than other alternatives and the time to repair such an outage likely greater than for other alternatives.

The existing 161 kV lines across Fox Lake and Lake Charlotte could be removed from the lakes by double-circuiting the 161 kV line with the new 345 kV line around these lakes. Route alternatives I90-1 and I90-2 could be used to remove the 161 kV line from both lakes. Route variations FL-3 and FL-4 **and modified route A (MRA-FL)** could be used to remove the 161 kV line from Fox Lake. Several route variations could be used to remove the 161 kV line from Lake Charlotte. All of these removals would positively impact aesthetics at and near the lakes by creating one transmission line ROW instead of two near the lakes. The removals would have a positive impact on agricultural operations along the 161 kV line. The removals would decrease avian impacts at both lakes. The removals would create new impacts related to transmission facilities necessary to affect the double-circuiting and would create incremental aesthetic and avian impacts along the route alternatives and route variations used for the double-circuiting.

6.1 Lakefield to Huntley Segment

Routes A and B and the I90 route alternatives extend from the Lakefield Junction substation to the Huntley substation (LH segment). There are four areas along this segment where route variations may mitigate impacts associated with routes A and B and the I90 route alternatives. This section first discusses the routes, route alternatives, and associated facilities in the Lakefield to Huntley segment and then discusses the route variations in this segment.

Impacts of routes, route alternatives and route variations in the Lakefield to Huntley segment are closely related to transmission line ROW sharing. **Impacts to human settlements** are anticipated to be minimal with aesthetic impacts and impacts to private airstrips being the only impacts that could be mitigated by routing. Because of their relatively greater transmission line ROW sharing, route A-LH and route alternatives I90-1 and I90-2 are anticipated to minimize aesthetics impacts. **Route variation** JA-2 and **modified route** A **(MRA**-JA**)** are anticipated to minimize aesthetic impacts near the Jackson Municipal Airport. Route variations FL-1 and LC-4 are anticipated to minimize aesthetic impacts at Fox Lake and Lake Charlotte, respectively.

Impacts to transportation and public services are anticipated to be minimal. However, route A-LH as well as select route variations near Fox Lake and Lake Charlotte would impact two, private airstrips. The route and route variations would significantly impact an airstrip in Fox Lake Township, and impact to an uncertain degree an airstrip in Rutland Township, both in Martin County.

Impacts to public health and safety are anticipated to be minimal. **Impacts to archaeological and historic resources** are anticipated to be minimal except for a section of route A-LH and route alternatives I90-1 and I90-2 and a section of route alternative I90-4. In these sections there are known archaeological resources and potential impacts to these resources would likely require mitigation measures.

Impacts to land-based economies are almost exclusively impacts to agricultural operations. Impacts to agricultural operations cannot be avoided; however, they can be mitigated and primarily by following existing transmission line ROW. Route A-LH is anticipated to minimize impacts on agricultural operations, as is route alternative I90-2. **Route variation** JA-2 and **modified route** A **(MRA**-JA**)** are anticipated to minimize agricultural impacts near the Jackson Municipal Airport. Route variations FL-1 and LC-4 are anticipated to minimize

agricultural impacts at Fox Lake and Lake Charlotte, respectively.

Impacts to the natural environment cannot be avoided, but these impacts are anticipated to be minimal. All surface waters in the segment would be spanned. Although wetlands would be spanned to the extent feasible, all of the routes and route alternatives would cross a wetland wider than 1,000 feet, which would likely require that one or more poles be placed within them. Impacts to flora are anticipated to be minimal. Direct impacts to fauna are anticipated to be minimal. Indirect impacts – collisions of avian species with transmission line conductors – would occur but can be mitigated by limiting these impacts to incremental impacts and by structure design and the use of bird flight diverters. Thus, route variation FL-1 would likely minimize avian impacts at Fox Lake, and route variation LC-4 would likely minimize avian impacts at Lake Charlotte. **Impacts to rare and unique natural resources** are anticipated to be minimal for all routes, route alternatives and route variations.

Impacts to electrical system reliability are anticipated to be minimal (and, in general positive for south central Minnesota) with the exception of route alternatives I90-4 and I90-5 Option 2. These alternatives place several transmission lines in close proximity such that the risk of a multiple-line outage is likely higher than other alternatives and the time to repair such an outage likely greater than for other alternatives.

The existing 161 kV lines across Fox Lake and Lake Charlotte could be removed from the lakes by double-circuiting the 161 kV line with the new 345 kV line around these lakes. Route alternatives I90-1 and I90-2 could be used to remove the 161 kV line from both lakes. Route variations FL-3 and FL-4 **and modified route A (MRA-FL)** could be used to remove the 161 kV line from Fox Lake. Several route variations could be used to remove the 161 kV line from Lake Charlotte. All of these removals would positively impact aesthetics at and near the lakes by creating one transmission line ROW instead of two near the lakes. The removals would have a positive impact on agricultural operations along the 161 kV line. The removals would decrease avian impacts at both lakes. The removals would create new impacts related to transmission facilities necessary to affect the double-circuiting and would create incremental aesthetic and avian impacts along the route alternatives and route variations used for the double-circuiting.

6.1.1 Routes, Route Alternatives and Associated Facilities

The discussion here of routes, route alternatives, and associated facilities is organized by categories of potential impacts. For example, impacts on human settlements, on transportation and public services, on public health and safety, and so forth. Within each category, the impacts of the routes and route alternatives are discussed first, and then those of the associated facilities.

Impacts of routes and route alternatives in the Lakefield to Huntley segment are, for the greater part, related to transmission line ROW sharing. Impacts to human settlements are anticipated to be minimal with aesthetic impacts and impacts to private airstrips being the only impacts that could be mitigated by routing. All routes and route alternatives, except route B-LH, have approximately 20 homes in close proximity to the line. All routes and route alternatives, except route B-LH, share or parallel 80-90 percent of their lengths with transmission line or roadway ROW. Because of their relatively greater transmission line ROW sharing, route A-LH and route alternatives I90-1 and I90-2 are anticipated to best minimize aesthetics impacts.

Impacts to transportation and public services are anticipated to be minimal. However, Route A-LH would impact two, private airstrips. Route A-LH would significantly impact an airstrip in Fox Lake Township, and impact to an uncertain degree an airstrip in Rutland Township, both in Martin County.

Impacts to public health and safety are anticipated to be minimal. Impacts to archaeological and historic resources are anticipated to be minimal except for a section of route A-LH and route alternatives I90-1 and I90-2 and a section of route alternative I90-4. In these sections there are known archaeological resources and impacts to these resources would likely require mitigation measures such as prudent pole placement, consultation with SHPO, and/or training of construction workers regarding handling of archaeological resources.

Impacts to land-based economies are almost exclusively impacts to agricultural operations. Impacts to agricultural operations cannot be avoided; however, they can be mitigated and primarily by following existing transmission line ROW. Route A-LH is anticipated to have the least impact on agricultural operations, followed by route alternative I90-2. Though several I90 alternatives utilize the existing 161 kV line west of the city of Sherburn, this utilization mitigates impacts only minimally, as the line in this area would be need to

be reconstructed further from the interstate and into adjacent fields.

Impacts to the natural environment cannot be avoided, but these impacts are anticipated to be minimal. With respect to surface waters, route B-LH crosses the fewest watercourses; route A-LH the most. Although wetlands would be spanned to the extent feasible, all of the routes and route alternatives would cross a wetland wider than 1,000 feet, which would likely require that one or more poles be placed within them. Impacts to flora are anticipated to be minimal. All routes and route alternatives would impact forested vegetation cover, primarily at the Des Moines and Blue Earth Rivers. Direct impacts to fauna are anticipated to be minimal. Indirect impacts – collisions of avian species with transmission line conductors – would occur but can be mitigated, to some extent, by routing. Routes that do not cross or are not in close proximity to surface waters are expected to impact relatively fewer waterfowl and birds. Route B-LH has the fewest watercourse crossings. All of the routes and route alternatives add a new (a second) high voltage transmission line (HVTL) near Fox Lake and Lake Charlotte and would incrementally increase avian impacts near these lakes. Impacts to rare and unique natural resources are anticipated to be minimal.

Impacts to electrical system reliability are anticipated to be minimal with the exception of route alternatives I90-4 and I90-5 Option 2. These alternatives place several transmission lines in close proximity such that the risk of a multiple-line outage is likely higher than other alternatives and the time to repair such an outage likely greater than for other alternatives.

Route alternatives I90-1 and I90-2 could be used to remove the existing 161 kV lines from Fox Lake and Lake Charlotte. This removal would positively impact aesthetics at both lakes and generally in the area, by creating one transmission line ROW instead of two near the lakes. The removal would have a positive impact on agricultural operations along the 161 kV line. The removal would decrease avian impacts at both lakes. The removal would create new impacts related to transmission facilities necessary to affect the double-circuiting and would create incremental aesthetic and avian impacts along I90-1 and I90-2.

Human Settlements

As discussed in Section 5.1, impacts to human settlements are assessed by looking at a variety of specific elements of human settlements: aesthetics, displacement, noise, property values, zoning, land use compatibility and electronic interference. Proximity to homes, schools, churches and other human settlement features and the extent of ROW sharing are the primary indicators that provide information about which routes and route alternatives would best minimize impacts to these elements of human settlements. Impacts to the relevant elements of human settlements are generally minimized by routes and route alternatives that are located away from homes and share ROW with existing infrastructure.

For some of the elements of human settlements discussed in Section 5.1 impacts from the project are expected to be minimal, and independent of the route selected for the project. For the Lakefield to Huntley segment, these elements are:

- **Displacement.** No displacements are anticipated because no homes or businesses are located within the ROW of the anticipated alignment of any of the routes or route alternatives.
- **Noise.** Noise from temporary construction is likely to be greatest where routes pass near residences, businesses, churches and schools. Overall noise impacts, however, are anticipated to be minimal for both construction and operation, and effects do not vary notably among route alternatives.
- **Property Values.** The effect of one particular project on the value of one particular property is very difficult to quantify, and it is nearly impossible to definitively assess the relative property value impacts of the routes and route alternatives under consideration. Generally, it is possible to avoid property value impacts by reducing aesthetic impacts, perceived electric and magnetic field (EMF) health risks and agricultural impacts. A discussion of each route and route alternative's effects on aesthetics is provided below. Agricultural impacts for the various routes and route alternatives are discussed later in this section.
- **Zoning and land use compatibility.** The project is expected to be compatible with all zoning laws, whichever route or route alternative is chosen, and land use is not expected to change significantly. Routes and route alternatives that avoid agricultural land or use existing infrastructure ROW would minimize impacts and challenges associated with farming around transmission line structures. See "Land Based Economies" discussions in Sections 6.1.1 and 6.2.1.

- **Electronic interference.** Most communication and media signals are transmitted at frequencies higher than the relatively narrow frequency spectrum associated with electromagnetic noise from transmission lines. Thus, electronic interference is anticipated to be minimal and to not vary notably between route alternatives.

The one element of human settlements where impacts are anticipated to be non-minimal and to vary notably between routes and route alternatives is aesthetics. Based on the analysis here, aesthetic impacts are fairly uniform across all routes and route alternatives, except route B-LH. Route A-LH and route alternatives I90-1 and I90-2 appear to best minimize impacts to aesthetics and human settlements in this segment because of their relatively greater sharing of transmission line ROW.

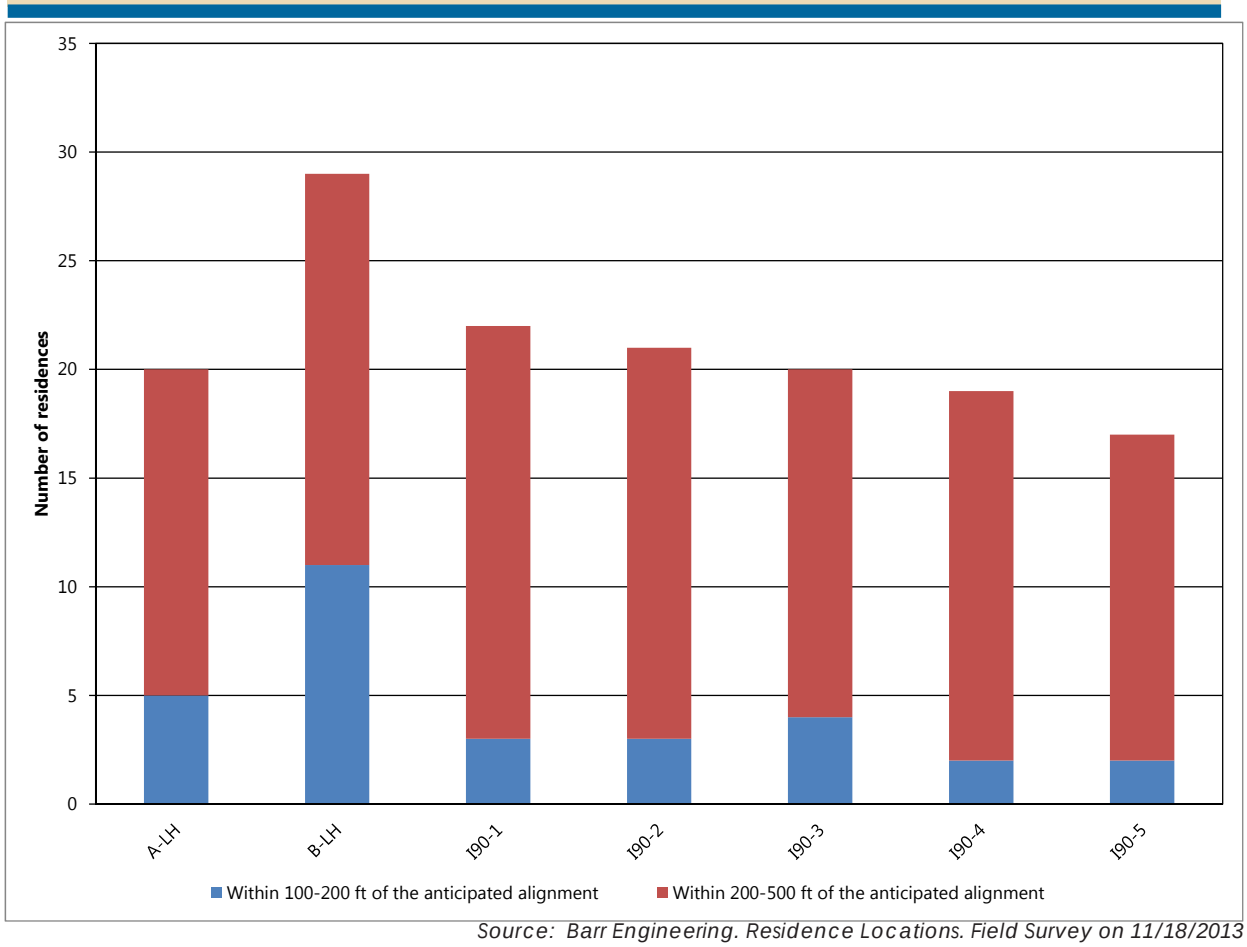
Aesthetics – Routes and Route Alternatives

Routes and route alternatives that are located away from homes or other occupied buildings minimize aesthetic effects because the transmission line structures would not be in the immediate viewshed of the residents/occupants. Map 6-1 and Map 6-2 provide an overview of human settlement features in the Lakefield to Huntley segment. Figure 6-1 shows the proximity of homes for routes and route alternatives in this segment. Figure 6-1 shows that all route and route alternatives, except route B-LH have approximately 20 homes in close proximity to the 345 kV line. Figure 6-1 also shows that using the I-90 ROW minimizes the number of homes located within 100-200 feet of the route or route alternatives' anticipated alignments and that route alternatives I90-4 and I90-5 have the fewest homes within 100-200 feet of their anticipated alignments. Route alternative I90-5 has the fewest total homes within 500 feet of its anticipated alignment.

Route B-LH has more homes within 100-200 feet of its anticipated alignment and within 500 feet of its anticipated alignment than any other route alternative in the Lakefield to Huntley segment. There are no schools or licensed daycares in the

Figure 6-1 Proximity of Homes – Lakefield to Huntley Substation

Except for route B-LH, the number of homes along routes and route alternatives is about 20.



Source: Barr Engineering. Residence Locations. Field Survey on 11/18/2013

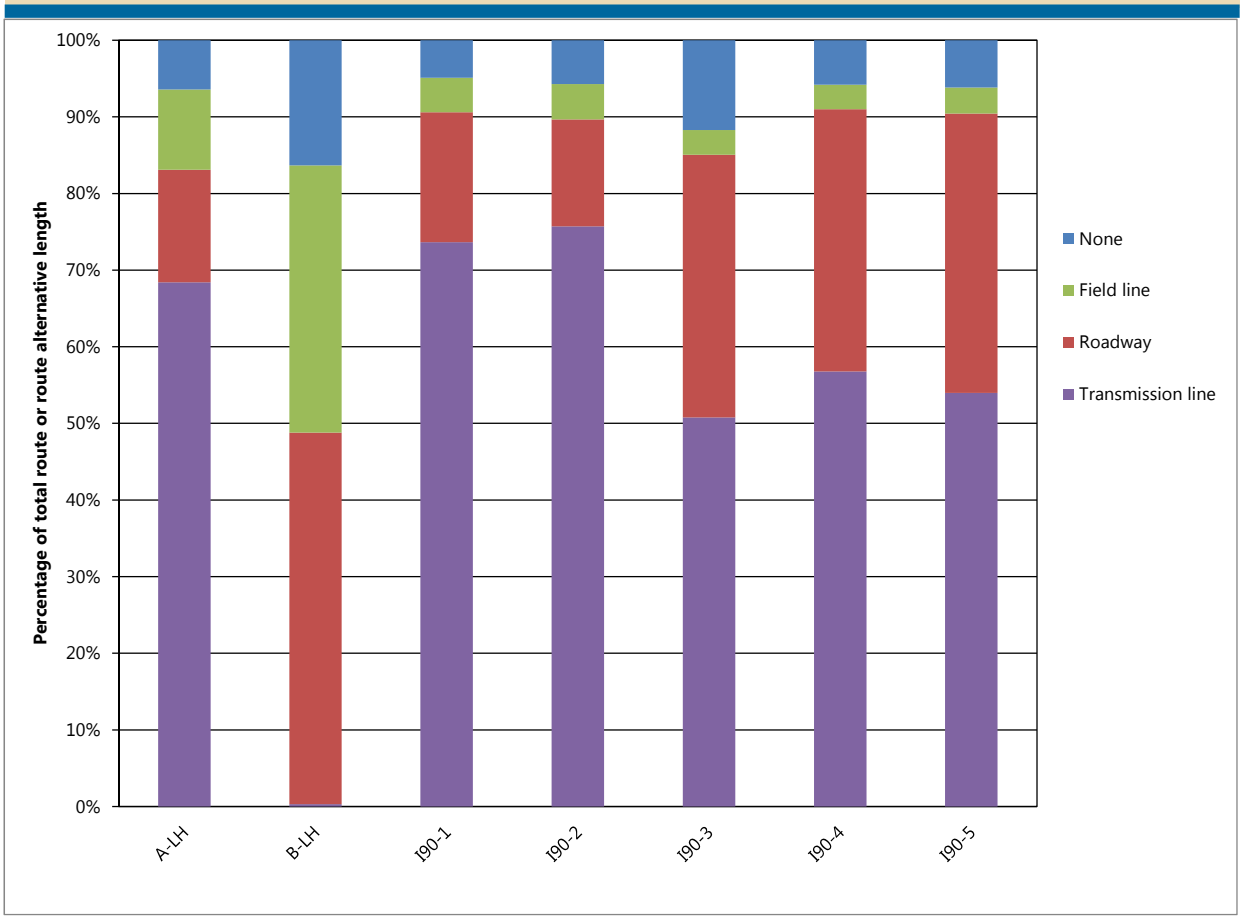
Photo 6-1 Sherburn Assembly of God Regional Worship Center

The worship center is located approximately 120 feet from the anticipated alignment of route A-LH.

Source: Barr photo
Looking East from State Highway 4 in Shurburn, Minnesota

Figure 6-2 ROW Sharing – Lakefield to Huntley

All routes and route alternatives, except for route B-LH, share or parallel 80-90 percent of their length with transmission line and roadway ROW.



Source: Barr Engineering. December 2013

Photo 6-2 Existing 69 kV line along I-90

Route alternatives that follow the I-90 ROW could share ROW with I-90 and an existing 69 kV line from Fox Lake to just west of Fairmont.

Source: Barr photo

Looking West along I-90 between Fairmont and Welcome, Minnesota

immediate vicinity of any of the route alternatives in this segment (Appendix J). The Sherburn Assembly of God Regional Worship Center, however, is located immediately south of route A-LH, approximately 120 feet off the anticipated alignment (Photo 6-1).

Aesthetic impacts can also be minimized by using existing ROW, where elements of the built environment already define the viewshed and where the addition of the proposed HVTL might thus have a relatively smaller effect. Figure 6-2 provides a summary of ROW sharing for routes and route alternatives in the Lakefield to Huntley segment.

Route alternatives that follow the I-90 ROW share or parallel the greatest percentage of their total length with existing ROW, including transmission and major highway ROWs. Route alternatives that follow the I-90 ROW could share ROW with I-90 as well as an existing 161 kV line from a point just east of Jackson to a point just north of Sherburn. From Sherburn, the I-90 routes would parallel an existing 69 kV line along the south side of Fox Lake and east to Fairmont (Photo 6-2). Route A-LH and route alternatives I90-1 and I90-2 share the greatest amount of ROW with existing transmission lines. Aesthetic impacts are anticipated to be relatively less if the project follows an existing transmission line rather than a highway ROW. Placing a transmission line where there is already a transmission line minimizes impacts to the existing viewshed. Such placement also avoids creating two transmission line ROWs in parts of the project area where there is currently only one.

Route alternative I90-4 would have greater aesthetic impacts than the other I90 route alternatives as it introduces a wider ROW with more transmission line elements where it runs north-south between I-90 and the proposed Huntley substation site. In this area, route alternative I90-4 would replace the existing 161 kV line with a 345 kV single circuit line on monopole structures, in addition to the 345/161 kV double-circuit line that would be introduced to the viewshed under all other routes and route alternatives. This configuration would require a wider ROW and would concentrate additional transmission line elements in this single ROW. A visual simulation of this arrangement is shown in Appendix D1 ("Huntley Substation Option 4 – Looking South from 160th Street" and "Huntley Substation Option 4 - Looking North from I-90").

While route A-LH shares or parallels slightly less existing ROW than the I90 route alternatives overall, it uses existing transmission line ROW for nearly 70 percent of its length. Where route A-LH shares transmission ROW, existing 161 kV H-frame structures would be replaced with taller, single pole structures that would accommodate both the existing 161 kV transmission line and the proposed 345 kV transmission line. While replacing existing structures would introduce a change in the viewshed, the marginal impact could be relatively minor compared to the introduction of new transmission line structures along new ROWs.

Route B would share or parallel less of its total length with existing transmission lines or roadways than

any of the other route alternatives in the Lakefield to Huntley segment, which would introduce new aesthetic impacts, while leaving aesthetics along the existing 161 kV ROW unchanged.

Overall, distance from homes and ROW sharing indicators suggest that using route A-LH or route alternatives I90-1 or I90-2 would minimize aesthetic impacts to residents. Since aesthetics is the primary element of human settlements that differs between routes and route alternatives in the Lakefield to Huntley segment, A-LH, I90-1 and I90-2 appear to minimize human settlement impacts in this segment.

Aesthetics – Associated Facilities

Each of the routes and route alternatives discussed above would have associated facilities at the Huntley substation end of the segment, and these facilities would have additional aesthetic impacts. These facilities are needed to extend and reconfigure existing lines from the old Winnebago Junction substation to the proposed Huntley substation site or the alternative southern Huntley substation site. The reconfiguration would involve constructing new lines as well as removing existing lines. New lines would create new aesthetic impacts, but removing existing lines could eliminate some existing impacts.

Among the associated facilities configurations, the configuration for route A-LH and route alternatives I90-1 and I90-2 minimizes aesthetic impacts by minimizing the amount of transmission line rerouting and using existing ROW that generally avoids new aesthetic impacts to homes.

Associated facilities for routes A-LH and B-LH, and route alternatives I90-1 through I90-4, would introduce new aesthetic impacts along the ROW between the existing Winnebago Junction substation and the proposed Huntley substation. While the lines that currently run to the Winnebago Junction substation would be extended to the proposed Huntley substation along an existing 161 kV transmission line ROW, new structures along the entire ROW and an increase from one to three sets of structures south of 170th Street would introduce new visual elements throughout this area.

Two buildings neighbor this ROW. The first is a farmstead located just west of 170th Street, approximately half a mile south of the existing Winnebago Junction substation. This home is located along the portion of the ROW where two existing 161 kV lines on H-frame structures would be replaced by a new double-circuit 161/69 kV line on monopole structures and two new 69 kV lines on single pole structures.

The second is a hunting cabin located off 160th Street, just west of the proposed Huntley substation (Photo 6-3). In this area, the existing 161 kV line would be replaced by two new double-circuit 161/69 kV lines on monopole structures and one new 69 kV line on single pole structures.

Photo 6-3 Viewshed Near Proposed Huntley Substation

Viewshed in the vicinity of a hunting cabin located immediately west of the proposed Huntley substation site.

Source: Barr photo

Looking Northeast at the existing 161kV line and the proposed Huntley substation site and towards the Winnebago substation

In both areas, the increase in the number of transmission line elements would affect the viewshed. Near the second residence, the replacement of a single existing 161 kV line with two new double-circuit 69/161 kV lines and one new 69 kV line would create a much wider ROW and notably increase the number of transmission line elements in the viewshed.

A visual simulation showing the effects of transmission line elements in this ROW (the proposed Huntley substation is not shown) are shown in Appendix D1 ("Route A and B Associated Facilities – Looking North from 160th Street" and "Route A - Looking South from 160th Street").

Route B-LH and route alternative I90-3 do not follow the existing 161 kV line from the Rutland substation and would therefore require an additional 161 kV line ROW to bring that line down to the B-LH ROW, where it could be accommodated on route B-LH's 345/161 kV structures. While the new 161 kV line would not follow an existing ROW, there are no homes or sensitive viewsheds in the immediate vicinity of the new line. Similarly, route alternative I90-4 would require a new ROW to bring the existing 161 kV line from the Rutland substation south and then east to the proposed Huntley substation site. While the new north/south Rutland to Huntley 161 kV line would not follow an existing ROW, there are no homes or sensitive viewsheds in the immediate vicinity of the new line. The nearest home is nearly 1,000 feet from the proposed alignment and significant tree-cover would block views of the line from this home.

Routes A-LH and B-LH, and route alternatives I90-1 through I90-4, would all involve removing a segment of the existing 161 kV line from the Rutland substation that currently passes through fields and wooded areas north of 345th Avenue and crosses the Blue Earth River before entering the Winnebago Junction substation. This existing 161 kV line is visible from 345th Avenue and is part of the viewshed near one residence located just less than 500 feet south of the line. Removing the line would eliminate transmission line elements from this home's viewshed. Removing the line would also eliminate these elements from the viewshed along 345th Avenue and views in the immediate areas where the line currently crosses the Blue Earth River.

Routes A-LH and B-LH, and route alternatives I90-1 through I90-4, would also involve removing a segment of the existing Blue Earth 69 kV line that extends northwest from 170th Street to the existing Winnebago Junction substation and is visible from 170th Street, Highway 169 and two nearby homes – one located approximately 1,000 feet west of the line off Highway 169 and the other off 170th Street approximately 200 feet southwest of the line. While removing this segment of 69 kV line would eliminate some aesthetic impacts in the area, it would be re-routed to the southwest along 170th Street. Re-routing this and other local lines would introduce new elements that would likely offset some of the benefits of the removal.

Route alternatives I90-5 Options 1 and 2 would use an alternative southern Huntley substation site and would involve different configurations to route lines from the existing Winnebago Junction substation to the alternative southern Huntley substation. The I90-5 options would have relatively more aesthetic effects, since they would require that lines from the Winnebago Junction substation be extended further south, running multiple local lines through the additional three-mile stretch between the proposed Huntley substation site and the alternative southern Huntley substation site.

Of the two, route alternative I90-5 Option 1 would have relatively more aesthetic impacts, because it uses multiple ROWs to bring the lines south from the Winnebago Junction substation. Like routes A-LH and B-LH and route alternatives I90-1 through I90-4, the I90-5 route alternatives would introduce new aesthetic impacts along the existing 161 kV ROW extending south from the Winnebago Junction substation, although impacts from the 190-5 route options would extend approximately three miles further south and would, therefore, impact three additional homes located within approximately 800 feet of the proposed alignment along this ROW. Visual impacts along this ROW have been simulated in Appendix D1 for route alternative I90-5 Options 1 and 2 ("Huntley Substation Option 1 Looking North from 160th Street", "Huntley Substation Option 1 Looking North from I-90", "Huntley Substation Option 2 Looking South from 170th Street" "Huntley Substation Option 2 Looking South from 160th Street", "Huntley Substation Option 2 Looking North from I-90").

Under route alternative I90-5 Option 2 all of the lines running south from the Winnebago Junction substation would be routed along the existing 161 kV ROW. This option would result in a wider ROW and more new transmission line elements in the viewshed along this ROW than would be introduced by route alternative I90-5 Option 1. However, this option would eliminate visual impacts where the existing Blue Earth to Huntley 69 kV line would be removed.

Both I90-5 route alternatives would also introduce a new route ROW running east-west parallel to 130th Street. Route alternative I90-5 Option 1 would require a new double-circuit 161/69 kV line in this area to bring both the Blue Earth to Huntley 69 kV and the Freeborn to Huntley 161 kV lines west to the alternative southern Huntley substation site. Route alternative I90-5 Option 2 would require a new 69 kV line in this area to bring the Blue Earth to Huntley 69 kV line west to the alternative southern Huntley substation site. Both I90-5 options would pass within 300 feet of one home located near the existing 69 kV ROW, but I90-5 Option 2 would introduce smaller poles and a narrower ROW.

While route alternative I90-5 Option 1 would utilize a smaller ROW extending south from the Winnebago Junction substation than Option 2, this route alternative would introduce new impacts by 1) routing the existing 161 kV line from the Rutland substation down a new ROW extending south, parallel to 345th Avenue, and then east, parallel to 130th Street, and 2) upgrading the north-south segment of the existing Blue Earth to Huntley line from 69 kV H-frame structures to 161 kV monopole structures. A total of three homes are located within these two route ROWs.

Substation construction for the proposed Huntley substation would most likely affect the hunting cabin located off 160th street, just west of the proposed Huntley substation site, by altering the view from this cabin (Photo 6-3). Other than this cabin, and because of distances to homes, aesthetic impacts at the Lakefield Junction substation and both the proposed Huntley substation and alternative southern Huntley substation sites are expected to be minor. The viewshed in the vicinity of the existing Lakefield Junction substation is shown in (Photo 6-4).

Transportation and Public Services

As discussed in Section 5.2, effects on transportation and public services are assessed by looking at a variety of specific elements of transportation and public services: roads, utilities, emergency services and airports.

For some elements of transportation and public services, discussed in Section 5.2, impacts from the project are expected to be minimal, and independent of the route selected for the project. For the Lakefield to Huntley segment, these elements are:

- **Roads.** Placement of transmission line structures would be coordinated with the Minnesota Department of Transportation (MnDOT) and local roadway authorities so that no long term impacts to roadways would occur for any route or route alternative. Any temporary impacts to roads during construction are expected to be minor and would be mitigated through coordination with roadway authorities.

However, MnDOT has expressed an interest in not only minimizing long-term impacts to the functioning and maintenance of I-90, but also in minimizing the number of crossings of I-90. This specific indicator is discussed below.

- **Utilities.** Operation of the proposed HVTL is not expected to cause impacts to other utilities in the project area.

Photo 6-4 Existing Lakefield Junction Substation Site

Source: EERA photo
Looking south at the Lakefield substation

- **Emergency services.** No impacts to emergency services are expected, and all temporary road closures would be coordinated with local jurisdictions to provide for safe access of emergency vehicles.

Thus, the elements of transportation and public services where impacts could be non-minimal and vary between routes are airports and, with respect to roads, the number of crossings of I-90.

Airports – Routes and Route Alternatives

With the exception of route B-LH, all routes and route alternatives in the Lakefield to Huntley segment are located within one mile of the Jackson Municipal Airport (Map 6-1 and Map 6-2). Based on Federal Aviation Administration (FAA) analysis to date, as included in ITCM's route permit application, all routes and route alternatives in this segment are anticipated to have no impacts on current or future operations at the airport. As discussed in Section 5.2.4, low-profile, specialty structures may be required to mitigate potential impacts with the airport.

Route A-LH also passes within 500 feet of two private-use grass airstrips in Martin County. The first is located in Section 23 of Fox Lake Township and abuts route A-LH. The second airstrip is located west of Lake Charlotte, in Section 18 of Rutland Township.

Route A-LH runs perpendicular to the airstrip in Section 23 of Fox Lake Township (Map 6-1) and would significantly impair operation of the airstrip. Route A-LH runs parallel to the airstrip in Section 18 of Rutland Township. This airstrip currently operates with an existing 161 kV line just south of and parallel to the airstrip. It is anticipated that a 345/161 kV double-circuit line with taller structures (route A-LH) could have some impacts on the operation of this airstrip (Map 6-2). Mitigation for both airstrips could possibly be achieved by moving or otherwise reconfiguring the airstrips. Mitigation for the airstrip in Rutland Township may be possible with low-profile specialty structures.

Airports – Associated Facilities

No airports are located in close proximity to any of the associated facilities for the routes and route alternatives in this segment. Thus, no impacts to airports are anticipated due to associated facilities.

Crossings of I-90

As noted above, MnDOT has expressed an interest in not only minimizing long-term impacts to the functioning and maintenance of I-90, but also in minimizing the number of crossings of I-90 in this segment. Route B-LH minimizes the total number of crossings, as it would not require any crossings of I-90. Route A-LH and route alternative I90-2 would require two crossings. Route alternative I90-1 would require six crossings of I-90, route alternative I90-3 eight, and I90-5 and I90-4 nine and 10, respectively.

Public Health and Safety

As discussed in Section 5.3, effects on public health and safety are assessed by looking at a variety of specific elements of public safety: EMF, implantable medical devices, stray voltage, induced voltage, air quality and environmental contamination.

For some of the elements of public health and safety discussed in Section 5.3 impacts from the project are expected to be minimal and independent of the route selected for the project. For the Lakefield to Huntley segment, these elements are:

- **EMF.** Impacts from EMF are anticipated to be minimal (Section 5.3.1 and Appendix H). Any perceived risk to public health and safety correlates to the proximity of human dwellings. Information on the proximity of human dwellings to the proposed alternatives is provided in the "Human Settlements" subsection of Section 6.1.1.
- **Implantable medical devices.** No impacts to implantable medical devices are anticipated.
- **Stray voltage.** No stray voltage impacts are anticipated as a result of the project. As discussed in Section 5.3.3, stray voltage is not associated with transmission lines, but with electrical distribution services. Any possible impacts on this distribution services can be mitigated through several measures including phase cancellation, separation and improved grounding (Section 5.3.3).
- **Induced voltage.** Induce voltage impacts are not anticipated as a result of the project. Route permits issued by the Commission require that electric transmission lines be constructed and operated to meet National Electric Safety Code (NESC) standards for induced voltages (Appendix B).
- **Air quality.** Air quality can potentially be affected by emissions from constructing and operating the project. Such impacts are expected to be minimal, and would not vary notably between route alternatives.

The one element of public health and safety where effects have the potential to vary between routes

is environmental contamination. Such effects can be minimized by prudent pole placement and placement of the alignment within the route to avoid disturbing contaminated areas.

Environmental Contamination – Routes and Route Alternatives

Minnesota Pollution Control Agency's (MPCA) What's In My Neighborhood (WIMN) database was consulted to identify environmental contamination along the routes and route alternatives in this segment. Outcomes of this review are detailed in Appendix J, Map 6-1 and Map 6-2 show point locations for WIMN sites in the project area. The WIMN review indicates that potential impacts due to environmental contamination are anticipated to be minimal and that impacts do not differ notably between the routes and route alternatives in this segment. Where contaminated sites have been identified along the routes or route alternatives, it would likely be possible to avoid health and safety risks by adjusting alignments or designing pole placements to span or go around these sites. If contaminated soil is encountered during construction, coordination with MPCA to develop an appropriate approach for contaminated soil management would minimize health and safety risks.

Environmental Contamination – Associated Facilities

Outcomes of WIMN database review are detailed in Appendix J. The WIMN review indicates that potential impacts due to environmental contamination are anticipated to be minimal for the associated facilities. As noted above health and safety risks can be avoided by adjusting alignment or designing pole placement to avoid these sites.

Land-based Economies

As discussed in Section 5.4, effects on land-based economies are assessed by considering a number of specific elements of land-based economies, such as agriculture, forestry, mining and recreation and tourism.

Project impacts to some of the land-based economies elements discussed in Section 5.4 are anticipated to be minimal and independent of the route selected for the project. These elements are:

- **Organic farms.** No impacts to organic farms are anticipated. ITCM has indicated that it would follow special construction and maintenance procedures near any organic farms in the project area to avoid loss of organic certification.
- **Livestock.** No impacts to livestock are anticipated as a result of the project. Construction activities could temporarily affect livestock by restricting pasture access and causing noise disturbance. Barns and buildings near the line may require grounding to avoid induced voltages (Section 5.4.1). Potential impacts and associated mitigation strategies, however, would not vary notably between route alternatives.
- **Aerial spraying.** Impacts to the coverage and effectiveness of aerial spraying in the project area would likely occur. The magnitude of these impacts is uncertain. Potential impacts and associated mitigation strategies, however, would not vary notably between route alternatives.
- **Irrigation.** No impacts to irrigation systems are anticipated.
- **Precision farming systems.** No impacts to precision farming systems are anticipated (Section 5.4.1).
- **Forestry.** No known marketable forestry resources exist in the ROWs for any of the routes or route alternatives.
- **Mining.** No known mining resources exist in the ROWs for any of the routes or route alternatives.

The two elements of land based economies where impacts have the potential to be non-minimal and to vary notably between routes are agricultural land, including prime farmland, and recreation and tourism. Based on the analysis here, route A-LH and route alternative I90-2 best minimize impacts to agricultural lands in this segment of the project. Impacts to recreation and tourism are anticipated to vary somewhat, but minimally, among the alternatives, and are anticipated to be minimal in this segment.

Agricultural Land, Prime Farmland – Routes and Route Alternatives

Figure 6-3 shows the percentage of each route or route alternative's ROW that has been classified by Natural Resources Conservation Service (NRCS) as prime farmland or farmland of statewide importance. Figure 6-3 also identifies the remaining percent of each route or route alternative's ROW that does not fall under either of these designations. Portions of the ROW identified in Figure 6-3 as "not designated as prime farmland" may include, for example, developed areas, lakes and forest areas.