



**Table 5-7. Land Use Based on Land Cover**

Land Use (miles)	Alternative Routes																
	Segment 1		Segment 2					Segment 3						Segment 4			
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Length <sup>1</sup>	12.9	13.0	83.3	85.9	86.0	85.0	85.1	93.6	94.7	99.8	98.5	97.5	98.7	97.8	96.5	11.0	11.7
Developed <sup>2</sup>	0.2	0.1	0.8	0.7	1.3	0.8	1.5	1.6	1.1	1.5	1.1	1.6	1.2	1.5	1.0	0.1	0.1
Residential	-	-	-	-	-	0.1	0.1	0.1	0.1	0.1	<0.1	0.1	0.1	0.1	<0.1	0.1	-
Agriculture/croplands	6.6	8.1	58.3	55.9	54.6	54.1	52.8	71.2	69.5	73.2	71.0	75.2	73.5	71.5	69.2	8.0	9.2
Pasture/grasslands	1.0	1.3	4.5	5.3	5.6	6.2	6.6	4.3	4.4	3.6	3.7	4.2	4.3	3.5	3.6	0.2	0.1
Forested Land	4.6	2.8	19.4	23.8	24.2	23.4	23.8	16.1	19.3	21.3	22.4	16.2	19.3	21.2	22.3	2.6	2.2
Water/Wetlands	0.5	0.7	0.3	0.3	0.3	0.3	0.3	0.2	0.4	0.1	0.2	0.2	0.4	0.1	0.2	<0.1	<0.1

<sup>1</sup>The sum of lengths within each land use may not equal total alternative route length due to rounding.

<sup>2</sup>Developed land use primarily consists of roads. A small percentage of industrial land is also included as developed land.

### 5.2.1 Developed Land Uses

Developed lands include those lands with residential, commercial, and industrial land uses, as well as institutional land use (e.g., schools, places of worship, cemeteries and hospitals). The Routing Team worked to develop routes that minimized impacts on these land uses where possible by avoiding populated areas and their incorporated boundaries and by developing routes that minimized potential impacts to commercial and industrial facilities to the extent possible. As a result, no residences are located within the ROW for any Alternative Routes.

**Table 5-8** identifies the total distance the Alternative Routes traverse in each county. Populations in the counties crossed by the Project range from more than 49,000 in Macoupin County to slightly more than 5,500 in Scott County (**Table 5-9**). Overall, counties located within the Study Area decreased in population by about 3 percent between the 2000 to 2010 census years. During the same period the population of State of Illinois increased by more than 3 percent.

<b>Table 5-8. Counties Crossed by Alternative Routes</b>																	
<b>County (miles)</b>	<b>Alternative Routes</b>																
	<b>Segment 1</b>		<b>Segment 2</b>					<b>Segment 3</b>						<b>Segment 4</b>			
	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	<b>H</b>	<b>I</b>	<b>J</b>	<b>K</b>	<b>L</b>	<b>M</b>	<b>N</b>	<b>O</b>	<b>P</b>	<b>Q</b>
Christian	-	-	-	-	-	-	-	27.6	27.6	22.8	22.8	5.7	5.7	-	-	-	-
Clark	-	-	-	-	-	-	-	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4	11.0	11.7
Cumberland	-	-	-	-	-	-	-	25.0	26.2	24.9	23.6	25.0	26.2	24.9	23.6	-	-
Greene	-	-	9.5	9.5	9.5	24.1	24.1	-	-	-	-	-	-	-	-	-	-
Macoupin	-	-	23.7	32.7	33.2	26.7	27.2	-	-	-	-	-	-	-	-	-	-
Montgomery	-	-	13.8	7.5	7.1	7.5	7.1	1.4	1.4	1.4	1.4	24.2	24.2	24.2	24.2	-	-
Pike	12.9	13.0	22.5	22.5	22.5	26.7	26.7	-	-	-	-	-	-	-	-	-	-
Scott	-	-	13.7	13.7	13.7	-	-	-	-	-	-	-	-	-	-	-	-
Shelby	-	-	-	-	-	-	-	29.1	29.1	40.2	40.2	32.2	32.2	38.3	38.3	-	-

<b>Table 5-9. Population Trends</b>			
State of Illinois	<b>2000</b>	<b>2010</b>	<b>Change (%)</b>
		12,419,293	12,830,632
<b>Counties Crossed by Alternative Routes</b>			
Christian	35,372	34,651	-2.04%
Clark	17,008	16,284	-4.26%
Cumberland	11,253	11,015	-2.11%
Greene	14,761	13,778	-6.66%
Macoupin	49,019	47,462	-3.18%
Montgomery	30,652	29,878	-2.53%
Pike	17,384	16,337	-6.02%
Scott	5,537	5,288	-4.50%
Shelby	22,893	22,266	-2.74%

Much of the population in the Study Area resides in the small and mid-sized communities that are roughly evenly spread across the Study Area. Rural homes make up the remainder of the population, with approximately 10,000 residences within the 2,500-square-mile Study Area (not including residences within incorporated areas), or roughly 4 residences per square mile. In general, the Routing Team attempted to avoid having Alternative Routes pass through or immediately adjacent to the small towns and their incorporated boundaries and to maximize distance from individual homes in the rural countryside to the extent practical.

**General Impacts and Best Management Practices**

Impacts to developed land generally would be limited to restricted use and development within the transmission ROW and changes to the viewshed of parcels crossed by or in proximity to

the transmission line (viewshed is discussed in Section 5.2.4). Grain Belt Express will obtain an easement that is approximately 150 to 200 feet wide. The property owner will still own the property under the transmission line. However, use of the ROW will be somewhat restricted to ensure the safe and reliable operation of the transmission line. The transmission ROW will be cleared to its full width of tall growing vegetation (taller than 10 feet) or as necessary for the safe and reliable operation of the transmission line. No physical structures (e.g., houses, barns, and garages) could be constructed within the ROW.

The Routing Team attempted to minimize impacts to developed land by maximizing the distance between incorporated areas and individual residences to the extent practical. In addition, the Alternative Routes were developed to parallel parcel boundaries whenever possible to avoid bisecting properties. The Routing Team considered paralleling existing linear infrastructure (transmission lines, pipelines and roadways) as opportunities to consolidate public infrastructure and reduce land use fragmentation.

In addition to existing linear infrastructure, the grid-based section lines of the public land survey system and the parcel boundaries that further dissect each section (referred to as section/parcel boundaries) also served to guide the development of alignments along logical divisions of ownership. The Routing Team aligned routes along section/parcel boundaries in the absence of, or as an alternative to, parallel alignments along existing linear infrastructure if existing land use would be more affected by the Project otherwise. This was most relevant in farmed areas, where farming operations extend to the edge of a property boundary. All Alternative Routes parallel existing electric transmission lines, rail corridors, roads, or section/parcel boundaries for some portion of their length (see **Table 5-10**).

### **Alternative Route Comparison**

**Table 5-10** compares the number parcels crossed by each Alternative Route and the distance from the transmission centerline to nearby residences, places of worship, cemeteries, and schools. No schools are located within 1,000 feet of any of the Alternative Routes. Parcel data were obtained from each county and grouped by size. Where continuous parcels are owned by the same landowner, the parcels are counted as a single parcel.

Table 5-10. Developed Land Use Inventory

Metric	Alternative Routes																
	Segment 1			Segment 2				Segment 3				Segment 4					
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Length (miles)	12.9	13.0	83.3	85.9	86.0	85.0	85.1	93.6	94.7	99.8	98.5	97.5	98.7	97.8	96.5	11.0	11.7
Parallels Transmission (miles)	1.8 (14%)	-	0.2 (<1%)	0.2 (<1%)	0.2 (<1%)	-	-	35.1 (38%)	17.5 (18%)	20.2 (20%)	2.6 (3%)	35.1 (36%)	17.5 (18%)	20.2 (21%)	2.6 (3%)	11.0 (100%)	3.6 (31%)
Parallels Road/Railroad (miles)	0.4 (3%)	2.8 (22%)	2.3 (3%)	6.8 (8%)	6.8 (8%)	5.5 (6%)	5.5 (6%)	0.7 (1%)	2.2 (2%)	1.3 (1%)	2.8 (3%)	1.5 (2%)	3.0 (3%)	2.1 (2%)	3.7 (4%)	-	-
Sited along Parcel Boundaries (miles) <sup>1</sup>	3.9 (30%)	2.8 (21%)	40.5 (49%)	39.3 (46%)	37.5 (44%)	34.0 (40%)	32.1 (38%)	35.2 (38%)	46.7 (49%)	43.2 (43%)	52.6 (53%)	34.9 (36%)	46.3 (47%)	39.9 (41%)	49.3 (51%)	-	2.2 (19%)
Residences within 250 feet <sup>2</sup>	2	-	1	1	1	2	2	7	3	4	-	7	3	4	-	-	-
Residences within 500 feet <sup>2</sup>	3	2	8	10	10	11	11	40	35	34	29	40	35	32	27	4	1
Places of Worship within 1,000 feet <sup>2</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Cemeteries within 1,000 feet <sup>2</sup>	1	-	4	3	3	3	3	4	3	3	2	4	3	3	2	1	-
Schools within 1,000 feet <sup>2</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Quarries crossed (#)	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	-	-
Parcels <10 acres (#)	10	5	35	33	32	26	25	40	39	34	33	42	41	36	35	3	3
<b>Total parcels crossed</b>	<b>72</b>	<b>67</b>	<b>578</b>	<b>506</b>	<b>538</b>	<b>454</b>	<b>486</b>	<b>630</b>	<b>670</b>	<b>642</b>	<b>674</b>	<b>616</b>	<b>656</b>	<b>605</b>	<b>637</b>	<b>51</b>	<b>59</b>

<sup>1</sup>In many cases, a single landowner owns one or more contiguous parcels. In these cases, the contiguous parcels were counted as a single parcel when calculating the distance sited along parcel boundaries.

<sup>2</sup> Distance calculated from centerline of the Alternative Routes.

*Segment 1*

Segment 1 traverses the Mississippi River floodplain and bluffs with only limited development. As shown in **Table 5-11**, El Dara and New Canton are the only communities located within 2 miles of Segment 1.

<b>Table 5-11. Communities Located within 2 miles of Alternative Routes in Segment 1</b>			
<b>Community</b>	<b>Population (2012 Census)</b>	<b>Alternative Routes (distance in miles)</b>	
		<b>A</b>	<b>B</b>
El Dara	75	0.4	1.5
New Canton	349	0.3	1.3

The Routing Team worked to avoid these towns and to distance the Alternative Routes from residential development. Alternative Route A is located closer to both towns but follows an existing transmission line for 1.8 miles when passing south of El Dara. Alternative Route B is farther south from the two incorporated areas aligned along local roadways in the floodplain and parcel boundaries in the bluffs.

Both Alternative Routes cross within 500 feet of only a few residences. As Alternative Route A parallels the existing transmission line in the bluffs, it traverses within 250 feet of two residences and one potential future home site with a recently built driveway. Alternative Route B does not cross within 250 feet of any residences. In addition, Alternative Route B crosses the fewest number of total parcels and the fewest small parcels (less than 10 acres in size). In general, crossing larger parcels is preferred to crossing smaller parcels because larger parcels can, in general, accommodate the ROW of the transmission line without limiting the use of a larger portion of the overall property. Neither Alternative Route is located within 1,000 feet of known places of worship. One cemetery is located within 1,000 feet of Alternative Route A; however, the Alternative Route does not cross the cemetery property.

While both routes are comparable with respect to impacts to developed uses, Alternative Route B avoids crossing within 250 feet of any residences, is located farther from populated areas, and crosses the fewest total parcels and small parcels, likely decreasing the amount of impacted landowners.

*Segment 2*

The western portion of Segment 2 is dominated by forested areas, the Mississippi River and Illinois River bluffs, and the Illinois River floodplain. Land use east of the Illinois River is predominately agricultural with dispersed forested areas located along tributaries of the Illinois River. Segment 2 is more developed compared to Segment 1. However, parcels tend to be

greater than 10 acres in size; therefore, the Alternative Routes were able to avoid close proximity to a large number of residences. **Table 5-12** identifies communities located within 2 miles of the Alternative Routes.

<b>Table 5-12. Communities Located within 2 miles of Alternative Routes in Segment 2</b>						
<b>Community</b>	<b>Population (2012 Census)</b>	<b>Alternative Routes (distance in miles)</b>				
		<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>
Alsey	233	1.5	1.5	1.5	-	-
El Dara	75	1.5	1.5	1.5	1.5	1.5
Farmersville	751	1.5	1.5	1.5	-	-
Glasgow	141	*	*	*	-	-
Harvel	223	-	-	0.9	-	0.9
Hettick	193	-	1.6	1.6	1.6	1.6
Manchester	261	0.5	0.5	0.5	-	-
Milton	272	0.5	0.5	0.5	-	-
Modesto	192	0.2	-	-	-	-
Nebo	336	-	-	-	1.3	1.3
Nilwood	242	-	1	1	1	1
Pittsfield	4,544	0.8	0.8	0.8	-	-
Pleasant Hill	941	-	-	-	1	1
Raymond	1,071	-	-	1.7	-	1.7
Scottville	118	1	0.5	0.5	-	-
Standard City	154	-	1.5	1.5	1.5	1.5
Time	23	0.2	0.2	0.2	-	-
Viriden	3,456	0.3	-	-	-	-
Waggoner	281	-	0.2	-	0.2	-
White Hall	2,676	-	-	-	1.5	1.5

\* Crossed by Alternative Route

The primarily northern routes (Alternative Routes C, D, and E) head due east and cross the Illinois River parallel to an existing pipeline. These routes are generally closer to towns and cities compared to the southern routes (Alternative Routes F and G) and cross within the incorporated boundaries of the Village of Glasgow after diverging from paralleling the pipeline east of the Illinois River. The southern routes increase the distance from some of these communities by paralleling the Mississippi River bluffs to the southeast before turning east and creating a new aerial crossing of the Illinois River. Alternative Routes C, D, and E parallel a very short distance of existing transmission line before crossing the Illinois River. Each of the Alternative Routes is sited along parcel boundaries for more than 30 miles, with Alternative

Route C sited on parcel boundaries for the greatest distance (40.5 miles). Each Alternative Route also parallels a short distance of roadways/railways.

All five Alternative Routes cross within 250 and 500 feet of a similar number of residences and a similar number of parcels less than 10 acres in size. Although Alternative Route C traverses the greatest number of total parcels, it is more than 2 miles shorter than any other Alternative Route. No places of worship are located within 1,000 feet of the Alternative Routes. Although all of the Alternative Routes are within 1,000 feet of three cemeteries, no cemeteries are physically crossed by any of the Alternative Routes; therefore, impacts are not anticipated.

In general, differences between the Alternative Routes in Segment 2 with respect to developed uses are not significant. However, Alternative Route C is slightly shorter than the other Alternative Routes, crosses the Illinois River adjacent to an existing pipeline, has fewer residences within 500 feet, and is sited along parcel boundaries for a greater distance.

### *Segment 3*

Segment 3 is predominately agricultural and is the most developed portion of the Study Area. The Routing Team attempted to avoid having any of the Alternative Routes run within any towns, villages, or cities. However, it was not always feasible to avoid crossing the incorporated boundaries of nearby communities (**Table 5-13**). With the exception of Alternative Routes I and K, each Alternative Route crosses within the boundaries of at least one community.

Between I-55 and the City of Pana, all of the Alternative Routes generally run along parcel boundaries. The northern routes in this area (Alternative Routes H, I, J, and K) are generally located farther from communities and require fewer detours to avoid development. The southern routes in this area (Alternative Routes L, M, N, and O) require more detours to avoid development and traverse within the Village of Wenonah adjacent to an active quarry. East of the Pana Substation, there are more opportunities to parallel existing transmission lines. However, residential development is located close to the transmission lines in this area, which makes paralleling less desirable. Between the Pana Substation and the next location where the Segment 3 routes intersect east of I-57, the northern routes in this area (Alternative Routes H, I, L, and M) generally follow a combination of parcel boundaries and existing transmission, while the southern routes in this area (Alternative Routes J, K, N, and O) generally follow along parcel boundaries. The Alternative Routes do not cross any incorporated communities in this area. East of I-57, the northern routes in this area (Alternative Routes H, J, L, and N) parallel an existing transmission line through the Village of Greenup. The southern routes in this area (Alternative Routes I, K, M and O) avoid Greenup by traversing to the south along to parcel boundaries.

<b>Table 5-13. Communities Located within 2 miles of Alternative Routes in Segment 3</b>									
<b>Community</b>	<b>Population (2012 Census)</b>	<b>Alternative Routes</b>							
		<b>H</b>	<b>I</b>	<b>J</b>	<b>K</b>	<b>L</b>	<b>M</b>	<b>N</b>	<b>O</b>
Casey	2,742	1.5	-	1.5	-	1.5	-	1.5	-
Coalton	303	-	-	-	-	1.9	1.9	1.9	1.9
Cowden	661	-	-	0.04	0.04	-	-	0.04	0.04
Greenup	1,537	*	0.6	*	0.6	*	0.6	*	0.6
Harvel	223	-	-	-	-	0.9	0.9	0.9	0.9
Jewett	235	-	1.1	-	1.1	-	1.1	-	1.1
Morrisonville	1,067	2	2	2	2	-	-	-	-
Nokomis	2,261	-	-	-	-	0.4	0.4	0.4	0.4
Oconee	180	-	-	0.8	0.8	-	-	0.8	0.8
Ohlman	133	1.5	1.5	1.5	1.5	1.7	1.7	1.7	1.7
Pana	5,808	0.8	0.8	-	-	0.8	0.8	-	-
Raymond	1,071	-	-	-	-	0.3	0.3	0.3	0.3
Sigel	374	-	-	0.2	0.2	-	-	0.2	0.2
Stewardson	736	-	-	1.3	1.3	-	-	1.3	1.3
Toledo	1,258	0.1	-	0.1	-	0.1	-	0.1	-
Wenonah	37	-	-	-	-	*	*	*	*

\* Crossed by Alternative Route

Greater than one-third of Alternative Routes H and L parallel existing transmission lines. As mentioned above, however, many homes are immediately adjacent to or are near the existing lines. As a result, compared to the other Alternative Routes, Alternative Routes H and L cross within 250 and 500 feet of the most residences. Similarly, compared to most other Alternative Routes, Alternative Routes J and N also parallel a significant distance of existing transmission line and are located within 250 feet of more residences. Alternative Routes O and K, which only parallel existing transmission for a short distance, have the fewest residences within 250 and 500 feet. No places of worship are located within 1,000 feet of the Alternative Routes. All of the Alternative Routes are within 1,000 feet of several cemeteries. None of the Alternative Routes cross cemeteries; therefore, impacts are not anticipated.

As shown in **Table 5-10**, Alternative Route K crosses the least number of parcels that are less than 10 acres in size (33); however, all of the remaining Alternative Routes are similar in this respect. Alternative Route K crosses the most total parcels with 674, nearly 70 more than Alternative N with the fewest total parcels crossed (605) but is the only Alternative Route that is sited along parcel boundaries for greater than 50 percent of its total length.

Although Alternative Route K is the third longest route in Segment 3, it is expected to result in fewer impacts to developed uses compared to other routes because it avoids crossing the incorporated boundaries of any communities, is sited along parcel boundaries for the greatest distance (53 percent of its route), has the fewest residences located within 250 and 500 feet,

and crosses fewer small parcels. Although Alternative Routes H and I are around 4 to 5 miles shorter, they cross within 250 and 500 feet of more residences than the other Alternative Routes.

*Segment 4*

Segment 4 is predominantly agricultural with sparse residential development. The only town in Segment 4 located close to the Alternative Routes is West Union, which is south of both Alternative Routes (**Table 5-14**).

<b>Table 5-14. Communities Located within 2 miles of Alternative Routes in Segment 4</b>			
<b>Community</b>	<b>Population (2012 Census)</b>	<b>Alternative Routes (distance in miles)</b>	
		<b>P</b>	<b>Q</b>
West Union	285	0.7	0.2

Alternative Route P parallels existing transmission for its entire route, while more than half of Alternative Route Q parallels a combination of existing transmission and parcel boundaries. Neither Alternative Route traverses within 250 feet of any residences. Compared to Alternative Route P, Alternative Route Q traverses within 500 feet of three fewer residences but closer to the community of West Union. Alternative Route P crosses within 1,000 feet of a church and a cemetery, while Alternative Route Q does not. However, Alternative Route P does not cross either feature; therefore, impacts are not anticipated. Both Alternative Routes traverse a similar number of total parcels and parcels less than 10 acres in size.

While both routes are comparable with respect to developed uses, Alternative Route P is expected to result in fewer impacts to developed uses because it is 0.7 mile shorter than Alternative Route Q, parallels an existing transmission line for 100 percent of its route, and crosses within 500 feet of only a few residences.

**5.2.2 Agricultural Use (Farm and Pasture/Grassland)**

As previously mentioned, land use within the Study Area is predominately agricultural with the most productive cultivated land in the Mississippi and Illinois Rivers floodplains. The main agricultural crop commodities in Illinois include corn, soybeans, and wheat. Livestock commodities include cattle, goats, sheep and hogs (USDA NASS 2013). Market value of Illinois agricultural products sold was estimated at approximately \$17.2 million dollars, ranking seventh within the U.S. market in 2007 (USDA NASS 2013). Pastures are used for grazing cattle and for the production of hay to feed livestock in the winter. Most of the Study Area uses dry land farming techniques, except areas in the Mississippi, Illinois, and Wabash floodplains where

center pivot irrigation is common. Extensive networks of drain tile are found in the central part of the Study Area in Macoupin, Montgomery, and Christian Counties.

### **General Impacts and Best Management Practices**

Impacts to agricultural land (crops and pasture/grassland) would be primarily confined to the construction phase of the Project. In croplands, access into fields during construction may be required during the growing season, which could damage crops or take an area out of production while the transmission line is being constructed. Landowners will be compensated for crop damage as a result of construction of the transmission line. In grassland or pastureland, access across land may be required and could temporarily remove some area from grazing activities during construction. In addition, soil compaction and erosion may be possible, but best management practices will be used to mitigate impacts resulting from soil erosion or compaction.

Grain Belt Express has also signed an Agriculture Impact Mitigation Agreement with the Illinois Department of Agriculture that identifies commitments to mitigate soil compaction and damages to crops, irrigation drainage tiles, irrigation systems, and other related impacts. A copy of the Agricultural Impact Mitigation Agreement is provided as an exhibit to the direct testimony of Grain Belt Express witness, Mark Lawlor.

The Routing Team attempted to minimize impacts to agricultural land by avoiding center pivot irrigation systems to the extent possible and by siting along parcel boundaries to minimize bisecting agricultural land. None of the Alternative Routes in Segments 1, 2, or 3 cross known center pivots. In Segment 4, eight center pivots are located along the ROW for Alternative Routes P and/or Q. However, the transmission line will be designed to span any area where the ROW overlaps with an irrigation system, thereby avoiding impacts on the operation of the pivot arm.

Specific to cropland areas, once the transmission line is constructed, farmers would have to farm around the transmission structures. These impacts are not expected in grassland or pasture areas because large cultivation equipment is not typically used and livestock could move freely under the transmission line. As mentioned previously, the footprint of each structure location would be permanently taken out of cropland production and could no longer be used for grazing (roughly 0.0009 acre for a typical single foundation structure). In accordance with the Agriculture Impact Mitigation Agreement, all tangent structures will use only single, drilled pier type concrete foundations or direct embed type foundations that are typical of single pole type structures. Grain Belt Express will not use multi-foundation lattice type structures for tangent structures, although such structures may be used for turns, long spans such as river crossings, and similar situations where specific engineering and environmental challenges are present. The use of guy wires will be avoided to the extent feasible. If guy wires are required, they will be marked with highly visible guards. To the extent feasible, guy wires and their

anchors will be placed out of crop and hayland, and will be placed along existing lines (e.g., property lines; section, quarter, and half section lines; and fence lines) and on land not used for row crops or hay.

Generally, livestock grazing operations do not require large machinery for plantings, chemical application, or harvesting, and operational impacts to these facilities would be minimal. Routing transmission lines along parcel boundaries or fence lines is considered the best routing option in cropland areas. Routing on parcel boundaries places the disturbance between ownerships, often minimizing the obstruction on farming operations for each landowner. In contrast, routing a transmission line diagonally through cultivated fields often involves support structures located in the middle of the fields rather than on the edge. This scenario results in a greater impact on farming operations because it creates a new obstacle to farm around. Thus, when possible and practical, the Routing Team placed alignments along parcel boundaries in cultivated areas. This was most practical in areas with large parcels aligned closely to section/parcel boundary lines.

### **Alternative Route Comparison**

#### *Segment 1*

As shown in **Table 5-7**, most of the length of Alternative Routes A and B crosses agricultural lands. Both Alternative Routes cross a similar distance through agricultural land—primarily cropland—and avoid crossing any existing center pivot irrigation systems. After crossing the Mississippi River, the first approximately 2.3 miles of Alternative Route B diagonally crosses some irregularly shaped cultivated fields. However, careful structure placement through these fields should minimize potential impacts on agricultural operations. As described in Section 4.3.3, Alternative Route B was developed in coordination with the landowners in the floodplain to minimize the need to place structures in the middle of large contiguously farmed fields with extensive pivot irrigation, and instead place structures alongside roads or between fields that would not be farmed contiguously (due to physical breaks such as drainage channels, elevation changes, or roads). Thus, Alternative Route A and B each would likely have comparatively similar impacts on agricultural operations despite length differences.

#### *Segment 2*

Each of the Alternative Routes crosses between 53 and 58 acres of agricultural land. None of the Alternative Routes cross existing center pivot irrigation systems. Where the Alternative Routes cross agricultural lands, they typically run along parcel boundaries. Given the similar distance of agricultural lands crossed, the Alternative Routes in Segment 2 are expected to result in similar impacts to agricultural lands.

### *Segment 3*

Each Alternative Route crosses approximately 70 acres of agricultural land. None of the Alternative Routes cross existing center pivot irrigation systems. Several of the Alternative Routes in Segment 3 parallel a significant distance of existing transmission lines. However, the existing transmission lines within Segment 3 often pass diagonally through agricultural fields instead of following along the edge of parcel boundaries. Parallel alignments along these lines (Alternative Routes H, I, J, L, M, and N) may likely result in more frequent structures in the middle of a cultivated field, impacting farming operations more than Alternative Routes that primarily run along parcel boundaries (Alternative Routes K and O).

### *Segment 4*

Alternative Routes P and Q traverse similar distances through cultivated lands. However, the alignment of Alternative Route P along the north side of the existing transmission line allows impacts on existing pivot irrigation in the Wabash River floodplain to be avoided. In contrast, Alternative Route Q, aligned on the south side of the existing transmission line, would likely limit the operation of one or two existing pivots and require larger spans and taller structures to avoid others. In general, this difference indicates that Alternative P would have a lesser overall impact on agricultural use in Segment 4.

## **5.2.3 Aesthetic Resources**

The assessment of potential aesthetic impacts commonly includes a characterization of the visual landscape, followed by the identification of visually sensitive areas, and a description of the potential for those visually sensitive areas to be impacted by the Project. The most visually sensitive areas for transmission infrastructure commonly include those areas near historic sites with sensitive viewsheds, major recreation sites that rely on natural scenic views, or areas with dense residential development. Potential impacts on historic resources are presented in Section 5.2.5.

Illinois hosts a range of natural and cultural-based recreational opportunities, including both dispersed and developed recreational area types. Examples of dispersed recreational activities include scenic driving, bicycling, backpacking, hunting, fishing, and off-road vehicle use. Developed recreation provides permanent facilities designed to accommodate activities such as camping, boat launching, sporting activities in athletic fields, or day-use activities (i.e., picnicking, visiting interpretive exhibits, and hiking/biking on trails). Predominant recreational activities include hunting, observing wildlife, siting tourist attractions, scenic driving, hiking/biking on National Historic Trails, boating activities on the reservoirs and rivers, and camping at state parks.

Many of these areas have recreational uses that are driven in part by area aesthetics. Area aesthetics are defined as a mix of landscape visual character, the context in which the landscape

is being viewed (view/user groups), and the scenic integrity of the landscape. The potential visibility and visual impact on the landscape and recreational areas from the four segments—Segment 1 through Segment 4—were reviewed through landscape character assessment, field evaluation, and environmental factor tabulations.

### **Description of Visual Character**

Visual character encompasses the patterns of landform (topography), vegetation, land use, and aquatic resources (i.e., lakes, streams, and wetlands). The visual character of an area is influenced by natural systems, human interactions, and use of land. In natural settings, the visual character attributes are natural elements, such as forested hillsides, open grasslands, or scenic rivers and lakes, whereas rural or pastoral/agricultural settings may include human-made elements such as fences, walls, barns and outbuildings, and occasional residences. In more developed settings, the visual character may include commercial or industrial buildings, manicured lawns, pavement, and other infrastructure. Photographs of the Study Area presented below were taken aurally from a helicopter, so they do not depict the view from the ground.

In Segment 1, visual character changes dramatically from west to east. The western part of the segment is characterized by the wide views of flat floodplain farmlands with the bluffs of the Mississippi River visible in the distance to the west (in Missouri) and along the edge of the floodplain to the east. Notable features on the landscape include tilled land and/or row crops, farm equipment, irrigation infrastructure, existing transmission and distribution lines, as well as drainage channels and levees. This view is typical of the floodplain for many miles to both the north and south and can be seen from U.S. 96, which is part of the Great River Road National Scenic trail.



**Floodplain farmlands of the Mississippi River showing river bluffs in Missouri (facing west)**

Visual character changes dramatically in the eastern bluffs of the Mississippi River floodplain roughly 7 miles east of the river's edge and continues to the Illinois River. Here, elevation and topographic variability change dramatically, as does the proportion of farmable lands. Views are shortened because hills and heavily forested drainages break up the visible landscape.



**View from the Mississippi River bluffs (facing west) with floodplain farmlands in the background**

Visual character in Segment 2 also changes from west to east. Segment 2 begins in the more heavily forested hills and valleys indicative of the area between the Mississippi and Illinois Rivers, passes through the heavily farmed floodplains of the Illinois River, and grows steadily more agricultural as the route continues east toward I-55. Smaller farms of variable shape intermix with the many forested drainages, providing variable view lengths and character.



**Southern Scott County, west of the Illinois River floodplain, smaller irregular farms are interspersed with forested drainages**

Agricultural land cover dominates the visual landscape in Macoupin County, as small forested drainages decline in prominence and broad uninterrupted views of farmland become more common. This gradual west to east increase in agricultural proportion varies between the northern and southern routes in Segment 2, with routes on the north generally transitioning more quickly to a larger proportion of farmland and routes on the south staying longer in the forest dominated lands between the rivers.



**Northwestern Macoupin County, agricultural land use dominates the visual landscape in the eastern portion of Segment 2**

Segment 3 begins in the predominately flat and heavily farmed landscape noted in the eastern portion of Segment 2. This visual character continues through northern Montgomery and southern Christian Counties. East of Pana, Segment 2 crosses through several major drainages, including Beck Creek, Kaskaskia River, Little Wabash River, Embarras River, and the North Fork of the Embarras River. At each major drainage, forest cover increases as arable land decreases, and farms of variable shape intermix with the many forested draws providing variable view lengths and character.



**Southern Shelby County, Beck's Creek drainage—irregular farms surround major forested drainages in Segment 3**

Existing transmission infrastructure becomes more notable in Segment 3, specifically south and east of Pana. Major transmission lines connect Pana, Neoga, and Casey, each crossing perpendicular to the major drainages that generally run north and south. One of these crossings, shown below, also crosses the Hidden Springs State Forest.



**Eastern Shelby County, existing 345 kV transmission ROW across Richland Creek and the Hidden Springs State Forest**

The Study Area narrows considerably by Segment 4, as the Alternative Routes converge on the eastern converter station and the Sullivan Substation just east of the Indiana state line. Land use along this final segment transitions from a mixture of farms and forested areas in the Little Creek drainage, to the intensive farm lands of the Wabash River floodplain. In the western portion of the Study Area, views are generally shorter and more varied. An existing 345 kV transmission line is a notable visible vertical feature in Segment 4 crossing through the forest drainages east of Little Creek and Mill Creek.



**Clark County, existing 345 kV transmission ROW across Little Creek drainage**

The converter station is located along this existing line on a large parcel with forest lined edges at a bend in Mill Creek. The forested riparian area provides screening to the north, east, and west of the station.



**Forested riparian area along Mill Creek surrounding proposed converter station**

Land use east of the converter station is dominated by farming, providing long nearly uninterrupted views to the tree-lined Wabash River. The existing line, sporadic homes, and extensive use of pivot irrigation systems are the primary visual features.



**Extensive farmlands in the Wabash River floodplain east of the converter station,  
Casey – Breed 345 kV line in the foreground**

### **Viewer/User Groups**

Many factors influence the visual impact of any Alternative Route. The viewer is one of these factors. A viewer is defined as not only the person who is viewing the transmission line but also as the person's expectations, activities, and frequency of viewing the line (USDA Forest Service 1995). Three types of viewers were identified in the Study Area:

- **Local Residents**—Local residents are those people who live in the area of the proposed transmission line. Residents may view the line from their yards or homes, while driving on local roads, farming, or during other activities in their daily lives. The sensitivity of local residents to the visual impact of the line may be mitigated over time by frequent exposure to existing transmission lines and other dissonant features already within the viewshed.
- **Commuters and Travelers**—Commuters and travelers are people who travel by the transmission line on their way to other destinations. Typically, drivers have limited views of the transmission line where vegetation or buildings provide screening and where the line crosses high above the road surface. Under these conditions, the visual perception of the line for commuters and travelers is anticipated to be relatively low because they are typically moving and have a relatively short duration of visual exposure to the line. When new visual features persist in the immediate vicinity or directly parallel to the road over long distances, longer visual exposure can be expected.
- **Recreational Users**—Recreational users include primarily local residents and visitors

involved in recreational activities, such as wildlife viewing, hunting, fishing, hiking, and camping. These areas are described in greater detail in **Table 5-15**. For some recreational users, scenery may be an important part of their experience because their activities may include attentiveness to views of the landscape for long periods. Such viewers also may have a high appreciation for visual quality and high sensitivity to visual change.

### **Scenic Integrity and Visual Absorption**

Scenic integrity is the degree by which the landscape character deviates from a natural or naturally appearing landscape in line, form, color, and texture of the landscape. In general, natural and naturally appearing landscapes have the greatest scenic integrity. As human-made incongruities are added to the landscape, scenic integrity diminishes.

Additionally, some landscapes have a greater ability to absorb alterations with limited reduction in scenic integrity. Character and complexity, as well as environmental factors, influence the ability of a landscape to absorb changes. Scenic integrity refers to the degree of intactness and wholeness of the landscape character. For example, new transmission and substation facilities are more likely to “blend-in” with surroundings near pre-existing industrial facilities. A new transmission line sited next to an existing transmission line provides less contrast, and therefore, can be absorbed into that landscape better than introducing a transmission line as a new feature into a previously undeveloped area.

The structure design itself could also have an impact on visibility and absorption. As described in Section 1.4, *Project Description*, a combination of lattice mast and monopole structures and lattice towers will be used for the Project. From a visual standpoint, lattice structures blend into the background, especially from the middle- and back-ground distances. The lattice design allows the natural colors of the surrounding backdrop to be seen, dissipating the visual intrusion of the transmission line. Monopole structures tend to stand out more on the landscape, compared with lattice structures. There are typically more monopole or lattice mast structures per mile than lattice structures. In areas where long vistas are possible, the use of monopole structures could lead to greater visible impacts, particularly in areas where a transmission line parallels a roadway, but the use of lattice mast structures would reduce this impact.

The following table presents information on a range of visually sensitive features and factors useful for comparing potential for aesthetic impacts from the Project (**Table 5-15** and **Figure 5-5**). This information was used to compare the potential visual impacts of each of the Alternative Routes with respect to the likely viewers, the existing visual character of the area, and its sensitivity to absorbing new vertical infrastructure in the visual landscape.

Table 5-15. Visually Sensitive Features

Resources	Unit of Measure	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	
NRHP Properties/Sites within 1 mile	Count	1	0	0	0	0	1	1	2	1	2	1	2	1	2	1	0	0	
<b>National Scenic Byways</b>																			
Great River Road	Description	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Historic Route 66	Description	-	-	X	X	X	X	X	-	-	-	-	-	-	-	-	-	-	
Historic Route 66 (Route 4 loop)	Description	-	-	X	X	X	X	X	-	-	-	-	-	-	-	-	-	-	
National Historic Road	Description	-	-	-	-	-	-	-	X	X	X	X	X	X	X	X	-	-	
<b>Residences/Development</b>																			
Residences within 500 feet	Count	3	2	8	10	10	11	11	40	35	34	29	40	35	32	27	4	1	
Populated places within 1 mile	Count	2	0	8	8	8	3	3	3	2	5	4	7	6	9	8	1	1	
Populated places within 2 miles	Count	2	2	11	13	14	8	9	6	5	9	8	10	9	13	12	1	1	
<b>Route Considerations</b>																			
Route Length	Length (Miles)	12.9	13.0	83.3	85.9	86.0	85.0	85.1	93.6	94.7	99.8	98.5	97.5	98.7	97.8	96.5	11.0	11.7	
Percent parallel to existing transmission lines	Percent	14%	0%	<1%	<1%	<1%	0%	0%	38%	18%	20%	3%	36%	18%	21%	3%	100%	31%	
<b>Recreational Resources</b>																			
Sites w/in 1 mile	Count	1	3	-	-	-	-	-	2	1	-	-	1	2	-	-	-	-	
Sites w/in 2 miles	Count	3	3	4	2	3	3	3	4	3	1	-	3	3	1	-	-	-	