3.1.2 Topography

In general, elevation increases from the northwestern to the southeastern portions of the Study Area. Differences in elevation within the Study Area range from approximately 506 feet above sea level in the northwestern portion of the Study Area to approximately 748 feet above sea level in the southeastern portion of the Study Area (USGS, 2016). The convergence of major highway infrastructure in the Study Area has altered the original topography. Additionally, Mill Creek runs through the northern portion of the Study Area. This natural feature provides the most distinct difference in topography. Elevation rises sharply from the banks of Mill Creek and gradually levels into the nearby residential neighborhoods. Select areas along the banks of Mill Creek are classified as a Hillside Overlay District. This land use regulation establishes standards for development along hillsides determined to have significant public and natural value (City of Cincinnati, 2021).

3.1.3 Water Resources

Mill Creek and its tributaries are the primary water resources in the Study Area (Figure 3-2). Historically, Mill Creek has been vital to Cincinnati's industrial growth. The 28-mile creek runs through the city center and meets the Ohio River west of downtown Cincinnati. Mill Creek has experienced significant harm through Cincinnati's growth and urbanization. Years of chemical and industrial dumping caused Mill Creek to lose significant populations of aquatic life, birds, and mammals by the 1960s. In 1992, the Ohio Department of Health declared fish from Mill Creek unsafe to eat. The OHEPA has recommended no bodily contact with Mill Creek waters due to elevated sewage and pollution levels (Mill Creek Alliance, 2021). In 1997, national river conservation group American Rivers referred to Mill Creek as "the most endangered urban waterway in America" (Midwest Biodiversity Institute, 2016). However, conservation efforts in recent years have begun to reverse the ecological damage to Mill Creek. Invertebrate, fish, mammal, and bird populations have returned as Mill Creek's toxicity has lessened. Despite these improvements, urban stormwater runoff pollution, combined sewage overflow, and wastewater treatment plant effluent pose challenges to the health of Mill Creek (Mill Creek Alliance, 2021).

Wetlands are areas inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, vegetation adapted for life in saturated soil conditions (U.S. Army Corps of Engineers [USACE], no date). Wetlands filter sediments and contaminants, reduce flood damage, provide breeding grounds for fish and wildlife, including endangered species, and protect shorelines from erosion. Reducing and preventing loss and damage to wetlands is a primary goal of the Clean Water Act (CWA) (USACE, no date). There are a few wetlands in the Study Area. Most are categorized in the National Wetland Inventory (NWI) data managed by the U.S. Fish and Wildlife Service (USFWS) as riverine wetlands along and within Mill Creek, its tributaries, and other

creeks in the Study Area. Palustrine wetlands are non-tidal, vegetated wetlands defined by dominant plant species, such as trees, shrubs, and emergent (herbaceous) plants (Cowardin et al., 1979). The extent of these types of wetlands within the Study Area is quite limited.

The Federal Emergency Management Agency (FEMA) has mapped floodplains within the Study Area (Figure 3-2). The Mill Creek Valley Conservancy District (MVCD) is the local sponsor for the USACE's flood control project for the Mill Creek Valley. It seeks responsible flood control options for the Mill Creek floodplain in Hamilton County (MVCD, 2013). Most of the floodplains in the Study Area are in the northern half. The most prominent floodplains are in the eastern portion of the Study Area, though there are also some located along Mill Creek and its tributaries. Some of the floodplains in the Study Area, as mapped by FEMA, are several hundred feet wide and, if crossed by the transmission line, may require structures to be placed within the floodplains. The MVCD also owns some land within the Study Area along Mill Creek just east of the Terminal Substation (Figure 3-2)

3.1.4 Vegetation

The Study Area lies within the Hot Continental Division ecosystem province, noted specifically for its broadleaved forests (U.S. Forest Service, 2015). The region's native vegetation is typical of the temperate deciduous forest variety. Common tree species in the Study Area include American beech, white ash, sugar maple, red oak, black cherry, slippery elm, bitternut hickory, black walnut, hackberry, shagbark hickory, blue ash, and white oak (Bryant and Held, 2004). These species typify the mesic nature of the county. Other species are more site-specific and restricted in their distribution (USFWS, 2021). In general, the Study Area displays native tree growth along the banks of Mill Creek. The residential areas of the Study Area typify urban and suburban tree plantings and grass lots.

3.1.5 Wildlife

Mill Creek facilitates much of the wildlife possibly found within the Study Area. Fish species in order of prevalence include central stoneroller, green sunfish, white sucker, bluegill, and spotfin shiner (Midwest Biodiversity Institute, 2016). In addition to common small mammals, white-tail deer and coyotes have been known to inhabit the urban landscape. Reptile and amphibian species may also be present within the Study Area where suitable habitat exists, such as in large residential yards, riparian areas associated with creeks and drainages, and wooded areas. Common bird species include the American crow, house sparrow, eastern bluebird, northern cardinal, red-winged blackbird, purple finch, and mourning dove (Ohio Department of Natural Resources, 2013).

3.1.6 Threatened and Endangered Species

The USFWS developed a service called Information for Planning and Consultation (IPaC) that provides a listing of protected species and lands within the Study Area. Based on a review of the IPaC results, running buffalo clover is an endangered flowering plant in the Study Area (USFWS, 2021). This plant requires periodic disturbance and a somewhat open habitat to grow, but it cannot tolerate full sun, full shade, or severe disturbance. This plant may be found in partially shaded woodlots, mowed areas, and along streams and trails (USFWS, 2019a).

The endangered Indiana bat and the threatened northern long-eared bat may also be found within the Study Area (USFWS, 2021). The Indiana bat hibernates in the winter in caves or abandoned mines and roosts under peeling bark on dead and dying trees during the summer (USFWS, 2019b). The northern long-eared bat also hibernates in the winter in caves and mines and roosts in cavities or crevices of both live trees and snags, as well as in caves and mines. This bat may also be found occasionally in barns and sheds (USFWS, 2020). According to the IPaC, there are presently no critical habitats in the Study Area (USFWS, 2021).

3.2 Social Resources

Following is a description of the social resources in the Study Area that could be impacted by the construction or operation of the proposed Project. Topics addressed include patterns of land use and development, parks and recreation areas, transportation and utilities, and cultural resources.

3.2.1 Urban and Residential Areas

The Study Area lies within Hamilton County, the city limits of Cincinnati, and several nearby independent municipalities. The majority of the Study Area is in Cincinnati proper (approximately 63 percent). The following municipalities comprise the remaining percentages of the Study Area: Amberley Village (approximately 13.5 percent), Golf Manor (approximately 11.6 percent), Reading (approximately 4.9 percent), Springfield Township (approximately 4.4 percent), Sycamore Township (approximately 2 percent), and Arlington Heights (approximately 0.7 percent). The Study Area is urbanized with a diverse mix of residential, commercial, industrial, institutional, and public space land uses. The most prominent land use in the Study Area is residential single family (approximately 25 percent), followed by residential multi-family (approximately 14 percent). There are approximately 76 individual subdivisions located with the Study Area.

The primary neighborhoods in Cincinnati proper impacted by the Project are Carthage, Hartwell, and Roselawn. The Bond Hill and Pleasant Ridge neighborhoods intersect with the southern boundary of the

Study Area. Neighborhoods in the independent municipalities listed previously also intersect the Study Area.

According to 2010 Decennial Census data, the three most populated neighborhoods in the Study Area are: Roselawn with a population of 6,440 and 3,474 housing units; Golf Manor with a population of 4,022 with 2,097 housing units; and Hartwell with a population of 1,899 and 986 housing units (U.S. Census Bureau, 2010).

The Study Area's residential areas are generally urban in character. The Brookwood neighborhood of Amberley Village (eastern edge of the Study Area) is more suburban in character, typified by cul-de-sacs and larger lots. Vine Street, West of I-75, serves as the main commercial artery through the Carthage neighborhood. Reading Road contains most of the commercial land uses through the Roselawn neighborhood. There are two large, currently undeveloped parcels on the western edge of Amberley Village zoned for industrial use.

Several significant institutional uses are present in the Study Area. Summit Behavioral Healthcare is a large psychiatric institution on the western boundary of the Study Area, east of I-75. South of this site is a Planned Development District with large-footprint manufacturing and commercial office uses. Woodward Career Technical High School is another notable institution in the Study Area located just south of East Seymour Avenue and west of Reading Road in the southern half of the Study Area. A bit further east on East Seymour Avenue is the Academy of Multilingual Immersion Studies. The Roselawn Condon School is located northwest of the intersection of Summit Road and Greenland Place. The University of Cincinnati – Reading Campus is in the northeastern corner of the Study Area, and Hartwell Elementary is located along the northwestern boundary. There are also a few smaller schools within the Study Area.

There are several large places of worship within the Study Area. New Prospect Baptist Church is located just north of Summit Road and east of I-75 in the northern portion of the Study Area. Turning Point Ministries Church is located north of Losantiville Avenue and west of Eastlawn Drive in the eastern portion of the Study Area. Allen Temple African Methodist Episcopal Church is located between Seymour Avenue and Reading Road. There are also many smaller places of worship throughout the Study Area, some of which include the Holy Trinity Eritrean Orthodox Tewahdo Church and Valley Fellowship Church of God along East Galbraith Road; Hartwell United Methodist and Hartwell Presbyterian at Parkway Avenue and Woodbine Avenue; Hartwell Baptist Church and Cincinnati Primitive Baptist Church on Parkway Avenue; Hartwell Church of God at Woodbine Avenue and DeCamp Avenue;

Greater Canaan Missionary Baptist at Reading Road and Losantiville Avenue; and Beulah Missionary Baptist Church on Section Road.

3.2.2 Parks and Recreation Areas

There are several notable parks and recreation areas in the Study Area. The Hamilton County Fairgrounds are located in the Carthage neighborhood, just west of I-75 and south of Ronald Reagan Cross County Highway. The Hamilton County Fair is the oldest county fair in Ohio. It also serves as a hub for other recreational and cultural events.

Immediately on the opposite side of I-75 is the New Prospect Baptist Church, which in conjunction with Great Parks of Hamilton County (Great Parks), provides recreational programming for the community at the Great Parks Nature Center at The Summit Outdoor Area. The church maintains campgrounds near I-75 and Mill Creek, and Summit Center Field baseball facilities. Great Parks currently has an amphitheater and other recreational facilities on the church property between Mill Creek and Summit Road with plans to expand their facilities to include a proposed hiking trail. Hartwell Recreation Center and Park is located along the northwestern boundary of the Study Area on West Galbraith Road and Vine Street and offers ballfields, a playground, basketball courts, a pool, and a fitness center.

Roselawn Park, in the southcentral portion of the Study Area, is home to multiple baseball diamonds and the P&G Cincinnati Reds Youth Academy, as well as playground equipment, basketball courts, a picnic shelter, and walking trails. Volunteer Park consists of a couple of ballfields and is located south of Losantiville Avenue west of Wiehe Road. Portions of two private country clubs, Maketewah and Losantiville, intersect the Study Area's southern boundary.

Additionally, Mill Creek serves as a natural feature of interest in the Study Area. The Greenway Trail is a three-mile bike path that runs along Mill Creek adjacent to the Study Area.

3.2.3 Transportation and Utilities

The Study Area contains notable transportation thoroughfares and utilities (Figure 3-2). I-75 and the Ronald Reagan Cross County Highway form a junction in the northern portion of the Study Area. These highways serve the Study Area's main interurban traffic volume. Another major north-south highway that bisects the center of the Study Area is U.S. Route 42 (Reading Road), and State Route 4 (Paddock Road/Vine Street) moves north-south through the Carthage and Hartwell neighborhoods. Other major collector roads include East Seymour Avenue and Losantiville Avenue in the southern portion of the Study Area, Section Road in the central portion of the Study Area, and East Galbraith Road in the northern portion of the Study Area. A mix of typical urban, gridded local streets and suburban-style cul-

de-sacs exist in the Study Area. Sanitary sewer, storm sewer, gas, and water utilities are located within the residential portions of the Study Area, mostly along local roads.

Several prominent rail lines run north-south, generally diagonally through the Study Area. Along the eastern Study Area boundary is the CSX Transportation, Inc. railroad, serving freight and passenger rail traffic. Just west of I-75 is the Norfolk Southern Dayton District, and the Indiana & Ohio Railway extends through the eastern half of the Study Area.

There are no known airports or airstrips located within the Study Area, nor are there any in close proximity that would require height restrictions for the proposed Project.

Duke Energy owns and operates the Terminal Substation in the northwestern corner of the Study Area from which most of the existing transmission lines in the Study Area, including the Terminal to Allen 69-kV line to be relocated as part of this study, extend. Duke Energy also owns and operates the Golf Manor Substation and Amberly Substation in the center of the Study Area along the Indiana & Ohio Railway and the Marion Merrell Dow Substation located in the far northeastern corner of the Study Area, adjacent to the University of Cincinnati – Reading Campus (Figure 3-2).

A variety of overhead transmission lines, ranging from 69-to 345-kV, transect the Study Area and connect to the previously mentioned substations (Figure 3-2). These transmission lines typically follow major transportation infrastructure. The primary transmission lines/ROWs investigated for this routing study include the Red Bank to Terminal 345-kV (Circuit 4546) / Cooper to Terminal 138-kV (Circuit 7481) double-circuit transmission line ROW that extends first east / west through the northern half of the Study Area and then north / south through the eastern portion. Another high voltage line corridor, extending generally along I-75 through the northern portion of the Study Area, is a triple-circuit ROW that includes the Port Union to Terminal 345-kV line (Circuit 4513), the Evendale to Terminal 138-kV line (Circuit 4685), and the Terminal to Lincoln 69-kV line (Circuit 1765).

There are three key 69-kV transmission line ROWs within the Study Area: the Terminal to Allen (Circuit 1762) line that is to be relocated as part of this routing study; the Elmwood to Terminal (Circuit 661) line that extends south along Summit Street from the Terminal Substation; and the Terminal to Lincoln (Circuit 1765) line that extends north along the CSX Transportation railroad along the northwestern portion of the Study Area. The Terminal to Lincoln Circuit 1765 is a split circuit, running both along the CSX Transportation railroad and within the triple-circuit transmission ROW mentioned above along I-75. In addition to the overhead transmission lines, there are numerous Duke Energy distribution lines in the Study Area, mostly along public roads.

3.2.4 Cultural Resources

Burns & McDonnell reviewed information obtained from the cultural resources database maintained by the Ohio State Historic Preservation Office (SHPO). There are multiple locations in the Study Area that have undergone Phase I Archaeological Surveys. These include land surrounding I-75 for highway improvements, a U.S. Army Reserve site, the Vine Street Bridge over Mill Creek, and the Hartwell Golf Course. There is an Ohio Genealogical Society historical cemetery site south of the Summit Behavioral Healthcare facility. There are also two locations within the Study Area that had determinations of eligibility completed for proposed projects. These include work within the Hamilton County Fairgrounds and an antenna / cell tower to be located along Losantiville Avenue on the eastern portion of the Study Area. Neither project was determined to have an effect on eligible properties (Ohio State Historic Preservation Office, 2021).

The Cincinnati Street Gas Lamps, comprised of 1,110 public gas lamps from the 19th Century, are classified as historic districts on the National Register of Historic Places (NRHP). These districts are present throughout Cincinnati, including two areas within the Study Area based on the SHPO data. One district is centrally located between Section Road and Losantiville Avenue east of Reading Road. The other district is in the northern portion of the Study Area generally along Chaucer Drive and Burkhart Street, south of Ronald Reagan Cross County Highway (Ohio State Historic Preservation Office, 2021).

There are 112 architectural and culturally significant historic structures in the SHPO data located within the Study Area. Data maintained by the National Park Service (NPS) of sites listed on the NRHP seems to indicate that none of these sites are listed on the NRHP.

3.3 Establishment of Evaluation Criteria

The evaluation of the proposed routes included a systematic comparison of the alternatives based on the social, environmental, and engineering criteria that represent the potential adverse effects on resources in the Study Area. Table 3-1 shows the routing criteria measured and evaluated.

The primary source of data used in this analysis was 2020 aerial imagery supplemented with digital data obtained from various sources, such as federal and state agencies and the Cincinnati Area GIS (CAGIS) site showing roads, railroads, parcels, buildings, streams, floodplains, and cultural resources, and Google Earth Street View imagery. The data source used for each factor is listed in Table 3-1.

The following sections describe how the factors were calculated, grouped by their representative impact type: engineering, environmental, and social.

Table 3-1: Routing Criteria

Factor	Type	Data Source
Total Length (feet, miles)	Engineering	GIS Calculation
Length with Reduced ROW / In Road or Railroad ROW (feet)	Engineering	GIS Calculation, CAGIS Roads, CAGIS Railroads, CAGIS Parcels
Heavy Angles (count)	Engineering	GIS Calculation
Road / Railroad Crossings (count)	Engineering	CAGIS Roads, CAGIS Railroads
Signs / Building Overhangs in ROW (count)	Engineering	Aerial Interpretation, CAGIS Buildings, Google Earth Street View
EPA Sites within 100 feet of Centerline (count)	Engineering	EPA
Streams Crossed (count)	Environmental	NHD
Floodplain Score (score)	Environmental	FEMA
Floodplain in ROW (acres)		
Floodway in ROW (acres)		
Woodland / Yard Trees in ROW (acres)	Environmental	Aerial Interpretation
Residential Proximity Score (score)	Social	Aerial Interpretation, CAGIS Buildings, CAGIS Addresses
Homes within 50 feet of Centerline (count)		
Homes within 51-100 feet of Centerline (count)		
Homes within 101-150 feet of Centerline (count)		
Homes within 151-200 feet of ROW (count)		
Public Facilities within 200 feet of Centerline (count)	Social	Aerial Interpretation, CAGIS Buildings, CAGIS Addresses
Businesses within 200 feet of Centerline (count)	Social	Aerial Interpretation, CAGIS Buildings, CAGIS Addresses
Parcels Crossed (count)	Social	CAGIS Parcels
Historic Structures within 200 feet of Centerline (count)	Social	Ohio SHPO
Length through NRHP Historic District (feet)	Social	NPS, Ohio SHPO

3.3.1 Engineering / Design Criteria

Engineering criteria were considered in the route analysis to account for impacts resulting from length, length where a reduced ROW would be required, heavy angles, road / railroad crossings, locations where

signs or building overhangs may overlap the ROW, and U.S. Environmental Protection Agency (EPA) hazardous waste sites near the routes.

Total Length is a general indicator of the overall presence of the Project. Length is also an indicator of construction costs. The longer the proposed route, the more expensive it would be if all other criteria were equal. Total length was measured in both feet and miles.

Length within Reduced ROW / In Road or Railroad ROW was measured to address locations where the ROW width would be limited and / or where the line would be in road or railroad ROW that could require special designs or authorizations for construction. Locations within road ROW would require coordination and authorization from the U.S. Department of Transportation (USDOT), ODOT, and / or county and city transportation departments. Routes within railroad ROW would require coordination and authorization from CSX Transportation, Norfolk Southern, and / or Indiana & Ohio Railway. Other reduced ROW areas were located outside of road and railroad ROW, but where buildings would encroach into the full ROW width. The line would need to be designed to fit within a narrower ROW to provide for safety clearance requirements.

Heavy Angles (>30 degrees) were considered because these angles typically require larger structures and more space. Consequently, these structures tend to be more visible and more expensive.

Road / Railroad Crossings provide an indicator of potential permitting and / or line crossing issues that may require special designs or additional permits.

Signs / Building Overhangs in ROW were identified using aerial photography interpretation and included tall man-made structures within the proposed ROW, such as business signs, billboards, flag poles, street lights, traffic signals, utility poles, and canopies / overhangs, that could require relocation or special designs to provide for safety and maintenance clearance requirements.

EPA Sites within 100 feet of the Centerline was measured to address the potential for additional permitting or mitigation requirements for sites listed by the EPA as having hazardous materials on site. These sites were listed under the Resource Conservation and Recovery Act Information System, the Toxics Release Inventory System, and / or the Integrated Compliance Information System and include active and inactive gas stations, pharmaceutical businesses, and other commercial and industrial properties.

3.3.2 Environmental Criteria

Due to the very developed nature of the Study Area, environmental criteria were not as significant of a concern compared to more rural projects. Environmental evaluation criteria for this project included streams crossed, floodplain and floodways in the ROW, and woodlands / yard trees in the ROW.

Streams Crossed was measured to capture the potential impact of crossing both perennial and intermittent streams based on National Hydrography Dataset (NHD) data. Additional permitting or construction limitations may be required at stream crossings for the transmission line.

Floodplain Score was calculated using digital FEMA floodplain data that identifies Special Flood Hazard Areas. These areas include floodways, the 100-year and 500-year flood zones, and other areas where the National Flood Insurance Program's floodplain management regulations are enforced and where the mandatory purchase of flood insurance applies. The score was calculated by multiplying the acres of **Floodway within the ROW** by two and adding to the acres of **Floodplain within the ROW**.

Woodland / Yard Trees in ROW was calculated through aerial photography interpretation and the use of a custom aerial interpretation tool to identify wooded areas and trees that would be cleared along each route. This factor could also be considered a social concern because homeowners may not want their yard trees cleared.

3.3.3 Social Criteria

Social criteria were included in the analysis to account for impacts to the human environment, including parcels crossed by the ROW and residences, businesses, public facilities, and cultural resources located near the routes.

Proximity to residences was considered for the route analysis. Homes within 50 feet of the centerline (i.e., within the full ROW), between 51 – 100 feet, between 101 – 150 feet, and between 151 – 200 feet from the centerline were identified within the Study Area using CAGIS building footprint and address data, aerial photography interpretation, and interpretation of Google Earth Street View imagery. The impact to these residences varied depending on the distance from the route. These values were converted to a **Residential Proximity Score** to reflect the public concern that residences located closer to a transmission line would be more affected than those further away. Table 3-2 shows the weights that were applied to each of the distances to derive the residential proximity score. The values for each distance category were multiplied by their weight and then summed together for the total residential proximity score for each route.

Table 3-2: Residential Proximity Score Weights

Distance	Weight
Houses within 50 feet of Centerline	2.0
Houses within 51 – 100 feet of Centerline	1.5
Houses within 101 – 150 feet of Centerline	1.0
Houses within 151 – 200 feet of Centerline	0.5

Businesses within 200 feet of the Centerline and **Public Facilities within 200 feet of the Centerline** were also quantified using CAGIS building footprint, parcel, and address data, aerial interpretation, and a review of Google Earth Street View imagery. Structures categorized as businesses included occupied commercial and industrial buildings. Public facilities included the Hamilton County Fairgrounds, the Cincinnati Board of Education building, schools, and religious facilities.

Parcels Crossed by the ROW were quantified for each route as a relative measure of the overall impact on private property. Routes that cross significantly more parcels tend to cost more as a result of additional landowners from which to acquire easements.

Historic Structures within 200 feet of the Centerline were determined using digital data obtained from the Ohio SHPO and includes structures such as businesses, residences, churches, and other structures recognized as architecturally or culturally significant in the area. These sites are not necessarily listed on the NRHP.

Length through NRHP Historic District was measured to capture the potential impact of routes that extend along Losantiville Avenue and cross the Cincinnati Street Gas Lamps NRHP District.

3.3.4 Weighting the Routing Criteria

The categories described above were considered to represent the potential impacts of construction and operation of the relocated transmission line. The Siting Team then assigned weights to the criteria based on their experience with similar transmission line projects across the country and based on an assessment of the importance of each factor to the selection of the proposed route. A weight scale from 1 to 7 was used for this process, with 1 representing the lowest impact and 7 representing the highest impact during the evaluation.

Weight factors were applied to each criterion to give greater consideration in the evaluation process to those criteria that are considered more important by the Siting Team. If weight factors were not applied,

all criteria would be assumed to have the same level of impact on the evaluation process. Although all criteria need to be considered during the routing process because they have the capacity to influence potential impacts, design, and cost, certain criteria have the capacity to influence the Project in a greater manner. Therefore, all criteria are not equal in terms of importance to the Project, and thus are weighted accordingly. For example, the number of streams crossed is an important criterion to be considered because of the potential impact to aquatic systems and habitat, as well as design factors. However, design issues are relatively easy to address when crossing streams and measures can be taken to mitigate impacts to aquatic systems along a waterway. Therefore, this criterion received a lower weight than other evaluated criteria. On the other hand, the number of residences located near the route was given a higher weight during the evaluation because of concerns often expressed by homeowners and landowners. Some factors were determined to not have much variability between routes, were not critical to the decision of which route to select, or would have no impacts for all routes; as such, they would not help discriminate between the various routes, which was the intent of this analysis. Therefore, those criteria were assigned a weight of zero. The weights associated with each routing criterion are presented in Table 3-3. Section 3.4 below describes the process of how the weights were applied in the analysis.

Table 3-3: Routing Criteria Weights

Factor	Weight
Total Length	1
Length with Reduced ROW / In Road or Railroad ROW	5
Heavy Angles	2
Road / Railroad Crossings	1
Signs / Building Overhangs in ROW	1
EPA Sites within 100 feet of Centerline	0
Streams Crossed	1
Floodplain Score	1
Woodland / Yard Trees in ROW	3
Residential Proximity Score	7
Public Facilities within 200 feet of Centerline	4
Businesses within 200 feet of Centerline	2
Parcels Crossed	0
Historic Structures within 200 feet of Centerline	0
Length through NRHP Historic District	0

3.4 Identification of Route Alternatives

The objective of the routing analysis was to identify a feasible route that relocated the existing Terminal to Allen 69-kV transmission line from across the I-75 bridge and away from the unstable slope along Summit Road. The primary goals regarding the route identification and selection process were to:

- Avoid the unstable slope area along Summit Road;
- Minimize the length of line to be relocated to minimize overall impacts;
- Maximize the distance of the line from existing residences and public facilities; and
- Share existing transmission and road ROWs whenever possible to further minimize impacts.

The Study Area is located within a highly developed area, so new ROW options for the relocated line were extremely limited. Co-location opportunities involved existing transmission line, road, and railroad ROWs. The primary co-location opportunities within the Study Area included the existing Duke Energy-owned Terminal to Red Bank Tap 345-kV / Terminal to Golf Manor 138-kV transmission line ROW, Summit Road, East Seymour Avenue, Reading Road, Losantiville Avenue, Section Road, East Galbraith Road, a CSX Transportation railroad corridor on the west side of the Study Area, and an Indiana & Ohio Railway corridor on the east side of the Study Area (Figure 3-2).

After crossing I-75, the first approximately 2,000 feet of the existing Red Bank to Terminal 345-kV / Cooper to Terminal 138-kV double-circuit transmission line ROW was investigated as a feasible co-location opportunity. The relocated line could share some of the existing ROW in this area to minimize overall land use impacts. Further east, however, the existing ROW extends through some densely developed residential areas with many homes that abut the existing ROW. Rebuilding these double-circuit structures to accommodate a third circuit would require taller structures and cause even greater impacts within the residential areas. After the residential area, this ROW turns south within the eastern portion of the Study Area, but the ROW is no more feasible in this location due to the Indiana & Ohio Railway it parallels to the east and commercial and industrial buildings already located under that line and immediately adjacent to the ROW.

Duke Energy is currently relocating and rebuilding the Elmwood to Terminal (Circuit 661) 69-kV line that crosses I-75 south of the bridge from the same quadruple-circuit lattice tower as the Terminal to Allen 69-kV line to be relocated as part of this study and continues south along Summit Road. That ROW is another potential co-location opportunity that was evaluated as part of this study.

Duke Energy's existing triple-circuit transmission line ROW (Port Union to Terminal 345-kV; Evandale to Terminal 138-kV; and Terminal to Lincoln 69-kV) was not a feasible option because there would not

be enough additional space for a new ROW parallel to the line between I-75 and the Norfolk Southern Railroad, nor where it crosses the two intersections of I-75 and Ronald Reagan Cross County Highway. It is already a triple-circuit line, so rebuilding that line with a fourth circuit would require more ROW and larger structures, which would not be feasible at its current location.

A less obvious existing ROW opportunity was identified between the triple-circuit lattice tower and the quadruple-circuit lattice tower, both located southwest of I-75 and Ronald Reagan Cross County Highway and east of Anthony Wayne Avenue and the Norfolk Southern railroad. Duke Energy previously acquired a 100-foot easement across the gravel parking lot between the two structures, so a route sited across I-75 just north of the bridge and existing Terminal to Allen 69-kV crossing would require no new ROW for the short distance between the two lattice towers.

Route alternatives were identified along the CSX Transportation railroad on the western edge of the Study Area. These options were feasible due to the presence of the existing Terminal to Lincoln 69-kV transmission line ROW and some local roads between the railroad and the densely developed area of homes and commercial buildings. These routes would have to be rebuilt within the existing 69-kV ROW and located within the local road ROWs to be feasible.

Route alternatives parallel to the Indiana & Ohio Railway on the eastern side of the Study Area were also developed. While the west side of the railway is more developed, and any available ROW is already used by the double-circuit Red Bank to Terminal / Cooper to Terminal ROW, the east side of the railroad, at least for a portion of the length starting north of Losantiville Avenue, could be feasible based on development present in the most recent aerial imagery.

Summit Road, East Seymour Avenue, Reading Road, Losantiville Avenue, Section Road, and East Galbraith Road are roads that were evaluated as part of the routing study. The development along these roads is largely commercial, but there are also some residential zones located along most of them as well. The ROW for the routes along these roads would overlap the road and, in some cases, the new structures might have to be located within the road ROW to minimize impacts.

Other existing corridors, such as I-75, other local roads, and the Norfolk Southern railroad were also investigated but were eliminated from consideration because a feasible route could not be identified along these corridors. The USDOT and ODOT generally do not allow electric transmission structures to be located within their ROW, nor do railroad companies. Given the density of development along these corridors, coupled with plans to expand I-75 and Ronald Reagan Cross County Highway within the Study

Area, routes along these corridors would not be feasible. Similarly, densely developed residential roads were not preferred options for the line to minimize impacts to residential areas.

The route alternatives consist of individual segments that can be combined in different arrangements to form a continuous path between the Project tap points from the existing Terminal to Allen 69-kV transmission line. Each segment begins and ends at intersections with other segments. The set of route alternatives for this Project consisted of 34 individual segments. The alternatives were identified to minimize, to the extent practicable, impacts to environmentally sensitive features and residential areas while avoiding the I-75 bridge. Ultimately, 34 distinct routes were developed using a combination of the 34 segments. Figure 3-3 shows the route alternatives and constraints overlaid on an aerial photography background of the Study Area.

3.5 Alternative Route Evaluation

The alternative analysis was based on social, environmental, and engineering criteria as described above. Data for each criterion were quantified for each segment and summed for each of the 34 routes. The route components and data for all route alternatives are shown in Table 3-4.

A designation of "69-" was added to the route numbers to help distinguish the various route alternatives from the individual segment numbers. Burns & McDonnell quantified the route criteria for the potential route alternatives. No single route had the lowest value for all the measured criteria. While a particular route may have the lowest impact for one criterion, it may have higher impacts for another. The routing criteria included units such as score, length, acres, and counts of selected resources. These units are not directly comparable but need to be considered as a whole in the evaluation process. The level of complexity resulting from numerous criteria and differences in measurement units made it difficult to conduct a route-by-route comparison to identify a route that would minimize potential overall impacts to the area. Therefore, Burns & McDonnell used the statistical Z-score analysis as a tool to screen the route alternatives to help with the selection of a preferred route.

The impacts associated with each criterion for each potential route were determined, and a Z-score was then calculated for each criterion for each route. A Z-score determines the mean value within a set of data, compares each individual route value to the mean, and transforms the data into comparable values. A degree of difference (standard deviation) is calculated for each route by determining how far each route value deviates from the mean value.

$$Z - Score = \frac{(Value - Mean)}{Standard\ Deviation}$$

Segment Endpoint
Preliminary Segment
Study Area
Existing Substation

Existing Transmission Lines
69-kV
138-kV
345-kV

Line To Be Relocated
Church
Hospital
Park

School
Municipal Boundary
Parcel

Federal
State
Local
NGO/Private Park
Country Club

Stream
NWI Wetland
Floodplain
Floodway

Waterbody
Area of Slope Instability

400 200 0 400
US Feet

DUKE ENERGY®

Figure 3-3
Aerial Map of Proposed Route Alternatives
I-75 / 10.10 69-kV Transmission
Line Relocation Project
Duke Energy

Source: CAGIS, GNIS, ESRI, U.S. Department of Education, NTAD, NHD, FEMA, Energy Velocity, EIA, Duke Energy, and Burns & McDonnell Engineering

Table 3-4: Route Data

Route	Segment	Total Length (feet)	Total Length (miles)	Length with Reduced ROW / In Road/RR ROW (feet)	Heavy Angles (count)	Road/RR Crossings (count)	Signs/Building Overhangs in ROW (count)	EPA Sites within 100 Feet of Centerline (count)	Streams Crossed (count)	Floodplain (acres)	Floodway (acres)	Flood Score (score)	Woodland/Yard Trees in ROW (acres)
69-1	1,3,6	2,330	0.4	710	4	2	5	0	1	0.4	0.3	1.0	1.9
69-2	1,4,6	2,200	0.4	710	3	2	6	0	1	0.4	0.3	1.0	1.7
69-3	1,5	1,830	0.3	870	3	2	3	0	1	0.4	0.3	1.0	1.8
69-4	2,3,6	2,110	0.4	720	3	2	4	0	1	0.6	0.3	1.2	1.8
69-5	2,4,6	1,980	0.4	720	2	2	5	0	1	0.6	0.3	1.2	1.5
69-6	2,5	1,610	0.3	880	2	2	2	0	1	0.6	0.3	1.2	1.6
69-7	7,11,12,14,17,19	14,690	2.8	9,940	14	22	126	7	0	0.0	0.0	0.0	8.2
69-8	7,11,12,14,18,19	14,740	2.8	9,990	16	24	123	7	0	0.0	0.0	0.0	8.2
69-9	7,11,12,15,16	17,110	3.2	9,950	11	20	138	9	2	2.3	0.3	2.8	11.0
69-10	7,11,13,16	17,590	3.3	8,380	16	17	123	9	2	2.4	0.3	2.9	11.4
69-11	7,8,10	4,530	0.9	2,890	3	7	16	1	0	0.0	0.0	0.0	2.8
69-12	9,10	1,810	0.3	1,500	2	2	13	0	1	0.0	0.3	0.7	1.6
69-13	9,8,11,12,14,17,19	13,290	2.5	9,870	13	21	124	6	1	0.0	0.3	0.7	8.3
69-14	9,8,11,12,14,18,19	13,340	2.5	9,920	15	23	121	6	1	0.0	0.3	0.7	8.3
69-15	9,8,11,12,15,16	15,710	3.0	9,880	10	19	136	8	3	2.3	0.6	3.5	11.1
69-16	9,8,11,13,16	16,190	3.1	8,300	15	16	121	8	3	2.4	0.6	3.6	11.5
69-17	20,21,24,26,28,29,31,34	11,350	2.1	8,020	14	25	126	6	2	0.1	0.6	1.3	8.7
69-18	20,21,24,26,28,29,32,33,34	11,340	2.1	9,170	11	25	124	6	2	0.1	0.6	1.3	8.7
69-19	20,21,24,26,28,30,33,34	11,290	2.1	9,610	12	23	128	6	2	0.1	0.6	1.3	8.8
69-20	20,21,24,27,28,29,31,34	11,360	2.2	8,010	13	26	130	6	2	0.1	0.6	1.3	8.7
69-21	20,21,24,27,28,29,32,33,34	11,350	2.1	9,160	10	26	128	6	2	0.1	0.6	1.3	8.8
69-22	20,21,24,27,28,30,33,34	11,300	2.1	9,600	11	24	132	6	2	0.1	0.6	1.3	8.8
69-23	20,22,23,24,26,28,29,31,34	11,370	2.2	8,040	16	25	127	6	2	0.1	0.6	1.3	8.5
69-24	20,22,23,24,26,28,29,32,33,34	11,360	2.2	9,190	13	25	125	6	2	0.1	0.6	1.3	8.5
69-25	20,22,23,24,26,28,30,33,34	11,310	2.1	9,630	14	23	129	6	2	0.1	0.6	1.3	8.5
69-26	20,22,23,24,27,28,29,31,34	11,380	2.2	8,030	15	26	131	6	2	0.1	0.6	1.3	8.5
69-27	20,22,23,24,27,28,29,32,33,34	11,370	2.2	9,180	12	26	129	6	2	0.1	0.6	1.3	8.5
69-28	20,22,23,24,27,28,30,33,34	11,320	2.1	9,620	13	24	133	6	2	0.1	0.6	1.3	8.5
69-29	20,22,25,26,28,29,31,34	11,080	2.1	7,800	12	24	139	6	2	0.1	0.6	1.3	7.4
69-30	20,22,25,26,28,29,32,33,34	11,070	2.1	8,950	9	24	137	6	2	0.1	0.6	1.3	7.5
69-31	20,22,25,26,28,30,33,34	11,020	2.1	9,390	10	22	141	6	2	0.1	0.6	1.3	7.5
69-32	20,22,25,27,28,29,31,34	11,090	2.1	7,790	12	25	143	6	2	0.1	0.6	1.3	7.4
69-33	20,22,25,27,28,29,32,33,34	11,070	2.1	8,940	9	25	141	6	2	0.1	0.6	1.3	7.5
69-34	20,22,25,27,28,30,33,34	11,030	2.1	9,380	10	23	145	6	2	0.1	0.6	1.3	7.5
Maximum		17,590	3.3	9,990	16	26	145	9	3	2.4	0.6	3.6	11.5
Average		10,103.5	1.9	7,198.2	10.2	18.4	101.6	5.0	1.6	0.4	0.5	1.3	7.1
Minimum		1,610	0.3	710	2	2	2	0	0	0.0	0.0	0.0	1.5
Standard Deviation		4,779.7	0.9	3,500.9	4.6	9.2	53.8	2.9	0.7	0.7	0.2	0.8	3.1

Table 3-4: Route Data, continued

Route	Segment	Residences Within 50 Feet of Centerline (count)	Residences Within 100 Feet of Centerline (count)	Residences Within 150 Feet of Centerline (count)	Residences Within 200 Feet of Centerline (count)	Residential Proximity Score (score)	Public Facilities Within 200 feet of Centerline (count)	Businesses Within 200 feet of Centerline (count)	Parcels Crossed by ROW (count)	Historic Structures within 200 Feet of Centerline (count)	Length through NRHP Historic District (feet)
69-1	1,3,6	0	0	2	0	2.0	2	2	11	0	0
69-2	1,4,6	0	0	2	4	4.0	2	2	11	0	0
69-3	1,5	0	10	4	3	20.5	0	0	19	0	0
69-4	2,3,6	0	0	2	0	2.0	2	2	9	0	0
69-5	2,4,6	0	0	2	4	4.0	2	2	9	0	0
69-6	2,5	0	10	4	3	20.5	0	0	17	0	0
69-7	7,11,12,14,17,19	36	5	37	12	122.5	4	51	135	3	0
69-8	7,11,12,14,18,19	37	5	36	12	123.5	4	51	139	3	0
69-9	7,11,12,15,16	47	8	35	11	146.5	5	41	154	4	0
69-10	7,11,13,16	7	23	19	12	73.5	3	39	96	2	820
69-11	7,8,10	11	21	6	12	65.5	1	4	54	2	0
69-12	9,10	7	18	3	5	46.5	0	0	29	2	0
69-13	9,8,11,12,14,17,19	39	9	39	15	138.0	3	47	141	3	0
69-14	9,8,11,12,14,18,19	40	9	38	15	139.0	3	47	145	3	0
69-15	9,8,11,12,15,16	50	12	37	14	162.0	4	37	160	4	0
69-16	9,8,11,13,16	10	27	21	15	89.0	2	35	102	2	820
69-17	20,21,24,26,28,29,31,34	11	33	23	24	106.5	4	47	158	4	170
69-18	20,21,24,26,28,29,32,33,34	9	33	22	26	102.5	4	46	160	4	170
69-19	20,21,24,26,28,30,33,34	9	33	22	26	102.5	4	46	160	4	170
69-20	20,21,24,27,28,29,31,34	11	33	24	24	107.5	4	47	164	4	170
69-21	20,21,24,27,28,29,32,33,34	9	33	23	26	103.5	4	46	166	4	170
69-22	20,21,24,27,28,30,33,34	9	33	23	26	103.5	4	46	166	4	170
69-23	20,22,23,24,26,28,29,31,34	8	37	19	22	101.5	4	46	160	5	170
69-24	20,22,23,24,26,28,29,32,33,34	6	37	18	24	97.5	4	45	162	5	170
69-25	20,22,23,24,26,28,30,33,34	6	37	18	24	97.5	4	45	162	5	170
69-26	20,22,23,24,27,28,29,31,34	8	37	20	22	102.5	4	46	166	5	170
69-27	20,22,23,24,27,28,29,32,33,34	6	37	19	24	98.5	4	45	168	5	170
69-28	20,22,23,24,27,28,30,33,34	6	37	19	24	98.5	4	45	168	5	170
69-29	20,22,25,26,28,29,31,34	10	20	12	21	72.5	4	46	154	4	170
69-30	20,22,25,26,28,29,32,33,34	8	20	11	23	68.5	4	45	156	4	170
69-31	20,22,25,26,28,30,33,34	8	20	11	23	68.5	4	45	156	4	170
69-32	20,22,25,27,28,29,31,34	10	20	13	21	73.5	4	46	160	4	170
69-33	20,22,25,27,28,29,32,33,34	8	20	12	23	69.5	4	45	162	4	170
69-34	20,22,25,27,28,30,33,34	8	20	12	23	69.5	4	45	162	4	170
	Maximum	50	37	39	26	162.0	5	51	168	5	820
	Average	12.8	20.5	17.9	16.6	82.4	3.2	34.8	121.8	3.1	138.2
	Minimum	0	0	2	0	2.0	0	0	9	0	0
	Standard Deviation	14.1	12.9	11.5	8.6	42.7	1.3	19.0	59.9	1.7	191.9

For example, the total length of all routes would be quantified, and the mean value would be determined for the entire set of routes. The total length for each route would then be compared against the mean value. If a particular route length was equal to the mean value, then the assigned Z-score would be zero. If the total length was greater than the mean value, then the Z-score for that route would be a positive number. If the total length was less than the mean value, the Z-score would be a negative value for that route. The more the individual route value exceeded the mean, the higher the positive number would be. Conversely, the more the route value was below the mean, the more negative the Z-score.

After all Z-scores were calculated, Burns & McDonnell applied the weight factors described in Section 3.2.4 to each criterion (see Table 3-3). Weights were multiplied by the raw Z-score calculated for each criterion for each potential route. By weighting the Z-scores, those criteria determined to warrant greater consideration during the evaluation process were weighted higher and thus became more significant contributors to the overall analysis and screening of the potential routes. The range of weights (1-7) was determined by the number of criteria, the relative importance of each criteria in relation to the others, and the need to differentiate between the proposed routes.

After applying weights to each of the calculated Z-scores for each criterion, the resulting weighted Z-scores for each criterion were summed for all proposed routes to give a total weighted Z-score for each route. Both positive and negative Z-scores were included in the analysis to determine the total weighted Z-score. As with individual criterion Z-scores, a positive total weighted Z-score for a particular route is less preferred and would suggest that the route would have greater-than-average impacts as compared to all routes. A negative Z-score is more preferred and would indicate routes having less-than-average impacts as compared to the other routes. The Z-score analysis allowed all routes to be screened to allow the Siting Team to focus on a smaller subset of routes with lower overall impacts.

Z-scores only consider quantified route evaluation criteria. Therefore, Z-scores do not necessarily reflect all actual impacts but provide a guide to better assess and compare overall potential impacts associated with all routes. Routes were sorted in ascending order, beginning with routes having the lowest Z-scores (less impactful and more preferred) and continuing to the routes having the highest Z-scores (most impactful and less preferred) (Table 3-5).

3.6 Route Selection

The resulting total weighted Z-scores for the 34 routes ranged from a low of -47.57 to a high of 29.66. The route alternatives that were analyzed were significantly different in length and other impacts. Some options were only a little over a thousand feet in length, while other alternatives were over three miles

Table 3-5: Weighted Route Scores

	Weights	1	5	2	1	1	1	1	3	7	4	2	
Route	Segment	Total Length (feet)	Length with Reduced ROW / In Road/RR ROW (feet)	Heavy Angles (count)	Road/RR Crossings (count)	Signs/Building Overhangs in ROW (count)	Streams Crossed (count)	Flood Score (score)	Woodland/Yard Trees in ROW (acres)	Residential Proximity Score (score)	Public Facilities Within 200 feet of Centerline (count)	Businesses Within 200 feet of Centerline (count)	Total
6	2,5	-1.78	-9.02	-3.55	-1.78	-1.85	-0.84	-0.15	-5.24	-10.15	-9.55	-3.66	-47.57
		1,610	880	2	2	2	1	1.2	1.6	20.5	0	0	
3	1,5	-1.73	-9.04	-3.12	-1.78	-1.83	-0.84	-0.40	-5.05	-10.15	-9.55	-3.66	-47.14
		1,830	870	3	2	3	1	1.0	1.8	20.5	0	0	
5	2,4,6	-1.70	-9.25	-3.55	-1.78	-1.80	-0.84	-0.15	-5.33	-12.86	-3.59	-3.45	-44.30
		1,980	720	2	2	5	1	1.2	1.5	4.0	2	2	
4	2,3,6	-1.67	-9.25	-3.12	-1.78	-1.81	-0.84	-0.15	-5.05	-13.19	-3.59	-3.45	-43.90
		2,110	720	3	2	4	1	1.2	1.8	2.0	2	2	
2	1,4,6	-1.65	-9.27	-3.12	-1.78	-1.78	-0.84	-0.40	-5.14	-12.86	-3.59	-3.45	-43.87
		2,200	710	3	2	6	1	1.0	1.7	4.0	2	2	
1	1,3,6	-1.63	-9.27	-2.69	-1.78	-1.80	-0.84	-0.40	-4.95	-13.19	-3.59	-3.45	-43.57
		2,330	710	4	2	5	1	1.0	1.9	2.0	2	2	
12	9,10	-1.74	-8.14	-3.55	-1.78	-1.65	-0.84	-0.77	-5.24	-5.89	-9.55	-3.66	-42.79
		1,810	1,500	2	2	13	1	0.7	1.6	46.5	0	0	
11	7,8,10	-1.17	-6.15	-3.12	-1.23	-1.59	-2.19	-1.64	-4.09	-2.78	-6.57	-3.24	-33.77
		4,530	2,890	3	7	16	0	0.0	2.8	65.5	1	4	
30	20,22,25,26,28,29,32,33,34	0.20	2.50	-0.53	0.61	0.66	0.52	-0.03	0.39	-2.29	2.36	1.08	5.49
		11,070	8,950	9	24	137	2	1.3	7.5	68.5	4	45	
33	20,22,25,27,28,29,32,33,34	0.20	2.49	-0.53	0.72	0.73	0.52	-0.03	0.39	-2.12	2.36	1.08	5.82
		11,070	8,940	9	25	141	2	1.3	7.5	69.5	4	45	
29	20,22,25,26,28,29,31,34	0.20	0.86	0.76	0.61	0.70	0.52	-0.03	0.30	-1.63	2.36	1.18	5.84
		11,080	7,800	12	24	139	2	1.3	7.4	72.5	4	46	
32	20,22,25,27,28,29,31,34	0.21	0.85	0.76	0.72	0.77	0.52	-0.03	0.30	-1.47	2.36	1.18	6.18
		11,090	7,790	12	25	143	2	1.3	7.4	73.5	4	46	
31	20,22,25,26,28,30,33,34	0.19	3.13	-0.10	0.40	0.73	0.52	-0.03	0.39	-2.29	2.36	1.08	6.39
		11,020	9,390	10	22	141	2	1.3	7.5	68.5	4	45	
34	20,22,25,27,28,30,33,34	0.19	3.12	-0.10	0.51	0.81	0.52	-0.03	0.39	-2.12	2.36	1.08	6.73
		11,030	9,380	10	23	145	2	1.3	7.5	69.5	4	45	
10	7,11,13,16	1.57	1.69	2.49	-0.15	0.40	0.52	1.96	4.12	-1.47	-0.61	0.45	10.95
		17,590	8,380	16	17	123	2	2.9	11.4	73.5	3	39	
16	9,8,11,13,16	1.27	1.57	2.05	-0.26	0.36	1.87	2.83	4.21	1.08	-3.59	0.02	11.43
		16,190	8,300	15	16	121	3	3.6	11.5	89.0	2	35	
27	20,22,23,24,27,28,29,32,33,34	0.26	2.83	0.76	0.83	0.51	0.52	-0.03	1.35	2.63	2.36	1.08	13.11
		11,370	9,180	12	26	129	2	1.3	8.5	98.5	4	45	
24	20,22,23,24,26,28,29,32,33,34	0.26	2.84	1.19	0.72	0.44	0.52	-0.03	1.35	2.47	2.36	1.08	13.21
		11,360	9,190	13	25	125	2	1.3	8.5	97.5	4	45	

Table 3-5: Weighted Route Scores, continued

	Weights	1	5	2	1	1	1	1	3	7	4	2	
Route	Segment	Total Length (feet)	Length with Reduced ROW / In Road/RR ROW (feet)	Heavy Angles (count)	Road/RR Crossings (count)	Signs/Building Overhangs in ROW (count)	Streams Crossed (count)	Flood Score (score)	Woodland/Yard Trees in ROW (acres)	Residential Proximity Score (score)	Public Facilities Within 200 feet of Centerline (count)	Businesses Within 200 feet of Centerline (count)	Total
21	20,21,24,27,28,29,32,33,34	0.26	2.80	-0.10	0.83	0.49	0.52	-0.03	1.63	3.45	2.36	1.18	13.41
		11,350	9,160	10	26	128	2	1.3	8.8	103.5	4	46	
18	20,21,24,26,28,29,32,33,34	0.26	2.82	0.33	0.72	0.42	0.52	-0.03	1.54	3.29	2.36	1.18	13.41
		11,340	9,170	11	25	124	2	1.3	8.7	102.5	4	46	
26	20,22,23,24,27,28,29,31,34	0.27	1.19	2.05	0.83	0.55	0.52	-0.03	1.35	3.29	2.36	1.18	13.56
		11,380	8,030	15	26	131	2	1.3	8.5	102.5	4	46	
23	20,22,23,24,26,28,29,31,34	0.26	1.20	2.49	0.72	0.47	0.52	-0.03	1.35	3.12	2.36	1.18	13.66
		11,370	8,040	16	25	127	2	1.3	8.5	101.5	4	46	
20	20,21,24,27,28,29,31,34	0.26	1.16	1.19	0.83	0.53	0.52	-0.03	1.54	4.11	2.36	1.29	13.77
		11,360	8,010	13	26	130	2	1.3	8.7	107.5	4	47	
17	20,21,24,26,28,29,31,34	0.26	1.17	1.62	0.72	0.45	0.52	-0.03	1.54	3.94	2.36	1.29	13.86
		11,350	8,020	14	25	126	2	1.3	8.7	106.5	4	47	
28	20,22,23,24,27,28,30,33,34	0.25	3.46	1.19	0.61	0.58	0.52	-0.03	1.35	2.63	2.36	1.08	14.02
		11,320	9,620	13	24	133	2	1.3	8.5	98.5	4	45	
25	20,22,23,24,26,28,30,33,34	0.25	3.47	1.62	0.51	0.51	0.52	-0.03	1.35	2.47	2.36	1.08	14.11
		11,310	9,630	14	23	129	2	1.3	8.5	97.5	4	45	
22	20,21,24,27,28,30,33,34	0.25	3.43	0.33	0.61	0.57	0.52	-0.03	1.63	3.45	2.36	1.18	14.32
		11,300	9,600	11	24	132	2	1.3	8.8	103.5	4	46	
19	20,21,24,26,28,30,33,34	0.25	3.44	0.76	0.51	0.49	0.52	-0.03	1.63	3.29	2.36	1.18	14.41
		11,290	9,610	12	23	128	2	1.3	8.8	102.5	4	46	
7	7,11,12,14,17,19	0.96	3.92	1.62	0.40	0.45	-2.19	-1.64	1.06	6.57	2.36	1.71	15.22
		14,690	9,940	14	22	126	0	0.0	8.2	122.5	4	51	
13	9,8,11,12,14,17,19	0.67	3.82	1.19	0.29	0.42	-0.84	-0.77	1.16	9.11	-0.61	1.29	15.71
		13,290	9,870	13	21	124	1	0.7	8.3	138.0	3	47	
8	7,11,12,14,18,19	0.97	3.99	2.49	0.61	0.40	-2.19	-1.64	1.06	6.73	2.36	1.71	16.49
		14,740	9,990	16	24	123	0	0.0	8.2	123.5	4	51	
14	9,8,11,12,14,18,19	0.68	3.89	2.05	0.51	0.36	-0.84	-0.77	1.16	9.27	-0.61	1.29	16.98
		13,340	9,920	15	23	121	1	0.7	8.3	139.0	3	47	
9	7,11,12,15,16	1.47	3.93	0.33	0.18	0.68	0.52	1.84	3.73	10.50	5.34	0.66	29.17
		17,110	9,950	11	20	138	2	2.8	11.0	146.5	5	41	
15	9,8,11,12,15,16	1.17	3.83	-0.10	0.07	0.64	1.87	2.71	3.83	13.04	2.36	0.24	29.66
		15,710	9,880	10	19	136	3	3.5	11.1	162.0	4	37	

Maximum	17,590	9,990	16	26	145	3	3.6	11.5	162.0	5	51
Average	10,104	7,198	10	18	102	2	1.3	7.1	82.4	3	35
Minimum	1,610	710	2	2	2	0	0.0	1.5	2.0	0	0

Note: Data in gray shading is route data for each route for comparison.

long. The longest alternatives extended along the CSX Transportation railroad corridor at the western edge of the Study Area, south along Summit Street, and along the other local streets and highways. As expected, the shorter routes scored considerably better (less impacting) than the longer alternatives.

The top scoring 8 routes, which varied in length from 1,610 feet to 4,530 feet, scored more than 39 points better than the longer options, which varied in length from 2.1 to 3.3 miles. These longer options, in addition to the length, would also have greater impacts to residences and yard trees / woodland, businesses, and public facilities, and would require more complex designs due to greater lengths of reduced ROWs and more signs, poles, and other obstacles within their ROWs. These longer routes would also generally impact more streams, floodplain, floodway, EPA sites, historic structures, and NRHP districts as well. As a result of these considerably greater impacts, the longer routes (ranking 9th through 34th) were removed from consideration.

Among the top 8 scoring routes, the bottom two routes (Routes 69-12 and 69-11) had greater overall impacts than the top 6 scoring routes. These two routes use Segment 10, which would be located largely on the south side of Summit Road, where there are many residences. To avoid the unstable slope area, Segment 10 had to be located on the south side of the road, very close to the residences. In addition, many yard trees between the road and the houses would likely need to be cleared. These routes could require that some transmission structures be located within the road ROW and there are also many signs, light poles, and other man-made structures located within the ROW that would need to be relocated or incorporated into the design. An existing gas line already located along Summit Road would further complicate the design of these routes. There are also 2 historic structures listed in the Ohio SHPO data located within 200 feet of Segment 10. The importance of these structures and the impact caused by the routes along Segment 10 would need to be further evaluated. Additionally, ODOT informed the Siting Team that they have plans to construct a retaining wall along Summit Road near Segments 9 and 10 and indicated that this would conflict with the potential pole that would be needed on the west side of Summit Road (see Section 3.6.1). The pole would need to be on the east side of the road where it would directly affect residences. Because there were other less impacting route alternatives still available for consideration and there were potentially significant conflicts on Segment 10, these two routes were removed from further consideration.

The remaining six routes were reviewed in more detail to select the preferred route. This additional review included landowner letters and meetings with key stakeholders, as described in Section 3.6.1. Figure 3-4 shows these routes that were part of additional focused review.

Evendale - Terminal 138-kV
Terminal - Lincoln 69-kV
Port Union - Terminal 345-kV
WOODBINE AV
ANTHONY WAYNE AV
RRCC EB TO I-75 SB RAMP
I-75 NB TO RRCC EB RAMP
Red Bank - Terminal 345-kV
Cooper - Terminal 138-kV
New Prospect Baptist Church
Great Parks Nature Center at the Summit Outdoor Area
SPRINGFIELD TOWNSHIP
CINCINNATI
SUMMIT RD
Elmwood - Terminal 69-kV
Mill Creek
I-75 SB EXWY
I-75 NB TO RRCC WB RAMP
Terminal - Allen 69-kV
I-75 NB EXWY
ABBIE PL
ROSS AV
EDGEMONT RD
CASTLETON PL
MCCLURE AV
1
2
3
4
5
6
9
10
530
540
550
560
570
580
590
600
610
520

Segment Endpoint
Focused Segment
Existing Substation

Existing Transmission Lines
69-kV
138-kV
345-kV
Line To Be Relocated

Church
Park
School
Area of Slope Instability

Residential Building
Non-Residential Building
Railroad
Municipal Boundary
Parcel

Federal
State
Local
NGO/Private Park
Country Club

Contour
Stream
Floodplain
Floodway

N
150 75 0 150
US Feet

DUKE ENERGY

Figure 3-4
Focused Route Network
I-75 / 10.10 69-kV Transmission Line Relocation Project
Duke Energy

Source: CAGIS, GNIS, ESRI, U.S. Department of Education, NTAD, NHD, FEMA, Energy Velocity, EIA, Duke Energy, and Burns & McDonnell Engineering

The top 6 scoring routes use either Segment 1 that crosses I-75 north of the existing double-circuit Red Bank to Terminal / Cooper to Terminal transmission ROW or Segment 2 that would cross I-75 parallel with that existing ROW. The top 2 routes (Routes 69-6 and 69-3) both use Segment 5, which interconnects with the existing Terminal to Allen 69-kV line alignment almost directly south of the intersection of Segments 1 and 2. The remaining 4 top routes (69-5, 69-4, 69-2, and 69-1) use either Segment 1 or 2 and then continue along Segments 3 / 6 or Segments 4 / 6. Segments 3, 4, and 6 also cross a portion of the land leased to Great Parks by the church for the Great Parks Nature Center at the Summit Outdoor Area. Segment 3 would be constructed parallel to the existing double-circuit transmission line ROW, while Segment 4 would cross the ROW. Segments 3 and 4 intersect to continue southward on Segment 6 across the New Prospect Baptist Church parking lot to interconnect with the existing Terminal to Allen 69-kV line on Summit Road.

3.6.1 Engagement

Once the routes were reduced to the smaller subset of focused routes, Duke Energy engaged with local landowners and key stakeholders along these routes. Letters were sent to landowners within 500 feet of the focused route alternative ROWs in early January 2021. A total of 151 landowners received letters, and Duke Energy requested comments or concerns be provided within 30 days.

Comments were received from three landowners. Two respondents live along Summit Road and were concerned about whether the highway project or the transmission line might require demolition of homes and how the construction of the line might impact the neighborhood, such as detours for traffic, access to homes, and the ability to walk in the area. Duke Energy replied that no home would be demolished as part of the transmission line project, and Duke Energy would take their concerns into account during construction to try to limit impacts to the neighborhood along Summit Road. All the focused routes would require some construction on Summit Road where the relocated route would reconnect with the existing 69-kV line alignment.

The third respondent lives on the west side of I-75 and was concerned about additional lines along the Norfolk Southern railroad tracks that could affect their home and pool. None of the focused route alternatives would be located along these railroad tracks.

In addition to the landowner letters, letters were also sent to key stakeholders. Follow-up meetings were held with representatives of Springfield Township, Ohio Department of Transportation, New Prospect Baptist Church, City of Cincinnati, and Great Parks. Below is a summary of each of these meetings and

letter responses. In each meeting, the Duke Energy team provided a Project overview and presented a map of the focused route alternatives to incorporate potential concerns or preferences into the routing study.

On November 5, 2020, Duke representatives met with representatives of Springfield Township to explain the Project and gather their input. The Township was concerned with potential impacts to residences but did not have any significant preferences for a specific route alternative. Duke plans to follow-up with Springfield Township following selection of the route.

On November 10, 2020, the Duke siting team met with ODOT to continue discussions regarding the Project. ODOT discussed their plans for a retaining wall near Segments 9 and 10 and indicated that this would conflict with the potential pole that would be needed on the west side of Summit Road. The pole would need to be on the east side of the road where it would directly affect residences. ODOT expressed a slight preference for Segment 2 versus Segment 1 to keep all the relocated lines closer together and in a single corridor over I-75.

Duke Energy representatives met with the head pastor at the New Prospect Baptist Church on November 18, 2020. The pastor was interested in the public outreach being done for the Project. Duke Energy again met with representatives of New Prospect Baptist Church on February 10, 2021. Each of the focused route alternatives were discussed in detail. While Segments 9 and 10 would not cross the church property, all attendees agreed that these routes had technical hurdles to overcome and that they would have a greater impact on residences, so the remainder of the meeting was spent reviewing the other focused routes. The church representatives indicated a preference for Segment 5 over Segments 3, 4, and 6, as well as an initial preference for Segment 1, but requested a site visit (see below) to visualize potential tree clearing impacts before finalizing their preference.

On December 3, 2020, the City of Cincinnati expressed concern about potential impacts to residences but did not specify any significant preference for the route alternatives. Duke Energy representatives will notify the City once a route has been selected.

The Duke Energy siting team first met with Great Parks of Hamilton County on December 7, 2020. Great Parks described the Summit Center, the purpose for the facility, and their plans for future improvements. Great Parks requested a map of the proposed ROW boundaries of the route alternatives crossing the property and said they would follow up with their concerns and preferences once they had reviewed that map. Duke Energy prepared and provided them with the requested map.

Great Parks replied in a letter to Duke Energy on January 29, 2021 indicating that they lease the property east of I-75 and north of Summit Road from New Prospect Church to provide outdoor recreation and nature education through the Nature Center at the Summit, located in New Prospect Church's Summit Center building and on the 6.5-acre leased park area. Great Parks provided a map of their planned facilities on the 6.5-acre property, including an archery range, restroom, stage and amphitheater, fire pit, hiking trails, interpretive plantings, and an outdoor classroom. Most of these facilities would be located along the eastern portion of the property and could be crossed by Segments 3 and 4. They reviewed the focused routes with the intent to preserve the natural ecology of the site and indicated a preference for Segments 1 and 5 that would avoid most of the facilities but would cross a planned hiking trail. They further indicated that New Prospect Church agreed with this preference (which was confirmed by Duke Energy during their meeting with the church representatives on February 10 as described above).

The site visit with both New Prospect Church and Great Parks representatives occurred on March 19, 2021. The purpose of the meeting was for the church and Great Parks to finalize their route preferences and for Duke Energy to collect information on their concerns with construction, design, and operation of the Project. Similar to previous discussions, there was general agreement that Segment 5 was preferable to Segments 3 or 4 and Segment 6. Duke Energy shared their assessment that the amount of tree clearing that would be required for Segment 1 versus Segment 2 would be very similar. Segment 2 to Segment 5 is more of an oblique angle but this route would require a narrower ROW. Segment 1 to Segment 5 would be more perpendicular but would require a wider ROW because less of the existing transmission line ROW would be shared. Duke Energy informed the church and park representatives about ODOT's slight preference for Segment 2 to keep the line crossings of I-75 together. The potential structure locations and ROW clearing were reviewed and discussed in the field on the property. After the field review, Great Parks agreed that Segment 2 was preferable to Segment 1 to keep the tree clearing adjacent to the existing transmission line corridor. Great Parks discussed this decision internally and provided a formal response on March 29, 2021 that confirmed their preference for Segments 2 and 5. The representatives of New Prospect Church agreed to support the Great Parks preference for these segments. Duke Energy agreed to have engineering staff investigate moving the pole location on the property further west to give more clearance from the existing lattice tower.

Duke Energy's next steps, as presented to the church and Great Parks representatives, will be to finalize the routes internally (see Section 3.7), document the decisions and process, and incorporate management review of the decision. Duke Energy will then communicate the decision to external stakeholders, including ODOT, City of Cincinnati, and Springfield township, and then Duke Energy will send out a letter to the public announcing the route. Duke Energy will begin detailed design and real estate research,

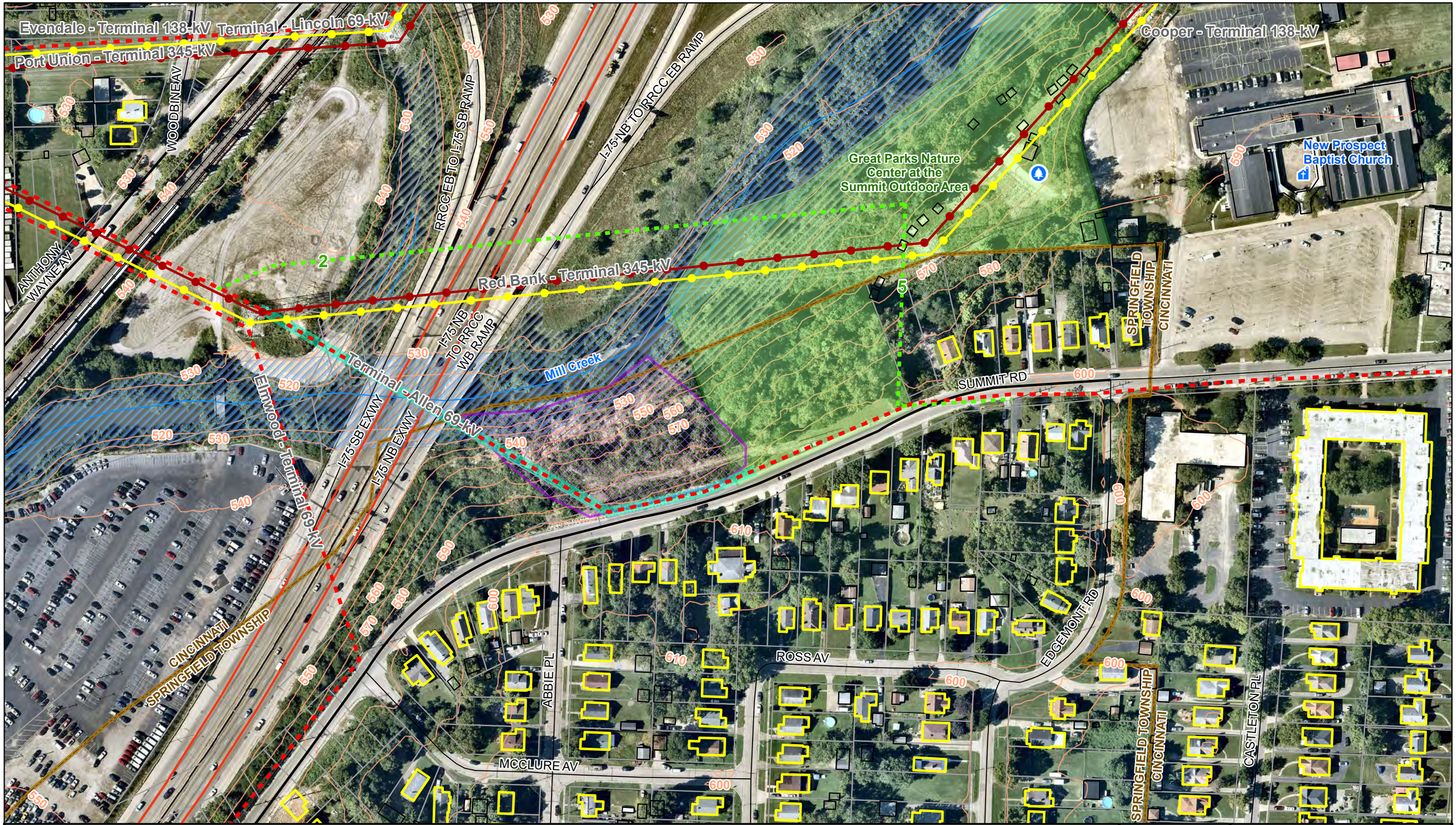
initiating appraisals and easement offers based on the amount of new ROW needed. Once the design is complete, Duke Energy will finalize real estate negotiations, file with the OPSB, complete environmental permitting, and begin construction planning. Construction is tentatively scheduled to start in the fall of 2022 and continue into spring of 2023, with an in-service date in the summer of 2023.

3.7 Description of Preferred Route

When considering the focused route alternatives, both quantitative and qualitative environmental, social, and engineering data were used to differentiate the routes and to provide a rationale for the selection of a preferred route alignment. The qualitative data included landowner and stakeholder feedback as described above.

Based on expected impacts and feedback received by the New Prospect Baptist Church and Great Parks, Route 69-6 was selected as the preferred route (Figure 3-5). Route 69-6 consists of Segments 2 and 5. Segment 2 would be constructed immediately adjacent and parallel to the double-circuit Red Bank to Terminal 345-kV / Cooper to Terminal 138-kV transmission line ROW as it crosses I-75. Segment 5 would be a new 69-kV ROW crossing a portion of the New Prospect Church property and a residential property that does not have a home constructed on it. Based on the communications with Great Parks, Segment 5 would also cross a proposed hiking trail. Representatives of the church and Great Parks indicated a preference for this route because it would impact fewer of the facilities within the park and less of the church property than the other focused alternatives.

Route 69-6 is the shortest route, and it would have the fewest heavy angles, road / RR crossings, signs and other man-made structures in the ROW, and businesses and public facilities within 200 feet of the centerline of all the routes evaluated. The route would also require very little reduced ROW necessitated by adjacent development. Environmentally, Route 69-6 would have very low impacts to streams, crossing only Mill Creek, and requires nearly the least amount of tree clearing since its ROW would overlap the existing transmission ROW for most of its length. The route would require some clearing of trees across the proposed hiking trail on the New Prospect Church park property. Route 69-6 would have more homes located within 200 feet than many of the other focused routes because Segment 5 interconnects with the existing 69-kV line along Summit Road in a residential area. The other alternative, Segment 6, which extends through the New Prospect Baptist Church parking lot, interconnects with the existing 69-kV line along Summit Road where there are few homes. However, the homes impacted by Route 69-6 are already within 200 feet of the existing Terminal to Allen 69-kV line. The portion of that line located west of the interconnection with Segment 5 will be removed, thereby resulting in fewer overall homes near the new



Preferred Route
Existing Substation

Existing Transmission Lines
69-kV
138-kV
345-kV
Line To Be Relocated

Residential Building
Non-Residential Building
Railroad
Municipal Boundary
Parcel

Contour
Area of Slope Instability
Local Park
NGO/Private Park
State

Stream
Floodplain
Floodway
School

Church
Park

150 75 0 150
US Feet

DUKE ENERGY

Figure 3-5
Preferred Route
I-75 / 10.10 69-kV Transmission Line Relocation Project
Duke Energy

Source: CAGIS, GNIS, ESRI, U.S. Department of Education, NTAD, NHD, FEMA, Energy Velocity, EIA, Duke Energy, and Burns & McDonnell Engineering

69-kV line than there are along the current line alignment. Given the impacts of the other routes on the park and the church property, Route 69-6 appeared to be the less impacting alternative.

The following sections describe the potential environmental effects that could result from the construction, operation, and maintenance of Route 69-6 for the relocation of the existing Terminal to Allen 69-kV transmission line. Potential impacts to both natural and social resources located in the Study Area are considered. This route is approximately 1,610 feet (approximately 0.3 miles) in length.

Table 3-6 contains a cumulative summary of the data for the preferred route, as well as the range of values for all the analyzed routes.

Table 3-6: Preferred Route Summary Data

Factor	Preferred Route 69-6	Range of Values for All Routes
Total Length (feet)	1,610	1,610 – 17,590
Length with Reduced ROW / In Road or Railroad ROW (feet)	880	710 – 9,990
Heavy Angles (count)	2	2 – 16
Road / Railroad Crossings (count)	2	2 – 26
Signs / Building Overhangs in ROW (count)	2	2 – 145
EPA Sites within 100 feet of Centerline (count)	0	0 – 9
Streams Crossed (count)	1	0 – 3
Floodplain Score (score)	1.2	0 – 3.6
Floodplain in ROW (acres)	0.6	0 – 2.4
Floodway in ROW (acres)	0.3	0 – 0.6
Woodland / Yard Trees in ROW (acres)	1.6	1.5 – 11.5
Residential Proximity Score (score)	20.5	2.0 – 162.0
Homes within 50 feet of Centerline (count)	0	0 – 50
Homes within 51 - 100 feet of Centerline (count)	10	0 – 37
Homes within 101 - 150 feet of Centerline (count)	4	2 – 39
Homes within 151 – 200 feet of Centerline (count)	3	0 – 26
Public Facilities within 200 feet of Centerline (count)	0	0 – 5
Businesses within 200 feet of Centerline (count)	0	0 – 51
Parcels Crossed (count)	17	9 – 168
Historic Structures within 200 feet of Centerline (count)	0	0 – 5
Length through NRHP Historic District (feet)	0	0 – 820

3.7.1 Impacts on Natural Resources

Following is a description of potential impacts to natural resources in the Study Area from the construction and operation of the preferred route. These resources include topography, soils, hydrology, vegetation, wetlands, and wildlife.

3.7.1.1 Topography

Clearing, construction, and operation of the proposed Project will not result in any significant impacts to the existing topography. Land clearing will consist of tree and shrub removal. Impacts, if any, to topography from the use of heavy equipment will be localized, limited, and temporary in nature.

Duke Energy's ROW clearing practices involve cutting vegetation within four inches of the ground. Stumps, low-growing vegetation, and root mats are left in place. There is no "grubbing" or grading within the ROW. However, some impacts to area soils will result from the use of heavy construction equipment and the excavation of soils required for installing the transmission structures. Construction activities, which are temporary in nature, can cause soil compaction, ruts or tracks from vehicular movement, and mixing of the soil profile.

During and following construction of the proposed transmission line, some erosion can occur within the cleared ROW. The NPDES regulates discharges of wastewater and stormwater from construction activities such as this transmission line project and requires the preparation and implementation of a sedimentation and erosion control plan to regulate and manage these discharges. In Ohio, the NPDES regulations are implemented by the OHEPA. Duke Energy will adhere to the NPDES regulations to control offsite sedimentation and avoid potential soil run-off into Mill Creek.

3.7.1.2 Water Resources

Construction and operation of the Project will not significantly impact surface water features along the transmission line route. The preferred route will cross Mill Creek, parallel to an existing transmission line ROW. Being parallel to the existing line will allow Duke Energy to overlap ROWs and thereby minimize the amount of new ROW and impact to the creek.

The transmission line will be designed to span Mill Creek so that no structures will be placed within the waterway. The preferred route would cross approximately 0.3 acres of floodway and 0.6 acres of floodplain associated with Mill Creek; however, no structures will be placed in the floodway or floodplain as mapped. The construction and maintenance of the transmission line will not disturb any subsurface waters. Each structure will be buried to a depth of approximately 10 percent of the actual structure height

plus 1.5 feet. Most of the structures will be buried approximately 9 to 15 feet, an insufficient depth to encounter most subsurface aquifers, if present.

Duke Energy notifies the USACE and OHEPA for its proposed transmission construction projects, seeking confirmation that the Project design falls under or is exempt from Section 404 and Section 401 permitting requirements. Should the Project require unavoidable impact to waters or wetlands, Duke Energy will obtain the required approvals. Duke Energy conducts wetland and stream determinations and obtains USACE approval for wetland and stream extent and location. This compliance, coupled with Duke Energy's limited-impacting ROW clearing practices, such as hand clearing in sensitive areas, is intended to prevent offsite sedimentation, including impacts to streams and wetlands, if present. The preferred route does not cross any NWI-mapped wetlands. Prior to construction, Duke Energy will survey the ROW to verify the presence or absence of any wetlands and obtain any needed permits. Duke Energy will implement appropriate erosion control measures to further minimize sediment from entering waterways or impacting wetlands.

3.7.1.3 Vegetation

Construction and maintenance of the proposed transmission line will result in the loss of tall vegetation within the transmission line ROW due to shrub and tree clearing. Herbaceous vegetation will not be removed but could be damaged by construction equipment and vehicular movement. Disturbed areas in uplands will be mulched and / or re-seeded following the disturbance, as described in Duke Energy’s erosion control plan, which will be submitted to the OHEPA for the Project. Most tree clearing activity will occur where the line crosses undeveloped woodland. The preferred route (Route 69-6) will require clearing approximately 1.6 acres of forested woodland. In addition to the clearing of the actual maintained ROW, danger trees that could fall into the new transmission line and cause an outage will also be removed outside the maintained corridor.

Most woody vegetation that will be impacted consists of deciduous hardwoods. Mature trees, such as sycamore, oaks, hickories, and maples occurring in the transmission line ROW, will have to be cleared to protect the integrity of the line. Ongoing maintenance of the ROW during operation of the line through mowing and/or herbicide application will encourage the proliferation of lower-growing types of vegetation, which helps stabilize the soil.

3.7.1.4 Wildlife

Construction and maintenance of the preferred route could result in some adverse impacts to wildlife. The removal of forested vegetation within or near the proposed ROW may impact foraging, shelter, or nesting

habitat for some species. Impacts to most species will be temporary and short-term during construction and will consist primarily of displacement and disturbance. Some less mobile species occurring in the construction corridor could be directly impacted, and movements between segmented habitats could be temporarily impeded due to noise and human presence. Additional temporary disturbance could occur during future maintenance of the line. No impacts are expected to fish or other aquatic species because waterways will be spanned or avoided, and erosion control techniques will be used to limit sedimentation of waterways.

3.7.1.5 Threatened and Endangered Species

According to the USFWS, running buffalo clover is an endangered flowering plant potentially found within the Study Area (USFWS, 2021). This plant requires periodic disturbance and a somewhat open habitat to grow, but it cannot tolerate full sun, full shade, or severe disturbance. The land crossed by the preferred route is very wooded (i.e., full shade) or regularly mowed Interstate ROW (i.e., full sun), so the likelihood that this species would be found along the preferred route is very low. There is a possibility that the species could be found within the existing transmission line ROW, but that ROW is already disturbed.

The endangered Indiana bat and the threatened northern long-eared bat may also be found within the Study Area. These species require caves for hibernation during the winter, which are not found along the preferred route, or tracts of dead or dying trees with peeling bark for summer roosting. Due to the very developed nature of the immediate route vicinity, the limited clearing required for the Project, and potential mitigation measures that could be implemented should habitat be found along the route, no impact is expected to these bat species.

If required by the USFWS, Duke Energy would conduct field surveys along the preferred route to determine if potential protected species habitat is present, and / or to determine the presence or absence of federally protected species, as required by the USFWS, or mitigation measures would be employed to avoid impacts to these species. Mitigation for bat roosting habitat typically includes seasonal restrictions on tree clearing.

3.7.2 Impacts on Social Resources

This section contains a discussion of the potential impacts of the Project on the social resources in the area. The following paragraphs provide information on potential impacts to urban and residential areas, parks and recreational areas, transportation and utility corridors, and cultural resources. In general, the preferred route will have very limited impacts on the existing land uses in the area. Duke Energy will

work with individual landowners and businesses to the extent feasible to reach agreeable solutions to land use conflicts that may arise.

3.7.2.1 Urban and Residential Areas

The preferred route is located within the city limits of Cincinnati generally west of Mill Creek and within Springfield Township east of the creek. Because the existing 69-kV transmission line being relocated is already close to many houses and businesses, impacts to nearby residences and businesses were unavoidable. The preferred route would be constructed within 200 feet of 17 homes, and no businesses or public facilities (except for the Great Parks Nature Center at the Summit Outdoor Area). All the homes are already located within 200 feet of the existing 69-kV transmission line along Summit Road. By relocating the line along the preferred route (Route 69-6), a portion of the existing 69-kV line will be removed, thereby reducing the overall impact to homes along the line. The preferred route crosses a residential property that does not currently contain a home. Duke Energy will work with that landowner to purchase the property or minimize impacts to the property and adjacent homes.

3.7.2.2 Parks and Recreation Areas

The preferred route is not within 200 feet of any established park facilities; however, it does cross the property owned by New Prospect Baptist Church and leased to Great Parks for the Great Parks Nature Center at the Summit Outdoor Area. Great Parks has plans to construct a hiking trail around the property which would be crossed by the preferred route. Discussions with Great Parks and church representatives revealed their preference for this route compared to other routes that would be closer or cross other facilities, such as the amphitheater and stage, restroom, and archery range. Some outdoor recreational activities, such as fishing, may also occur in Mill Creek. Limited, temporary impacts to seasonal fishing activities may occur during construction of the transmission line.

3.7.2.3 Transportation and Utilities

Construction of the preferred route may result in some disruption of traffic during deconstruction of the existing line, construction/erection of new foundations and structures, stringing of the line, and hauling of material to the job site. Most of these impacts will occur on Summit Road. Duke Energy will manage construction activities to limit impacts to local homeowners and commuters using Summit Road.

Duke Energy will coordinate with ODOT for deconstruction of the existing 69-kV line crossing I-75 and for the construction of the relocated route across I-75 and on/off ramps north of the bridge. Duke Energy will adhere to city, county, state, and federal regulations for road crossings and will coordinate with the

ODOT to verify state requirements are met and to acquire permits as needed. The preferred route does not cross any railroads. No airports or airstrips are expected to be impacted by the preferred route.

The preferred route would cross the double-circuit Red Bank to Terminal 345-kV / Cooper to Terminal 138-kV transmission line ROW. Crossings of transmission lines will be evaluated and designed to result in the least potential impact to electrical service should a failure occur on one or both lines.

3.7.2.4 Cultural Resources

The route identification process included avoidance to the extent practicable of known historical and archaeological resources based on a records search of the Study Area conducted by Burns & McDonnell via the SHPO's website. This search indicated there were no NRHP-listed or eligible archaeological sites or historic structures that may be crossed by or within 200 feet of the preferred route. If the SHPO requires an archaeological survey of portions of the preferred line route, Duke Energy will retain a consultant to perform the survey and submit the results, and any proposed mitigation will be coordinated with the SHPO.

4.0 CONCLUSION

The construction and operation of the proposed Project will have very limited impacts on natural and social resources in the Study Area, in part because it would require only 1,610 feet of new construction. Because the Project is located adjacent to an existing transmission line ROW for most of its length and can overlap that ROW, land use impacts from the Project will be minimized. Because the line is a relocation of an existing 69-kV line, impacts to residences along the preferred route are expected to be short-term and temporary. Once the route is constructed, permanent impacts to residences are expected to be somewhat less than along the previous 69-kV alignment. The preferred route crosses Mill Creek and would require some clearing, so Duke Energy would implement erosion and sediment control measures to limit sedimentation of the creek during construction until the ROW is stabilized. The preferred route crosses land leased by New Prospect Baptist Church to Great Parks for development as a park and crosses a proposed hiking trail. However, the preferred route would cross the park where there are fewer established or planned facilities, so the impact to the property should be reduced. Communications with the church and Great Parks indicate the preferred route is also their preference. For the above reasons, the preferred route (Route 69-6) is the best overall route to address the need to relocate the line from over the I-75 mile marker 10.10 bridge and away from the unstable slope along Summit Road.

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APPENDIX A - AGENCY CORRESPONDENCE

Great Parks of Hamilton County

January 29, 2021

Duke Energy
Joshua Waldroff, Project Manager
Transmission – Public Engagement
EX552 | 315 Main Street
Cincinnati, OH 45202

Re: New I-75 Construction and Power Line Relocation

Dear Mr. Waldroff:

Great Parks of Hamilton County is responding to your request for input from stakeholders on the New I-75 Construction and Power Line Relocation. Great Parks leases property from New Prospect Church at 1580 Summit Road in the Roselawn community of Cincinnati. At this location Great Parks provides outdoor recreation and nature education through its Nature Center at The Summit, located in New Prospect's Summit Center building, and its 6.5 acre lease area. The opportunities for engaging with nature that Great Parks provides would not otherwise be available in this community.

Our goals relative to this project are to mitigate impacts to existing and planned facilities, which we have put significant resources into establishing, and to preserve the natural ecology of the site. Protecting these existing and planned assets is essential to being able to achieve our mission in this community.

With these goals in mind Great Parks is advocating for Duke to route the proposed power lines through segments 1 and 5 as shown on the map provided in your comment letter dated January 4, 2021. Great Parks is a partner with New Prospect Baptist Church in its efforts to provide for the mental and physical health and development of the community surrounding the Summit Center. As such we have discussed how we would like to see this project proceed and are in agreement with them on the preferred routing for the power lines to be installed through this project.

If you have any questions, please do not hesitate to contact me at 513-374-3314 or screighton@greatparks.org.

Yours truly,

Sean Creighton, PLA, LEED AP
Landscape Architect
greatparks.org

10245 Winton Road
Cincinnati, Ohio 45231

I-75 Exit

Mill Creek

Outdoor Classroom

Hiking Trail

Archery Range

Equipment Storage

Restroom Building

Stage w/ Shade Canopies

Amphitheater Improvements

Fire Pit (Small Groups)

Access Drive

Pawpaw Trees

The Summit Center

Creek Access

Interpretive Planting

Hiking Trail

0 30 60 120

SCALE IN FEET

Summit Rd.

Great Parks Nature Center at The Summit Outdoor Area

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Commission of Ohio Docketing Information System on

7/20/2022 11:07:39 AM

in

Case No(s). 22-0553-EL-BNR

Summary: Application Part 3 - Construction Notice for the Duke Energy Ohio, Inc. Ham 10.10 I-75 Transmission Relocation Project electronically filed by Mrs. Debbie L. Gates on behalf of Duke Energy Ohio Inc. and D'Ascenzo, Rocco O. Mr. and Akhbari, Elyse and Kingery, Jeanne W