CHAPTER 2

2 ALTERNATIVES

The selection of alternatives involves the screening of both alternative project solutions to the transmission problem as well as alternative locations for any facilities which those solutions require. These screenings involve gathering available data regarding the existing transmission system configuration, current and anticipated land uses, cultural features, natural resources, technical feasibility, other siting constraints and economic factors including potential project costs.

The following description of the alternatives begins with features of the construction and operation of a 500-kV transmission line that would be applicable regardless of the location of the line. This general description is followed by descriptions of project alternatives, which include two study area alternatives involving the construction and operation of the proposed transmission line as well as the No Action Alternative, and siting alternatives involving specific corridors within each study area.

2.1 Description of the Proposed 500-kV Transmission Line

2.1.1 Construction

Right-of-Way

The new right-of way would be 175 feet in width. TVA would obtain easements from landowners for the new ROW. These easements give TVA the right to construct, operate, and maintain the transmission line. Fee title for the land within the ROW would remain with the landowner, and the easement would prohibit certain activities such as the construction of buildings within the ROW that could interfere with the transmission line or create a hazardous situation.

Because of the need to maintain adequate clearance between tall vegetation and transmission line conductors, as well as to provide access for construction equipment, most trees and shrubs would be initially removed from the entire width of the ROW. Trees outside of the right-of-way which are tall enough to pass within 10 feet of a conductor if they fell towards the line would also be removed. Equipment used during this ROW clearing includes chain saws, skidders, bulldozers, and/or feller/bunchers. Marketable timber would be salvaged where feasible; otherwise, woody debris and other vegetation would be piled and burned, chipped, or taken offsite. In some instances, vegetation may be windrowed along the edge of the ROW to serve as sediment barriers. Vegetation removal in streamside management zones (SMZs) and wetlands would be restricted to trees tall enough, or with the potential to soon grow tall enough, to interfere with conductors. In rugged terrain, vegetation at the bottom of ravines would be left if there is adequate clearance between it and the conductors.

Structures and Conductors

The proposed line would use self-supporting, galvanized, laced-steel structures. The electrical conductors would consist of three sets of three, 954,000 circular mil aluminum-steel-reinforced cables bundled in a triangular configuration, suspended beneath the

structure cross-arms by two insulators, 14 feet, long arranged in a “V” shape. The transmission line would be rated at 3000 amperes (A). Two single ground wires would be placed on the two highest points of the structures to provide lightning protection. In some cases, these ground wires may carry fiber optic or other communication circuits. The structures may also have a second cross-arm added beneath the 500-kV line to support a lower voltage line, allowing additional transmission lines on the same right-of-way. Tower height will vary with terrain and land use along the route but will normally range between 85 to 125 feet. The distance between structures will vary based on the same factors put will typically be about 1000 feet. Tower foundations are normally a laced-steel grillage, one per leg, buried in the earth. Some towers at points where the line turns an angle will require foundations of reinforced concrete. Figure 2-1 shows a sketch of a typical structure.

Structures which support long spans such as at a river crossing or interstate highways would be substantially taller than the typical to maintain required clearance beneath the conductors. Towers exceeding 200 feet height above ground would require lighting under FAA regulations. This lighting would be either a white strobe light at all times or a combination of the strobe light during daylight hours and a constant red light a night. Aircraft warning spheres would be placed on the highest wires (ground wires) at river and interstate crossings and at any other locations where aviation patterns require them.

After clearing, construction would generally progress in the following order:

- Excavation of foundation or grillage holes
- Installation of the foundations and grillages
- Assembly, on the ground of large portions of the steel structures
- Placement of the assembled structures on the foundations using cranes
- Hanging of insulators with “pulling blocks” or pulleys attached to allow the new conductors and ground wires to be pulled through
- Pulling the ground wires and conductors into place
- “Sagging” the conductor; that is, adjusting it to the proper tension and height to meet the required clearances
- Clipping the conductor into place on the end of the insulators
- Inspection and testing of the line
- Right-of-way restoration and clean up

Prior to installing the conductors, temporary clearance poles would be installed at road and railroad crossings to reduce interference with traffic. A small rope would be pulled from structure to structure through the pulling blocks. The rope would be connected to the conductors and ground wires and used to pull them down the line. A bulldozer and specialized tensioning equipment would be used to pull conductors and ground wires to the proper tension. Crews would then clamp the wires to the insulators and remove the pulling blocks. In some areas were access is difficult a helicopter may be used for various tasks including moving of material and personnel, pulling conductor pull-ropes or installation of conductor spacers.

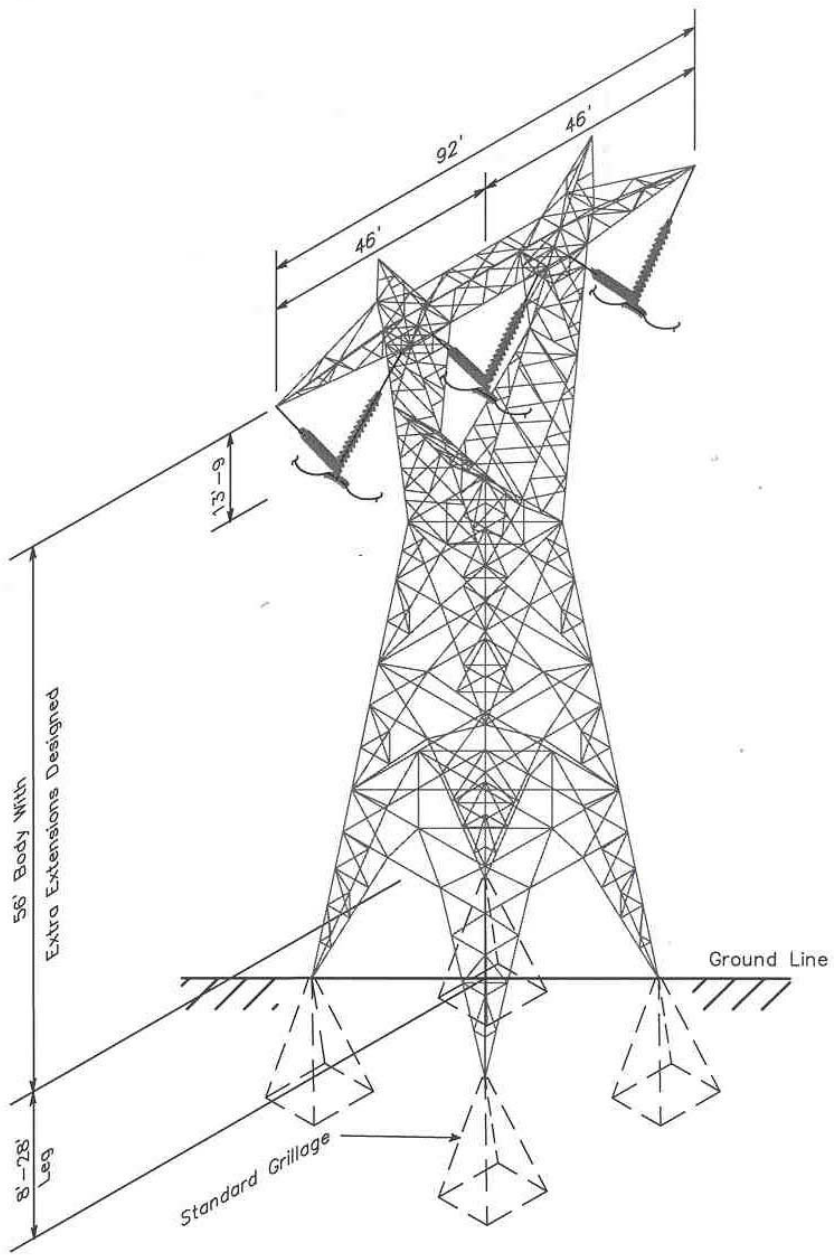

Figure 2-1. Typical 500-kV Transmission Line Structure.

After the line is constructed the ROW would be revegetated using native, low-growing plants species in appropriate areas. Areas such as pasture, agricultural fields, or lawns would be returned to their former condition. Additional applicable environmental quality protection specifications that would be used during ROW clearing and transmission line construction are listed in Appendices B and C and in TVA's Guide for Environmental Protection and Best Management Practices for Transmission Construction and Maintenance Activities (Muncy 1999).

The transmission line ROW can be used by the landowner for many purposes; however, the construction of permanent buildings, trees that reach the height of the electrical conductors and storage of any flammable material would be prohibited.

Access Roads

Permanent access roads would be needed to allow vehicle access to each structure and other points along the ROW. TVA would obtain the necessary permission to use these access roads from landowners. Existing roads, some of which may need upgrading, would be used where possible. New access roads would be located on the ROW wherever possible, and designed to avoid severe slope conditions and minimize stream crossings. New access roads would be about 18 feet wide and surfaced with dirt or gravel. Culverts and other drainage devices, fences, and gates would be installed as necessary. New access roads would be planted with approved seed mixtures following construction.

The actual locations of access roads cannot be determined until a preferred corridor and specific alignment is chosen and individual structure locations are identified.

Construction Assembly Areas

Construction assembly areas would be required for worker assembly, vehicle parking, and material storage. These areas are usually leased from a private landowner for the duration of the construction period. They are typically 5 to 10 acres in size, relatively flat, previously cleared, and located adjacent to an existing paved road near the transmission line. Depending on site conditions, some grading and installation of drainage structures may be required. The areas would be graveled and fenced, and trailers used for material storage and office space would be parked on the areas. Following the completion of construction activities, all trailers, unused materials, and construction debris would be removed from the site. Removal of the fence would be at the discretion of the landowner.

A separate construction assembly area is typically required for about each 10 miles of new transmission line. The actual locations of assembly areas cannot be determined until a preferred corridor and specific alignment are identified.

Changes to the Cumberland Fossil Plant Switchyard

An additional bay containing a 3000 A, 50kA SF-6 500-kV breaker would be constructed in the 500-kV switchyard at Cumberland Fossil Plant on the south end of the existing 500-kV bays. If a route is selected which would exit the plant site to the south, the transmission line would terminate at this bay. No earthwork would be required for this new bay other than that needed to install its supporting foundation.

If a route is selected which would exit the site to the north, an additional length of bus work would be needed inside the switchyard to connect the new bay to a line pull-off structure on the north side of the yard. This alternative would require moving the existing switchyard fence on the west side of the yard but would not require any earthwork other than construction of support foundations for the new bay and new bus work. Environmental quality protection measures that would be used during construction in the switchyard, as well as in substations, are listed in Appendix D.

2.1.2 Operation and Maintenance

Inspection

500-kV transmission lines are inspected by aerial surveillance, using a helicopter, at 6 month intervals and by ground observation every one to two years. These inspections are conducted to locate damaged conductors, insulators, or structures, and to report any abnormal conditions which might hamper the normal operation of the line or adversely impact the surrounding area. During these inspections, the condition of vegetation within the ROW, as well as immediately adjoining the ROW, is noted. These observations are then used to plan corrective maintenance or routine vegetation management.

Vegetation Management

Because of the need to maintain adequate clearance between tall vegetation and transmission line conductors, periodic vegetation management would be conducted along the ROW. This would consist of two different activities: felling of “danger trees” adjacent to the cleared ROW, and control of vegetation with the cleared ROW. Any trees located off the ROW which are tall enough to pass within 6 feet of a conductor or structure (if it were to fall toward the line) are designated as “danger trees” and would be removed.

Management of vegetation within the cleared ROW would use an integrated vegetation management (IVM) approach designed to encourage low-growing plant species and discourage tall-growing plant species. A vegetation reclearing plan would be developed for each transmission line segment based on the results of the periodic inspections described above. The two principal management techniques are mechanical mowing using tractor-mounted rotary mowers, and herbicide application. Herbicides would be selectively applied from the ground with backpack sprayers or vehicle mounted sprayers, or, for larger areas, particularly in rugged terrain, by broadcast aerial spraying.

Any herbicides used would be applied in accordance with applicable state and federal laws and regulations. Only herbicides registered with the U.S. Environmental Protection Agency would be used. Appendix E contains a complete list of the herbicides and adjuvants (ingredients added to the herbicide solution to increase its effectiveness) currently used by TVA in ROW management. This list may change over time as new herbicides are developed or new information on presently approved herbicides becomes available.

2.2 Project and Siting Alternatives

The National Environmental Policy Act and its implementing regulations direct that federal agencies commence NEPA reviews early on in the planning of proposed actions. To do this, TVA employs a detailed, comprehensive siting process when it plans its transmission line projects. This is an iterative process and takes into account sensitive environmental and cultural resource features that become “constraints” on locating proposed lines. Initially, broad alternative study corridors are identified and line rights of way (ROWs) are eventually located within the study corridor selected for the project. Because transmission line ROWs are actually much narrower than these study corridors, sensitive features that are associated with specific corridors can often be avoided when final line routes are selected. Corridors and discrete line segments are discarded or redirected as analyses proceed. One of the last steps in the line siting process is selecting the exact locations for line structures after a final ROW has been identified and surveyors and construction forces begin work. It is at this point that potential impacts can be fully identified. However, TVA’s

transmission line siting process ensures that decision makers and the public are apprised of potential impacts and their potential significance before this final step.

2.2.1 Project Alternatives

2.2.1.1 Alternative 1 - Cumberland-Montgomery Study Area

This alternative involves the construction and operation of between about 32 and 45 miles of 500-kV transmission line from Cumberland Fossil Plant to the Montgomery 500-kV Substation. Five additional 3000 A, 50kA SF-6 500-kV breakers would be installed at the Montgomery Substation to terminate the new line and to create a double breaker bus arrangement which would protect generation at Paradise Fossil Plant. Changes to the Cumberland Fossil Plant switchyard are described above in Section 2.1.1.

2.2.1.2 Alternative 2 - Cumberland-Davidson Study Area

This alternative involves the construction and operation of about 50 miles of 500-kV transmission line from Cumberland Fossil Plant to the Davidson 500-kV Substation. This alternative would also require the installation of an additional 500-kV bay and 3000 A, 50kA SF-6 500-kV breaker at the Davidson Substation. These changes would require excavation for installation of supporting foundations. All activities would occur on existing substation property, and part of the fence surrounding the substation would be relocated to enclose the new bay. Changes to the Cumberland Fossil Plant switchyard are described above in Section 2.1.1.

2.2.1.3 Alternative 3 - No Action Alternative

Under the No Action Alternative, the proposed transmission line would not be constructed. This would result in the risk of loss of electric service in the Nashville area, which has a total load of over 4000 megawatts. There would also be risk of loss of system stability and risk of damage to generators at Cumberland and Paradise generating plants. In order to minimize the risk of instability, generation would have to be reduced at these plants during some system conditions. This could further exacerbate potential service disruptions in the Nashville area.

2.2.2 Siting Alternatives

Siting Process

The basic steps followed when determining a transmission line route are to:

- define the study area;
- determine corridors within the study area that will minimize potential impacts to cultural and natural features;
- design one or more alternative transmission line routes within the corridor(s);
- gather public input; and
- incorporate public input into the final selection of the preferred transmission line route.

Factors considered during the project siting process include current and anticipated land uses, cultural features, natural resources, technical feasibility, and economic factors including potential project costs.

The study area defined for this project (Figure 1-1) incorporates potential line corridors between Cumberland Fossil Plant and the Montgomery 500-kV Substation, and between Cumberland Fossil Plant and the Davidson 500-kV Substation. TVA produced aerial photography of this large study area and used it to supplement maps in a geographic information system (GIS). Known locations of urban areas, commercial/industrial areas, schools, churches, parks, wildlife management areas and other public lands, wetlands, floodways, streams, ponds, and endangered and threatened species were included on these maps. Information gathered during the initial public scoping for this project was also used in making these maps.

These maps and associated databases were then used to determine and evaluate potential transmission line corridors. The GIS technology enabled simultaneous consideration of the relative impacts of corridors based on a variety of environmental and other factors (referred to as “siting constraints and opportunities”). The potential transmission line corridors described below are the result of this detailed siting process

2.2.2.1 Alternative 1 - Cumberland-Montgomery Study Area

Four broad alternate corridors from TVA’s Cumberland Fossil Plant to TVA’s Montgomery 500-kV Substation have been identified (Figure 2-2). The corridors vary in width according to observed siting constraints and opportunities. They overlap in many locations.

2.2.2.1.1 Cumberland-Montgomery Study Corridor A

This corridor begins at TVA’s Cumberland Fossil Plant switchyard located on the west side of the plant in Stewart County, Tennessee. From this point the corridor goes south, crosses TN 149, and turns east avoiding the developed area north of Erin. The corridor continues east generally following the Montgomery, Houston and Dickson County lines and then turns slightly northeast staying south of the Cunningham community. The corridor continues northeast crossing the Cumberland River about two miles north of the Montgomery and Cheatham County line. To avoid the path of the future State Highway 840, the corridor turns north about a mile west of TN 12 and passes between the Freedonia and Excell communities. As it approaches the existing Davidson-Montgomery 500-kV transmission line, it turns north-northwest and follows a path parallel to the existing transmission line and just east of the city of Clarksville to terminate at the Montgomery Substation. The corridor length is about 45 miles.

2.2.2.1.2 Cumberland-Montgomery Study Corridor B

Corridor B is about 37 miles long. From Cumberland Fossil Plant, Corridor B runs south for a short distance and then east. It passes south of Cumberland City to run just north of the Montgomery-Houston County line and around the north side of Cunningham. Near Cunningham, it turns to the northeast and crosses the Cumberland River about six miles

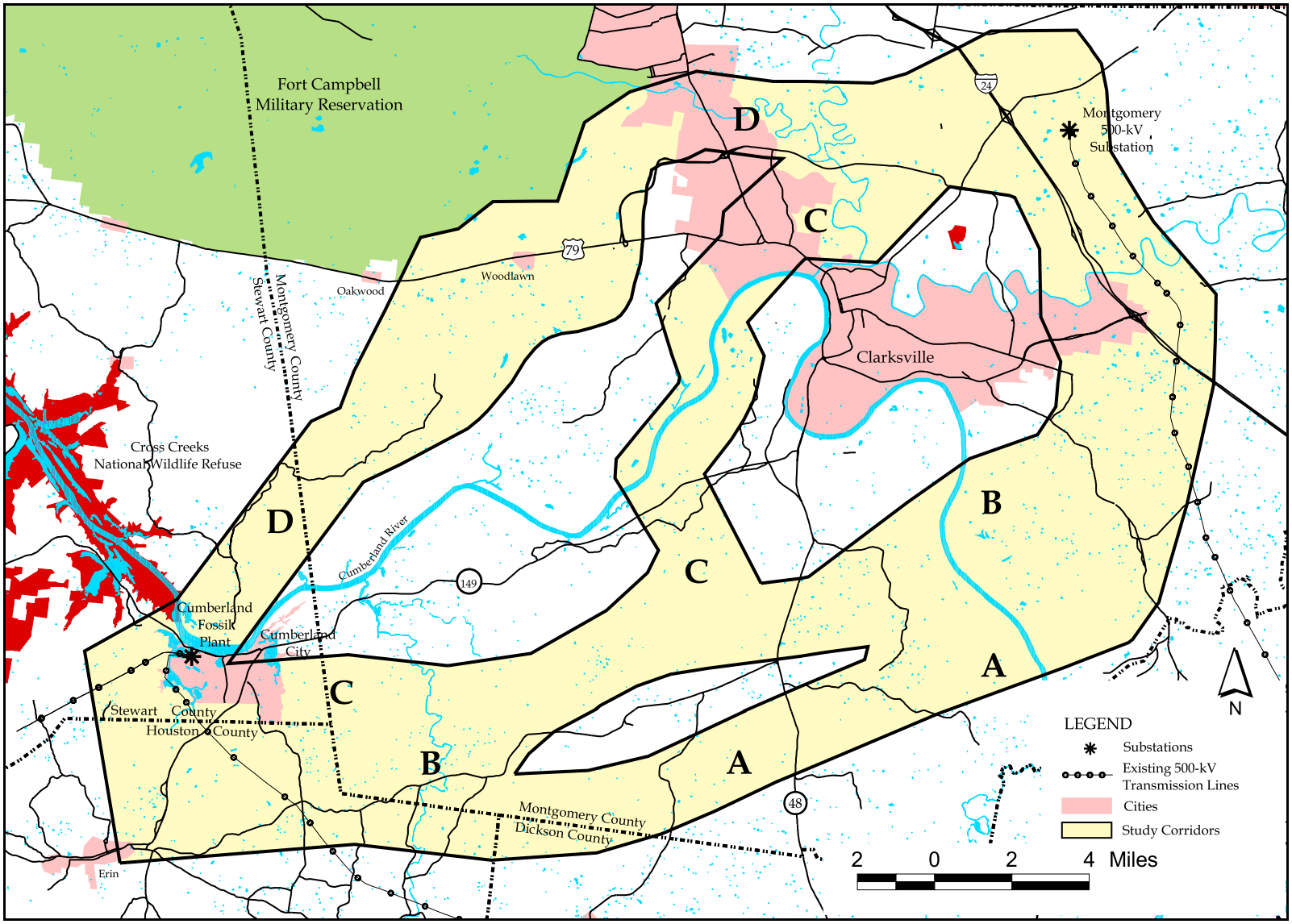

Figure 2-2. The Cumberland-Montgomery Study Area and associated transmission line corridors.

north of the Cumberland-Cheatham County line. It joins Corridor A near TN 12 and overlaps it around the east side of Clarksville to the Montgomery 500-kV Substation.

2.2.2.1.3 Cumberland-Montgomery Study Corridor C

The western end of this corridor overlaps Corridors A and B. It soon follows portions of existing transmission lines beginning with the Cumberland-Davidson 500-kV line until reaching the Johnsonville Fossil Plant-Clarksville 161-kV line near Yellow Creek and the community of Ellis Mills. It follows the general path of this line to the northeast until reaching the Budds Creek area. At Budds Creek it turns north-northwest to the south side of the Cumberland River. It then turns northeast to follow the Cumberland River and the CSX Railroad to the zinc plant near the Briarwood community. At the zinc plant the corridor turns north and runs parallels to the river in the vicinity of several existing transmission lines to the northwest side of Clarksville. It crosses US 79 in the New Providence area, crosses the lower reaches of the West Fork Red River, and crosses the 101st Airborne Division Parkway. It continues to the northeast and east parallel to existing transmission lines across TN 48, I-24, and US 79 to the Montgomery 500-kV Substation. Corridor C is about 41 miles long.

2.2.2.1.4 Cumberland-Montgomery Study Corridor D

From the switchyard on the west side of Cumberland Fossil Plant, Corridor D runs to the northeast across the Cumberland River, TN 233, and Blooming Grove Creek to US 79. It then runs east and northeast, partly on the Fort Campbell Military Reservation, past the community of Woodlawn. It stays to the north of Purple Heart Parkway/TN 374 and crosses US 41A near Ringgold. It passes south of Clarksville Outlaw Field Airport and along the north side of 101st Airborne Division Parkway. It continues east, partially overlapping Corridor C, crosses I-24, and turns south to cross US 70 east of I-24. It then enters the Montgomery 500-kV Substation from the north. Corridor D is about 32 miles long.

2.2.2.2 Alternative 2 - Cumberland-Davidson Study Area

Two broad alternate corridors from TVA's Cumberland Fossil Plant to TVA's Davidson 500-kV Substation have been identified (Figure 2-3). The corridors vary in width according to observed siting constraints and opportunities, and overlap at each end.

2.2.2.2.1 Cumberland-Davidson Study Corridor A

Corridor A exits the switchyard on the west side of Cumberland Fossil Plant and goes south and southeast along the same general path as the existing Cumberland-Davidson 500-kV Transmission Line. It crosses TN 149 and TN 13 and runs eastward just south of the Montgomery, Houston and Dickson County lines. It passes to the north of Slayden and Cumberland Furnace. In the vicinity of Rock Springs Road and the communities of Rock Springs and Coaling, it turns southeast to cross TN 49, the Harpeth River near Collier Bend, and TN 250. It then turns slightly eastward and crosses through the southern portion of Cheatham Wildlife Management Area. After crossing TN 249 east of the Cheatham Wildlife Management Area, it intersects the Davidson-Montgomery 500-kV Transmission Line and turns south to follow the line across US 70, the Harpeth River, and I-40 into the Davidson 500-kV Substation. Corridor A is about 50 miles long.

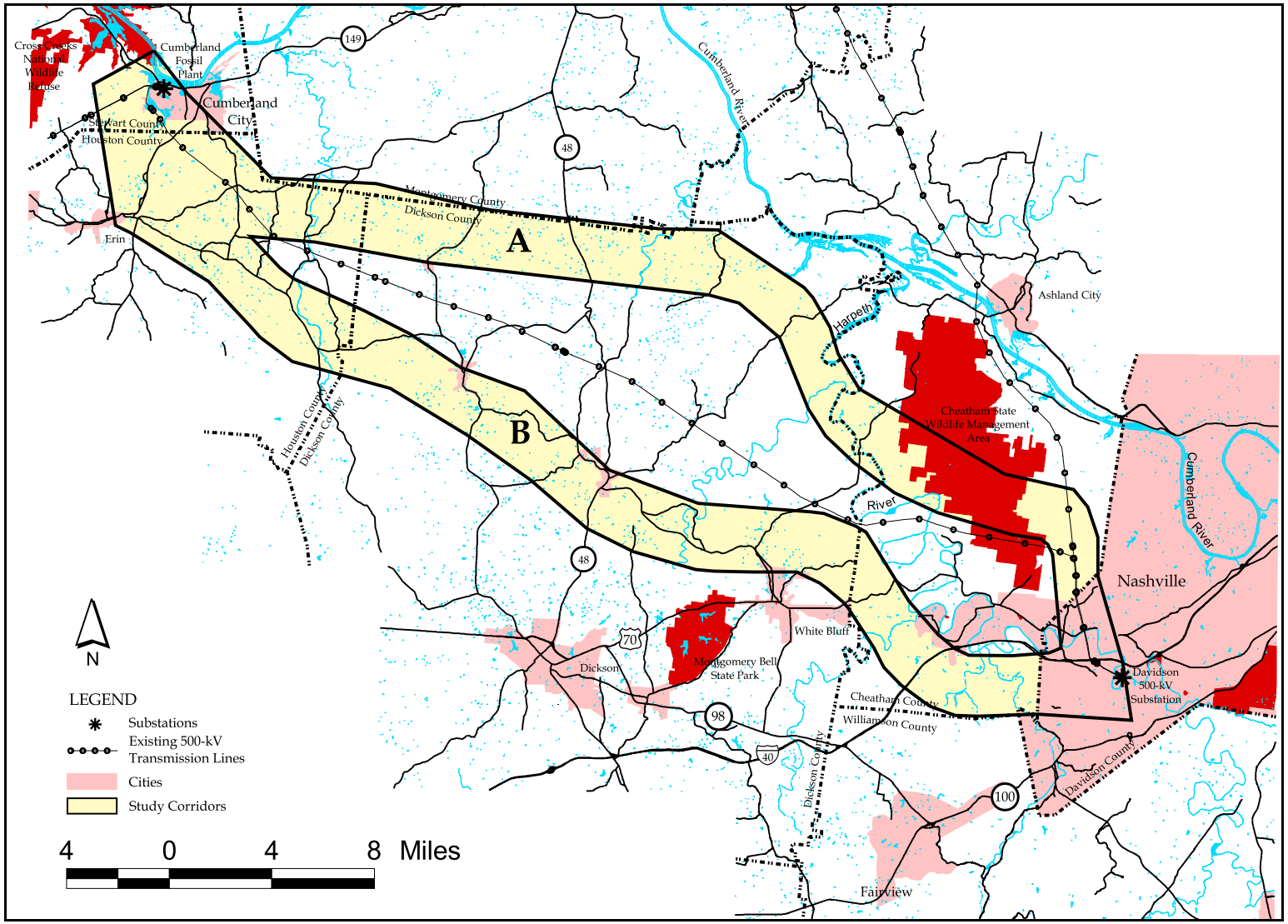

Figure 2-3 The Cumberland-Davidson Study Area and associated transmission line corridors

2.2.2.2.2 Cumberland-Davidson Study Corridor B

Corridor B exits the switchyard on the west side of Cumberland Fossil Plant and then turns south to partially overlap corridor A. It passes to the east of Erin and then turns to the southeast towards Vanleer and Charlotte. It passes south of these two communities and then turns eastward as it crosses Jones Creek. Corridor B then crosses TN 250 north of White Bluff and before crossing the Dickson-Cheatham County line, it turns to the southeast. It crosses US 70 and Turnbull Creek. After crossing I-40, it turns to the east to cross Brush Creek and the South Harpeth River and terminate at the Davidson 500-kV Substation. The total length of Corridor B is about 51 miles.

2.3 Alternatives Considered But Eliminated From Further Consideration

2.3.1 New Switching Station and Transmission Line

TVA briefly considered an alternative involving constructing a new 500-kV switching station in Humphries County, Tennessee and 500-kV transmission line from the switching station to the Davidson 500-kV Substation. The switching station would be built near and connected to the existing Johnsonville–Davidson 500-kV transmission line. The new 500-kV transmission line would be at least 40 miles long and built on new right-of-way.

This alternative would have additional costs and potential impacts of a new 500-kV switching station. Detailed transmission system studies showed that this alternative would not adequately meet the project need. This alternative was eliminated from further consideration.

2.3.2 Load Management/Conservation

A major objective of this project is to maintain transmission system reliability. Reliability is related to system loads as well as system configuration and external factors such as weather, catastrophic events and events on adjoining systems. In addition, the proposed project addresses a present risk to maintaining the current level of service; this risk will increase as system loads increase in the future.

The risk to maintaining service to the greater middle Tennessee area is partially load dependent and could, therefore, be affected by load reduction. However, under present conditions, it would be necessary to decrease current peak loads by at least 4000 MW to maintain acceptable voltage levels. A 2002 study conducted by Pacific Energy Associates for TVA assessed a number of demand-side management options. This study showed that the maximum peak load reduction achievable within a 2 year period, using a number of demand-side management options, was expected to be about 187 MW throughout the TVA system. Achieving an on-peak reduction of 4000 MW in middle Tennessee through demand-side management is therefore not feasible.

Conservation and load management would not fully address the system stability issues that are an objective of the proposed action. These risks can only be decreased by addition of another high capacity transmission line in the area. The load management/conservation alternative was eliminated from further consideration.

2.4 Comparison of Alternatives

The alternative study areas and corridors were evaluated on the basis of four areas of comparison: potential impacts to natural features, potential impacts to land uses, potential impacts to cultural features, and engineering attributes. Economic issues, especially those related to project costs, are directly and indirectly incorporated into this evaluation. This evaluation was partially based on an enumeration of characteristics of the project area (Table 2-1). Data used in this enumeration included the number of houses, the number of churches, forested area, the number of areas of steep slopes, wetland area, and 24 other attributes. The raw numbers in this table were converted to numerical scores using standard statistical methods. The overall scores for each of the six corridors were then computed and the alternatives and corridors were ranked by overall desirability. The Cumberland-Davidson study area rated lower in most categories, in large part because of the greater length of the corridors it contained.

2.4.1 Engineering Attributes

The number of transmission line crossings and railroad crossings is similar in the two study areas. The Cumberland-Montgomery corridors would require more primary road crossings, and the total number of road crossings would be greater for the Cumberland-Davidson corridors. The number of pipeline crossings is also greater for the Cumberland-Davidson corridors. A substantial amount of work would be required in the Cumberland Fossil Plant switchyard regardless of the alternative selected. No new bay would be required at the Montgomery Substation. A new bay and associated earthwork would be required at the Davidson Substation.

2.4.2 Natural Features

Because of their greater length, the area of new ROW would be about 20% greater for the Alternative 2 Cumberland-Davidson corridors than for the Alternative 1 Cumberland-Montgomery corridors. The Cumberland-Davidson study area is more heavily forested than the Cumberland-Montgomery study area, and impacts of forest clearing during transmission line construction would be considerably greater in the Cumberland-Davidson corridors. Impacts to wildlife populations would consequently also likely be greater in the Cumberland-Davidson corridors. Both alternative study areas contain identified plant communities of conservation concern.

While selection of either alternative study area would result in several stream crossings; the Cumberland-Davidson study area contains more streams supporting endangered or threatened species, more National Rivers Inventory streams, and a State Scenic River. Wetlands are present in both study areas, and, based on aerial photo interpretation, comprise 0.1% of less of each corridor. The proportion of wetland area is greatest in Cumberland-Montgomery Corridors A and D, and least in Cumberland-Montgomery Corridor C and Cumberland-Davidson Corridor B. Because of the size and configuration of the wetlands, potential impacts within the Cumberland-Montgomery study area would probably be greatest for Cumberland-Montgomery Corridor D and least for Cumberland-Montgomery Corridor C. There appears to be little difference in potential wetland impacts between the two Cumberland-Davidson corridors.

Endangered, threatened or otherwise sensitive species are known from both alternative study areas and all corridors. The number of previously reported populations of listed species is generally greater in the Cumberland-Montgomery corridors. As with wetlands, a

more refined determination of potential impacts to listed species can be made after final line routes are delineated and field-inspected.

Both alternative study areas and all corridors contain areas managed for natural resource conservation such as state natural areas, wildlife refuges, and wildlife management areas. The potential for impacts to these areas varies greatly because of the arrangement of the areas and because of the compatibility of a new transmission line with their different management objectives. Within the Alternative 1 Cumberland-Montgomery Study Area, the potential for impacts to managed areas is probably greatest in Corridor D. Within the Alternative 2 Cumberland-Davidson Study Area, the potential for impacts is probably greatest in Corridor A because of the presence of Cheatham Wildlife Management Area.

Table 2-1. Summary of selected attributes of Alternative Study Areas and Corridors.

	Cumberland-Montgomery				Cumberland-Davidson	
	A	B	C	D	A	B
Engineering Attributes						
Length (Miles)	45	37	41	32	50	51
Road Crossings - Primary	3	5	7	4	3	2
Road Crossings - Secondary	8	5	8	4	12	17
Pipeline Crossings	1	1	2	1	6	7
Transmission Line Crossings	7	6	8	5	7	5
Railroad Crossings	2	2	3	2	2	2
Natural Features						
Total Area (acres)	54300	48389	53115	44057	65339	66532
Forested Area (acres)	25096	20109	22908	17825	39432	40296
Open Water (acres)	757	934	1237	719	882	812
Floodplains (acres)	4637	5637	8061	4028	6083	4860
Sensitive Steam Crossings[1]	2	2	1	1	3	4
River Crossings		1	2	2	3	2
Major Stream Crossings	1	1	1	1	3	4
Wetland Area (acres)	539	409	376	382	529	424
End. & Thr. Species Pop'ns	3	11	15	31	6	8
Caves	1	3	6	6	3	3
Managed Areas[2] (acres)		11717	8070	8219	11151	13200
Land Use						
Apartment Buildings	12	21	47	79	5	18
Schools	2	13	5	17	5	5
Houses	2570	2815	2722	2749	1910	2891
Barns	115	142	260	142	990	1222
Poultry Barns	2	3	3	6	0	0
Commercial & Industrial Bldgs.	125	152	275	153	86	184
Parkland (acres)	35	27	27	57	145	179
Cultural Features						
Archaeological Sites	13	6	9	1	6	1
Churches	13	17	22	18	19	26
Cemeteries	44	32	36	10	395	54
Recreation Areas (acres)	46	142	46	131	59	107

[1]Streams supporting endangered or threatened species
[2]Includes wildlife refuges, wildlife management areas, natural areas

2.4.3 Land Use

Land use varies in the two alternative study areas and associated corridors and includes urban, suburban, and industrial development, forestry, and agriculture. The Cumberland-

Montgomery corridors have a greater proportion of urban/suburban development than the Cumberland-Davidson corridors, and consequently, higher densities of apartment buildings, houses, and commercial and industrial buildings. Commercial land use is highest for Cumberland-Montgomery Corridor C and lowest for Cumberland-Davidson Corridor A. Parks make up a very small proportion of each study area and corridor. Two large special use areas are the Cheatham Wildlife Management Area located along Cumberland-Davidson Corridor A and Fort Campbell Military Reservation, part of which is included in Cumberland-Montgomery Corridor D.

No additional land would be required for project activities at the Cumberland Fossil Plant, the Montgomery 500-kV Substation, or the Davidson 500-kV Substation.

2.4.4 Cultural Features

Based on available records, the Cumberland-Montgomery Corridor A contains the greatest number of identified archaeological sites. Detailed surveys will conducted along delineated line routes to confirm the presence of historical resources. The differences among the alternative study areas and corridors in the number of churches and acreage of recreation areas is relatively small. Cumberland-Davidson Corridor A contains considerably more cemeteries than the other corridors.

2.5 The Preferred Alternative

The major differences between the two alternative study areas are related to the length of their associated corridors and the general level of urban/suburban development. The Cumberland-Montgomery corridors are shorter and have a higher level of urban/suburban development. The Cumberland-Davidson corridors are more heavily forested and potential impacts to several other natural features could be greater in this study area. One of the Cumberland-Davidson Corridor A would cross the Cheatham WMA, and the Cumberland-Montgomery Corridor D could cross a portion of Fort Campbell. A transmission line in one of the Cumberland-Montgomery corridors, because of the shorter length, would be less expensive to construct and operate than a line in a Cumberland-Davidson corridor.

A statistical analysis of the data in Table 2-1 was conducted to quantitatively rank the corridors. Based on the results of this analysis, as well as other factors less easily quantified, the final ranking of the corridors, from most preferable to least, is a follows: Cumberland-Montgomery D, B, C and A, followed by Cumberland-Davidson B and A. Based on this evaluation, TVA's preferred alternative is Alternative 1 – the Cumberland-Montgomery Study Area. Within this study area, the preferred corridors are B and D.