

Burlington - Wray

230-kilovolt Transmission Project

MACRO CORRIDOR STUDY

January 2012

Submitted To:



Submitted By:



Prepared By:



CONTENTS

1.0	INTRODUCTION	1
1.1	Description of Tri-State Generation and Transmission Association.....	1
1.2	Description of the Rural Utilities Service	2
1.3	Project Description	2
1.3.1	Right-of Way Considerations	3
1.3.2	Proposed Structures	3
2.0	MACRO CORRIDOR STUDY	7
2.1	Definition of the Study Area.....	7
2.2	Data Collection and Evaluation	11
2.3	Opportunities and Constraints Analysis.....	11
2.3.1	Land Use and Jurisdiction.....	19
2.3.1.1	Land Cover and Surface Water	19
2.3.1.2	Residential Areas.....	19
2.3.1.3	Schools, Hospitals, Nursing Homes, Churches, Cemeteries, Commercial Businesses.....	20
2.3.1.4	Aviation Facilities	25
2.3.1.5	Communication and Radio Towers	26
2.3.1.6	Oil and Gas Development Infrastructure.....	29
2.3.1.7	Wind Energy Facilities	29
2.3.1.8	Agricultural Land	29
2.3.1.9	Recreation Areas	29
2.3.1.10	State Wildlife Areas	29
2.3.1.11	Wetland Reserve Program Areas (Federal)	29
2.3.1.12	Municipal Boundaries	35
2.3.2	Existing Linear Transportation And Utility Corridors.....	35
2.3.2.1	Highways/Roads.....	35
2.3.2.2	Pipeline Rights of Way.....	35
2.3.2.3	Existing Utility Corridors	35
2.3.3	Cultural And Historic Resources	38
2.3.4	Terrain.....	39
2.3.5	Wildlife Resources.....	39
2.3.5.1	Threatened and Endangered Species	39
2.3.5.2	Amphibians.....	45
2.3.5.3	Birds	45
2.3.5.4	Fish	46
2.3.5.5	Mammals.....	46
2.3.5.6	Reptiles.....	47
2.3.6	Game Species.....	47
2.3.6.1	Birds	47
2.3.6.2	Mammals	47

2.4	Preliminary Alternative Corridor Identification	48
2.4.1	Modification of Preliminary Alternative Corridors Following the Public Informational Meetings	48
3.0	FUTURE ACTIVITIES	74
3.1	Route Identification and Comparative Analysis	75
3.2	Field Reconnaissance and Identification of Route-Specific Constraints	75
3.3	Public and Stakeholder Involvement	76
3.4	Permits and Approvals.....	76
3.5	NEPA Process.....	77
4.0	MEETINGS AND CONSULTATIONS HELD TO DATE	79
5.0	REFERENCES	81

TABLES

Table 1-1	Transmission Structure Design Components.....	3
Table 2-1	Routing Opportunities.....	13
Table 2-2	Routing Constraints	13
Table 2-3	FAA-registered Public Airfields in the Study Area	25
Table 2-4	FAA-registered Private Airstrips in the Study Area	25
Table 2-5	Federally and State-Listed Species In Kit Carson And Yuma Counties.....	40
Table 2-6	Corridor Descriptions	49
Table 3-1	Major Permits, Approvals, and Consultations for the Project	77

FIGURES

Figure 1-1	Proposed Tangent Transmission Structure	4
Figure 2-1	Study Area	9
Figure 2-2	Composite Map.....	17
Figure 2-3	Land Cover and Surface Water.....	21
Figure 2-4	Existing Infrastructure	22
Figure 2-5	Transportation and Communication Facilities.....	27
Figure 2-6	Agricultural Land.....	31
Figure 2-7	Land Jurisdiction.....	33
Figure 2-8	Existing Electrical Transmission Facilities and Terrain	37
Figure 2-9	Bald Eagle, Greater Prairie Cchicken & Great Blue Heron Habitat	41
Figure 2-10	Game Species.....	43
Figure 2-11	Corridor Additions, Expansions, and Eliminations	71
Figure 2-12	Revised Corridors	73

APPENDICES

A GIS Data Sources

ACRONYMS AND ABBREVIATIONS

AE	Alternative Evaluation
AM	amplitude modulation
APLIC	Avian Power Line Interaction Committee
ACSR	Aluminum conductor steel reinforced
CDNR	Colorado Department of Natural Resources
CDOT	Colorado Department of Transportation
CDOW	Colorado Division of Wildlife
CDPHE	Colorado Department of Public Health and Environment
CNHP	Colorado Natural Heritage Program
CPCN	Certificate of Public Convenience and Necessity
CR	County Road
DORA	Colorado Department of Regulatory Agencies
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
FM	frequency modulation
GIS	geographic information system
GNIS	Geographic Names Information System
kcmil	thousand circular mils
kV	kilovolt
MCS	Macro Corridor Study

MVA	megavolt amperes
NEPA	National Environmental Policy Act
NGO	non-governmental organization
NHPA	National Historic Preservation Act
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
NWP	Nationwide Permit (USACE)
PCA	Potential Conservation Area
Project	Burlington-Wray 230-kV Transmission Project
CPUC	Colorado Public Utilities Commission
ROW	right-of-way
RUS	Rural Utilities Service
SH	State Highway
SWA	State Wildlife Area
Tri-State	Tri-State Generation and Transmission Association, Inc.
U.S.	United States
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

This page intentionally left blank

1.0 INTRODUCTION

Tri-State Generation and Transmission Association, Inc. (Tri-State) is proposing the Burlington-Wray 230-kilovolt (kV) Transmission Project (Project), which would involve the construction of approximately 55-70 miles of a new 230-kV transmission line from the existing Burlington Substation near Burlington, Colorado, in Kit Carson County, to the existing Wray Substation near Wray, Colorado, in Yuma County. The purpose of the Project is to alleviate transmission system limitations in eastern Colorado, improve Tri-State's ability to dispatch existing generation resources in eastern Colorado, and improve Tri-State's ability to deliver energy to native load customers¹. The Project also will accommodate the integration of future electric generation resources in eastern Colorado, including renewable energy resources, through the increased capacity of the electric transmission system. Tri-State's members (K.C. Electric Association and Y-W Electric Association, Inc.) provide retail service to end-use consumers in the Study Area. The specific facts explaining the purpose of, and need for, the Project are set forth in the Alternative Evaluation (AE)² prepared for the United States Department of Agriculture Rural Utilities Service (RUS) in conjunction with this Macro Corridor Study (MCS) document as described in Section 1.2 below, as well as Tri-State's application for a Certificate of Public Convenience and Necessity (CPCN), submitted to the Colorado Department of Regulatory Agencies (DORA) – Public Utilities Commission (PUC) . Tri-State received a CPCN for the Project on January 12, 2011³.

The purpose of this Macro Corridor Study (MCS) is to identify preliminary alternative transmission line corridors for the Project. The MCS describes the process used to identify the preliminary alternative transmission line corridors, divided into four steps:

- 1) Definition of the Study Area
- 2) Data Collection and Evaluation
- 3) Opportunities and Constraints Analysis
- 4) Preliminary Alternative Corridor Identification

Each step is described in more detail in Sections 2. Section 3 describes future activities in the process, including future routing activities and compliance with the National Environmental Policy Act (NEPA).

1.1 DESCRIPTION OF TRI-STATE GENERATION AND TRANSMISSION ASSOCIATION

Tri-State Generation and Transmission Association, Inc. (Tri-State) is a wholesale electric supplier owned by the 44 member distribution systems that it serves. Tri-State is engaged in the generation, transmission,

¹ Native load customers are the wholesale and retail power customers as defined in Tri-State's Open Access Transmission Tariff, available at <http://www.oatioasis.com/TSGT>.

² The AE for this Project is available online at <http://www.tristategt.org/Transmission/Burlington-Wray.cfm> and at <http://www.rurdev.usda.gov/UWP-ea.htm>.

³ For more information on Tri-State's CPCN, enter docket number 10A-906E at the following link: https://www.dora.state.co.us/pls/efi/EFI_Search_UI.Search.

and sale of electric energy and capacity to its members throughout a 200,000-square-mile service territory across Colorado, New Mexico, Wyoming, and Nebraska. Tri-State owns interests in electric generating facilities in the states of Colorado, Wyoming, New Mexico, and Arizona, and it owns transmission facilities in the states of Colorado, New Mexico, Wyoming, and Nebraska.

Tri-State, founded in 1952 by its original member systems, today serves more than 1.4 million customers via its cooperative members in four states. Its mission is to provide its members a reliable, cost-based supply of electricity while maintaining a sound financial position through effective use of human, capital, and physical resources in accordance with cooperative principles. For more information visit <http://www.tristategt.org/>.

1.2 DESCRIPTION OF THE RURAL UTILITIES SERVICE

Tri-State is seeking funding for the Project from the RUS. RUS helps rural utilities expand and keep their infrastructure up-to-date by providing payments, grants, loans, and loan guarantees for the development and commercialization of vital utility services. RUS's programs revitalize rural communities with a variety of infrastructure improvements, and create sustainable opportunities for wealth, new jobs, and increased economic activity in rural America. RUS is a federal government entity and is required to evaluate environmental impacts of its actions pursuant to NEPA and the Council on Environmental Quality's implementing regulations (40 Code of Federal Regulations 1500-1508). RUS guidance regarding NEPA implementation requires that an MCS and AE be prepared and accepted by RUS prior to the start of the official NEPA process.

1.3 PROJECT DESCRIPTION

The Project will consist of the construction of a new single-circuit 230-kV electric transmission line between the existing Burlington and Wray Substations, both of which are owned by Tri-State. The Project will install a 230-kV transmission line that is approximately 55-70 miles long through eastern Colorado, and will be electrically parallel to the existing Burlington – Bonny Creek – South Fork – Idalia – Vernon Tap – Wray 115-kV transmission line. The Project will be constructed using a single 1272 thousand circular mils (kcmil) ACSR conductor per phase with a maximum operating temperature of 100° Celsius. In addition, the project will require the installation of an overhead fiber optic wire that will be used for internal Tri-State communication needs. Upgrades in the form of new 230-kV equipment will also be required at the existing Burlington and Wray Substations to support the line.

As described in more detail in the AE, the existing 115-kV line is currently a weak link in Tri-State's eastern Colorado transmission system, and the 120 megavolt amperes (MVA) thermal limit of the existing Burlington-Wray 115-kV line limits the operation of the existing generation in the region. The capacity across the line also limits the ability to deliver energy to serve the electrical demand in the region. This existing line could be up-rated from 120 MVA to 140 MVA to improve the load-serving capabilities, by correcting certain terminal equipment limitations, but this would not be sufficient to address the existing generation operation limitations and load serving capacity deficiencies. By adding the proposed Project, Tri-State will be able to correct these transmission deficiencies, and also accommodate the integration of

potential new renewable generation resources in the region. This Project is required to eliminate the existing limits to the operation of electrical generation in this service area and to provide reliable future load serving capability for Tri-State’s member loads in eastern and southern Colorado, while also allowing for the addition of future generation resources. This Project is planned to begin construction in 2014, and expected to be completed in the fourth quarter of 2015, with an in-service date in late 2015.

1.3.1 Right-of Way Considerations

The new transmission line is proposed to be constructed with a right-of-way (ROW) 150 feet in width. Tri-State representatives will work with the landowners along the selected route to obtain the necessary land rights to allow access for surveying, construction, operation, and maintenance of the new transmission line. All ROW will be obtained by securing easements from the underlying landowner.

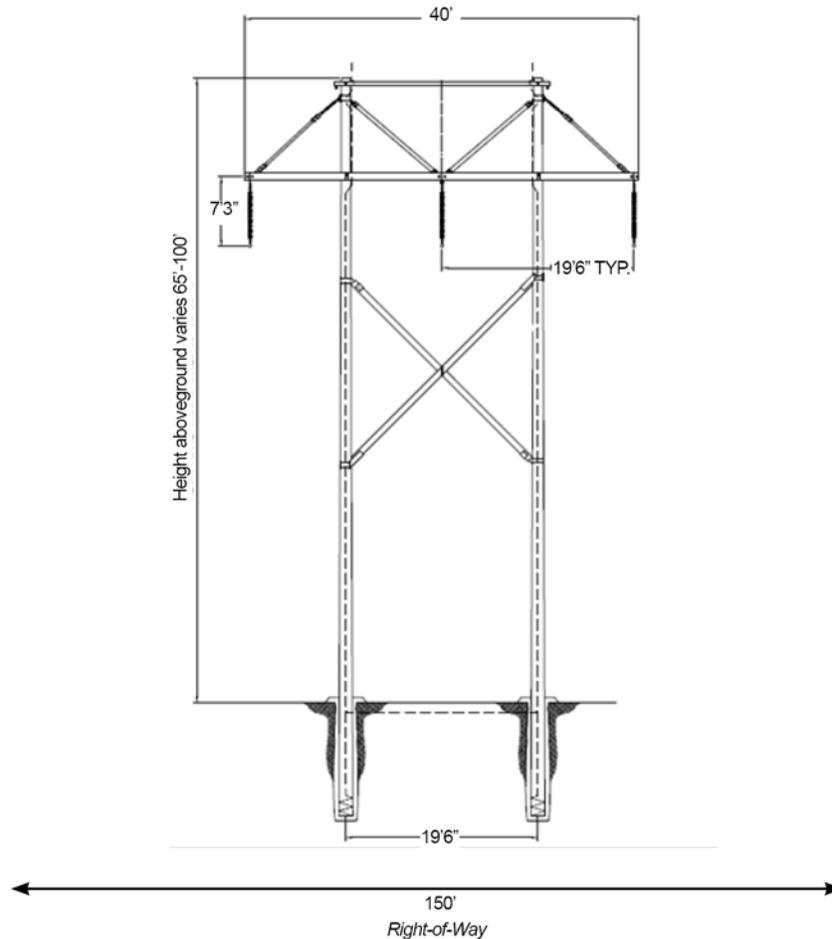
1.3.2 Proposed Structures

The typical design characteristics for the transmission structures proposed to be used for the new transmission line are listed in Table 1-1. A diagram of the proposed tangent transmission structure is presented in Figure 1-1. The tangent structure will comprise the vast majority of structures used in the line.

TABLE 1-1 TRANSMISSION STRUCTURE DESIGN COMPONENTS

Design Component	Wooden H-Frame Structures
ROW Width	150 feet
Distance Between Structures	600-1,100 feet
Aboveground Structure Height	65-100 feet
Number of Structures per Mile	6-9
Ground Clearance Beneath Conductor at Maximum Operating Conditions	28 feet

FIGURE 1-1 PROPOSED TANGENT TRANSMISSION STRUCTURE



A variety of H-Frame structures will be used, and they are typical, single circuit designs used at this voltage by Tri-State and other utilities in the region. These are low profile structures that are well-suited for single-circuit transmission lines that traverse open country and can accommodate midrange span lengths. The most common structure will be the H-frame (two poles) tangent structure depicted in Figure 1-1, but where the line changes direction or tensions, angle or dead-end structures will be used. These structures will typically have three poles, and will be supported by multiple guys. Additional types or special structures may be used as required.

The phase conductor will be placed in a horizontal configuration and two wires will be placed on the top of the structure to protect the transmission line from lightning strikes. One of the upper wires will be an overhead ground wire consisting of a minimum 3/8" high strength stranded steel wire. The other wire will be an optical ground wire containing 48 fibers and may be slightly larger than the overhead ground wire. The ground wire and the fiber optic wire will be designed so as to have similar sag characteristics under a specific loading condition. Because of the differing characteristics of the two upper wires, it is not possible to match the sag under all conditions, but the sag differential will be minor so as not to be

visibly intrusive. Tri-State uses the fiber optic cables for system reliability purposes including system protection, operations, and communications functions.

This page intentionally left blank.

2.0 MACRO CORRIDOR STUDY

The purpose of the MCS is to identify potential preliminary transmission line corridors between the existing Burlington Substation in Kit Carson County, Colorado and the existing Wray Substation in Yuma County, Colorado. These preliminary alternative corridors are an initial step in the process to identify a preferred route and alternative routes for the transmission line by maximizing routing opportunities and minimizing impacts to routing constraints. The sections below summarize the process that was used to identify preliminary alternative transmission line corridors.

For the Burlington-Wray 230-kV Transmission Project, four distinct steps were followed:

- 1) Definition of the Study Area
- 2) Data Collection and Evaluation
- 3) Opportunities and Constraints Analysis
- 4) Preliminary Alternative Corridor Identification

In addition, future activities (Route Identification and Comparative Analysis, Field Reconnaissance and Identification of Route-Specific Constraints, Public and Stakeholder Involvement, Permit Application, and NEPA compliance) are briefly outlined in Section 3.0.

Below is a list of common terms used throughout this report.

Study Area – the broad area analyzed for routing opportunities for the transmission line between the Burlington and Wray Substations.

Corridor – a strip of land identified within a Study Area which has the potential of being used for a portion of the line route based upon an evaluation of land uses and resources. Multiple potential corridors are identified to maximize routing options. Corridors often represent short portions of potential line routes and intersect with other potential corridors. Corridors were generally 1-mile-wide during preliminary planning.

Route – A complete path from one endpoint of a proposed transmission line to the other endpoint. Routes are composed of several line segments and the total route will begin and end at the identified substation dead end structures.

Line Segment – a portion of the route that has been defined within a certain corridor. The start and end points of a line segment are intersections (nodes) with other line segments within one or more corridors (at substations).

2.1 DEFINITION OF THE STUDY AREA

The first step of the MCS involved identifying the geographic area in which the new transmission line would be located. The extent of a study area is determined primarily by the location of the endpoints of the project and a reasonable area around those endpoints within which to identify feasible transmission line routes.

The Burlington-Wray 230-kV Transmission Project Study Area was delineated based on the proposed interconnections at the existing Burlington and Wray Substations, which are owned and operated by Tri-State. The boundaries of the Study Area are influenced by the location of the existing substations, the engineering constraints for a line to enter or exit the substations, other existing ROW (i.e., associated with roads, highways, pipelines, existing or planned transmission lines, canals, etc.), and existing political and geographic boundaries. The objective in defining a Study Area is to limit the identification of alternative corridors to an area that would be feasible for construction of a transmission line relative to the length of line and cost of construction, and to identify an area large enough to provide the opportunity to identify alternative corridors that avoid constraints and minimize potential impacts.

The Project Study Area is generally defined as an area 18 miles in width (east to west) between these two substations in portions of Kit Carson and Yuma Counties. Figure 2-1 depicts the Project Study Area.

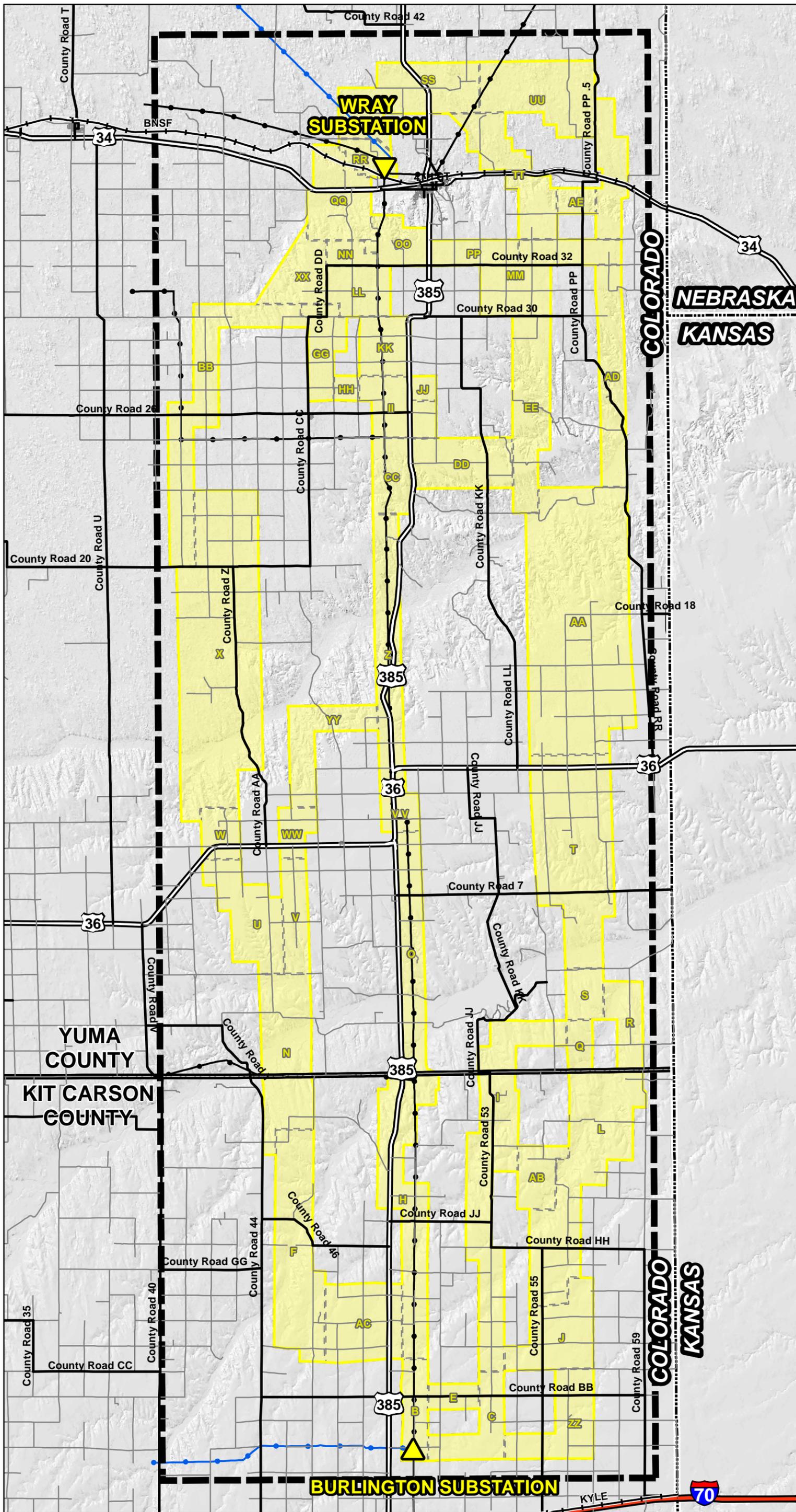


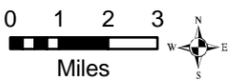
Figure 2-1

Study Area

Legend

- Study Area
- Preliminary Corridor*
- Wray Substation (End Point)
- Burlington Substation (End Point)
- Existing 115 kV Transmission Line
- Existing 230 kV Transmission Line
- Transportation**
- Interstate Highway
- U.S. Highway
- Major Roads
- Local Roads
- Railroads
- State Line
- County Line

1 inch = 19,800 feet

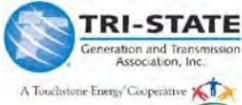


1 inch = 3.75 miles

***Note:**
Preliminary Corridors are typically one mile wide or greater, are not fixed, and may be adjusted, removed, or added during subsequent phases of the project.

Sources:
CDOT - Highways, Major and Local Roads, Railroads, Municipal Limits
USGS - Elevation

Acronyms:
BNSF: Burlington Northern Santa Fe
CDOT: Colorado Department of Transportation
USGS: United States Geological Survey



This page left intentionally blank.

2.2 DATA COLLECTION AND EVALUATION

The second step of the MCS involved collecting resource data within the Study Area from relevant management agencies and state and local governments. Resource data obtained from municipalities, counties, state and federal agencies, and utilities were used to prepare geographic information system (GIS) based resource maps in the following categories:

- Land Cover and Surface Water
- Land Use and Jurisdiction
- Existing Linear Transportation and Utility Corridors
- Cultural and Historic Resources
- Biological Resources

Appendix A presents a list of GIS data resources. All data collected reflect information readily available from the resource and local, state, and federal agencies. No new field data were collected as part of the MCS. The resource data were mapped in GIS format and combined with aerial photography of the Study Area to identify suitable areas for routing the new transmission line. As described below, each resource was categorized as an opportunity (suitable area), an avoidance area, or an exclusion area. The opportunities were further categorized as greater opportunity (such as existing linear features, including roads, transmission corridors, railroads), opportunity (such compatible land uses, including rangeland and open land), and lower opportunity to reflect the potential the specific feature in the specific geographic setting (areas where specific constraints are absent, such as cropland). The following sections describe in more detail each set of resource data that was collected as part of this analysis.

2.3 OPPORTUNITIES AND CONSTRAINTS ANALYSIS

For this Project, opportunities were identified as existing linear facilities or physical features providing suitable routing possibilities. These opportunities are generally characterized by the potential to be adjacent to an existing ROW or linear corridor. Examples of opportunities include existing transmission lines, other utility corridors, transportation corridors, compatible land uses, and other linear features such as property lines.

Constraints are resources, features, or land uses that present unfavorable attributes for locating and constructing a transmission line. Constraints include factors that would negatively affect site access, affect design or construction, or add additional licensing/permitting requirements. Routing constraints include items such as habitable structures, hospitals, schools, and sensitive areas such as wetlands, protected species' habitat, and cultural resources.

Once resource data were collected (as described in Section 2.2), a GIS model was created to illustrate those areas within the Study Area identified as opportunities, avoidance areas, and exclusion areas. Avoidance areas include sensitive areas that are likely to incur environmental impacts or result in land use conflicts if directly affected by the Project. It is preferable to avoid these areas if opportunity areas are available elsewhere. If a sensitive area cannot be completely avoided, impacts can be minimized through route refinement, careful placement of the transmission structures and access roads, seasonal restrictions

and other mitigation measures. Exclusion areas include locations with the highest level of sensitivity, including those areas with regulatory or legislative designations or extreme physical constraints not compatible with transmission line construction and/or operation. In general, locating a transmission line in these areas could result in increased environmental impacts, significantly higher costs, and/or additional regulatory approvals. Tables 2-1 and 2-2 summarize the routing opportunity and constraint criteria, respectively, that were developed for the Project. Figure 2-2 depicts a composite map of the opportunities and constraints identified in the Project Study area.

Major constraints within the Study Area included: 1) the Bonny Lake State Park and adjacent recreation area; 2) the Natural Resources Conservation Service (NRCS) designated wetland preservation area east of Wray; 3) the Wray Municipal Airport; 4) State Wildlife Areas (SWA), 5) the existing wind energy facility near Burlington; 6) areas with a high density of traveling irrigation systems; and 7) areas with a high density of oil and gas development.

The following subsections describe the resources evaluated as part of the opportunities and constraints analysis.

TABLE 2-1 ROUTING OPPORTUNITIES

Resource	Opportunity Area (Optimize Use for Routing)
Existing Transmission Lines	Within 0.25 miles of existing transmission line corridors (69-kV and above)
Compatible Land Uses	Open land or rangeland, along edges of fields; federal or state land with existing disturbance and otherwise compatible use; designated energy corridors
Roads (interstate, state, county)	Parallel to and within 0.25 miles of road, but not within road ROW
Railroads	Parallel to and within 0.25 miles of railway, but not on railroad ROW
Canals/Ditches	Parallel to and within 100 feet of a canal or ditch

TABLE 2-2 ROUTING CONSTRAINTS

Type of Constraint	Avoidance Area	Exclusion Area
Land Use and Jurisdiction		
Land cover and surface water	Developed, medium intensity; developed, high intensity; within boundary of emergent and woody wetlands; within 660 feet of perennial waterways and lakes; within floodplain	Open water; within 100 feet of perennial waterways, springs and lakes
Residences (identified at this time only as Existing Structures)	500 feet	100 feet
Cemeteries	250 feet	Within boundary
Commercial businesses*	250 feet	100 feet
Churches	500 feet	100 feet
Hospitals, nursing homes	1,320 feet (0.25 mile)	100 feet
Schools, kindergartens, nurseries (including registered day care facilities)	1,320 feet (0.25 mile)	100 feet
Municipal boundaries	Within incorporated or unincorporated municipal boundaries	---
Private airstrips	---	5,000 feet or within FAA prescribed boundaries described

Type of Constraint	Avoidance Area	Exclusion Area
		in 14 CFR 77
FAA-registered airports	10,000 feet	7,000 feet or within FAA prescribed boundaries described in 14 CFR 77
Heliports	---	2,000 feet
Directional beacon [such as those used by the Federal Aviation Administration (FAA)]	---	1,320 feet (0.25 mile)
Radio transmitters	AM – 1,000 feet, FM – 500 feet	150 feet
Television transmitters	---	500 feet
Communication towers	Within 150 feet of Federal Communications Commission (FCC) structure	Within 50 feet of FCC structure
Cell phone towers	---	75 feet
Oil and gas wells	---	Generally, 75 feet from the transmission line centerline. All oil and gas facilities should be outside the transmission line ROW.
Wind energy turbines	---	Generally, 75 feet from the transmission line centerline. All turbines should be outside the transmission line ROW.
Federally designated lands not compatible with transmission lines – NRCS, Wetland Reserve Program		Within boundary
State Lands not compatible with transmission lines - State Parks, State Wildlife Area	Within boundaries of State Wildlife Areas	Within boundary of State Parks
Municipal boundaries	Within incorporated or unincorporated municipal boundaries	
Agricultural Land		
Cropland	Farmland of statewide	Within mechanical

Type of Constraint	Avoidance Area	Exclusion Area
	importance	irrigation footprint
Animal feed lots	---	100 feet
Historic and Archaeological Sites		
Recorded prehistoric/historical and archeological Sites	1,000 feet	100 feet
Sites listed on the National Register of Historic Places-listed or determined eligible for listing	1,000 feet	100 feet
Publicly-mapped historic cemeteries*	1,000 feet	100 feet
State historic markers*	1,000 feet	100 feet
Areas of high and moderate prehistoric and historic site potential*	1,000 feet	100 feet
Biological Resources		
Greater prairie chicken production areas	Within boundary of production area	---
Raptor habitat	---	Within 0.25 miles of known active nests for most raptors [Colorado Division of Wildlife (CDOW) 2008].
Bald eagle habitat	---	Within 0.5 mile of active nests, active winter night roosts. Also hunting perches are determined site specifically (CDOW 2008).
Burrowing owl habitat	---	150 feet from March 15 to October 31. Also efforts to eradicate prairie dogs should occur outside this time period (CDOW 2008).
Great blue heron habitat	Nesting area	---
Geology and Soils		
Slopes	Areas with greater than 15 percent slope	---

*None currently identified

**Determination of structure type (i.e., house, barn, commercial businesses, garage, etc) has not been conducted yet

This page intentionally left blank.

Figure 2-2

Composite Map With Corridors

Legend

-  Study Area
-  Preliminary Corridor*
-  Wray Substation (End Point)
-  Burlington Substation (End Point)
-  Interstate Highway
-  U.S. Highway
-  State Line
-  County Line
-  Existing 115 kV Transmission Line
-  Existing 230 kV Transmission Line
-  Transmission Line

- Opportunities & Constraints**
-  Exclusion Area
 -  Avoidance Area
 -  Lesser Opportunity Area
 -  Opportunity Area
 -  Greater Opportunity Area

1 inch = 3.75 miles
 1 inch = 19,800 feet



Miles

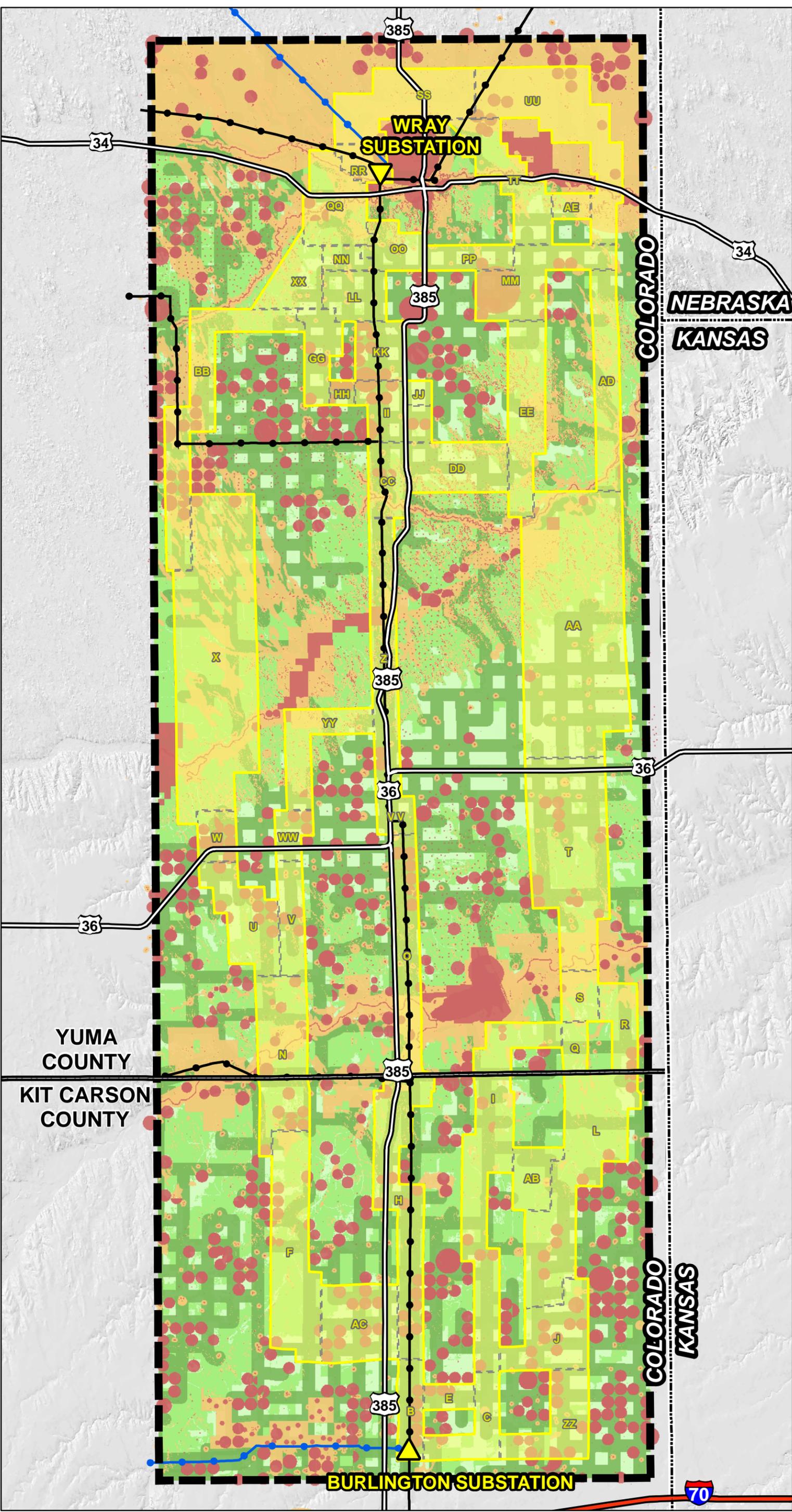
*Note:
 Preliminary Corridors are typically one mile wide or greater, are not fixed, and may be adjusted, removed, or added during subsequent phases of the project.

Sources:

- CDOT** Highways, Major and Local Roads, Railroads, Municipal Limits
- CDOW** Bonny Lake State Park, Managed Land, State Wildlife Areas
- ESRI** Hillshade, Elevation
- FAA** Air Facilities
- NDIS** Species Habitats
- NRCS** Wetland Reserve Program Lands
- SLB** Surface Ownership, State Land Trust
- USGS** Hydrology, Populated Places, Elevation, Topographic Features

Acronyms:

- CDOT:** Colorado Department of Transportation
- CDOW:** Colorado Department of Wildlife
- FAA:** Federal Aviation Administration
- NDIS:** Natural Diversity Information Source
- NRCS:** Natural Resources Conservation Service
- SLB:** State Land Board
- USGS:** United States Geological Survey



This page intentionally left blank.

2.3.1 Land Use and Jurisdiction

2.3.1.1 Land Cover and Surface Water

Land cover describes general land use categories rather than specific designations. Figure 2-3 Land Cover and Surface Water depicts the land cover information that was obtained and the locations of the major waterways within the Study Area. Land use and land cover data were obtained from the USGS-National Land Cover Dataset (USGS-NLCD 2000).

Data on streams, creeks, rivers, canals, and ditches were collected from the USGS – National Hydrographic Dataset and the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) (USGS 2011a). Wetlands typically support distinct communities of vegetative and wildlife species, along with providing flood control, sediment stabilization, erosion control, nutrient removal, groundwater recharge, and other important functions. The majority of NWI-mapped wetlands in the Study Area are small open water ponds, agricultural ponds, and other depression wetlands. The remaining vegetated wetlands are narrow riparian areas associated with ephemeral or perennial streams, which have areas of riparian plant species, but do not generally contain continuous wetland areas along the entire length of the channels. Figure 2-3 depicts the locations of the major waterways and wetland areas within the Study Area.

Generally, wetlands and surface waters can be avoided through careful pole placement and spanning the transmission line across wetland areas, as the maximum distance that can be spanned for the type of structures proposed for this Project is approximately 1,100 feet. Greater spans may be obtained by use of different types of materials and/or structures. To prevent construction-related disturbance, such as erosion, sedimentation, and potential water quality impacts, areas within 100 feet of lakes and perennial streams were considered exclusion areas, and areas within 660 feet (1/8 mile) of these features will be avoided to the extent feasible during routing. In addition, structure placement within wetland areas will be avoided when possible. Identification of the preferred and alternative corridors will avoid impact to wetlands to the extent feasible, and the corridors are sufficiently wide to allow for avoidance when more detailed routing occurs. If a significant amount of wetlands would be affected by the final line routing, wetlands surveys will be conducted prior to construction so that the transmission line can be routed to minimize impacts to these resources.

2.3.1.2 Residential Areas

Structures identified on the aerial photography were digitized to aid in the routing of the transmission line. This information is depicted on Figure 2-4, Existing Infrastructure. The aerial photography used for this analysis is the most recent photography available from the National Imagery Program administered by the NRCS. Since field reconnaissance has not been conducted at this time, Figure 2-4 depicts structures, and does not differentiate between types of structures (residences, barns, sheds, abandoned, etc). Information concerning these structures will be developed further in the future, using visual verification of the status. Areas within 100 feet of an occupied residence are designated as exclusion areas, and areas within 500 feet of an occupied residence will be avoided during routing whenever

possible. Although some residences are located within an identified corridor, generally the width of the identified corridors should allow for flexibility and avoidance of residences during more detailed routing.

2.3.1.3 *Schools, Hospitals, Nursing Homes, Churches, Cemeteries, Commercial Businesses*

The Colorado Department of Public Health and Environment (CDPHE) provided GIS data on the location of schools, hospitals, and nursing homes (CDPHE 2011). Data on school and church locations were obtained from USGS “Seamless” GIS dataset (USGS 2011b). The locations of cemeteries were determined from the USGS geonames database and the Colorado Genealogy and History web site (Colorado GenWeb 2011). The locations of these facilities are depicted in Figure 2-4, Existing Infrastructure. The areas within 100 feet of each facility are designated as an exclusion area, and areas within 0.25 mile of the hospitals, nursing homes and schools are designated as avoidance areas. Churches were assigned an avoidance area of 500 feet and commercial businesses were assigned a 250 foot avoidance area.

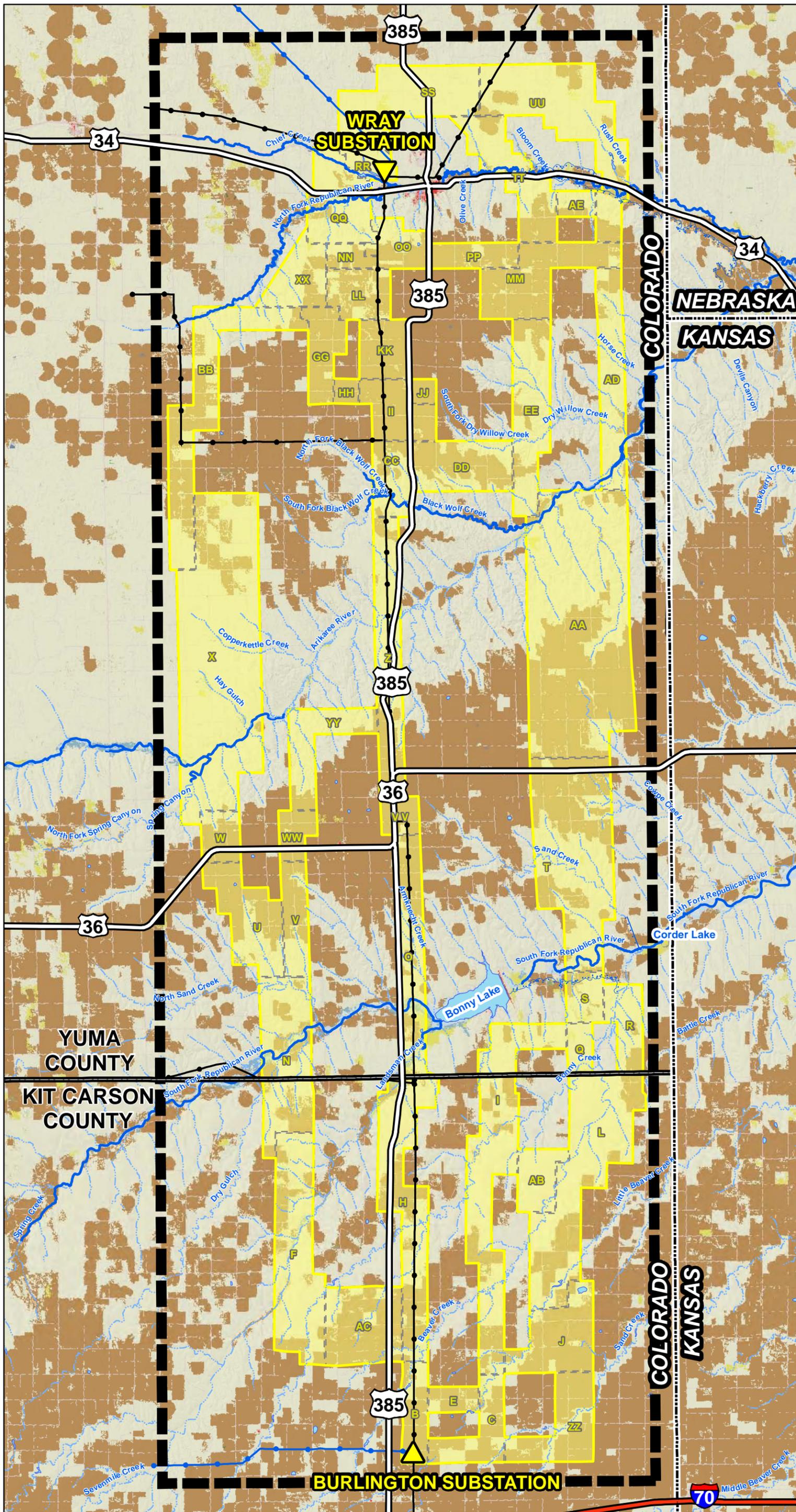


Figure 2-3

Land Cover & Surface Water

Legend

- Study Area
- Preliminary Corridor*
- Wray Substation (End Point)
- Burlington Substation (End Point)
- Existing 115 kV Transmission Line
- Existing 230 kV Transmission Line
- Interstate Highway
- U.S. Highway
- Major Roads
- Surface Water**
- Canal / Ditch
- Intermittent Stream
- Perennial Stream/River
- Lake/Reservoir
- Land Cover**
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, High Intensity
- Barren Land
- Deciduous Forest
- Evergreen Forest
- Shrub/Scrub
- Grassland/Herbaceous
- Pasture/Hay
- Cultivated Crops
- Woody Wetland
- Emergent Herbaceous Wetlands
- State Line
- County Line

0 1 2 Miles
 1 in = 3.75 miles

***Note:**
 Preliminary Corridors are typically one mile wide or greater, are NOT fixed, and may be adjusted, removed, or added during subsequent phases of the project.

Sources:
 CDOT - Highways, Major Roads
 USGS - Elevation, Land Cover, Hydrography

Acronyms:
 CDOT: Colorado Department of Transportation
 USGS: United States Geological Survey



This page left intentionally blank.

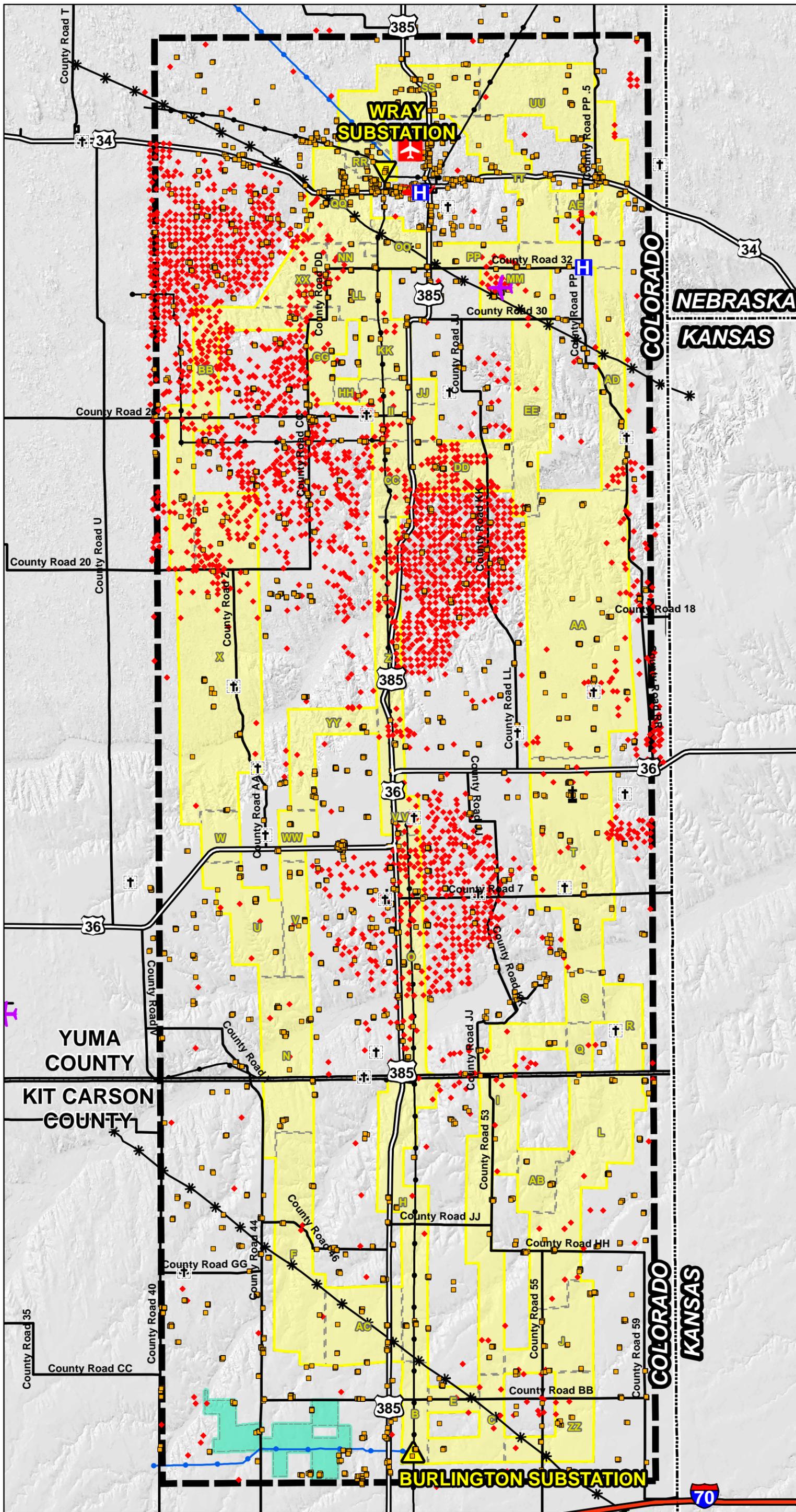


Figure 2-4

Existing Infrastructure

Legend

- Study Area
 - Preliminary Corridor*
 - Wray Substation (End Point)
 - Burlington Substation (End Point)
 - Existing 115 kV Transmission Line
 - Existing 230 kV Transmission Line
 - Existing Pipeline
 - Interstate Highway
 - U.S. Highway
 - Major Roads
 - State Line
 - County Line
 - Existing Infrastructure**
 - Cemetery
 - School
 - Church
 - Health Care Facility
 - Private Airstrip
 - Public Airport
 - Private Heliport
 - Structure
 - Oil Well
 - Existing Wind Farm
- 0 1 2 3 4
 Miles
 1 in = 3.75 miles

***Note:**
 Preliminary Corridors are typically one mile wide or greater, are not fixed, and may be adjusted, removed, or added during subsequent phases of the project.

Sources:
 CDOT - Highways, Major Roads
 CDPHE - Health Care Facilities
 COGEN - Cemeteries
 FAA - Air Facilities
 OGCC - Oil Wells
 USGS - Schools, Churches, Cemeteries, Elevation

Acronyms:
 CDOT: Colorado Department of Transportation
 CDPHE: Colorado Department of Public Health and Environment
 COGEN: Colorado Genealogy Web Project
 FAA: Federal Aviation Administration
 OGCC: Oil and Gas Conservation Commission
 USGS: United States Geological Survey



This page left intentionally blank.

2.3.1.4 Aviation Facilities

Information on airports was obtained from the FAA (FAA 2011). The FAA regulates the proximity of tall structures to approach and departure zones associated with airport runways. The runway glide-paths out to 10,000 feet of a public airport and 5,000 feet of a private airport were therefore excluded from potential locations for the Project to maintain ample clearance for aircraft. The only exception to this is near the Wray Municipal Airport where an existing transmission line already exists within 10,000 feet of the runway. In this area, the terrain where the transmission line is located is lower than the runway, allowing this area to be available for transmission lines and therefore, this area was not marked as an exclusion area. Table 2-3 summarizes information about the one FAA-registered public airfield in the Study Area.

TABLE 2-3 FAA-REGISTERED PUBLIC AIRFIELDS IN THE STUDY AREA

Name	Wray Municipal
Latitude	40°06'01"N
Longitude	102°14'27"W
Runway Length	5400 feet
Elevation	3667 feet

In addition to the public airfield, there is one FAA-registered private airstrip in the Study Area. Information regarding this airport is summarized in Table 2-4.

TABLE 2-4 FAA REGISTERED PRIVATE AIRSTRIPS IN THE STUDY AREA

<i>Name</i>	<i>Whomble Airstrip #1</i>
Latitude	40°01'17"N
Longitude	102°10'30"W
Runway Length	2100 feet (est.)
Elevation	3700 feet

The only heliport identified within the Study Area is at the Wray Community District Hospital. There is an indication on the USGS topography map that an airstrip once existed northwest of the Bonny Lake

Dam. Current aerial photos indicate that a small structure is present at the northwest end of the area; however, this area does not appear to be an active airstrip.

The Kit Carson County Airport, Hildebrandt, and Aviation Acres, (all near Burlington, Colorado) and Idler Brothers Airport (Idlers Field) near Kirk, Colorado, are all located outside the Study Area boundary. Figure 2-5, Transportation and Communication depicts the locations of aviation facilities in the Study Area.

2.3.1.5 *Communication and Radio Towers*

The Federal Communications Commission (FCC) provided the locations of communication facilities within the Study Area. Communication facilities include television transmission towers, microwave towers, AM/FM radio towers, paging towers, and cellular telephone towers (FCC 2011).

Table 2-2 summarizes the avoidance and exclusion distances around the various types of television, radio, and communication towers in the Study Area. The locations of existing communication towers that have been identified are depicted on Figure 2-5, Transportation and Communication.

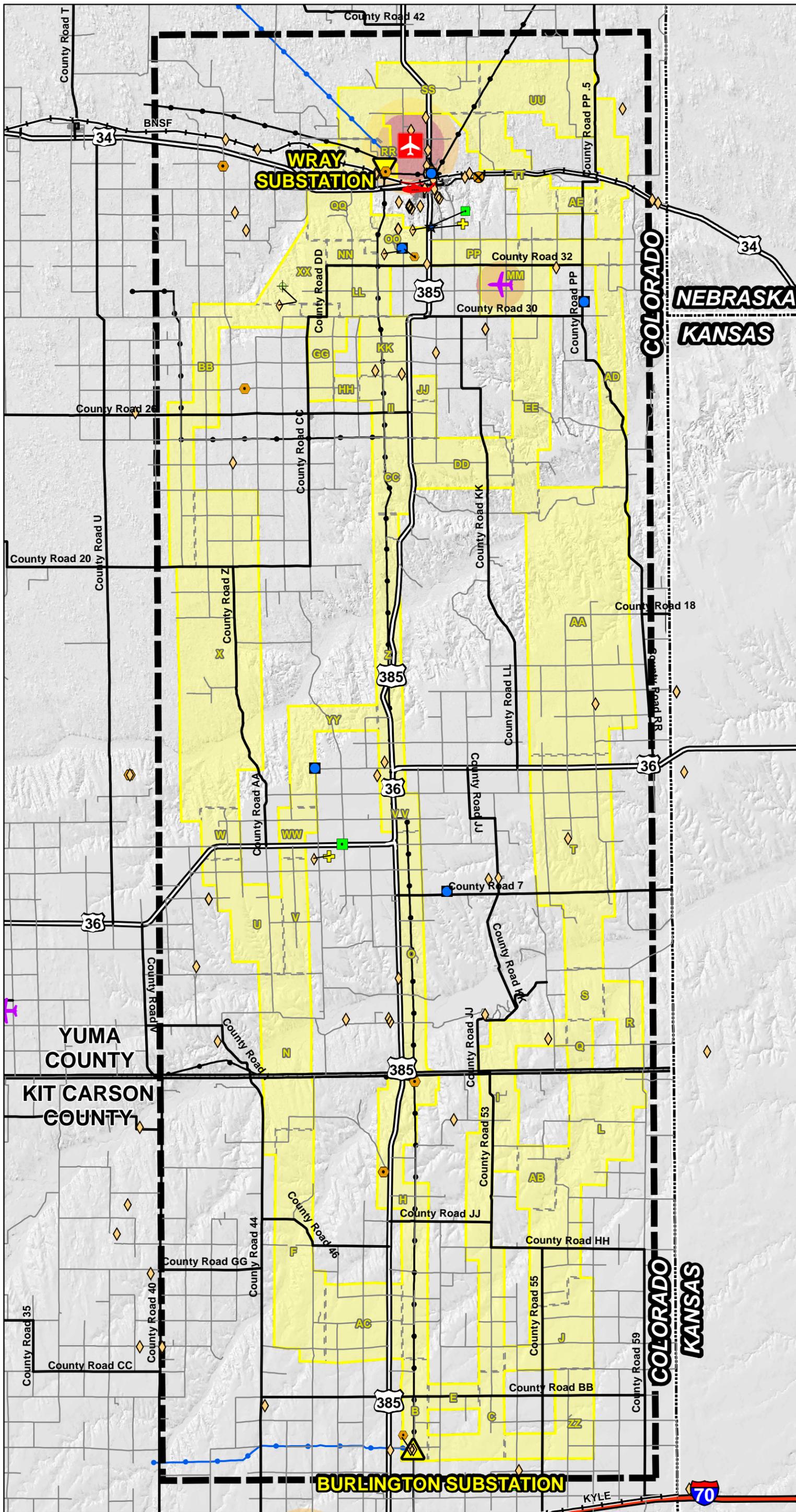


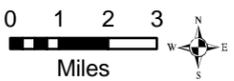
Figure 2-5

Transportation & Communication

Legend

- Study Area
- Preliminary Corridor*
- Wray Substation (End Point)
- Burlington Substation (End Point)
- Existing 115 kV Transmission Line
- Existing 230 kV Transmission Line
- Interstate Highway
- U.S. Highway
- Major Roads
- Local Roads
- Railroads
- Private Airstrip with Exclusion/Avoidance Buffer
- Public Airport with Exclusion/Avoidance Buffer
- Private Heliport with Exclusion Area Buffer
- Communications Towers**
- AM
- FM
- Cellular
- BRS/EBS
- Land Mobile Private
- Land Mobile Commercial
- Microwave
- TV - NTSC
- State Line
- County Line

1 inch = 19,800 feet



1 inch = 3.75 miles

***Note:**
Preliminary Corridors are typically one mile wide or greater, are not fixed, and may be adjusted, removed, or added during subsequent phases of the project.

Sources:
CDOT - Highways, Major and Local Roads Railroads, Municipal Limits
FCC - Towers/Antennae
FAA - Air Facilities
USGS - Elevation

Acronyms:
BNSF: Burlington Northern Santa Fe
BRS-EBS: Broadband Radio Service - Educational Broadband Service
CDOT: Colorado Department of Transportation
FAA: Federal Aviation Administration
NTSC: National Television System Committee
USGS: United States Geological Survey



This page left intentionally blank.

2.3.1.6 Oil and Gas Development Infrastructure

Data concerning the locations of oil and gas wells were obtained from the Colorado Oil and Gas Conservation Commission (2011). Oil and gas well sites occur over much of the Study Area. Publicly available oil and gas well locations are depicted in Figure 2-4. Well head compressors may be utilized on some well pads to assist with natural gas recovery. There are no publicly available GIS data available for pipeline compressor stations or natural gas treatment facilities within the Study Area. Areas within 75 feet of a well pad boundary or compressor station are exclusion areas.

2.3.1.7 Wind Energy Facilities

An existing wind farm development west of Burlington is identified on Figure 2-4. The boundary of the development was provided by the wind energy developer. The transmission line will be sited so that no existing wind turbines will occur within the transmission line ROW.

2.3.1.8 Agricultural Land

Agriculture is an important segment of the economy throughout the Study Area and eastern Colorado, and includes rangeland/pasture and cropland. Cropland is largely present along river corridors in the Study Area, and some land in this area is mechanically irrigated by commercial radial/pivotal or lateral movement watering systems. The irrigation pivots depicted were digitized from aerial photographs taken in 2011. Data regarding regions of prime farmland were obtained from the NRCS (2011). Figure 2-6, Agricultural Land Map, depicts the farmland of statewide importance, irrigated cropland, and the areas with soils that are considered prime farmland if irrigated.

Agricultural areas with center pivot irrigation were excluded to the extent feasible. Transmission lines can be routed along the edges of irrigated fields if necessary.

2.3.1.9 Recreation Areas

There is one major recreation area in the Study Area, Bonny Lake State Park. The park itself is an excluded area not considered for siting the new transmission line.

2.3.1.10 State Wildlife Areas

There are four designated SWAs in the Study Area, as depicted on Figure 2-7, Land Jurisdiction: Sandsage SWA, Stalker Lake SWA, Simmons SWA, South Republican SWA, and Willow Creek SWA. These areas provide wildlife recreation opportunities, such as deer hunting and fishing. These areas are avoidance areas for siting the new transmission line.

2.3.1.11 Wetland Reserve Program Areas (Federal)

There is only one parcel of Federal land in the Study Area, a NRCS Wetland Reserve Program parcel east of Wray. This NRCS land is depicted on Figure 2-7, Land Jurisdiction. This area is an excluded area not considered for siting the new transmission line.

This page left intentionally blank.

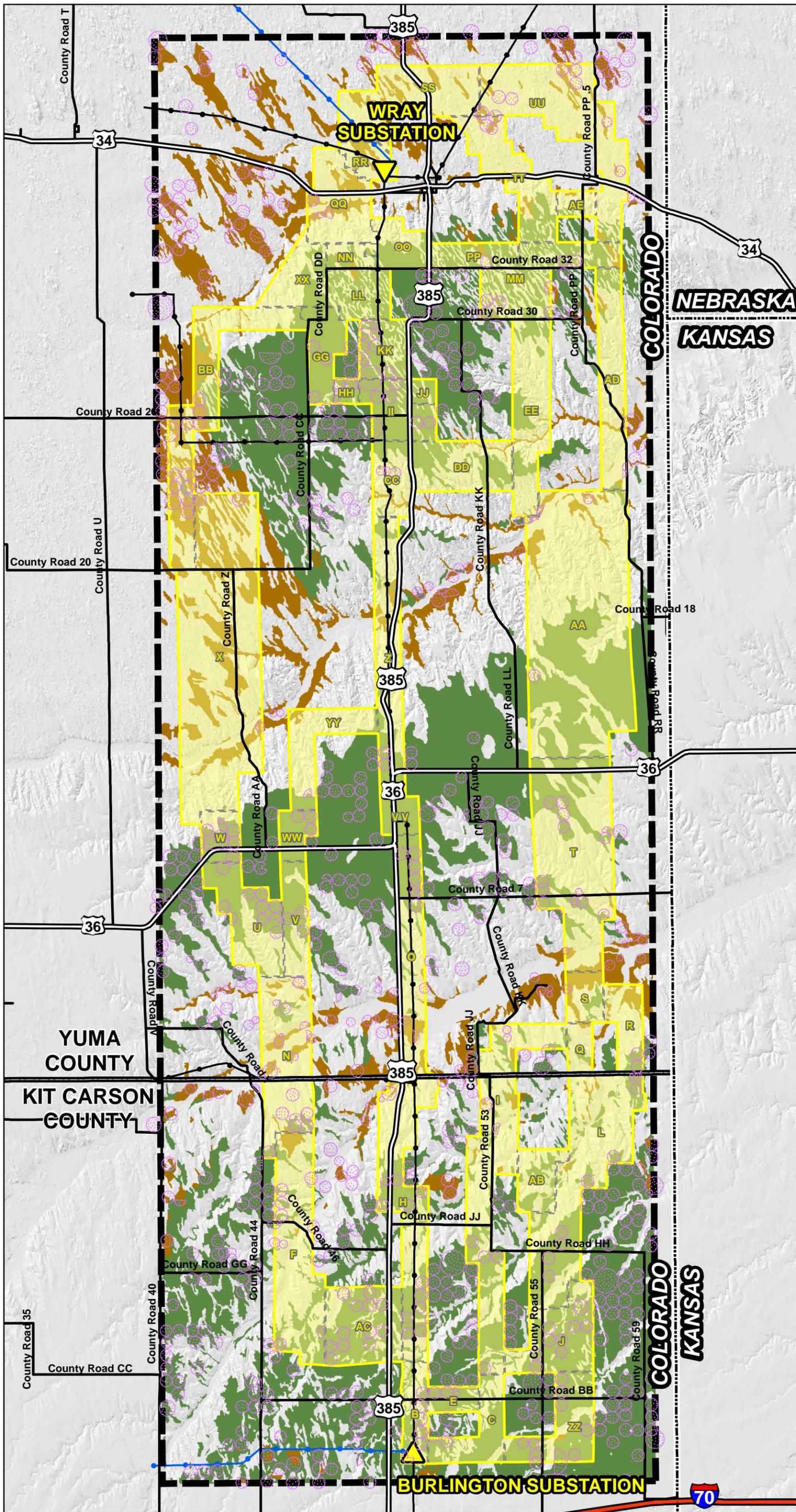


Figure 2-6

Agricultural Land

Legend

- Study Area
- Preliminary Corridor*
- Wray Substation (End Point)
- Burlington Substation (End Point)

- Existing 115 kV Transmission Line
- Existing 230 kV Transmission Line
- Interstate Highway
- U.S. Highway
- Major Roads
- State Line
- County Line

Farmland

- Farmland of statewide importance
- Prime farmland if irrigated
- Irrigated Cropland



1 in = 3.75 miles

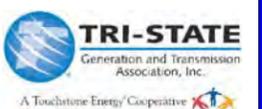
***Note:**
Preliminary Corridors are typically one mile wide or greater, are not fixed, and may be adjusted, removed, or added during subsequent phases of the project.

Sources:

- CDOT - Highways, Major Roads, Municipal Bounds
- NRCS - Soils
- USGS - Elevation

Acronyms:

- CDOT: Colorado Department of Transportation
- NRCS: Natural Resources Conservation Service
- USGS: United States Geological Survey



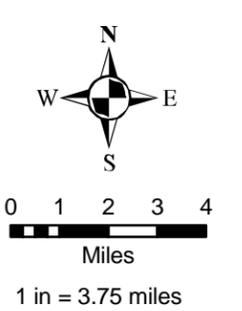
This page left intentionally blank.

Figure 2-7

Land Jurisdiction & Historic Resources

Legend

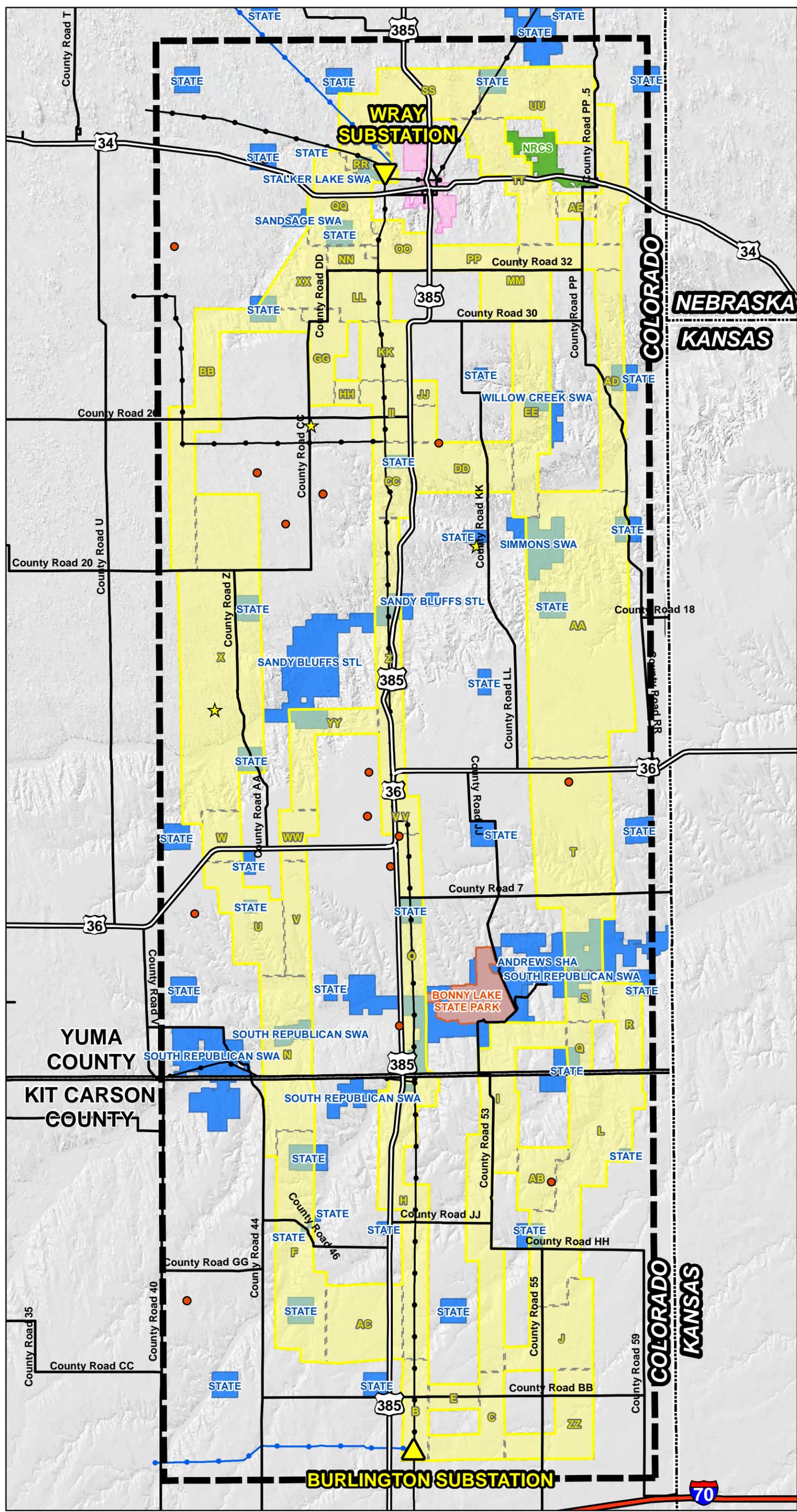
-  Study Area
-  Preliminary Corridor*
-  Wray Substation (End Point)
-  Burlington Substation (End Point)
-  Existing 115 kV Transmission Line
-  Existing 230 kV Transmission Line
-  Interstate Highway
-  U.S. Highway
-  Major Roads
-  State Line
-  County Line
-  NRHP or State Listed Sites
-  Other Historic Sites
- Land Jurisdiction**
-  NRCS (WRP)
-  Bonny Lake State Park
-  State Land
-  Municipal Bounds



***Note:**
Preliminary Corridors are typically one mile wide or greater, are not fixed, and may be adjusted, removed, or added during subsequent phases of the project.

Sources:
 CDOT - Highways, Major Roads, Municipal Bounds
 CDOW - Bonny Lake State Park, State Wildlife Areas
 NRCS - Wetland Reserve Program Lands
 SLB - Surface Ownership, State Land Trust

Acronyms:
 CDOT: Colorado Department of Transportation
 CDOW: Colorado Department of Wildlife
 NRCS: Natural Resources Conservation Service
 NRHP: National Register of Historic Places
 SHA: State Habitat Area
 SLB: State Land Board
 STL: State Trust Land
 SWA: State Wildlife Area
 WRP: Wetland Reserve Program



This page left intentionally blank.

2.3.1.12 *Municipal Boundaries*

Areas within municipality boundaries (City of Wray) are avoidance areas; however, municipal boundaries are presently excluded from any of the proposed preliminary corridors for siting the new transmission line. Land jurisdiction is depicted on Figure 2-7.

2.3.2 **Existing Linear Transportation And Utility Corridors**

The existing transportation system in the region is an extensive system of county roads, and U.S. and State Highways. The roadways in the Study Area are depicted on Figure 2-5, Transportation and Communication.

Major roads, natural gas pipelines and transmission lines were identified and mapped as possible routing opportunities. Highways in the Study Area were generated from ESRI “Highways” shapefiles, while county and local roads were generated from County Road GIS files. There is only one active railroad line (Burlington Northern Santa Fe) within the Study Area, and this line extends generally east to west through Wray, Colorado, generally parallel to Colorado State Highway (SH) 34.

2.3.2.1 *Highways/Roads*

The primary opportunity is along U.S. Highway 385 which extends generally north-south between Burlington and Wray. SHs 36 and 34 cross west to east and offer very little opportunities for paralleling with a line extending between Burlington and Wray. There are several county roads located in both Kit Carson and Yuma Counties that could offer opportunities for a route to essentially parallel adjacent to the existing roadway. All of the roads within the Study Area are identified on Figure 2-5.

There are no designated scenic byways identified within the Study Area.

2.3.2.2 *Pipeline Rights of Way*

Pipeline locations are not publicly available for security reasons. There are apparent pipelines that cross portions of the Study Area in a northwest-southeast direction. This was identified using the aerial photography. There is also a proposed water pipeline being developed in the northeastern portion of Study Area.

Two major pipelines in the Study Area are depicted on Figure 2-4, Existing Infrastructure. The location of these pipelines was inferred from the available aerial photography of the Study Area.

2.3.2.3 *Existing Electric Utility Corridors*

The existing electric transmission lines (69-kV and above) and the significant terrain features identified in the Study Area are depicted on Figure 2-8 Existing Electrical Transmission Facilities and Terrain.

Existing transmission lines, in cases where the existing land use is appropriate and adequate space is available, provide opportunities for routing the new line within or adjacent to existing ROWs. Locating the new line along existing lines could potentially reduce impacts associated with the construction,

operation, and maintenance of the line. In general, existing transmission lines provide an opportunity corridor.

The existing transmission lines in the Study Area are identified on Figure 2-8. There is an existing line (115-kV) extending between the Burlington and Wray substations and connecting the intermediate substations – Bonny Creek, Hale and South Fork, Idalia, and Vernon tap. Any of these existing transmission line ROWs present an opportunity for construction of essentially adjacent parallel transmission lines within 0.5 miles, and are considered opportunities for locating the Project.

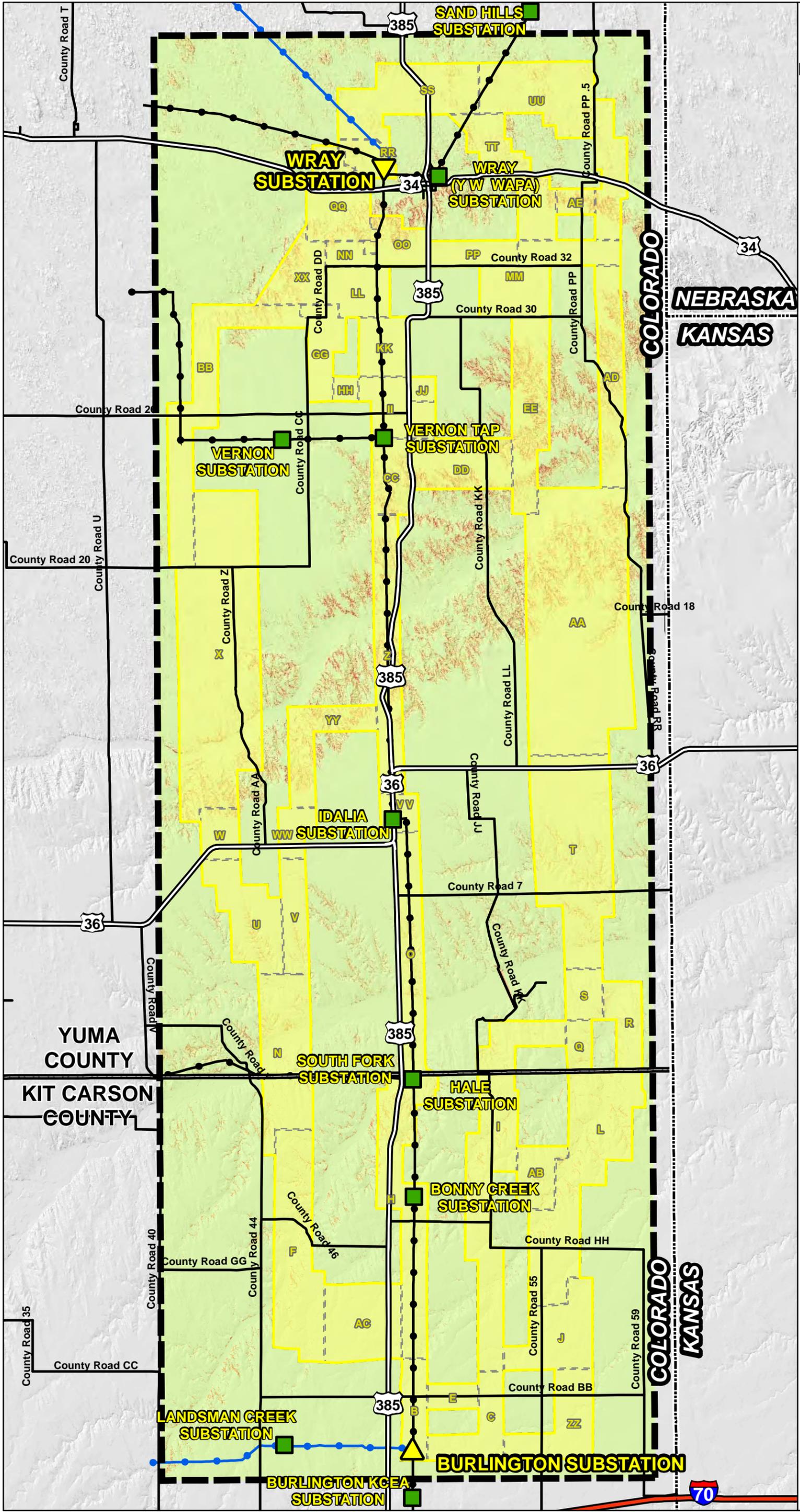
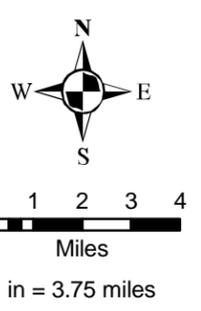


Figure 2-8

Existing Electrical Transmission Facilities and Terrain

- Legend**
- Study Area
 - Preliminary Corridor*
 - Wray Substation (End Point)
 - Burlington Substation (End Point)
 - Electrical Sub-Station
 - Existing 115 kV Transmission Line
 - Existing 230 kV Transmission Line
 - Interstate Highway
 - U.S. Highway
 - Major Roads
 - State Line
 - County Line
- Slope**
- 0-15 %
 - 15-30 %
 - > 30 %



***Note:**
Preliminary Corridors are typically one mile wide or greater, are not fixed, and may be adjusted, removed, or added during subsequent phases of the project.

Sources:
CDOT - Highways, Major Roads,
USGS - Slope, Elevation

Acronyms:
CDOT: Colorado Department of Transportation
USGS: United States Geological Survey



This page left intentionally blank.

2.3.3 Cultural And Historic Resources

A search was performed for sites of historic or archeological importance within the Study Area, using the National Park Service's National Register of Historic Places (NRHP) database (2011). This search identified a total of 127 sites, including 15 Centennial farms within the Study Area and several dwellings and homesteads, of which a few are designated as eligible for listing on the NRHP. Of the sites identified, six are listed as eligible for listing and two sites are listed, including the Walter and Anna Zion Homestead and the Beecher Island Battleground. The Vernon School – Vernon Community Center is listed on the State register. The other sites designated as eligible include a church, two late prehistoric camps, two homesteads, and a portion of the Chicago, Burlington and Quincy to Denver Railroad. Table 2-2 summarizes avoidance and exclusion distances for different types of cultural resources. Although locations of previously recorded archaeological sites were identified in the Study Area, these below-ground resources were not mapped as this information is sensitive and not publicly available.

2.3.4 Terrain

Steep slope and loose soil can create difficult conditions for transmission line installation and maintenance. Areas of steep terrain are small within the Study Area and are identified on Figure 2-8.

2.3.5 Wildlife Resources

2.3.5.1 Threatened and Endangered Species

A comprehensive literature review was conducted to identify federally and state-listed species of concern that could potentially be affected by the Project. These species included those that are listed as endangered or threatened under the Endangered Species Act (ESA), those that are afforded state regulatory protection, and those of special concern without regulatory protection. The literature review included informal consultations with the USFWS and the Colorado Division of Wildlife (CDOW), data from the CDOW, and aerial photo interpretation of potential habitats within the Study Area. A list of species protected at the federal and/or state level that could potentially occur within the Study Area is provided as Table 2-5.

Information concerning habitat areas for the all the species listed in Table 2-5 was not readily available; species-specific habitats present in the Study Area will be assessed in a later phase of the Project when biological surveys occur. Available habitat area information was mapped and is presented in Figure 2-9 Bald Eagle, Greater Prairie Chicken, and Great Blue Heron Habitat, and Figure 2-10, Game Species. A brief discussion of each protected species that could potentially occur within the Study Area based upon the results of the literature review, aerial photographic interpretation, and reconnaissance survey is presented below.

TABLE 2-5 FEDERALLY AND STATE-LISTED SPECIES IN KIT CARSON AND YUMA COUNTIES

Common Name	Scientific Name	Federal Listing	State Listing	Listed in Kit Carson County	Listed in Yuma County
AMPHIBIANS					
Northern cricket frog	<i>Acris crepitans</i>	None	Special Concern		X
Northern leopard frog	<i>Rana pipiens</i>	None	Special Concern	X	
Plains leopard frog	<i>Rana blairi</i>	None	Special Concern		X
BIRDS					
Bald Eagle	<i>Haliaeetus leucocephalus</i>	None	Special Concern	X	X
Ferruginous Hawk	<i>Buteo regalis</i>	None	Special Concern	X	X
Long-billed Curlew	<i>Numenius americanus</i>	None	Special Concern	X	X
Mountain Plover	<i>Charadrius montanus</i>	Proposed	Special Concern	X	X
Piping Plover	<i>Charadrius melodus</i>	None	Threatened	X	
Western Burrowing Owl	<i>Athene cucularia hypugaea</i>	None	Threatened	X	X
FISH					
Brassy minnow	<i>Hybognathus hankinsoni</i>	None	Threatened		X
Plains minnow	<i>Hybognathus placitus</i>	None	Endangered		X
Plains orangethroat darter	<i>Etheostoma spectabile</i>	None	Special Concern	X	X
Stonecat	<i>Noturus flavus</i>	None	Special Concern		X
Suckermouth minnow	<i>Phenacobius mirabilis</i>	None	Endangered		X
MAMMALS					
Black-tailed prairie dog	<i>Cynomys ludovicianus</i>	None	Special Concern	X	X
Swift fox	<i>Vulpes velox</i>	None	Special Concern	X	X
REPTILES					
Common garter snake	<i>Thamnophis sirtalis</i>	None	Special Concern		X
Yellow mud turtle	<i>Kinosternon flavescens</i>	None	Special Concern	X	X

Figure 2-9

**Bald Eagle,
Greater Prairie
Chicken & Great
Blue Heron
Habitat**

Legend

-  Study Area
-  Preliminary Corridor*
-  Wray Substation (End Point)
-  Burlington Substation (End Point)
-  Existing 115 kV Transmission Line
-  Existing 230 kV Transmission Line
-  Interstate Highway
-  U.S. Highway
-  State Highway
-  Major Roads
-  State Line
-  County Line
-  Bald Eagle Winter Concentration
-  Bald Eagle Communal Roost
-  Greater Prairie Chicken Production Area
-  Great Blue Heron Nesting Area

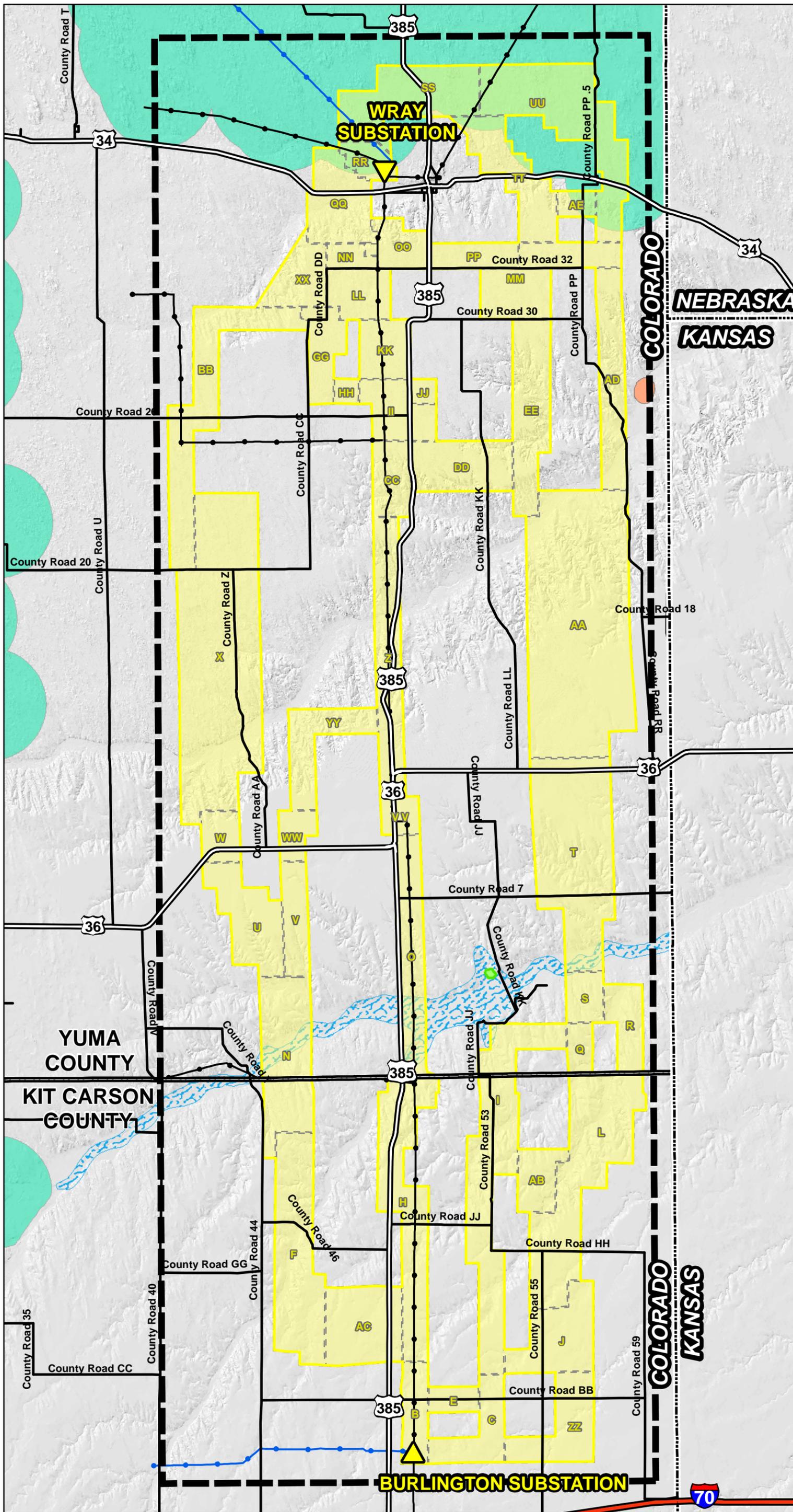


1 in = 3.75 miles

***Note:**
Preliminary Corridors are typically one mile wide or greater, are not fixed, and may be adjusted, removed, or added during subsequent phases of the project.

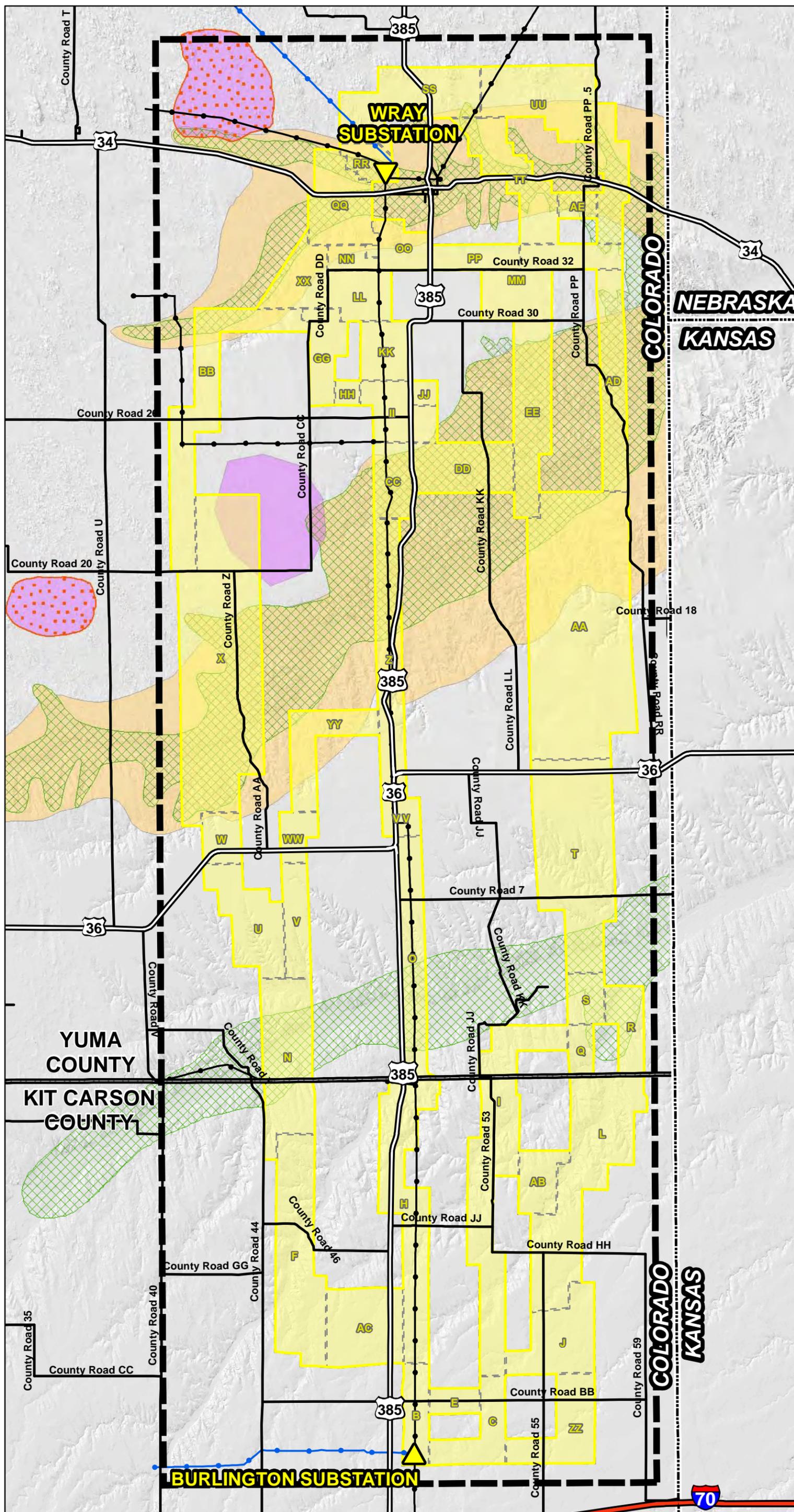
Sources:
CDOT - Highways, Major Roads, Municipal Bounds
NDIS - Bald Eagle, Prairie Chicken, Heron areas
USGS - Elevation

Acronyms:
CDOT: Colorado Department of Transportation
NDIS: Natural Diversity Information Source
NRCS: Natural Resources Conservation Service
USGS: United States Geological Survey



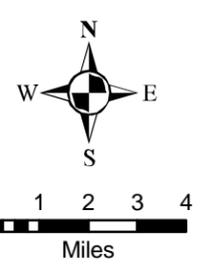
This page left intentionally blank.

Figure 2-10



Legend

- Study Area
- Preliminary Corridor*
- Wray Substation (End Point)
- Burlington Substation (End Point)
- Existing 115 kV Transmission Line
- Existing 230 kV Transmission Line
- Interstate Highway
- U.S. Highway
- Major Roads
- State Line
- County Line
- Whitetail Deer Winter Range
- Whitetail Deer Concentration
- Pronghorn Winter Range
- Pronghorn Winter Concentration



***Note:**
Preliminary Corridors are typically one mile wide or greater, are not fixed, and may be adjusted, removed, or added during subsequent phases of the project.

Sources:
 CDOT - Highways, Major Roads, Municipal Bounds
 NDIS - Pronghorn, Whitetail Deer Areas
 USGS - Elevation

Acronyms:
 CDOT: Colorado Department of Transportation
 NDIS: Natural Diversity Information Source
 NRCS: Natural Resources Conservation Service
 USGS: United States Geological Survey



Burlington-Wray 230-kV Transmission Project

This page left intentionally blank.

2.3.5.2 *Amphibians*

The three amphibian species (northern cricket frog, northern leopard frog, and plains leopard frog) listed in Table 2-5 are typically associated with ephemeral to permanent water sources (ponds, streams, irrigation canals) and hydrophytic to riparian vegetation (Hammerson 1999- Amphibians and Reptiles of Colorado). As depicted on Figure 2-3, Land Cover and Surface Water, ephemeral and perennial water sources are observed throughout the Study Area, thereby indicating that any one or all three of species could be present. However, since these three species are only listed as State Special Concern, there is no regulatory mandate protecting them. Areas within 660 feet of perennial waterways and lakes and within floodplain boundaries are avoidance areas, and areas within 100 feet of perennial waterways, springs and lakes and open water are exclusion areas, so it unlikely that the Project would significantly impact amphibian habitats.

2.3.5.3 *Birds*

Bald Eagle

The Bald Eagle is a state-listed species of special concern. Bald Eagles are present year-round throughout Colorado as spring and fall migrants, breeders, or winter residents, and typically nest from October to July. Occasional transient Bald Eagles are more likely to forage within the Study Area than nest, but a nest would not be uncommon in the few mature riparian areas present within the Study Area.

Demonstrated Bald Eagle habitat information was obtained from CDOW (2011) and mapped on Figure 2-9 (information on recorded nests was not mapped but has been requested from CDOW). For the purposes of the opportunities and constraints analysis, areas within 0.5-mile from active Bald Eagle nests are excluded.

Ferruginous Hawk

This species is listed as a state special concern species in both counties because of the major land transition from prairie dog towns to range and agricultural lands. This prairie dog-obligate species prefers grasslands with abundant prey, and could be considered a common species for this area. Areas within 0.25-mile of active nests for most raptors, including Ferruginous Hawks, will be excluded from siting consideration.

Long-billed Curlew

This grassland species prefers open areas and wide view and short (less than 1 foot) vegetation. It is likely that this species occurs in areas without sand sagebrush, and most of the Study Area should be considered preferred habitat. This state-listed species of special concern is known to occur in both counties. Habitat data for Long-billed Curlew was not available from CDOW's Natural Diversity Information Source FTP Server (CDOW 2011).

Mountain Plover

The Mountain Plover is proposed to be listed on the federal list, and is currently a state-listed species of special concern. Mountain Plovers are uncommon summer residents in the High Plains of eastern

Colorado. Mountain Plovers seek dry, disturbed, or intensively grazed, open flat tablelands that include heavily grazed areas near stock ponds, playa lakes, and prairie-dog towns. Based on aerial photograph, potential habitat for Mountain Plovers has been identified within the Study Area. Habitat data for Mountain Plover was not available from CDOW's Natural Diversity Information Source FTP Server (CDOW 2011).

Piping Plover

The piping plover is a state-listed threatened species that prefers alluvial beaches or sandbars free of vegetation. According to GIS data obtained from CDOW's Natural Diversity Information Source FTP Server, no piping plover habitat occurs in the Study Area (CDOW 2011).

Western Burrowing Owl

The Western Burrowing Owl is state-listed threatened species in both counties. Western Burrowing Owl habitat requirements include open grasslands, which are found in the Study Area. GIS data of western burrowing owl habitat was not available from the CDOW Natural Diversity Information Source FTP Server (CDOW 2011). The species sometimes occupies open areas such as vacant lots near human habitation or airports and are often associated with black-tailed prairie dog colonies. The owls can excavate their own burrows but prefer to use abandoned burrows of other animals, including black-tailed prairie dog. During breeding, the owls will enlarge a main nesting burrow but will maintain and utilize a number of smaller burrows. Resident pairs will keep the same territory throughout the breeding season. Since prairie dogs habitat includes the entire Study Area, it is possible that Western Burrowing Owls are present in the Study Area. Areas within 150 feet of owl burrows will be avoided during construction during the breeding season, from March 15 to October 31.

2.3.5.4 *Fish*

Fish are unlikely to be impacted by the Project as open water areas are excluded from siting consideration.

2.3.5.5 *Mammals*

Black-Tailed Prairie Dog

The black-tailed prairie dog is state-listed as a species of special concern. Black-tailed prairie dogs are found in dry, flat, short grasslands with low, relatively sparse vegetation, including areas overgrazed by cattle or vacant/disturbed parcels, and live in large family groups. Black-tailed prairie dogs are known to inhabit both counties in the Study Area, and their known habitat includes all of the Study Area. During site reconnaissance efforts, locations of prairie dog towns will be recorded, and these areas will be avoided to the extent practicable.

Swift fox

This state-listed species of special concern has been observed in both counties in the Study Area. This fox is typically observed in eastern Colorado, where the terrain is flat to gently rolling and has somewhat

native vegetation (e.g., blue grama and buffalograss). Since this species is typically observed with prairie dogs, which inhabit the Study Area, it is likely to assume this species resides within portions of the Study Area. The overall range of swift fox covers a large swath of the Study Area on either side of the South Fork of the Republican River and Arikaree River. For the purposes of the opportunities and constraints analysis, swift fox habitat was not categorized as avoidance or exclusion areas.

2.3.5.6 Reptiles

The common garter snake is state special concern species recorded in Yuma County, not Kit Carson County. This snake prefers riparian areas to complete its life cycle, which are located along ephemeral and perennial streams in the Study Area within Yuma County. The yellow mud turtle is a state special concern species that has been observed in both counties in the Study Area. This turtle prefers slow moving water (e.g., irrigation ditches, ponds) with muddy or sandy bottoms, and areas with aquatic vegetation. This preferred habitat exists in portions of the Study Area. Areas that include habitat for both of these species are avoidance and exclusion areas as discussed in Section 2.3.2.1; therefore, the Project is not likely to have significant impacts to these reptile species.

2.3.6 Game species

Several game species, both birds and mammals, can be observed in the Study Area. These species are more specifically discussed below.

2.3.6.1 Birds

Several species of game birds [mourning dove (*Zenaida macroura*), ring-necked pheasants (*Phasianus colchicus*), and greater prairie chickens] occur, and are hunted within the Study Area. Game birds, by their very definition, are those species whose populations can sustain hunting pressure. Greater prairie chickens used to be listed as a state endangered species from 1973 to 1993, at which time they were down-listed to state threatened until 1998, when they were delisted, and have been hunted for several years. These birds have production areas in the northern end of the Study Area, and just west of the Study Area, as depicted in Figure 2-9. Tours of the leks are a popular tourist attraction from late March through April, when the male birds are performing their courtship dances. Within the greater prairie chicken production area is an avoidance area for the purposes of siting the new transmission line.

2.3.6.2 Mammals

Several species of mammals [pronghorn (*Antilocapra americana*), mule deer (*Odocoileus hemionus*), and white-tailed deer (*Odocoileus virginianus*)] occur and are hunted within the Study Area. Similar to game birds, these mammalian species' populations in eastern Colorado are large enough to sustain hunting pressure in addition to other causes of mortality. These species also shift to seasonal habitats throughout the Study Area, as they have differing winter ranges and winter concentration areas, as depicted in Figure 2-10. Game winter range and concentration areas were not designated as avoidance or exclusion areas.

2.4 PRELIMINARY ALTERNATIVE CORRIDOR IDENTIFICATION

Identification of the alternative corridors is a detailed process that includes reviewing resource data, identifying routing opportunities and constraints, and consulting with local jurisdictions, public agencies, and reviewing input received from the public at public meetings and submitted through the Project's website. The opportunities and constraints Composite Map (Figure 2-2) was used to identify a number of preliminary alternative corridors. The corridors begin and end at logical termini or where one corridor branches off from another. These preliminary alternative corridors were presented at public Informational Meetings held in Burlington and Wray on September 20 and 21, 2011, respectively. Information gathered at these meetings, from consultation with public agencies, and from preliminary field reconnaissance (conducted in December 2011) then was used to refine the preliminary alternative corridors (it is the refined corridors that appear on Figures 2-2 through 2-10 in this MCS). Continued information gathering and stakeholder input will be used in future route selection.

Corridors primarily were identified based on areas of greatest opportunity that usually followed existing utility or corridors and section and property lines. Corridors are generally 1 mile wide. Some corridors are greater than 1 mile wide to incorporate more than one opportunity feature. In some cases, avoidance or exclusion areas fall within the identified corridor; however, the corridor width generally allows enough flexibility to identify 150-foot-wide routes that will avoid most constraints. A description of each of the preliminary alternative corridors is provided in Table 2-6.

2.4.1 Modification of Preliminary Alternative Corridors Following the Public Informational Meetings

Based on public review of the preliminary alternative corridors during public Informational Open House meetings, numerous verbal and written comments regarding individual preliminary alternative corridors were collected. All comments received on individual corridors were reviewed and evaluated and new corridors or revision of existing corridors were considered as appropriate. The review included project management, engineering, environmental, and land/real estate representatives. The changes that were implemented are summarized in Table 2-6 and each alternative corridor is depicted on Figure 2-11 to demonstrate the original preliminary alternative corridors and proposed new, eliminated, or revised alternative corridors. Figure 2-12 depicts the refined alignment of the alternative corridors.

TABLE 2-6 CORRIDOR DESCRIPTIONS

Corridor	Opportunity Along Existing Transportation Corridor	Opportunity Along Existing Transmission Line	General Description	Special Considerations	Modification to Corridor After the September, 2011 Public Informational Meetings
A	Eliminated			Corridor A was eliminated because of the constraints associated with the existing 230-kV line, the wind farm, and existing structures.	
B	Entire corridor is parallel to US 385 and southern 2 miles of corridor also parallel County Road (CR) 50 in Kit Carson County	4 miles adjacent to the existing 115-kV line	4 miles; this is the corridor due north of the Burlington Substation; mostly private land in cultivation; some shrubland, grassland	Includes approximately five center pivot irrigation systems; constrained by the location of the existing 115-kV line; Beaver Creek turns into an intermittent stream in the northernmost portion of the corridor	Corridor did not change.
C	3 miles adjacent to CR Z, and 3 miles adjacent to CR 53 in Kit Carson County		5.5 miles; this is the corridor due east of the Burlington Substation; mostly private land in cultivation; some shrubland, grassland	Includes one center pivot irrigation system and areas under active cultivation; includes a portion of a subdivision about one mile east of the Burlington Substation; includes oil and gas wells; includes parts of the intermittent Little Beaver Creek; includes four oil and gas wells	Corridor did not change.

Corridor	Opportunity Along Existing Transportation Corridor	Opportunity Along Existing Transmission Line	General Description	Special Considerations	Modification to Corridor After the September, 2011 Public Informational Meetings
D	Eliminated				Corridor D was eliminated because of the lack of east-west roads (opportunities) and because it was no longer necessary to have a connector to Corridor A, since Corridor A also was eliminated.
E	Along CR BB in Kit Carson County		2 miles; mostly private land in cultivation	Includes 2.5 center pivot irrigation systems, areas under active cultivation, and one existing oil well	Corridor did not change.
F	Along CR 45 and CR 46 in Kit Carson County		9.5 miles; mostly uncultivated private land, shrubland, grassland; some irrigated cropland; some State land	Includes several parcels of State land, crosses Landsman Creek and Bonny Creek; includes center pivot irrigation systems, and areas under active cultivation, and three oil and gas wells	Corridor F no longer includes Section 3 (Township 7 South, Range 43 West) or Section 34 (Township 6 South, Range 43 West). These sections were constrained by the presence of existing structures, center pivot irrigation, and other irrigated cropland which presented significant challenges to routing a transmission line through the area.
G	Eliminated.				Corridor G was eliminated. A new corridor (AC) was added south of the previous location of Corridor G. This new corridor (AC) presents better routing opportunities. Corridor G was constrained by numerous existing structures along CRs HH and GG.

Corridor	Opportunity Along Existing Transportation Corridor	Opportunity Along Existing Transmission Line	General Description	Special Considerations	Modification to Corridor After the September, 2011 Public Informational Meetings
H	Along to CR 50, CR KK and US 385 in Kit Carson County	9.5 miles adjacent to existing 115-kV Line	12 miles; mostly private land, shrubland, grassland some irrigated cropland, some State land	Crosses Bonny Creek; includes approximately seven center pivot irrigation and areas under active cultivation; includes five oil and gas wells; constrained by the location of the existing 115-kV line and both Bonny Creek and Hale/South Fork Substations; includes state land parcel associated with South Republican SWA; includes a microwave tower just south of CR LL	Corridor did not change.
I	Along CR 52 and CR 53 in Kit Carson County-and along CR KK in Yuma County		14 miles; private land; mostly shrubland and grassland; some irrigated cropland	Includes some existing center pivot irrigation and areas under active cultivation; crosses Bonny Creek; includes 12 oil and gas wells	The northeastern-most portion of Corridor I moved approximately 1.5 miles to the east. Corridor I now includes all of Section 26 and half of Section 25 (Township 5 South, Range 43 West). This shift was due to the elimination of Corridor P and to connect to Corridor Q. Overall, the corridor area increased.

Corridor	Opportunity Along Existing Transportation Corridor	Opportunity Along Existing Transmission Line	General Description	Special Considerations	Modification to Corridor After the September, 2011 Public Informational Meetings
J	3 miles along CR CC and CR DD, 3 miles along to CR 56 and CR 57 in Kit Carson County		6.5 miles; private land; mostly in active cultivation and irrigated cropland	Includes approximately four center pivot irrigation circles and areas under active cultivation; crosses upper portion of Little Beaver Creek; includes two oil and gas wells; appears to include a pond or playa	The western boundary of Corridor J moved 1.5 miles to the west. Corridor J now includes Section 19 and parts of Sections 13, 18, and 24 (Township 7 South, Range 42 West). The corridor was expanded to include north-south routing opportunities through Sections 13 and 24. Overall, the corridor area increased.
K	Eliminated				Corridor K was eliminated. This small corridor was not useful in considering potential routes, because in this portion of the Study Area, routes will run north-south and there are no compelling reasons for cutting to the east or west in this area.
L	3 miles along CR 55; 6 miles along CR 56; 4 miles along CR 57; 3 miles along CR 58 in Kit Carson County		10 miles; mostly private land; mostly shrubland, grassland and irrigated cropland; some State land	Crosses Little Beaver Creek and Beaver Creek; includes some state land parcels and nine oil and gas wells	Corridor did not change.

Corridor	Opportunity Along Existing Transportation Corridor	Opportunity Along Existing Transmission Line	General Description	Special Considerations	Modification to Corridor After the September, 2011 Public Informational Meetings
M	Eliminated				Corridor M was eliminated. This small corridor was not useful in considering potential routes, because in this portion of the Study Area, routes will run north-south and there are no compelling reasons for cutting to the east or west in this area.
N	3 miles along CR 44 in Kit Carson County and 4 miles along CR AA in Yuma County		6 miles; mostly private land; mostly shrubland, grassland; some irrigated cropland, some State land	Crosses South Fork of Republican River at confluence with Dry Gulch; includes portion of South Republican SWA; includes whitetail deer concentration and bald eagle winter concentration areas; wetland areas likely exist around the South Fork of the Republican River; includes three oil and gas well	The eastern boundary of Corridor N moved approximately 1 mile to the east. In most instances, the western boundary of Corridor N also moved approximately 0.5-mile to the east. This overall shift to the east was made to avoid constraints in the central portion of Corridor N, near the County Line, associated with the location of the existing 115-kV line and presence of pivot irrigation. The new alignment of Corridor N provides for routing opportunities though undeveloped grassland and shrubland. Overall, the corridor area increased slightly.

Corridor	Opportunity Along Existing Transportation Corridor	Opportunity Along Existing Transmission Line	General Description	Special Considerations	Modification to Corridor After the September, 2011 Public Informational Meetings
O	Along US 385 and CR GG in Yuma County	9.5 miles adjacent to existing 115-kV line	9.5 miles; private and State land; mostly irrigated cropland; some grassland/shrubland; some State land	Crosses intermittent Landsman creek and includes portions of intermittent Armknecht Creek; crosses South Fork of Republican River (area includes bald eagle winter concentration and wetlands), and includes portions of the South Republican SWA; adjacent to western boundary of Bonny Lake State Park; corridor also includes a section of State land already crossed by existing line; constrained by the location of the existing line and 61 existing oil & gas wells; includes 10 existing center pivot irrigation and areas under active cultivation; includes whitetail deer winter concentration areas	Corridor O did not change.

Corridor	Opportunity Along Existing Transportation Corridor	Opportunity Along Existing Transmission Line	General Description	Special Considerations	Modification to Corridor After the September, 2011 Public Informational Meetings
P	Eliminated			Corridor P was eliminated; however, some portions of what was Corridor P are now part of Corridor T. The southernmost portion of Corridor P was eliminated entirely, as it was constrained by the location of the Bonny Lake dam and existing structures. A route through this southernmost portion of Corridor P would have required crossing a large portion of the South Republican SWA.	
Q	2 miles along CR NN in Yuma County		2 miles; private sand State land; mostly shrubland/grassland, some irrigated cropland	Crosses intermittent portion of Bonny Creek; includes portion of State land section; includes one oil and gas well; includes whitetail deer winter concentration areas	Corridor did not change.
R	3.5 miles along CR QQ and 1 mile along CR 3 in Yuma County		4 miles; mostly private land; shrubland, grassland, some irrigated cropland, some State land	Crosses Bonny Creek and appears to contain some wetland areas; includes ¼ section of State land; includes two existing center pivot irrigation circles; includes whitetail deer winter concentration area	Corridor did not change.

Corridor	Opportunity Along Existing Transportation Corridor	Opportunity Along Existing Transmission Line	General Description	Special Considerations	Modification to Corridor After the September, 2011 Public Informational Meetings
S	3 miles east-west along CR CR 2 and CR 3; 2 miles north-west along CR NN and PP in Yuma County		2 miles; private and State land; mostly shrubland and grassland; some cropland	Includes portion of South Republican SWA; includes whitetail deer concentration areas, includes several intermittent streams	The western boundary of Corridor S was moved approximately 1.5 miles to the east. Section 23 and the western portion of Section 24 (Township 5 South, Range 43 West) are now excluded from Corridor S. This change was to accommodate changes to Corridor I. Overall, the corridor area decreased.
T	5 miles along CR PP in Yuma County		8.5 miles; private land and State; shrubland, grassland, some irrigated cropland	Crosses South Fork of Republican River below Bonny Lake dam, and includes portions of South Republican SWA; includes some existing center pivot irrigation and areas under active cultivation; includes intermittent portions of Sand and Cowpe Creeks; includes whitetail deer concentration areas; includes some woody wetlands; includes bald eagle winter concentration areas; includes 16 oil and gas wells	The western boundary of Corridor T moved approximately 2 miles to the west. There was a previously excluded portion of the Study Area located between Corridors P and T that is now included within Corridor T. Corridor P was eliminated and Corridor T now includes the previously excluded portion, and most of what was formerly Corridor P. The elimination of Corridor P is described above. The expansion of Corridor T provides increased routing opportunities in this area.

Corridor	Opportunity Along Existing Transportation Corridor	Opportunity Along Existing Transmission Line	General Description	Special Considerations	Modification to Corridor After the September, 2011 Public Informational Meetings
U	2.5 miles north-south along CR AA; 2 miles east-west along CRs 5 and 6; 2.5 miles north-south along CR; 2 miles north-south along CR Y in Yuma County		5 miles; mostly private land, mostly cultivated cropland; some shrubland, grassland; some irrigated cropland, some State land	Includes center pivot irrigation and areas under active cultivation; includes four existing oil and gas wells; includes ¼ section of state land; includes four oil and gas wells	The northeastern boundary of Corridor U in Sections 25 and 36 (Township 4 South, Range 45 West) moved 0.5-mile to the east. In addition, the northwest quarter of Section 31 (Township 4 South, Range 44 West) is now included in Corridor U. These additions were made to include routing opportunities along CR AA. Overall, the corridor area increased.
V	3 miles along CR BB in Yuma County		3 miles; private land, mostly cultivated croplands	Includes center pivot irrigation and areas under active cultivation; includes one oil and gas well	The southern boundary of Corridor V was moved approximately 1.5 miles to the south to include potential routing opportunities through undeveloped grassland/shrubland along CR BB.
W	4 miles east-west along CR 10; 2 miles north-south along CRs Z, AA, and BB in Yuma County		2 miles north-south and 4 miles east-west; mostly private land in cultivation and irrigated cropland; some State land; some shrubland and grassland	Includes center pivot and lateral irrigation systems	The eastern boundary of Corridor W moved approximately 2.5 miles to the west. The eastern boundary of the corridor now runs north-south along CR Z. The eastern portion of the corridor was constrained by the presence of a cemetery, center pivots, existing structures, and other irrigated croplands. Overall, the corridor area decreased.

Corridor	Opportunity Along Existing Transportation Corridor	Opportunity Along Existing Transmission Line	General Description	Special Considerations	Modification to Corridor After the September, 2011 Public Informational Meetings
X	Along CRs Y, Z, and AA in Yuma County		10 miles; mostly private land, mostly grassland, some shrubland, some irrigated cropland, some State land	Crosses Arikaree River, Hay Gulch, and Copperkettle Creek; includes some areas under active cultivation and 88 oil and gas wells; includes some state lands; includes whitetail deer winter range and concentration areas	The western border of Corridor X moved approximately 0.75-mile to the west. The eastern border of Corridor X moved 0.5-mile to the east. These changes allow for increased routing opportunities in this area, which is mostly undeveloped grassland/shrubland. The expanded corridor also provides increased options for crossing the Arikaree River. Overall, the corridor area increased.
Y	Eliminated				Corridor Y was eliminated. The northern portion of Corridor Y was highly constrained by the presence of irrigated cropland, center pivots, existing structures, and numerous oil and gas wells.
Z	11 miles along US 385 in Yuma County	11 miles adjacent to existing 115-kV line	11 miles; mostly private land, shrubland, grassland, some irrigated cropland, some state land	Crosses intermittent sections of Arikaree River includes part of Sandy Bluffs State Trust Lands; includes some areas under active cultivation and some existing center pivot irrigation; includes 59 oil and gas wells; includes whitetail deer winter range and concentration areas	Corridor did not change.

Corridor	Opportunity Along Existing Transportation Corridor	Opportunity Along Existing Transmission Line	General Description	Special Considerations	Modification to Corridor After the September, 2011 Public Informational Meetings
AA	Along CRs NN and MM in Yuma County		11 miles; private and State land; irrigated cropland; shrubland and grassland	Crosses Arikaree River and includes portion of Simmons SWA; includes areas under active cultivation; includes whitetail deer winter range and concentration areas; includes 32 oil and gas wells	The eastern boundary of Corridor AA moved approximately 2 miles to the east to include additional routing opportunities in the northern portion of the corridor, outside the boundary of Simmons SWA. Overall, the corridor area increased.
BB	6.5 miles along CR X; 4 miles along CR Y, 4 miles east-west along CR 30 in Yuma	1 mile adjacent to existing 115-kV line	15 miles; mostly private land; mostly cultivate cropland and grassland; some shrubland; some State land	Includes some areas under active cultivation, and a high density of existing center pivot irrigation; includes 94 oil and gas wells; includes a portion of the North Fork Republican River; includes whitetail deer winter range and concentration areas; includes a parcel owned by a landowner opposed to the Project	The southernmost boundary of Corridor BB moved 0.5-mile to the north and now ends along CR 20. The northwestern quarter of Section 27 that was previously part of Corridor BB is now included in Corridor X (all of Section 27 is now included in Corridor X). This change was made to better define the transition from Corridor X to BB. Overall, the corridor area decreased slightly.

Corridor	Opportunity Along Existing Transportation Corridor	Opportunity Along Existing Transmission Line	General Description	Special Considerations	Modification to Corridor After the September, 2011 Public Informational Meetings
CC	Along US 385; east-west along CR 22, 23, 24, 25 and 26(E-W); approximately 2 miles north-south along CRs BB, CC, DD, EE and FF in Yuma County	3 miles of existing 115-kV line (north-south), and 4 miles of existing 115-kV line (east-west)	6 miles; includes private land, land in cultivation, irrigated cropland, shrubland, grassland, and some state land	Crosses portions of Black Wolfe Creek, and has a high density of residences in the area of Vernon; constrained by the location of the existing line and existing substations, 20 existing oil and gas wells, existing center pivot irrigation, and areas under active cultivation; also includes conservation easement lands in 2S 4W, Sections 2 and 12; includes and adjoins residential and agricultural property owned by a landowner opposed to the Project	The western portion of Corridor CC was eliminated given the multiple constraints associated with the town of Vernon, the number of center pivots, and the location of the existing 115-kV line, Vernon Tap Substation, and Vernon Substation. Overall, the corridor area decreased.
DD	Along CRs 23 and 24 in Yuma County		4 miles; private land; irrigated cropland; shrubland and grassland	Includes some areas under active cultivation; includes 65 oil and gas wells; much of the corridor is within whitetail deer winter range and concentration areas	The northern boundary of Corridor DD was expanded approximately one mile to the north. All of Sections 31-34 (Township 1 South, Range 43 West) are now included in Corridor DD. Overall, the corridor area increased to allow for potential routing opportunities north of CR 24.

Corridor	Opportunity Along Existing Transportation Corridor	Opportunity Along Existing Transmission Line	General Description	Special Considerations	Modification to Corridor After the September, 2011 Public Informational Meetings
EE	Along CR LL and MM in Yuma County		8 miles; private land; mostly shrubland and grassland; some irrigated cropland	Includes some areas under active cultivation; much of the corridor is within whitetail deer winter range and concentration areas; includes several intermittent streams; includes seven oil and gas wells	Corridor did not change.
FF	Eliminated				Corridor FF was eliminated. The previous eastern boundary of Corridor FF is now the western boundary of new Corridor AD. Routing through Corridor FF was constrained by the presence of several existing structures along CR PP.
GG	Along CRs CC and DD in Yuma County		4 miles; private land; and irrigated cropland	Includes areas under active cultivation, with a high density of existing center pivot irrigation; includes 12 oil and gas wells	Corridor did not change.
HH	East-west along CR 27; north-south along CR DD in Yuma County		1 mile; private land; irrigated cropland	Includes areas under active cultivation, with existing center pivot irrigation and three oil and gas wells	Corridor did not change.

Corridor	Opportunity Along Existing Transportation Corridor	Opportunity Along Existing Transmission Line	General Description	Special Considerations	Modification to Corridor After the September, 2011 Public Informational Meetings
II	Along CR FF in Yuma County	Along existing 115-kV line	2.5 miles; private land; irrigated cropland	Includes areas under active cultivation, with several existing center pivot irrigation ; includes 19 oil and gas wells; constrained by the location of the existing line and existing substations and U.S. 385	The southeastern boundary of Corridor II moved approximately 1.5-mile to the east to allow for potential routing opportunities on both sides of U.S. 385. Overall, the corridor area increased.
JJ	Along CR 27 in Yuma County		4 miles; private land; irrigated cropland	Includes areas under active cultivation, with existing center pivot irrigation; crosses whitetail deer winter range and concentration area	The eastern portion of Corridor JJ was highly constrained by the presence of structures and center pivots; therefore, the eastern boundary of Corridor JJ moved approximately 2 miles to the west. Overall, the corridor area decreased.
KK	Along CR FF in Yuma County	Along existing 115-kV line	2.5 miles; private land; irrigated cropland	Entire area under active cultivation, with a high density of existing center pivot irrigation; constrained by the location of the existing line; includes three oil and gas wells	Corridor did not change.
LL	North-south along CRs DD, EE, and FF; east-west along CR EE in Yuma County	2 miles along existing 115-kV line	2 miles; private land; irrigated cropland	Includes areas under active cultivation; constrained by the location of the existing line; includes six oil and gas wells	Corridor did not change.

Corridor	Opportunity Along Existing Transportation Corridor	Opportunity Along Existing Transmission Line	General Description	Special Considerations	Modification to Corridor After the September, 2011 Public Informational Meetings
MM	North-south along CRs MM and PP; east-west along CRs 31, 32, and 33 in Yuma County		3 miles; private land in cultivation; grassland	Includes areas under active cultivation, with several existing center pivot irrigation; includes a hospital and microwave tower along CR PP; includes 19 oil and gas wells	The western boundary of Corridor MM was moved approximately 2 miles to the west and now parallels CR KK in order to include a potential routing opportunity along CR KK. The eastern boundary of Corridor MM was moved approximately 1.75 miles to the west, and all of Sections 25 and 36 (Township 1 North, Range 42 West) are now excluded. Overall, the corridor area remained approximately the same.
NN	Along CRs DD and EE in Yuma County		1 mile; private land; grassland; cultivated cropland	Includes five oil and gas wells; areas under active cultivation; includes whitetail deer winter range and concentration area	The eastern boundary of Corridor NN was moved approximately 0.5-mile to the east and now includes the western half and southern half of Section 22 (Township 1 North, Range 44 West). Overall, the corridor area increased.
OO	East-west along CRs 32 and 33, and FF in Yuma County	2 miles of existing 115kV line is within corridor	2 miles; private land, grassland and cultivated cropland	Includes areas under active cultivation; includes whitetail deer winter range and concentration area; constrained by the location of the existing line; includes portion of a pipeline based on aerial photography	The southern quarter of Section 22 (Township 1 North, Range 44 West) in Corridor OO was moved into Corridor NN to follow parcel lines. Overall, the area of Corridor OO decreased slightly.

Corridor	Opportunity Along Existing Transportation Corridor	Opportunity Along Existing Transmission Line	General Description	Special Considerations	Modification to Corridor After the September, 2011 Public Informational Meetings
PP	Along CRs 32 and 33 in Yuma County		3.5 miles; private land; cultivated cropland	Several structures exist along CRs 32 and 33; includes ten oil and gas wells	Corridor did not change.
QQ	Along CRs DD and DD.75 in Yuma County		3.5 miles; includes mostly private land; shrubland, grassland, cultivated cropland	Corridor is small and highly constrained; includes areas under active cultivation, with center pivot irrigation, and an animal feed lots; crosses whitetail deer winter range and concentration area; numerous residences along CR DD.75; crosses North Fork Republican River and Chief Creek; BNSF railroad bisects the northern portion of the corridor; includes nine oil and gas wells	Eastern boundary of Corridor QQ was moved approximately 1 mile to the east to include a potential routing opportunity east of CR EE.

Corridor	Opportunity Along Existing Transportation Corridor	Opportunity Along Existing Transmission Line	General Description	Special Considerations	Modification to Corridor After the September, 2011 Public Informational Meetings
RR	Along BNSF Rail; along US 34; along CR FF in Yuma County	Follows existing 115-kV and existing 230-kV line	3.5 miles; includes the Wray Substation; private and State land; shrubland, grassland	Highly constrained corridor; constrained by the location of the existing lines around the Wray Substation and access to Wray Substation; includes Stalker Lake SWA; includes whitetail deer winter range and small portion of Greater Prairie Chicken Production Area; includes high-density residential development along CR FF and West 7 th Street	The southern portion of Corridor RR was highly constrained by existing structures and the location of the existing 115-kV transmission line. The southern boundary of Corridor RR was moved approximately 1.5 miles to the north to remove this constrained area from consideration. Overall, the corridor area decreased.
SS	Along CR 38 and 39 in Yuma County	1.5 miles of existing 230 kV line is within corridor	6.5 miles; private land; shrubland, grassland, and some cultivated cropland	Constrained by the location of the existing line; includes whitetail deer winter range; entire corridor is within Greater Prairie Chicken Production Area; includes one oil and gas well	The northern boundary of Corridor SS was moved approximately 1 mile to the north to include a potential routing opportunity just south of CR 40. Overall, the corridor area was increased.

Corridor	Opportunity Along Existing Transportation Corridor	Opportunity Along Existing Transmission Line	General Description	Special Considerations	Modification to Corridor After the September, 2011 Public Informational Meetings
TT	Along CR MM; 1 mile east-west along the BNSF railroad/US 34 in Yuma County		6 miles; private land; shrubland, grassland, and areas in active cultivation and irrigated cropland	Crosses US 34, the BNSF railroad, the North Fork Republican river, the existing 115 kV line; includes whitetail deer winter range and concentration area; northernmost area may include a small portion of Greater Prairie Chicken Production Area	The northeastern-most boundary at the northern edge of Corridor TT was moved 1 mile to the east; all of Section 28 (Township 2 North, Range 43 West) is now included in the corridor. Overall, the corridor area increased slightly to allow for routing opportunities along section lines.
UU	North-south along CR QQ and east-west along CRs 38 and 39 in Yuma County		9.5 miles; private land; mostly shrubland, grassland; some irrigated cropland	Includes areas under active cultivation, with existing center pivot irrigation; crosses US 34, the BNSF rail, and the North Fork Republican river; includes whitetail deer winter range and concentration area; includes Rush Creek; includes five oil and gas wells; almost entire corridor is within Greater Prairie Chicken Production Area	The northern boundary of Corridor UU was moved approximately 1 mile to the north to include a potential routing opportunity just south of CR 40. Overall, the corridor area was increased.

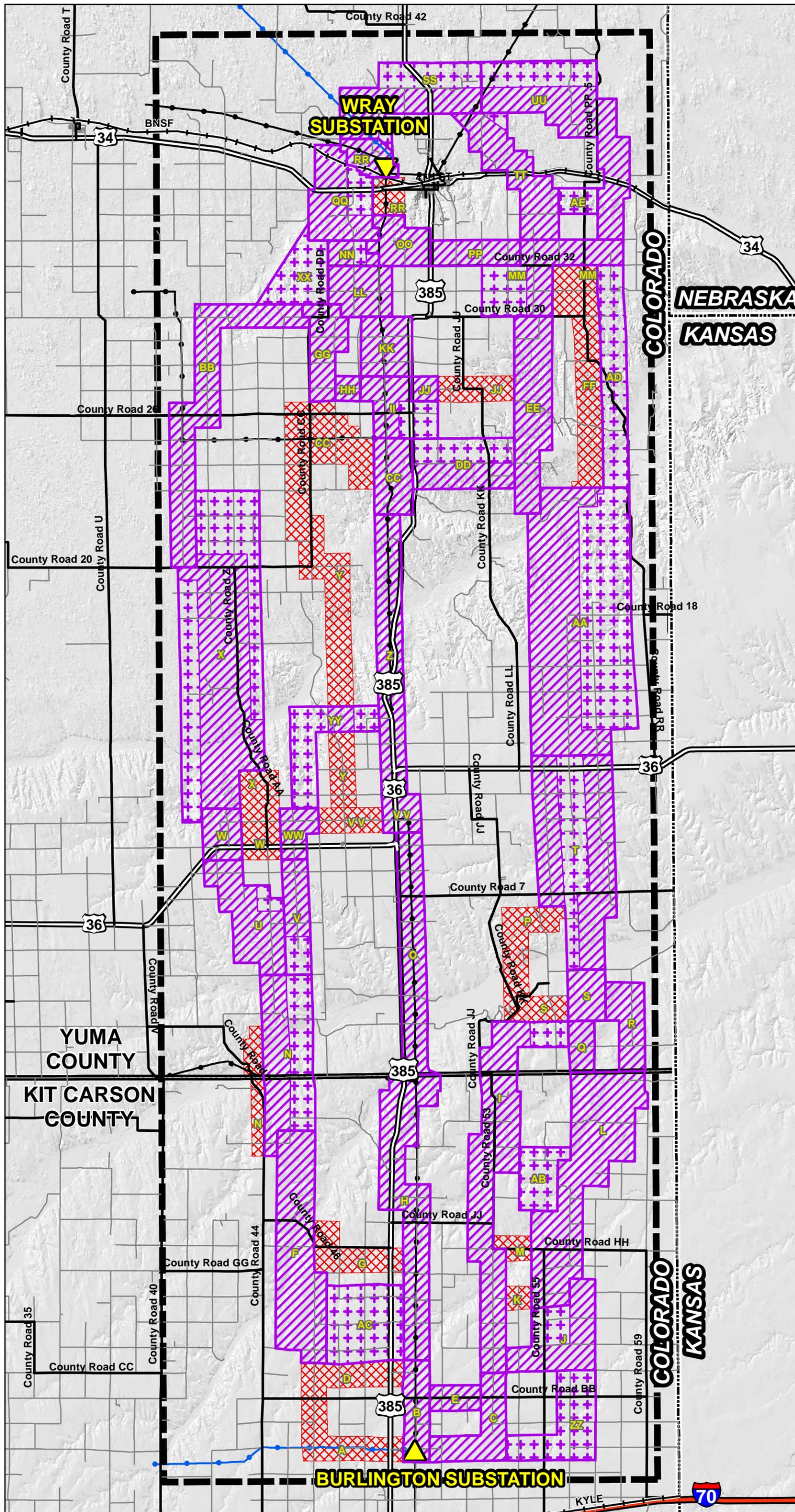
Corridor	Opportunity Along Existing Transportation Corridor	Opportunity Along Existing Transmission Line	General Description	Special Considerations	Modification to Corridor After the September, 2011 Public Informational Meetings
VV	Along CR 10 in Yuma County	1.5 miles of existing 115-kV line is within corridor	4 miles; private land; active cultivation and irrigated cropland	Includes several center pivot irrigation systems and lateral sprinkler systems; constrained by the location of the existing line and access around Idalia substation; includes oil and gas wells and a cemetery; includes eight oil and gas wells	The western portion of Corridor VV was eliminated due to the concentration of mechanically irrigated cropland in this area just north of Idalia. In addition, Corridor Y was eliminated, so the western portion of Corridor VV is no longer necessary to connect to the former Corridor Y. Overall, the corridor area decreased.
WW	Along CR BB in Yuma County		2.0 miles; private land; active cultivation and irrigated cropland	Includes approximately three center pivots and other irrigated cropland	Corridor WW was added north of Corridor V to include potential routing opportunities along CR BB.
XX	Along CRs CC and DD in Yuma County		2.7 miles; mostly private land; includes shrubland, grassland, and cultivated cropland; includes some State land	Includes 29 oil and gas wells; several structures exist along CR DD	Corridor XX was added to include potential routing opportunity along CR CC.

Corridor	Opportunity Along Existing Transportation Corridor	Opportunity Along Existing Transmission Line	General Description	Special Considerations	Modification to Corridor After the September, 2011 Public Informational Meetings
YY	Along CR BB (north-south) and CR 14 (east-west) in Yuma County		6.3 miles; mostly private land; some state land; mostly undeveloped grassland and shrubland; some irrigated cropland	Includes four oil and gas wells and some irrigated cropland	Corridor YY was added to include potential routing opportunities east-west through undeveloped land along CR 14 and north-south through undeveloped land in Sections 29 and 32 (Township 3 South, Range 44 West) and Sections 5 and 8 (Township 4 South, Range 44 West).
ZZ	East-west along CR Z and north-south along CRs 56 and 57 in Yuma County		5.8 miles; private land; mostly cultivated and irrigated cropland	Includes center pivots and four oil and gas wells	Corridor ZZ was added to include north-south routing opportunities in the easternmost portion of the Study Area, for example, along CRs 56 and 57.
AB	Along CR 54 (north-south) and along CRs LL and MM (east-west)		2.5 miles; private land; undeveloped grassland	Includes an intermittent portion of Beaver Creek and small cluster of existing structures along CR 55.5	Corridor AB was added to incorporate routing opportunities between Corridors I and L.
AC	Along CR DD (east-west) and CR 48		2.5 miles; mostly private land; mostly cultivated and irrigated cropland	Includes a small portion of state land and seven center pivots and other cultivated cropland; includes an intermittent portion of Bonny Creek	Corridor AC was added south of the previous location of Corridor G (which was eliminated). Corridor AC presents better routing opportunities.

Corridor	Opportunity Along Existing Transportation Corridor	Opportunity Along Existing Transmission Line	General Description	Special Considerations	Modification to Corridor After the September, 2011 Public Informational Meetings
AD	Along CRs RR and QQ in Yuma County		9 miles; mostly private land ; some state land; mostly undeveloped grassland/shrubland with some small areas of cropland	Includes intermittent portions of Horse Creek and Dry Willow Creek; crosses the Arikaree River; includes eight oil and gas wells	Corridor AD was added to allow for a long north-south routing opportunity through mostly undeveloped land in the easternmost portion of the Study Area. This corridor also provides another option for a crossing of the Arikaree River (the other option in the eastern Study Area is within Corridor AA).
AE	Along CRs 34 and 35 in Yuma County		1.5 miles; private land; undeveloped shrubland/grassland; some cropland	Includes an intermittent stream associated with the North Fork Republican River; includes some cropland; includes three oil and gas wells	Corridor AE was added to provide a possible link from Corridor AD westward to Corridor TT.

This page intentionally left blank.

Figure 2-11



Corridor Additions Expansions & Eliminations

- Legend**
- Study Area
 - Wray Substation (End Point)
 - Burlington Substation (End Point)
 - Existing 115 kV Transmission Line
 - Existing 230 kV Transmission Line
 - Interstate Highway
 - U.S. Highway
 - Major Roads
 - Local Roads
 - Railroads
 - State Line
 - County Line

- Corridor Change**
- Eliminated Corridors
 - No Change
 - Expanded or Added Corridors

1 inch = 19,800 feet
 0 1 2 3 Miles
 1 inch = 3.75 miles

***Note:**
 Preliminary Corridors are typically one mile wide or greater, are not fixed, and may be adjusted, removed, or added during subsequent phases of the project.

Sources:
 CDOT - Highways, Major and Local Roads Railroads, Municipal Limits
 USGS - Elevation

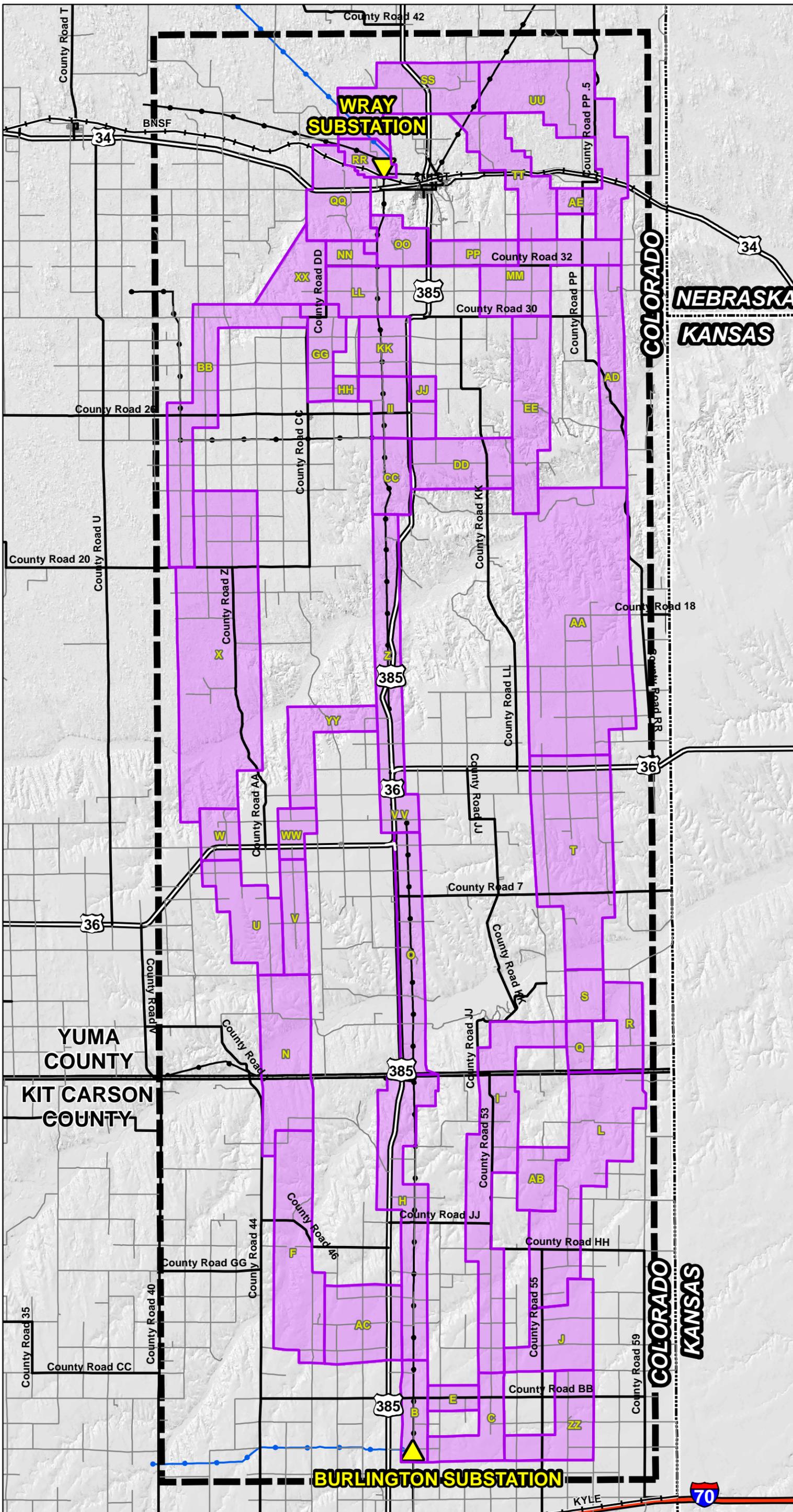
Acronyms:
 BNSF: Burlington Northern Santa Fe
 CDOT: Colorado Department of Transportation
 USGS: United States Geological Survey



Burlington-Wray 230-kV Transmission Project

This page left intentionally blank.

Figure 2-12



- Revised Corridors**
- Legend**
- Study Area
 - Wray Substation (End Point)
 - Burlington Substation (End Point)
 - Existing 115 kV Transmission Line
 - Existing 230 kV Transmission Line
 - Transportation**
 - Interstate Highway
 - U.S. Highway
 - Major Roads
 - Local Roads
 - Railroads
 - State Line
 - County Line
 - Preliminary Corridors

1 inch = 19,800 feet

0 1 2 3 Miles

1 inch = 3.75 miles

***Note:**
Preliminary Corridors are typically one mile wide or greater, are not fixed, and may be adjusted, removed, or added during subsequent phases of the project.

Sources:
CDOT - Highways, Major and Local Roads Railroads, Municipal Limits
USGS - Elevation

Acronyms:
BNSF: Burlington Northern Santa Fe
CDOT: Colorado Department of Transportation
USGS: United States Geological Survey



Burlington-Wray 230-kV Transmission Project

This page left intentionally blank.

3.0 FUTURE ACTIVITIES

3.1 ROUTE IDENTIFICATION AND COMPARATIVE ANALYSIS

A desktop analysis to assess and quantify impacts to resources from each of the preliminary alternative corridors will be conducted. This analysis will be used to identify specific alternative routes within each of the corridors. This process allows for the quantification of Project-related impacts associated with each potential route. Potential routes will need to meet the Project objectives, which require that the routes:

- Connect the Burlington and Wray Substations
- Are compatible with the existing electric systems
- Maximize opportunities and minimize constraints
- Are compatible with existing land uses
- Are cost-effective

The route refinement process will involve quantification and comparison of the environmental impacts that are anticipated as a result of the implementation of the Project. Potential routes will be analyzed on a segment-by-segment basis using routing criteria developed through the public/agency consultation process. These criteria will expand upon the opportunity and constraints criteria used to identify preliminary corridors. For each of the routing criteria, segment impacts will be quantified to allow for easy comparison. Impacts associated with route alternatives will then be totaled and rank will be assigned to each route, with “1” representing the least impact and a higher number (depending on the number of route alternatives considered) representing the most impact. An alternative route’s ranking will reflect the relative impact that a given route alternative has upon resources compared to the impacts of the other route alternatives.

3.2 FIELD RECONNAISSANCE AND IDENTIFICATION OF ROUTE-SPECIFIC CONSTRAINTS

Preliminary routes will be presented in second series of public meetings and will be analyzed in detail during the NEPA process. Field reconnaissance will be conducted on the ground and by helicopter, if necessary, after the second public meeting during the resource quantification and route refinement process. Ultimately, a preferred and at least one alternative route will be selected for further analysis. The routes that are carried forward for final analysis will represent a rational balance between the need for reliable electric service with potential environmental impacts, public acceptance, engineering considerations, economics, regulatory requirements, and land use.

Additional route-specific constraints will include identifying and mapping floodplains and specific information on soils and wildlife habitat that could influence routing decisions. In addition, as the process continues, surveys for threatened and endangered species, as well as cultural resources surveys will be conducted.

3.3 PUBLIC AND STAKEHOLDER INVOLVEMENT

Public and stakeholder involvement and Project communication will be integral to the evaluation of the identified corridors, the identification and refinement of routes, and the selection of a preferred and alternative route for detailed environmental analysis. Information regarding the Project will be available on Tri-State's Web site (<http://www.tristategt.org/Transmission/Burlington-Wray.cfm>) and will be updated as progress occurs.

The public involvement process will include public scoping workshops that will begin the formal NEPA process. At these workshops, hosted by RUS, Tri-State will present the revised corridors and preliminary routes to the public and RUS will solicit input regarding issues of concern. This outreach will assist in refining the alternatives and help determine the level of analysis necessary to address the issues relevant to the proposed Project. Public input will continue to be a part of the Project through the NEPA process and the development of the NEPA document for the Project.

Stakeholders are those people and organizations that may be affected or have some interest in the Project. Potential stakeholders for the Project identified to date include:

- Businesses, residents, and property owners along the preliminary alternative corridors
- Mineral rights owners
- Cities of Wray and Burlington
- Counties of Kit Carson and Yuma
- USFWS
- Colorado Division of Wildlife
- Colorado Department of Transportation
- Alternative energy developers and providers
- Colorado State House Representative Jon Becker (District 63)
- Colorado State Senator Greg Brophy (District 1)
- U.S. Senators Mark Udall and Michael Bennet
- U.S. Representative Cory Gardner (District 4)

3.4 PERMITS AND APPROVALS

Table 3-1 lists major permits, approvals and consultations that may be required for the Project.

TABLE 3-1 MAJOR PERMITS, APPROVALS, AND CONSULTATIONS FOR THE PROJECT

<i>Agency</i>	<i>Permit/Approval/Consultation</i>
FEDERAL	
Advisory Council on Historic Preservation (ACHP)	If necessary, ACHP will comment on the project and its effect on historic properties under Section 106 of the National Historic Preservation Act (NHPA)
FEMA	Standard Flood Hazard Determination
USACE	Authorization to discharge dredged or fill material into waters of the U.S. under Section 404, Clean Water Act, under Individual Permit or NHPs 12, 25, and 33
U.S. Department of the Interior, USFWS	Consultation regarding compliance with Sections 7 or 10 of the ESA, the Migratory Bird Treaty Act, and the Fish and Wildlife Coordination Act
FAA	Notice of Proposed Construction or Alteration (Form 7460-1)
STATE	
PUC	CPCN (obtained January 14, 2011)
CDPHE	Pollutant Discharge Elimination System Construction Stormwater Discharge Permit
State Land Board	Commercial Lease Application for ROW crossing of state-owned property
Colorado Office of Archeology and Historic Preservation	Review and comment on undertakings potentially affecting cultural resources (Section 106, NHPA)
CDOW	State-listed threatened and endangered species consultations
CDOT	Utility Special Use Permit - Road and highway crossing permits
COUNTIES - Yuma and Kit Carson	
Yuma County	Major Land Use Permit
Kit Carson County	Land Use (Development) Permit

3.5 NEPA PROCESS

As part of the environmental review for the Project, it is expected that an Environmental Assessment (EA) with Scoping will be prepared for this Project to satisfy RUS requirement for environmental pursuant to NEPA and its implementing regulations. The EA also will be prepared per RUS Bulletins 1794-A-601 and 1794A-603. Specifically, the EA will include descriptions of the Project, the need for the Project, alternatives evaluated, the affected natural and human environments, potential environmental impacts, and recommended measures to mitigate anticipated impacts. Public scoping meetings are expected to be held at the beginning of the NEPA process and continued outreach to Project stakeholders will occur as part of the EA process. Public comments received will be considered as part of the EA analysis, including recommendations for short- and long-term Project mitigation.

This page intentionally left blank.

4.0 MEETINGS AND CONSULTATIONS HELD TO DATE

To date, two public Informational Open House meetings were held on September 20 and 21, 2011, to initiate public involvement in the Project. Informal conversations, consultations and update meetings also have been held with Yuma and Kit Carson Counties and wildlife biologists with CDOW.

This page intentionally left blank.

5.0 REFERENCES

- Colorado Department of Public Health and Environment [CDPHE]. 2011. Geographic Information Systems (GIS) [On-line]. Available at: <http://www.cdphe.state.co.us/gis/> (accessed November 1, 2011).
- Colorado Division of Wildlife [CDOW]. 2008. *Recommended Buffer Zones and Seasonal Restrictions for Colorado Raptors*. Denver, CO.
- CDOW. 2011. Natural Diversity Information Source FTP Server. Available at http://ndis.nrel.colostate.edu/ftp/ftp_response.asp. Updated October 20, 2011.
- Colorado GenWeb. 2011. *Publicly-mapped Cemeteries* [On-line]. Available at: <http://cogenweb.com/> (accessed November 1, 2011).
- Colorado Oil and Gas Conservation Commission. 2011. *Petroleum Oil and Gas Development GIS* [On-line]. Available at: <http://cogcc.state.co.us/> (accessed November 1, 2011).
- Federal Aviation Administration [FAA]. 2011. *Airport Locations* [On-line]. Available at: <http://www.faa.gov> (accessed November 1, 2011).
- Federal Communications Commission [FCC]. 2011. Licensing Database Extracts [On-line]. Available at: http://wireless.fcc.gov/geographic/index.htm?job=licensing_database_extracts (accessed July 2011).
- National Park Service [NPS]. 2011. *National Register of Historic Places* [On-line]. Available at: http://nrhp.focus.nps.gov/natreg/docs/All_Data.html (accessed July 2011).
- Natural Resources Conservation Service [NRCS]. 2011. *2011 National Agriculture Imagery Program, County Mosaics* [On-line]. Available at: <http://datagateway.nrcs.usda.gov> (accessed November 1, 2011).
- United States Geological Survey [USGS]. 2011a. National Hydrography Dataset [On-line]. Available at: <http://nhd.usgs.gov/> (accessed November 1, 2011).
- USGS. 2011b. Seamless Data Warehouse [On-line]. Available at: <http://seamless.usgs.gov/> (accessed November 1, 2011).
- USGS-National Land Cover Dataset [USGS-NLCD]. 2000. National Land Cover Dataset [On-line]. Available at: <http://egsc.usgs.gov/isb/pubs/factsheets/fs10800.html> (last accessed November 1, 2011).

This page intentionally left blank.

APPENDIX A
GIS DATA SOURCES

This page intentionally left blank.

GIS DATA SOURCES			
Opportunity or Constraint	Sources / Agency	URL Location/Source	Age of Data
BACKGROUND MAPPING			
Aerial Photography			
2011 National Agriculture Imagery Program, County Mosaics	USDA-NRCS	http://datagateway.nrcs.usda.gov	2011
Topographic Maps			
1:24,000 Scale Topographic Maps	United States Geological Survey (USGS)	http://datagateway.nrcs.usda.gov	Various
ROUTING OPPORTUNITIES			
Existing Infrastructure			
Existing Transmission Lines	Tri-State	Shapefiles	2011
Existing Highways/Public Roadways (Federal, State, Public)	Colorado Department of Transportation (CDOT)	http://apps.coloradodot.info/dataaccess/	2011
Existing Railroads	CDOT	http://apps.coloradodot.info/dataaccess/	2006
Property/Tract Lines	County Tax Offices		2011
ROUTING CONSTRAINTS			
Land Management			
Federal Lands - National Parks, National Recreation Areas, National Monuments, National Forests, National Wildlife Refuges, National Wild and Scenic Rivers, National Scenic Trails and Roadways	USGS	http://www.nationalatlas.gov/atlasftp.html?openChapters=chpbound%2Cchppeople#chppeople	2009
	National Park Service (NPS)	http://www.nps.gov/hfc/cartonps-trails.htm#	2008
	Tri-State Tri-State	Aerial photograph interpretation and field reconnaissance Public Open Houses and Agency/ non-governmental organization (NGO) consultation	2009 2009
State Lands – State Parks, State Recreation Areas, State Forests, State Wildlife Refuges, State Scenic Trails and Roadways	Colorado Department of Natural Resources (CDNR)	http://parks.state.co.us/NATURALRESOURCES/PARKSRESOURCES/TEWARDSHIP/GIS/Pages/GIS.aspx	2011
	State Land Board	http://trustlands.state.co.us/MapsandData/Pages/MapsAndData.aspx	2011
	Tri-State	Aerial photograph interpretation and field reconnaissance Public Open Houses and Agency/NGO consultation	2011

GIS DATA SOURCES			
Opportunity or Constraint	Sources / Agency	URL Location/Source	Age of Data
County/Group/Club/Church – Parks, Recreation Areas, Forests, Refuges, Private Conservation Lands	Tri-State	Aerial photograph interpretation and field reconnaissance	2011
		Public Open Houses and Agency/NGO consultation	2011
Special Land Uses			
Municipal Boundaries (Urban Areas)	CDOT	http://apps.coloradodot.info/dataaccess/	2010
Residential Structures	Tri-State	Aerial photograph interpretation and field reconnaissance	2011
Commercial/Industrial/Business Structures	Tri-State	Aerial photograph interpretation and field reconnaissance	2011
Churches	USGS-Geographic Names Information System (GNIS)	http://seamless.usgs.gov/	2009
Hospitals	Colorado Department of Public Health and Environment (CDPHE) GIS	http://www.cdphe.state.co.us/gis/	2011
Nursing Homes	CDPHE	http://www.cdphe.state.co.us/gis/	2011
Schools	USGS-GNIS	http://seamless.usgs.gov/	2011
Other Structures Inhabited or Intended to be Inhabited	Tri-State	Aerial photograph interpretation and field reconnaissance	2011
Commercial/Industrial Areas	Tri-State	Aerial photograph interpretation and field reconnaissance	2011
Petroleum Oil and Gas Development	Colorado Oil and Gas Conservation Commission	http://cogcc.state.co.us/	2011
Existing energy Development (including wind energy)	Tri-State	Wind Energy Developer Provided	2010
Electronic Installations			
Commercial Amplitude Modulation (AM) Radio Transmitters	FCC	http://wireless.fcc.gov/geographic/index.htm?job=licensing_database_ext_racts	0523/2011
	Tri-State	Field reconnaissance	2011
Frequency Modulation (FM) Radio Transmitters	FCC	http://wireless.fcc.gov/geographic/index.htm?job=licensing_database_ext_racts	0523/2011
	Tri-State	Field reconnaissance	2011
Microwave Relay Stations	FCC	http://wireless.fcc.gov/geographic/index.htm?job=licensing_database_ext_racts	0523/2011
	Tri-State	Field reconnaissance	2011
Other Electronic Installations	FCC	http://wireless.fcc.gov/geographic/index.htm?job=licensing_database_ext_racts	0523/2011
	Tri-State	Field reconnaissance	2011

GIS DATA SOURCES			
Opportunity or Constraint	Sources / Agency	URL Location/Source	Age of Data
Airstrips			
Private Airstrips within 10,000 Feet	Tri-State	Aerial photograph interpretation and field reconnaissance	2011
FAA-registered Airports within 20,000 Feet	FAA	FAA Microsoft Excel database incorporated into GIS Aerial photograph interpretation and field reconnaissance	2011 2011
Heliports within 5,000 Feet	FAA	FAA MS Excel database incorporated into GIS Aerial photograph interpretation and field reconnaissance	2011 2011
Agricultural Land			
Agricultural Cropland (without Traveling Irrigation Systems)	Tri-State	Aerial photograph interpretation and field reconnaissance	2011
Agricultural Cropland with Traveling Irrigation Systems	Tri-State	Aerial photograph interpretation and field reconnaissance	2011
Agricultural Rangeland/Pasture	Tri-State	Aerial photograph interpretation and field reconnaissance	2011
Prime Farmland, and Prime when irrigated	NRCS, United States Department of Agriculture.	http://soildatamart.nrcs.usda.gov	2011
Historical and Archaeological Sites			
Publicly-mapped Cemeteries within 1,000 Feet	USGS-GNIS	GNIS, http://geonames.usgs.gov/domestic/download_data.htm Colorado GenWeb, http://cogenweb.com/	2011
Identified Historical/Archeological sites	National Park Service National Register Information System (NRIS) database and National Register of Historic Places (NRHP)	Data Interpretation	2011
Environmentally Sensitive Areas			
Rivers and Streams	USGS	http://nhd.usgs.gov/	2011
NRCS Wetlands Reserve Program Easements	USDA-NRCS	GIS data provided by NRCS via e-mail	2011
Open Water (Reservoirs, Lakes, Ponds)	USGS	http://nhd.usgs.gov/	2011
Federal Emergency Management Agency (FEMA) 100-year Floodplains	FEMA	http://msc.fema.gov/webapp/wcs/stores/servlet/FemaWelcomeView?storeId=10001&catalogId=10001&langId=-1	Various
Scrub-Shrub and/or Emergent Wetlands	U.S. Fish and Wildlife Service (USFWS) - National Wetlands Inventory (NWI) Maps	http://www.fws.gov/wetlands/Data/Mapper.html	2011
Bottomland Forest and/or Forested Wetlands	USFWS-NWI Maps	http://www.fws.gov/wetlands/Data/Mapper.html	2011

GIS DATA SOURCES

Opportunity or Constraint	Sources / Agency	URL Location/Source	Age of Data
Protected Species Records	CDOW	http://ndis.nrel.colostate.edu/ftp/ftp_response.asp	
Potential Conservation Area (PCA)	Colorado Natural Heritage Program (CNHP) PCAs	http://www.cnhp.colostate.edu/download/gis.asp	2011