3.16 Transportation and Access

This section of the EIS describes the national, state, and local transportation networks serving the analysis area and characterizes typical and representative transportation planning considerations within these networks. The primary topics addressed include roadway systems, design standards, traffic volumes, traffic congestion, safety, and maintenance. In addition, this section of the EIS addresses the presence of railroads, airports, and military airspace operating areas within the analysis area and related planning considerations. Transportation-related topics addressed in other sections include off-highway vehicle use (Section 3.13, Recreation Resources) and travel restrictions in areas of special designation (Section 3.14, Land Use).

3.16.1 Regulatory Background

A variety of federal, state, and local agencies administer and regulate roadways, railways, and airports. The American Association of State Highway and Transportation Officials (AASHTO) and the Federal Highway Administration (FHWA) are responsible for interstate and U.S. highways. State DOTs are responsible for state highways and routes. County and local roads are controlled by the presiding jurisdiction (cities, counties). Other roads on federal lands are managed by the applicable federal agencies (NPS, BLM, USFS, etc.). Railroad operations are regulated by state commissions. Aviation is governed by the Federal Aviation Administration (FAA). Each of these regulatory and governing agencies and the military has their own authority, as detailed below.

3.16.1.1 Roadway Requirements

<u>Roadway Design Standards and Specifications</u>

In general, relevant AASHTO and the FHWA define design standards, specifications, and guidelines for roadways (Interstate and U.S. Highways) throughout the U.S. that would be used for design and traffic control of roadways in the Project area. Design standards include AASHTO publications: *A Policy on Geometric Design of Highways and Streets, Guidelines for Geometric Design of Very Low-Volume Local Roads (ADT ≤ 400)* (AASHTO 2001), and *Roadside Design Guide* (AASHTO 2011). Relevant FHWA publications include the *Manual for Uniform Traffic Control Devices (MUTCD)* (FHWA 2009). Other appropriate design protocols would be followed as appropriate for the area containing the roadway.

Each state within the analysis area adopts their own set of design standards and specifications for federal and state highways or routes. Many of these refer to the manuals published by the federal agencies previously mentioned. The following are the major state department of transportation (DOT) design standards, specifications and guidelines that govern state-level roadways:

- Wyoming – Road Design Manual (Wyoming DOT [WDOT] 2004), Standard Plans (WDOT 2011), WDOT Basic and Operating Policy (WDOT 1998);
- Colorado – M&S Standard Plans (Colorado DOT [CDOT] 2006), State Highway Access Code (CDOT 1998);
- Utah – Utah DOT (UDOT) Standards and Specifications (UDOT 2008), Access Management Program (UDOT 2011); and
- Nevada – Road Design Guide 2010 (Nevada DOT [NDOT] 2010).

In addition to these references, state DOTs publish standard construction specifications detailing required materials and procedures. State DOTs also publish design standards for bridge projects. Most, if not all, roadway and bridge publications can be found on the respective state DOT websites. Current versions of these design manuals or new, relevant manuals are applied to future transportation projects. Cities and counties also may have additional, specific design standards and specifications.

On public lands, BLM, USFS, other Federal, and state road requirements have been set forth. One primary standard applicable on public land is “The Gold Book – Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development” (BLM and Forest Service 2007).

On BLM-managed lands, new road construction and roads improved for Project use would be required to meet or exceed the minimum standards of width, alignment, grade, surface, and other requirements presented in the BLM Travel Management Program and BLM Manual Section 9113 (BLM 1985). On USFS lands, road construction and roads improved for Project use would be required to comply with the Forest Service Manual (FSM) (USFS 1999a) and Forest Service Handbook (FSH) (USFS 1999b). Some example sections relative to the Project are FSH 7709.56 – *Road Preconstruction Handbook (Forest Service 2010)*, FSH 7709.57 – *Road Construction Handbook (Forest Service 1992)*, and 7709.58 – *Transportation System Maintenance Handbook (Forest Service 2009b)*.

Corresponding BLM and USFS travel management plans have been developed and apply throughout the analysis area. The plans are designed to provide decision-makers with information to manage road systems that are safe and responsive to public needs and desires, are economically and efficiently managed, and have minimal negative ecological impacts on the land. The plans include designated areas for motorized use, prohibition of some uses to protect resources, or limitations on road use at certain times of the year for resource protection.

The WDOT’s Utility Accommodation Regulation (WDOT 1990) provides the permit, encroachment, and occupancy requirements for construction and operations activities. Similar requirements apply in Utah, Colorado, and Nevada.

<u>Other Relevant Local Roadway Requirements</u>

Cities, counties, and other public agencies typically require an encroachment permit or similar authorization from the applicable jurisdictional agency at locations where road construction activities would occur within or above the public road ROW. The specific requirements of the encroachment permit from the applicable transportation agency would be individually determined based on Project and jurisdiction specifics. The encroachment permit issued by state and local jurisdictions may include the following requirements:

- Identify all roadway locations where special construction techniques such as night construction would be used to minimize impacts to traffic flow;
- Develop circulation and detour plans to minimize impacts to local street circulation, which may include the use of signing and flagging to guide vehicles through and/or around the construction zone;
- Schedule truck trips outside of peak morning and evening commute hours;
- Limit lane closures during peak hours to the extent possible;
- Include detours for areas potentially affected by Project construction;
- Install temporary traffic control devices as specified in the *Manual of Uniform Traffic Control Devices for Streets and Highways* (FHWA 2009); and
- Store construction materials only in designated areas.

Encroachment permit requirements would be specified by the agency having jurisdiction. Enforcement of the terms of an encroachment permit would reduce impacts associated with road closures.

3.16.1.2 Railroads

The Wyoming Transportation Commission, the Utah Public Service Commission, and the Colorado and Nevada Public Utilities Commissions each oversee railroad operations and operators in their respective states. These entities make public decisions involving railroad safety matters. Specific procedures and standards apply in each state for shared corridor operations and modifications of at-grade crossing.

The National Electrical Safety Code (NESC) (IEEESA 2011) sets policies for practical safeguarding of persons during the installation, operation, or maintenance of electric supply and communication lines and associated equipment. Any railroad/overhead utility crossing interaction would conform to NESC requirements and applicable code requirements. Key requirements include the following four items.

1. Poles or other structures supporting power must be 50 feet from the centerline of main running tracks, centralized traffic control (CTC) sidings and heavy tonnage spurs. Pole location adjacent to industry tracks must provide at least a 30-foot clearance from the centerline of track when measured at right angles. If located adjacent to curved track, then said clearance must be increased at the rate of 1.5 inches per degree of curved track.
2. Regardless of the voltage, un-guyed poles shall be located a minimum distance from the centerline of any track equal to the height of the pole above the ground line plus 10 feet. If guying is required, the guys shall be placed in such a manner as to keep the pole from leaning or falling in the direction of the tracks.
3. High voltage poles and structures (345 kV and higher) must be located outside of railroad ROW.
4. Crossings must not be installed under or within 500 feet from the end of any railroad bridge, or 300 feet from the centerline of any culvert or switch area.

3.16.1.3 Airports

Airports require clear zones for aviation safety. Clear zones vary according to airport activity and the types of aircraft operating at a particular airport. Large airports and military facilities have more extensive requirements than smaller airports and smaller landing strips.

Clear zone requirements typically involve a three dimensional space free of aviation obstacles. In some areas, guy wires, towers, transmission lines, tall buildings and other possible aviation hazards are marked, lighted and/or charted based on Federal Aviation Administration (FAA) requirements. FAA requirements also cover an airport's radar, flight control instruments, flight paths and other fundamental aspects of airport operations and safety. Standards are applied along with customization to address actual conditions at individual airports.

Locations where potential air space obstruction hazards would be constructed may require submittal of a "Notice of Proposed Construction or Alteration" to the FAA based on criteria contained in 14 CFR 77, titled "Objects Affecting the Navigable Air Space." FAA requirements set forth in Advisory Circular AC 70/7460–2K, titled "Proposed Construction or Alteration of Objects that May Affect the Navigable Airspace," provide information to persons proposing to erect or alter an object that may affect navigable airspace and corresponding notification and review requirements. Overhead transmission lines and their supporting structures are subject to these requirements (FAA March 2000) which are summarized as follows:

- The FAA must be notified if a proposed action involves construction or alteration exceeding 200 feet above ground level and construction or alteration within:
  - 20,000 feet (approximately 4 miles) of a public use or military airport that exceeds a 100:1 sloping surface from any point on the runway of each airport with at least one runway more than 3,200 feet;
  - 10,000 feet (approximately 2 miles) of a public use or military airport that exceeds a 50:1 sloping surface from any point on the runway of each airport with its longest runway no more than 3,200 feet;
  - 5,000 feet of a public use heliport that exceeds a 25:1 sloping surface;
- A "No-hazard Declaration" is required by the FAA if a structure is more than 200 feet in height according to the FAA Act of 1958 (FAA 2011) (PL 85-726) (14 CFR 77); and
- The applicable FAA Regulation for landing strips for agricultural and other aviation purposes is FAR Part 157. These airports may or may not be shown on the FAA sectional charts.

3.16.1.4 Military Airspace Operating Areas

Additional requirements are applicable at military sites and within military operating areas (MOAs) and military training routes (MTRs). Unlike public airports, military operations often include large areas surrounding their airports and operations for testing, training, and other purposes well beyond the military airport areas' landing and takeoff boundaries. These areas are given special airspace designations linked to corresponding military operations. A Section 1101 Air Space Permit is required for air space construction clearance according to the FAA Act of 1958 (PL 85-726) (14 CFR 77).

3.16.2 Data Sources

The information and maps presented in this discussion were compiled from various Project documents, state and federal documents, regulations, and guidelines. Some of the baseline map information was derived from the U.S. DOT, Research and Innovative Technology Administration, Bureau of Transportation Statistics. Additional baseline map information was derived from the U.S. Census TIGER/Line data and other federal data sources.

3.16.3 Analysis Area

The analysis area for the alternatives has two components. The first component is the overall area defined by the national, state and local road and railroad transportation network serving the alternative routes. This area is characterized in the figures that show the overall corridor from Wyoming to Nevada (**Figures 3.16-1** through **3.16-4**). The second component is composed of smaller, more focused areas defined by specific interconnections between the larger road, railroad and airport networks and individual transportation facilities and activities that cross or otherwise connect with or relate to alternatives and associated features. The smaller areas typically include improved and unimproved routes within the local roadway network, railroads, airports, and controlled airspaces. The roads within this portion of the analysis area are considered the Project "backbone" roads. **Figure 3.16-5** and **Figure 3.16-6** provide examples of the local roadway network (road density, distribution, and type) to generally characterize the second component of the analysis area. The following discussions address both components of the analysis area.

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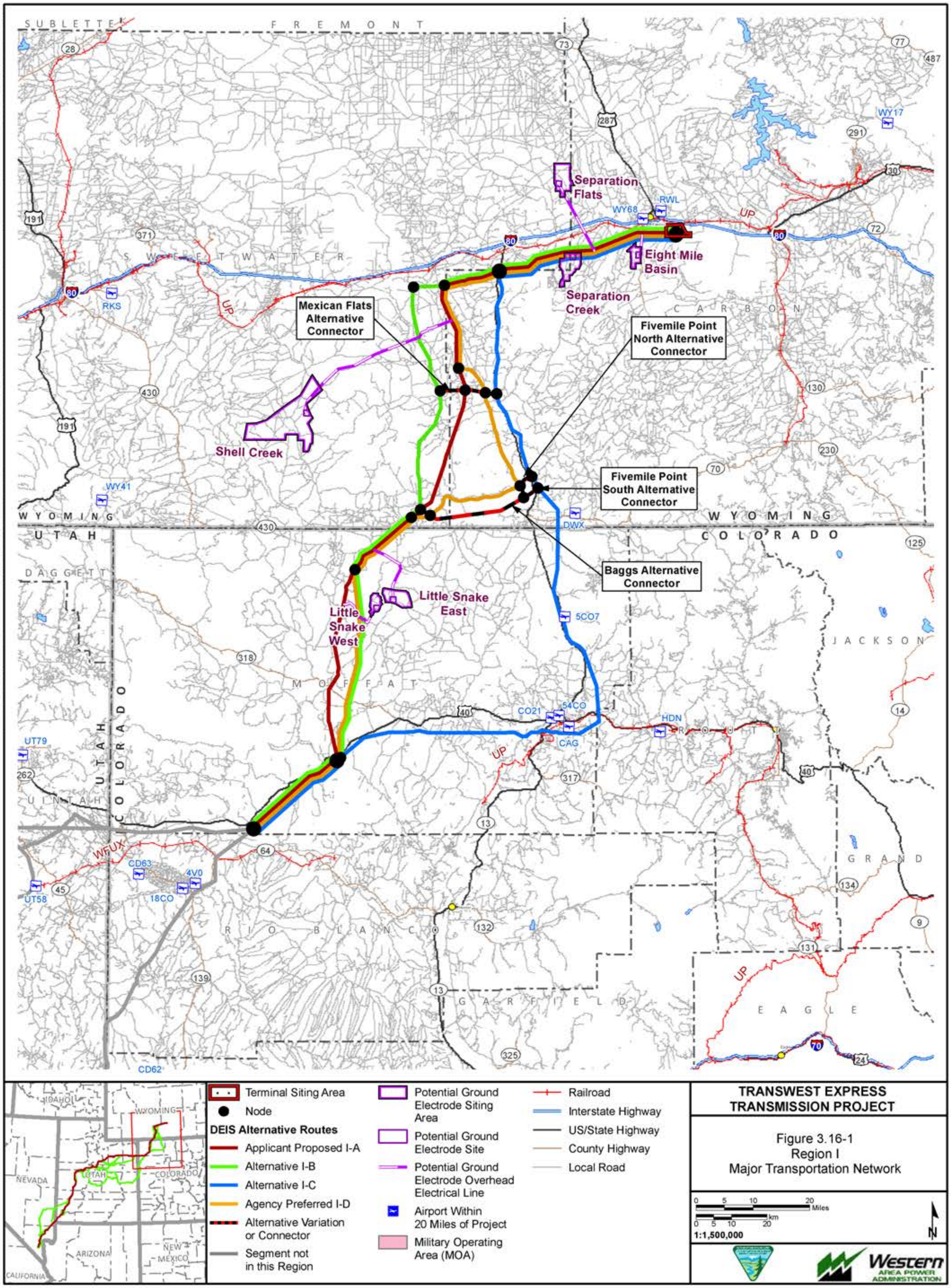

Figure 3.16-1
Region I
Major Transportation Network

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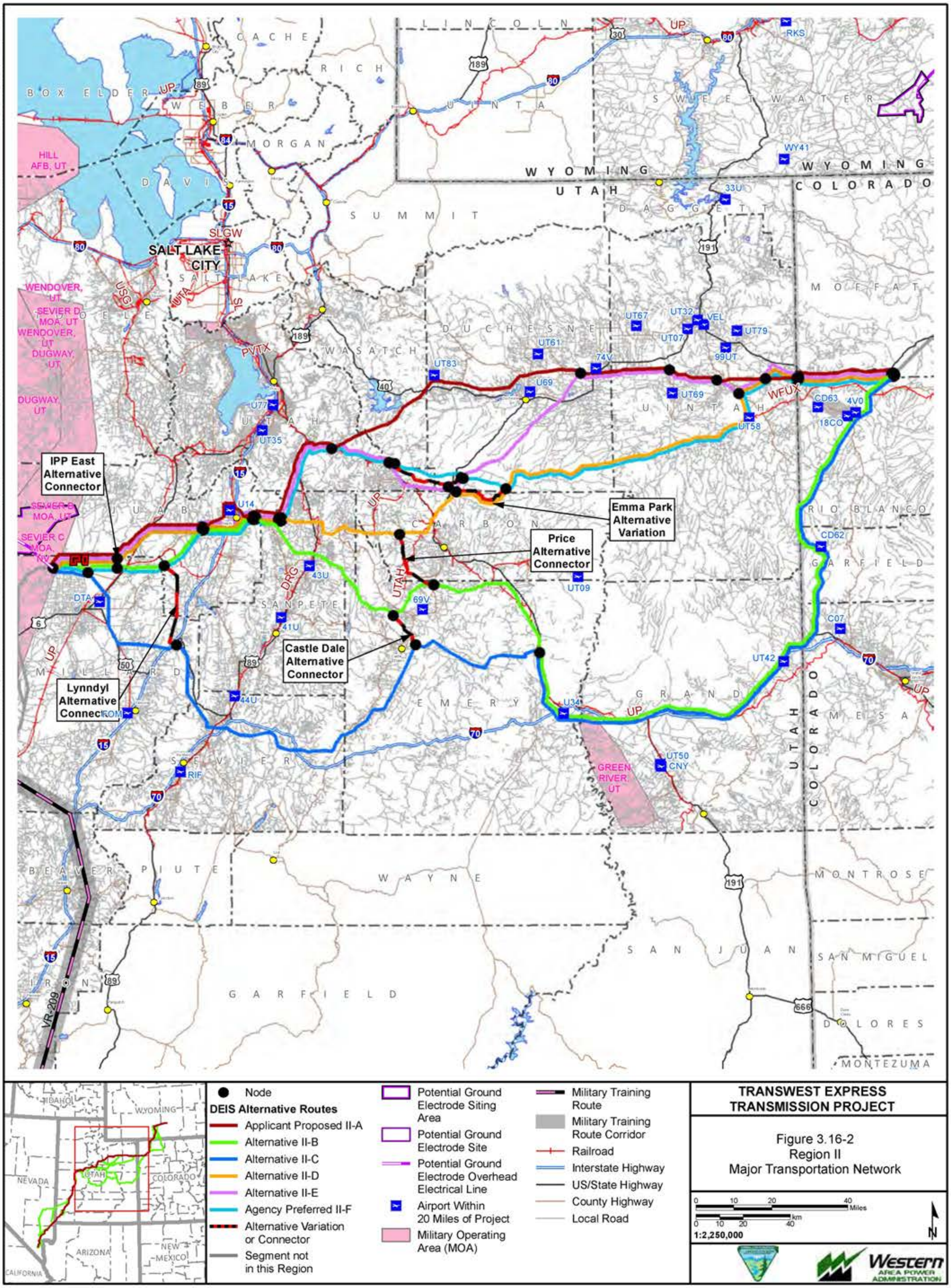

Figure 3.16-2
Region II
Major Transportation Network

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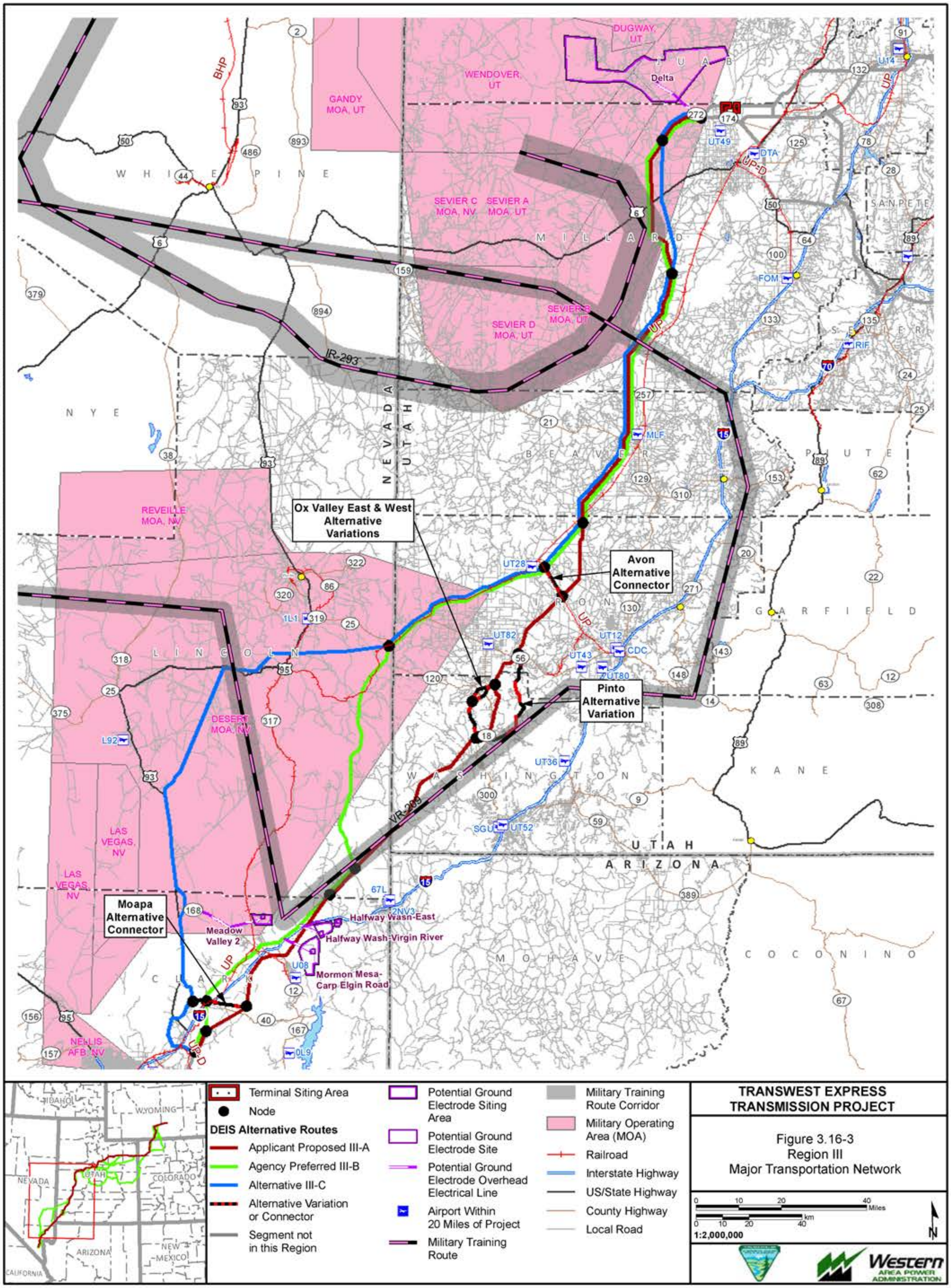

Figure 3.16-3
Region III
Major Transportation Network

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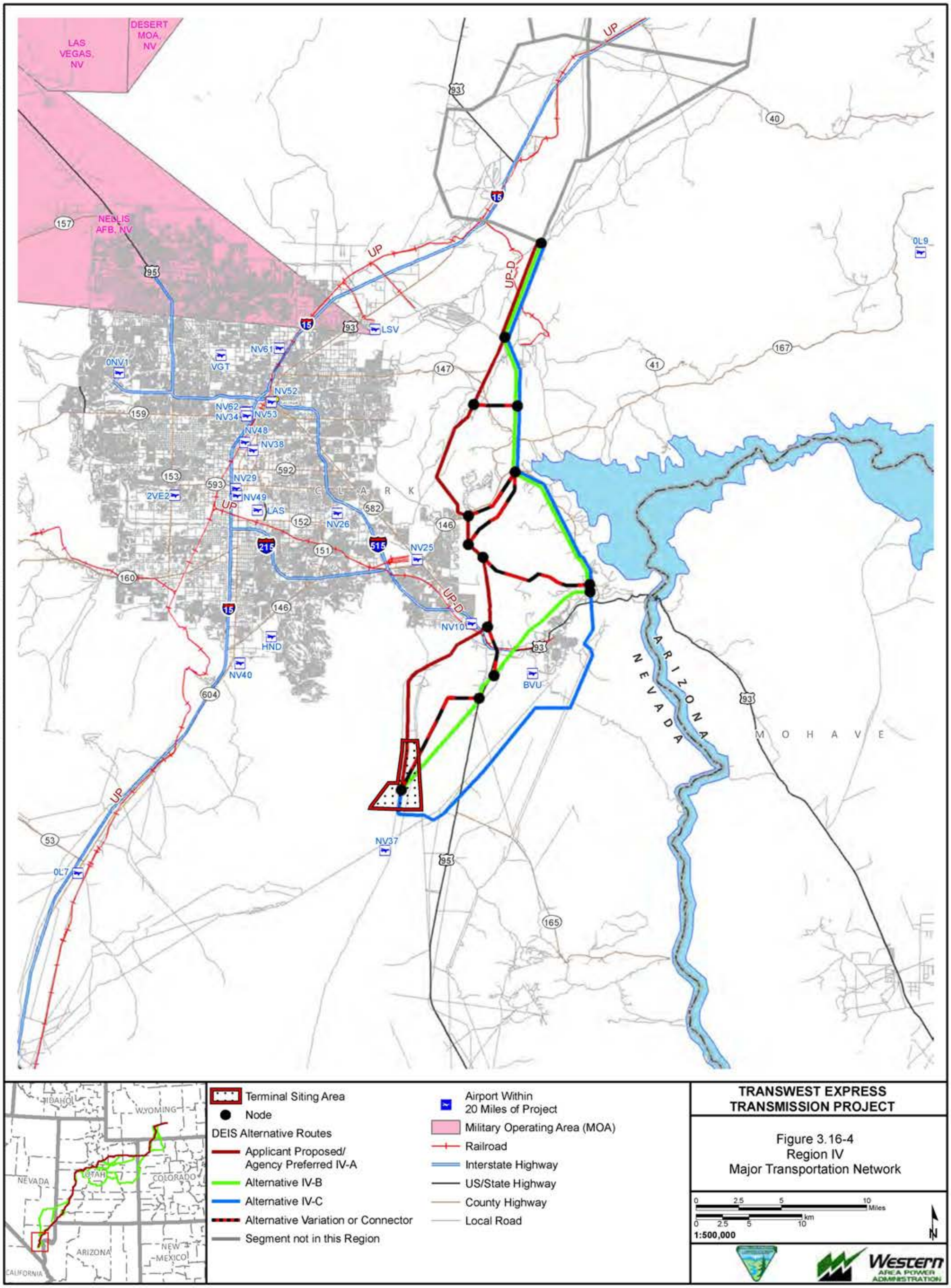

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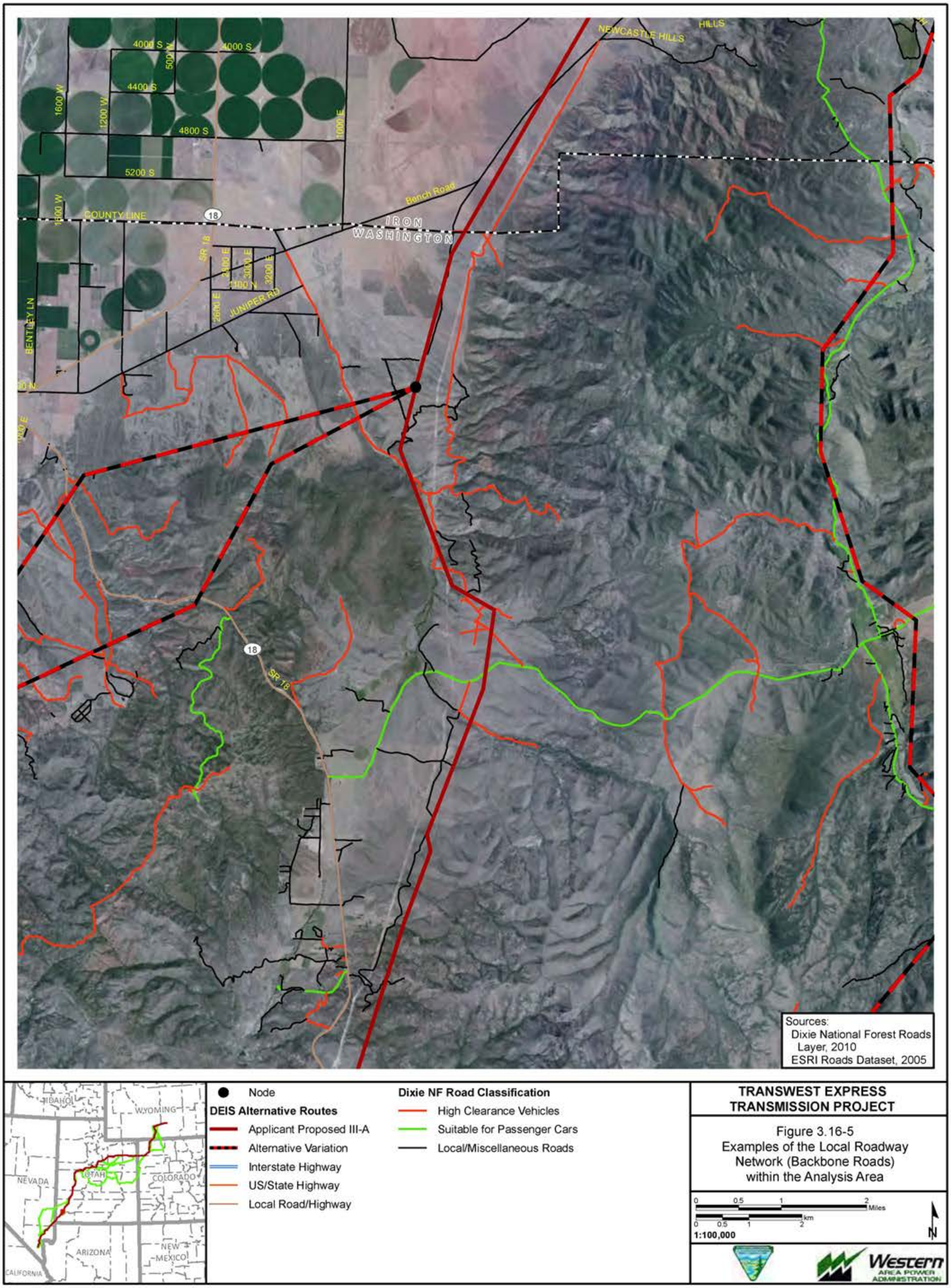

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.16-5
Examples of the Local Roadway Network (Backbone Roads) within the Analysis Area

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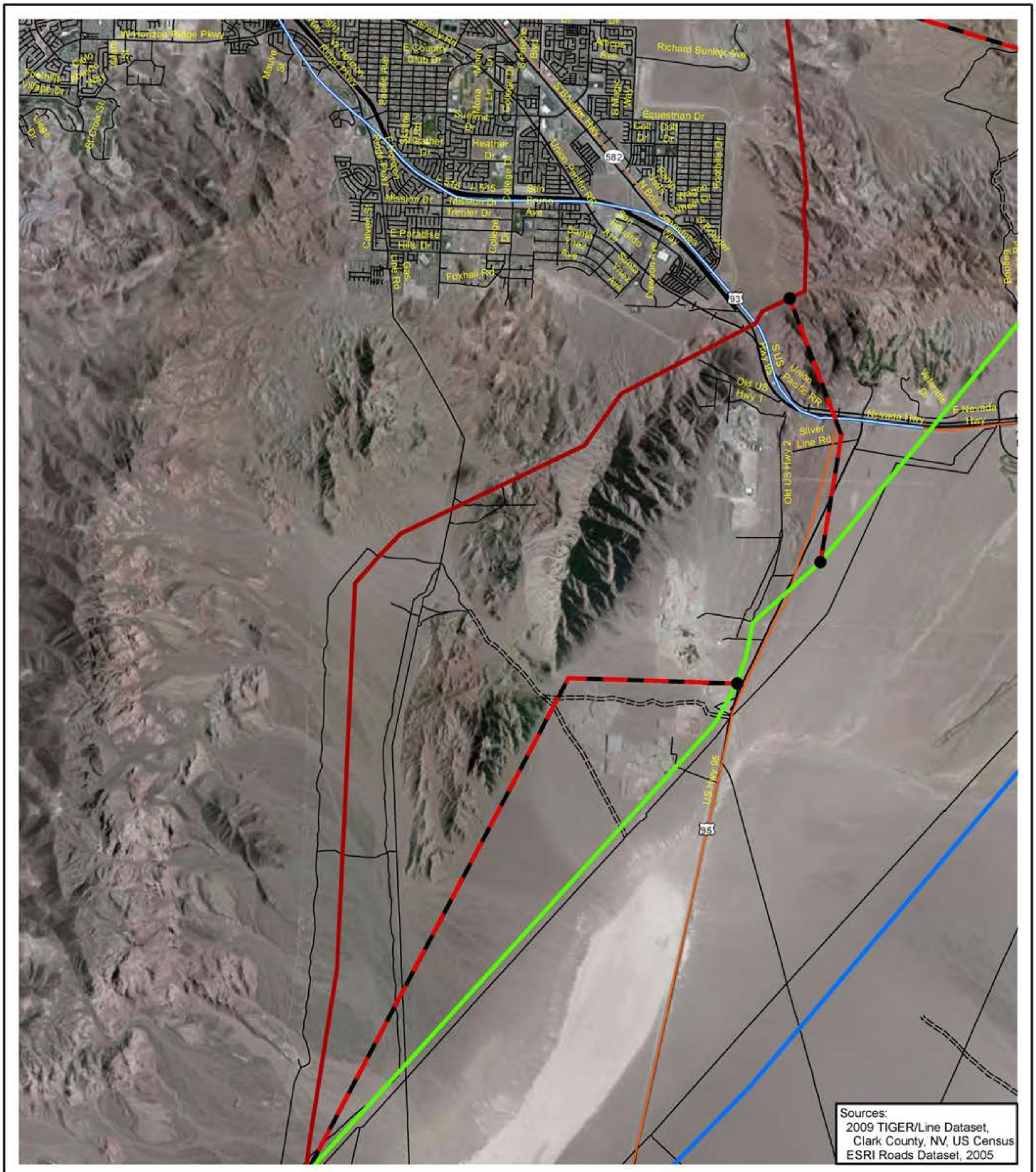

- Node

DEIS Alternative Routes

- Applicant Proposed/ Agency Preferred IV-A
- Alternative IV-B
- Alternative IV-C
- Alternative Variation or Connector

- Interstate Highway
- US/State Highway
- Local Road/Highway

TIGER/Line Classifications

- Primary Road
- Secondary Road
- Local Road
- Vehicular Trail (4WD)
- Railroad

TRANSWEST EXPRESS TRANSMISSION PROJECT

Figure 3.16-6
Examples of the Local Roadway Network (Backbone Roads) within the Analysis Area

0 0.5 1 2 Miles
0 0.5 1 2 km
1:100,000

Western Area Power Administration

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3.16.4 Baseline Description

3.16.4.1 Roads

Roadway Network

The interstate system, U.S. highways, and state highways provide national and state routes through the analysis area for automobiles and trucks. These roads can support high travel speeds and traffic volumes by meeting specific state and federal design standards.

The local roadway networks serving the analysis area provide higher levels of access within the analysis area. Local roads in the analysis area are designed to carry lower volumes at lower speeds than federal and state roads. Some portions of the analysis area have extensive local roadway networks (urban and suburban areas), while other portions of the analysis area have few to no local roads (rural and remote areas). Roadway types located within the analysis area include major and minor arterials and collectors, and unpaved roads.

Local roadway conditions characterize different accessibility and terrain conditions found within the overall Project corridor and can be classified into four categories:

- Urban-Flat;
- Suburban-Rolling;
- Rural-Steep; and
- Remote-Mountainous.

Each condition within the analysis area presents specific and unique transportation and access issues and challenges. For example, issues and challenges associated with developed or relatively flat areas with established roadway networks frequently involve the potential for residential and business access constraints, congestion, and deficient intersection design and operations.

Issues and challenges involving undeveloped areas and/or steeper terrain and unimproved roads are often linked to construction complexity (sharp horizontal and vertical curves), safety features (sight distance and speed control), and maintenance considerations (road and slope stability based on geology, geotechnical factors, and drainage/stormwater control features like culverts and ditches). Unimproved roads present ongoing maintenance requirements for public agencies. Typical maintenance requirements include grading and adding roadbase to smooth travel surfaces. These activities are highly dependent on factors such as use characteristics, slope, and weather conditions. Maintenance requirements can be increased by higher than normal travel volumes and the use of these roads by heavy trucks.

The use of, or modification to, existing roadways and the construction of new roadways require direct interaction with local public agencies responsible for these roadways and adherence to applicable local, state and federal standards and requirements.

Project Roadway Accident Statistics

Each State in the analysis area has its own method of collecting and reporting crash data and statistics. Most DOTs report four types of data: total, property damage only, injury, and fatal crashes. Accident type, factors involved, and driver demographics also may be included. A high level or summary analysis of crash data was performed on individual roadways or county areas to characterize the affected environment of the Project analysis area.

WDOT published the *Wyoming FY2012 Problem Identification* (WDOT 2012). From the report, based on 2008 to 2010 crash information, a highway safety index state ranking system was established. Crash information was reported by county.

CDOT reports crash data based on individual roadways. Data provided by CDOT are plotted on safety performance functions, which are specific to rural or urban, terrain type and number of lanes. The safety performance function consists of the annual average daily traffic (AADT) vs. Accidents per Mile per Year graph containing data points from similar roadway types throughout the state of Colorado. Depending on where the specific roadway data point falls on the graph gives a general indication if the roadway's crash data are within an expected range (CDOT 2005).

UDOT provides crash data by county. There are 13 counties in the analysis area within Utah: Beaver, Carbon, Duchesne, Emery, Grand, Iron, Juab, Millard, Sanpete, Sevier, Uintah, Utah and Wasatch. The *Utah Crash Summary 2010* (Utah State Department of Public Safety 2010) ranks each county on total crash rate per 100 million vehicle miles traveled as well as providing a county-by-county highway safety ranking.

NDOT also provides crash data by county. The analysis area involves two counties, Clark and Lincoln (NDOT 2011).

Accident statistics for unimproved local roadways are not readily available or consistent. Key safety issues often involve vehicles operating at unsafe speeds given road conditions, mixing several vehicle classes (passenger cars, motorcycles, trucks and slow/wide construction vehicles), poor lighting or drainage conditions, and limited sight distance.

Public and Private Access Conditions involving Local Roadways

The local roadway network exists to provide access to public and private property. These roads also connect communities and provide access to natural resources, recreation areas, and utility corridors. Depending on location, access may be available at all times and in other areas, access is limited or prohibited. Private property may be served by public and/or private roads. Public property is primarily served by public roads, but there are some exceptions based on specific agreements (easements) between landowners and land management agencies. Most private roads do not provide public access and may or may not be gated to limit unauthorized travel.

3.16.4.2 Railroads

Roads, railroads, transmission lines, and other uses of utility corridors often follow common parallel alignments, often crossing one another. The use of a common corridor and railroad crossings in general present potential safety issues and risks routinely addressed throughout the country.

3.16.4.3 Airports

Based on proximity of the Project to existing airports, some of these airports and their operations present the potential for safety considerations.

3.16.4.4 Military Airspace Operating Areas

The major military facilities in the analysis area include:

- Nevada Test and Training Range (NTTR);
- Utah Test and Training Range (UTTR); and
- Utah Launch Complex/White Sands Missile Range near Green River, Utah.

The NTTR, affiliated with Nellis Air Force Base (AFB), Creech AFB, and Luke AFB, includes special designations for Low Altitude Tactical Navigation airspace and emergency aircraft evacuation/ejection areas within the analysis area. These designations and related details are set forth in a Letter of Agreement between the U.S. Air Force (USAF) and BLM (USAF-BLM 2005). The details of the Letter of Agreement are presented here: http://www.airspacecoordination.org/coord/nellis_LOA.pdf.

WWEC and other utility corridors pass through the NTTR and the Desert MOA. Refer to **Figures 2-3** and **3.16-3** for the boundaries of the Desert MOA. The flight "altitude floors" are set at 100 feet above-ground level (AGL) within the Desert MOA. However, WWEC Final EIS and RMP utility corridors exist within the surface area boundaries of the Desert MOA.

The NTTR involves almost 3 million acres of land and is a valuable military aviation and economic resource. The NTTR is Air Combat Command's largest complex with 3 airfields, 2 ranges, and 10 other sites providing 12,000 square nautical miles of airspace (MacNeill 2012). MTR VR-209 passes through the NTTR as shown in **Figure 3.16-3**. Special Operating Procedure (9) states "Caution: Watch for power lines…" The importance of Special Operating Procedure (9) is that military pilots using VR-209 are currently informed about the presence of power lines.

The UTTR, affiliated with Hill AFB, also is in the analysis area. Like the NTTR, the UTTR is a valuable military aviation and economic resource. The Hill AFB Sevier A and C MOA and the Hill AFB Sevier B and D MOA involve routine and low-risk training and testing. The UTTR was designated in 1979 specifically to support cruise missile testing, which is ongoing. The Hill AFB Sevier A and B MOA restrictions address low altitude flights. The flight altitude floors are set at 100 feet AGL within the Hill AFB Sevier A and B MOAs. The UTTR supports approximately 1,200 sorties annually that train in the 100-foot AGL regime. There are few places in U.S. airspace that allow flights to this low altitude other than UTTR and NTTR. The Hill AFB Sevier C and D MOAs occur above the A and B MOAs and address aircraft operations at higher altitudes. However, WWEC Final EIS and RMP utility corridors exist within surface area boundaries of the Hill AFB Sevier MOAs. MTR VR-209 and MTR IR-293 pass through the UTTR as shown in **Figure 3.16-3**. Minimum (flight) altitudes are established to provide at least 100 feet vertical clearance of known man-made obstructions within the route width. Obstructions under 200 feet AGL were not considered in route design.

At Hill AFB, most of the operations require use of air space and training includes a great deal of interaction with ground forces. The UTTR has approximately 13,000 square nautical miles of air space, about half of which is MOA and half is restricted air space (EGS/TWE 2009).

WWEC and other utility corridors pass through the UTTR (see **Figure 2-4** through **2-7** and **Figure 3.16-3**). A moratorium on planning from the 2000 Defense Act states that no planning would occur on public lands under the jurisdiction of the BLM in the State of Utah that are adjacent to or near the UTTR and Dugway Proving Ground or beneath the MOAs, Restricted Areas, and airspace that make up the UTTR. If the alternatives and/or the associated features are proposed on federal lands "adjacent to, near or beneath" an MOA a Resource Management Plan Amendment is required (Ashcroft 2011; BLM 1985).

The moratorium on planning would only apply if an RMP Amendment is required based on a lack of conformance with the existing land use plan. A Project can be sited "adjacent to, near or beneath" a MOA as long as it conforms to the existing RMP.

The Utah Launch Complex/White Sands Missile Range currently is not used for military air space operations. However, the U.S. Department of Defense may use this site in the future for military air space operations or other operations. WWEC Final EIS, RMP, and LRMP utility corridors pass through the northern end of the site (see **Figure 2-4** through **2-7** and **Figure 3.16-2**).

3.16.5 Regional Summary

Table 3.16-1 indicates the major transportation network infrastructure in the analysis area summarized by Project region and includes major roadways, railroads, and airports. **Figures 3.16-1** through **3.16-4** depict the transportation infrastructure by Project region.

Table 3.16-1 Major Transportation Network Infrastructure by Project Regions

Region	Interstate Highways	U.S. Highways	State Highways	Railroads	Airports
I	I-80	30, 40, 191, 287	13, 45, 70, 88, 318, 430, 789	Union Pacific WFUX	Rawlins, Wyoming; Craig, Colorado
II	I-15, I-70	6, 40, 50, 89, 191	10, 24, 28, 35, 64, 87, 89, 125, 132, 135 139, 174, 208, 260	Union Pacific WFUX	Delta, Utah; Price, Utah; Nephi, Utah; Vernal, Utah; Green River, Utah
III	I-15	6, 50, 89, 93, 95, 189	21, 56, 78, 147, 168, 169, 219, 257, 319	Union Pacific	Delta, Utah; Milford, Utah; St. George, Utah; Cedar City, Utah
IV	I-15 I-215 I-515	93, 95	147, 564	Union Pacific	McCarren International, Las Vegas, Nevada

3.16.5.1 Roadways

<u>Roadway Network, Access and Terrain Conditions</u>

The level of road development, public and private property access and topography vary considerably in each of the Project regions. However, regional road network, local access, applicable standards, congestion, and safety conditions are similar within the four regions of the analysis area. Conditions in Region IV generally are more developed resulting in more congestion and safety issues; however, the terrain is less steep than in the other Regions.

<u>Capacity</u>

The Highway Capacity Manual (Transportation Research Board 2010) is used to estimate a volume-to-capacity (v/c) ratio. Volume-to-capacity ratio is the hourly volume (in passenger car equivalent) divided by the hourly capacity of the roadway being analyzed. Operating at or near capacity (depending on the agency) is considered a failure. The key data inputs for estimating a v/c ratio include: hourly traffic volume, number of lanes, terrain type and percentage of trucks.

Peak hour volumes were estimated from the AADT volumes provided by State DOTs and the number of lanes corresponding to the AADT were recorded. In all cases, the terrain type was considered rolling and a traffic volume consisting of 12 percent trucks was assumed. These assumptions generally match analysis area characteristics. State DOTs provided AADT volumes for interstates and state highways. Data were collected from 2009 or later for the major roadways listed previously at or near locations where access may be needed and where crossings may occur. For all major roadways within the analysis area (all states), the volume-to-capacity ratio during the peak hour is estimated to be 0.35 or better (i.e., all roadways are operating at 35 percent of their capacity).

In some locations within the analysis area, past, ongoing and anticipated activities have added, add or would add "unusually" high levels of traffic to a particular local roadway network. This traffic is associated with construction, operation and/or maintenance of various types of industrial projects (pipelines, power transmission lines, telecommunication lines, oil and gas exploration and production, mining, power generation (coal, solar, and wind), road construction, and resource management activities such as timber harvest, fire suppression and burn area rehabilitation. These activities typically increase travel on the road network during finite construction periods or in some cases for extended periods associated with facility operations or both. This traffic, in combination with baseline traffic levels, can create congestion, safety, and/or road maintenance issues during the overlapping timeframes.

The cumulative impact analysis presented in Chapter 5.0 identifies past, present and reasonably foreseeable projects within the analysis area.

<u>Accident Rate Conditions by State</u>

Accident information is generally compiled and reported by States. The Project regions relate to state boundaries as follows:

Region I	Wyoming, Colorado and Utah
Region II	Colorado and Utah
Region III	Utah and Nevada
Region IV	Nevada

The following information presents accident conditions by State.

Wyoming: The statewide safety index average is 12.0 with 1.0 being the worst rank. Roadway accident statistics for Wyoming indicate that Carbon, Fremont, and Sweetwater counties have a total ranking safety index of 12.60, 6.00, and 10.20, respectively. According to this ranking, Fremont and Sweetwater counties fall below the statewide average and Carbon County is slightly above the statewide average (WDOT 2012).

Colorado: Based on crash information in Colorado provided by CDOT, all roadways in the analysis area are within the expected range, except SH 13 near Craig, Colorado (CDOT 2005).

Utah: Out of the 13 counties analyzed, all rank safer than the statewide average based on crash rate per 100 million vehicle miles traveled except Utah and Duchesne counties. The State of Utah has a second way of evaluating safety using additional criteria. Based on this county highway safety ranking, Duchesne, Wasatch, Uintah, and Utah counties fall below the safety ranking average, meaning the roadways are less safe than the average roadway.

Nevada: Based on data provided by NDOT from 2008 to 2010, Clark County has a higher total crash rate per 100 million vehicle miles traveled than the state average. This is expected since Las Vegas is located in the county and urban crash rates tend to be higher than average. Lincoln County has a lower total crash rate than the statewide average (NDOT 2011).

3.16.5.2 Railroads

More railroad tracks are found in Region IV than in the other regions. Railroad density is the highest in the northwestern portion of Region IV.

3.16.5.3 Airports

Airports are distributed throughout the analysis area, but cluster in the urban area within Region IV. Region I has the fewest airports.

3.16.6 Impacts to Transportation and Access

This section of the EIS describes potential impacts of the alternatives on the national, state, and local transportation networks serving the Project analysis area. The discussion covers impacts on roads, railroads and airports. One primary focus of this analysis is on access road construction requirements and their impacts on transportation and access.

The analysis area for the alternatives and their associated features has two components. The first component is the overall area defined by the national, state and local road and railroad transportation network serving the alternatives. The second component is composed of smaller, more focused areas defined by specific interconnections between the larger road, railroad and airport network and individual transportation facilities and activities that cross or otherwise connect with or relate to the alternatives and their associated features. The smaller areas typically include improved and unimproved routes within the local roadway network, railroads, airports, and controlled airspaces. The roads within this portion of the analysis area are considered the Project "backbone" roads. In general, the overall width of the second component of the analysis area ranges from 2 to 5 miles split evenly from the alignment centerlines. The following discussions address both components of the analysis area.

Key transportation and access impact issues raised in the scoping process included concerns about the following topics:

- Road construction requirements to provide access to the 250-foot-wide transmission line ROW and the features of the associated alternatives; and
- Increased traffic volumes on local roads and related impacts on access, safety, and road maintenance.

Transportation and access concerns in the analysis area and issues addressed in this section of the EIS include:

- Expansions of the local roadway network, trip generation and related impacts on capacity/congestion, travel time, access, and safety;
- Transmission line railroad crossings and related safety issues;
- Transmission line proximity to airports and associated safety issues; and
- Transmission line proximity to military airspace operation areas.

Traditional transportation planning and analysis methods are applied to characterize potential impacts. However, a special programmatic methodology was employed to determine the miles of access road construction requirements and to assess their impacts (see Chapter 2.0 and **Appendix D**).

A programmatic methodology was developed to estimate miles of new access roads, differentiating between required access roads both inside and outside the 2-mile transmission line corridor. In addition, four terrain types (flat, rolling, steep, and mountainous) were considered to determine different road improvement needs along the routes. The methodology used the results obtained from the 18 example segments and the slope of the 250-foot-wide transmission line ROW to estimate miles of new access roads required for every transmission line segment. The segment totals were then aggregated to create a total number of access road miles needed for each alternative in each Region. Access road miles along with other metrics were used to make comparisons between the alternatives. This programmatic methodology and the results were reviewed and approved by the EIS Project team for use in the Draft EIS analysis.

Route-specific Road Access Plans would be developed for the Agency Preferred Alternative once the Agency Preferred Alternative is determined (TWE-6). Each Road Access Plan would be composed of a map defining the 250-foot-wide transmission line ROW, structures (towers) and right of way, and the requirements of the backbone access network (roadway routes to the transmission line). The backbone access network requirements would define existing routes that do not require improvements, existing routes that require improvements, and new routes to be constructed. The surface type (gravel, paved or other) and terrain type (flat, rolling, steep and mountainous) also would be defined. The overall set of Road Access Plans for the Agency Preferred Alternative would be used to refine the impacts analysis for the Agency Preferred Alternative and to define location-specific mitigation measures, as needed. Public agencies responsible for roads within the backbone access network would use the Road Access Plan to develop appropriate conditions for use of each road during their individual permit review processes.

West Wide Energy Corridor Final Programmatic EIS Best Management Practices (TRAN-1, TRAN-2, TRAN-3, and TRAN-4 from **Appendix C**) supplement the Road Access Plan development process:

> TRAN-1: The applicant shall prepare an access road siting and management plan that incorporates relevant agency standards regarding road design, construction, maintenance, and decommissioning. Corridors would be closed to public access unless determined by the appropriate federal land manager to be managed as part of an existing travel and transportation network in a land use plan or subsequent travel management plan(s).
>
> TRAN-2: The applicant shall prepare a comprehensive transportation plan for the transport of transmission tower or pipeline components, main assembly cranes, and other large equipment. The plan should address specific sizes, weights, origin, destination, and unique equipment handling requirements. The plan should evaluate alternative transportation routes and should comply with state regulations and all necessary permitting requirements. The plan should address site access roads and eliminate hazards from truck traffic or impacts to normal traffic flow. The plan should include measures such as informational signage and traffic controls that may be necessary during construction or maintenance of facilities.
>
> TRAN-3: Applicants shall consult with local planning authorities regarding increased traffic during the construction phase, including an assessment of the number of vehicles per day, their size, and type. Specific issues of concern (e.g., location of school bus routes and stops) should be identified and addressed in the traffic management plan.
>
> TRAN-4: Additional access roads needed for decommissioning shall follow the paths of access roads established during construction to the greatest extent possible; all access roads not required for the continued operation and maintenance of other energy systems present in the corridor shall be removed and their footprints reclaimed and restored.

In addition, BMPs dealing directly with process requirements (compliance with applicable laws, regulations, agency stipulations, and the requirements of the ROD) and specific impact issues further supplement the Road Access Plan development process (see **Appendix C**). Examples of BMPs directly related to transportation and access issues include:

> All new roads would be designed and constructed to a safe and appropriate standard, “no higher than necessary” to accommodate intended vehicular use. Roads would follow the contour of the land where practical.
>
> Construction would be scheduled for slower times of visitation during the week and slower seasons to minimize the impacts of construction traffic on public access.

Newly permitted routes would be obliterated and/or returned to their original condition when they no longer serve their permitted purpose or public interest.

The alternative requiring the most miles of road construction would have the most impact on the roadway network by improving and extending the network and resulting road access, along with creating new permanent disturbance. In addition, this alternative would require the highest level of new road maintenance and would increase safety and access impacts, especially in areas with steep and mountainous terrain.

The analysis applies miles of roadway building as a comparative metric along with other metrics such as:

- Roadway capacity relative to anticipated vehicle trip generation;
- Proportion of public vs. private land crossed by the transmission line;
- Number of major road crossings;
- Number of railroad crossings;
- Proximity to airport flight patterns; and
- Proximity to military airspace operating areas.

The expansion of the roadway network for Project purposes increases the transportation network with associated impacts on resources such as vegetation, soils, water quality, and wildlife habitats. Impacts to other resources from access road construction are discussed in the respective resource sections of this chapter. Impacts from Project development on the existing transportation network are addressed in this section of the EIS.

Table 3.16-2 presents a summary of resource topics, analysis considerations, and relevant assumptions.

Table 3.16-2 Relevant Analysis Considerations for Transportation and Access

Resource Topic	Analysis Considerations and Relevant Assumptions[1]
Road Construction: Enhancements to the Local Roadway Network	Analyze road construction requirements using a special methodology that defines miles of new road by terrain type to establish local roadway network enhancements. Major assumptions include road improvements expand the existing roadway network and improve travel conditions after completion; Road Access Plans would be developed for the Agency Preferred Alternative; and road improvements would comply with applicable design and construction standards and permit requirements (refer to TRAN-1, TRAN-2, TRAN-3, and TRAN-4). Additional technical assumptions also were used to derive anticipated access road miles.
Road Safety	Evaluate road safety in relation to additional miles of new roads and road use involving terrain types, especially steep and mountainous. The major assumption involves linking slow moving vehicles and vehicles traveling on steep and mountainous roads with limited sight distance and other factors to characterize overall potential safety risks.
Road Maintenance and Load Limits	Evaluate road maintenance in relation to addition of miles of steep and mountainous roads and road use estimates by Project vehicles. The major assumption is that new road miles, especially steep and mountainous roads and trip generation, coupled with an evaluation of existing load limits, are reasonable metrics for assessing potential future road maintenance requirements.

Table 3.16-2 Relevant Analysis Considerations for Transportation and Access

Resource Topic	Analysis Considerations and Relevant Assumptions[1]
Trip Generation, Roadway Capacity and Congestion	Analyze construction, operation, maintenance, and decommissioning of the proposed alternatives and associated facilities in terms of maximum daily trip generation. Major assumptions used in the analysis are construction descriptions and schedules presented by the Project proponent.
Access	Evaluate the potential for public and private property access disruption due to roadway construction. It is assumed that the relative impacts on public and private access are characterized by evaluating the proportion of public and private land traversed by the transmission lines. Issues associated with restricted access are addressed in Sections 3.13, Recreation Resources, and 3.14, Land Use.
Transmission Line Installation over Major Roads and Railroads	Determine the number of major roadway (e.g., interstate highways, U.S. highways, state highways) and railroad track crossings to assess the overall potential for travel delays. It is assumed that temporary traffic delays and/or detours may occur when materials, equipment, and transmission lines are installed over these travel corridors.
Airport and Related Military Airspace Operation Area Conflicts	Determine the number of airports and controlled airspace areas within 5 miles of the alternatives and associated facilities to assess the relative air navigation hazard impacts by alternative. It is assumed that transmission towers and conductors within 5 miles of an airport or designated air space area may increase air navigation hazards during and after construction and that the addition of tower and conductors within Military Airspace Operating Areas outside of existing utility corridors present substantial conflicts.

[1] **Appendix C** identifies design features (proponent commitments) to decrease impacts, and RMP stipulations, specific to each BLM Field Office or Forest Service Forest, to avoid or decrease Project impacts (Refer to TRAN-1 through TRAN-8, and others).

Trip generation rates were developed for the construction, operation, and decommissioning phases of the Project. The TWE PDTR included a 2.5-year construction schedule and workforce information for the overall transmission line and individual tasks to complete the Project. Each task was given an approximate duration, sequence, and workforce needed, in terms of people and vehicles/equipment. The estimates were reported for a typical 20-mile section of transmission line.

The duration of transmission line construction activities involving any given parcel of land may extend up to 1 year, although the total amount of time of actual construction activity would be much shorter, in the range of a few months. Over any particular section of the route, transmission line construction would be characterized by short periods (ranging from 1 day to 1 to 2 weeks) of relatively intense activity interspersed with periods with no activity. Typical work days would be Monday through Saturday, 7am to 7pm.

Based on this information and a conservative approach, daily trip generation rates were estimated for specific construction locations that would change as progress is achieved along individual transmission line segments. It was estimated that the maximum daily trips generated from construction of the Project on a given day would be from 200 to 250 trips. These trips would vary in terms of vehicle type (automobile, small truck, large truck, and transport vehicles for 30-ton cranes).

The construction period daily trips would be distributed over 12 hours (7am to 7pm) with higher trip generation rates between 7am and 9am and 4pm to 6pm. Approximately 20 percent of the daily construction trips would be expected to occur during a 1-hour peak period. Assuming all morning and afternoon peak trips would be inbound and outbound, respectively, the total number of trips per hour would be about 50 or less than one vehicle every minute.

This conservative analysis assumes all trips would be on one road headed to one specific location along the transmission line. Under more likely conditions, these trips would be distributed to multiple destinations over more than one access road. Also, trip generation would be considerably lower from 9am to 4pm. Many inbound vehicles would arrive and then remain on-site during the construction period and would not be outbound until construction in their location is completed.

Given these conditions, congestion would be rare, but possible where other trip generating projects or other local conditions have substantially increased travel volumes near Project-related transmission line construction. Traffic from various kinds of development (pipelines, other power transmission lines, telecommunication lines, oil and gas exploration and production, mining, power generation (coal, solar and wind), road construction, and resource management activities such as timber harvest, fire suppression and burn area rehabilitation) occurring at the same time as transmission line activities could lead to congestion, safety issues and increased maintenance requirements.

Trip generation from the operations and maintenance phase would be substantially less than the construction phase. The types of vehicles used for inspection include helicopters and 4x4 trucks and ATVs. When inspections deem repair is needed, vehicle types would vary based on actual conditions, but would be similar to the vehicle mix assumed during the construction phase.

The decommissioning phase of the Project would be similar to the construction phase. Maximum daily trip generation would range from 200 to 250 trips. Peak hour trip generation would range from 40 to 50 vehicles per hour (see **Table 3.16-3**).

Table 3.16-3 Estimated Trip Generation Relative to Roadway Capacity within the Existing Backbone Roadway Network

Roadway Type	Total Hourly Capacity	Project-related Trip Generation Percent of Total Hourly Capacity (Estimated 50 One-Way Peak Hour Trips)
Class II Highway Speed Limit: 55 mph	1750 875 in each direction	3
Local Arterial (Paved) Speed Limit: 25 - 35 mph	780 390 in each direction	6
Two Lane Gravel Road (Good Condition)	700 – 1000 350 to 500 in each direction	5 to 7
Two Lane Gravel Road (Poor to Fair Condition)	500 – 699 250 to 350 in each direction	7 - 10
Unimproved Road (Unsuitable for TransWest Construction Vehicles)	100 – 500 50 - 200 in each direction	N/A

A similar conservative approach was taken to estimate the daily trip generation rates for the construction of the Northern and Southern terminals. A draft construction schedule was broken into tasks detailing anticipated duration, employees, and vehicles required per task. Based on the construction schedule, estimated trip generation by the construction of the Northern or Southern terminals would be 400 to 450 trips per day. This assumes that every vehicle needed for a particular task enters and exits the site every day. However, it is more logical that certain vehicles would arrive when needed and be left on site until their specific duty is completed. Using this more conservative approach, it is estimated that the trips generated by the construction of the Northern or Southern terminals would be 220 to 270 trips per day.

Table 3.16-3 places the anticipated trip generation rates in perspective relative to the capacity of various roadway types within the existing backbone roadway network.

Based on the data in **Table 3.16-3**, the incremental impact of the peak hour traffic is minor on roads suitable for the anticipated Project-related vehicles and additional work is needed on key capacity issues required to improve roads that are inadequate. Five primary variables contribute to unimproved roadway adequacy:

1) Surface type;
2) Drainage;
3) Road width;
4) Width of clear zone; and
5) Road alignment rating (comfortable travel speed).

As described previously, route-specific road access plans would be developed for the Agency Preferred Alternative once it is determined. These plans would make determinations about roadway adequacy and the need for road improvements. These determinations would be checked by public agencies responsible for roads within the backbone access network. Adjustments would be made, as needed, prior to approval and corresponding mitigation would be developed for implementation during the construction and operational phases of the Project. These adjustments would include the possibility that some roadways have unusual background traffic levels from ongoing industrial or other activities and/or the possibility that another project could occur in the same place and at the same time as the TransWest Project. In these situations, the local permit process would address the Project's incremental impacts along with the added impacts of the other actions.

3.16.6.1 Impacts from Terminal Construction, Operation, and Decommissioning

The Northern and Southern Terminals are proposed within general siting areas, but the specific locations have not been finalized. Road Access Plans (TWE-6) and Access Road Siting and Management Plans (TRAN-1) and other details (TRAN-2) serving these facilities are not available at this time and the special methodology assumptions involving access requirements by terrain type have not been developed. Road Access Plans, Access Road Siting and Management Plans, and site details would be prepared and analyzed for these sites and the Agency Preferred Alternative once the sites are determined. Consequently, transportation and access impacts for the terminal sites are described in general terms.

The Northern and Southern terminals would be expected to generate approximately 220 to 270 vehicle trips per day during the construction and decommissioning phases of the Project. Far fewer trips per day would be expected during the operation and maintenance phase at these locations. Based on anticipated trip generation rates, trip distribution and site conditions, transportation and access impacts are anticipated to be similar at either site. Transportation and access-related design features (TWE-6), as well as incorporation of agency BMPs (TRAN-1, TRAN-2, and TRAN-3), would minimize potential impacts. The following discussions characterize transportation and access conditions at each terminal location.

<u>Northern Terminal</u>

The Northern Terminal is located about 2 miles from an east/west Union Pacific railroad line that generally follows I-80 and State Route 76. Access to the Northern Terminal site and the transmission line alignments leading to and from the terminal site is available via existing I-80 interchanges and State Highway 76 intersections. A road network connected to these interchanges and intersections exists, but it is incomplete in terms of access to the terminal site. The road network is composed of public and private gravel roads. Access to the transmission line alignment and terminal site could be achieved with extensions to the existing roadway network. The use of existing private roadways would be advantageous and any necessary new roads would be designed and specified for the Agency Preferred Alternative in the Road Access Plans (TWE-6) and Access Road Site and Management

Plans (TRAN-1). Additional road maintenance would be expected from new road construction and from use of local roadways and would be implemented as specified in the Road Access Plans (TWE 6) and Access Road Site and Management Plans (TRAN-1). New connections to the I-80, State Route 76, and railroad crossings appear to be unnecessary or avoidable. The nearest airport to the northern site, Rawlins Municipal Airport, is about 5 miles away. Any potential impacts of terminal construction on air traffic would be minimized by adherence to applicant design features (TWE-55) and agency BMPs (GEN-9, AC-1, AC-4, and PHS-3).

Summary: After considering design features, agency BMPs, and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. No substantial safety impacts would be expected. Access impacts would be temporary and minor. No impacts on airports or airspace operations are anticipated based on facility features and the distance to the nearest airport operations.

Southern Terminal

The Southern Terminal is located in an area currently served by U.S. Highway 95. Access to the southern terminal site, or alternative terminal site, and the transmission line alignments leading to and from the terminal site is available via one primary intersection. A road network is connected to this intersection, but it is incomplete in terms of access to the terminal site. The road network is composed of public and private paved and gravel roads. Access to the transmission line alignment and terminal site could be achieved with extensions to the existing roadway network. The use of existing private roadways would be advantageous and any necessary new roads would be designed and specified for the Agency Preferred Alternative in the Road Access Plans (TWE-6) and Access Road Site and Management Plans (TRAN-1). Additional road maintenance would be expected from new road construction and from use of local roadways and would be implemented as specified in the Road Access Plans (TWE 6) and Access Road Site and Management Plans (TRAN-1). No railroads are located in the vicinity. The nearest airport to the southern site, Boulder City Municipal, is 12 miles away.

With Design Option 2, the southern converter station would be located at IPP and there would be a series compensation station between IPP and Las Vegas. This would change construction requirements, but the transportation and access impacts from the Southern Terminal with Design Option 2 would be similar to those described for the alternatives. Design Option 2 would shift the location of trip generation from various facilities associated with the alternatives to new locations. This shift is not expected to create substantive effects that were not described for the alternatives. No substantial differences in transportation and access effects would be expected during the operation and decommissioning phases of the Project.

With Design Option 3, an additional substation would be built near IPP. No substantive transportation and access impacts would be anticipated from this substation site.

Summary: After considering design features, agency BMPs and other project approval requirements listed above and under the Northern Terminal, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. No substantial safety impacts would be expected. Access impacts would be temporary and minor. No impacts on airports or airspace operations are anticipated based on facility features and the distance to the nearest airport operations.

As part of the Construction, Operations and Maintenance (COM) Plan, an Access Road Plan would be developed for the Northern and Southern terminals during final engineering and design to define site-specific access to each structure and temporary work area. The plans would incorporate relevant local, state, and federal agency standards regarding road design, construction, maintenance, and decommissioning. The Road Access Plan would incorporate best management practices and specific approval conditions stipulated by the agencies in their respective decision documents and permits and a variety of design commitments to avoid and minimize impacts. Specific approval conditions would vary and would likely address local road surface and use conditions.

The construction activities, workforce and equipment requirements for the 20-mile transmission line construction units would be very similar or the same for the design options as described for the alternatives.

Design Option 2 – DC from Wyoming to IPP; AC from IPP to Market Place Hub

Design Option 2 primarily involves modified transmission line facilities, the southern converter station would be located at IPP and there would be a series compensation station between IPP and Las Vegas. This would change construction requirements, but the transportation and access impacts from Design Option 2 would be similar to those described for the alternatives. Design Option 2 would shift the location of trip generation from various facilities associated with the alternatives to new locations. This shift is not expected to create substantive impacts that were not described for the alternatives. No substantial differences in transportation and access impacts would be expected during the operation and decommissioning phases of the Project.

Design Option 3 – Phased Build Out

Design Option 3 is similar to the alternatives, except the Project would be built and operated in phases, with more components located at the IPP station. Consequently, this option primarily changes the construction schedule to allow a phased build out. The previously described transportation and access impacts would occur over a more extended period of time. The transportation and access impacts from Design Option 3 would be similar to those described for the Alternatives but the impacts would be distributed over the phased construction sequence. Design Option 3 would shift the location of trip generation from various facilities associated with the alternatives to new locations. This shift is not expected to create substantive impacts that were not described for the alternatives. No new transportation and access impacts would be created by extended and phased construction periods. No substantial differences in transportation and access impacts would be expected during the operation and decommissioning phases of the Project.

3.16.6.2 Impacts Common to all Alternative Routes and Associated Components

The following discussions provide an overview of important potential transportation and access impacts that could be caused by the transmission line alternatives. Sections 3.16.6.3 through 3.16.6.6 provide comparative analyses for the impacts within Regions I through IV.

Construction Impacts

Road Construction: Enhancements to the Local Roadway Network

Road extensions, widening and other improvements would increase the size and improve the quality of the local roadway network. These impacts on the local roadway network are characterized by total roadway miles by Alternative. Road Access Plans (TWE-6) and Access Road Site and Management Plans (TRAN-1) would be developed for the Agency Preferred Alternative during final engineering and design. The Road Access Plans would define site-specific access to each structure and temporary work area and which road improvements would be permanent versus temporary. For the purpose of the Draft EIS, access road miles and disturbances are estimated for access roads within the corridor as described in Chapter 2.0 and **Appendix D**. Roadless area construction methods are described in **Appendix B**, Section 3.5.7.3, Roadless Construction Methods.

The COM Plan would incorporate environmental measures, stipulated in the lead agencies' RODs; provide information on the TWE Project design, construction, operation, and maintenance practices; and specify the environmental mitigation measures to be used and implemented by contractors and personnel. The TWE Project would be planned, constructed, operated, and decommissioned in accordance with the agencies' RODs, the BLM's ROW Grant stipulations, USFS Special Use Permit stipulations, and requirements of other permitting agencies. The COM Plan would include a mitigation monitoring plan to address how each mitigation measure, required by permitting agencies in their respective decision documents and permits, would be monitored for compliance.

The COM Plan would include a specific Road Access Plan that incorporates relevant agency standards regarding road design, construction, maintenance, and decommissioning. The Road Access Plan would incorporate best management practices, stipulated by the agencies in their respective decision documents and permits.

Construction of new access roads would be required only as necessary to access structure sites lacking direct access from existing roads, or where topographic conditions (e.g., steep terrain, rocky outcrops, and drainages) prohibit safe overland access to the site on unpaved roads. Where terrain and soil conditions are suitable, non-graded overland access ("drive & crush") would be utilized. New access roads would be located within the 250-foot-wide transmission line ROW whenever practical and would be sited to minimize potential environmental impacts.

Site-specific improvement requirements would be specified, approved, and implemented. Roads damaged by construction vehicles would be returned to pre-construction condition, as specified by applicable agencies.

With respect to the potential environmental impacts that would be caused by road construction, the existing design features (proponent commitments) include a wide range of measures developed to avoid or decrease environmental impacts from road construction and use. Details are provided in **Appendix C**.

Summary: Impacts to the local roadway network would occur from new road construction and roadway improvements.

Road Safety

Road construction and installation of transmission lines would add vehicle travel to the roadway network and could introduce travel obstructions on local roads creating potential safety issues. No hazardous or unsafe conditions would be expected for motorists and pedestrians given compliance with design features (TWE-5, TWE-6, TWE-9, and TWE-12), agency BMPs (TRAN-1, TRAN-2, TRAN-3, and PHS-3), applicable design and operational standards, regulations, laws and permit requirements.

Construction involving narrow roads with horizontal and vertical curves and the presence of large, slow moving trucks also creates potential safety issues, especially where construction vehicles travel along routes used by others. Even though access roads serving the 250-foot-wide transmission line ROW would be designed to meet road safety standards, travel on them is likely to generate safety issues because sharp horizontal and vertical curves limit sight distance and generate the potential for excessive speeds and longer stopping distances on steep segments. The potential for safety issues is higher for large trucks, trucks with heavy loads and trucks being driven by drivers who may be unfamiliar with road conditions. Adherence to design features (TWE-5, TWE-6, TWE-9, and TWE-12) and agency BMPs (TRAN-1, TRAN-2, TRAN-3, and PHS-3) would minimize any potential safety issues.

Summary: After considering design features, BMPs, and other project approval requirements, the following conclusion can be made. Minor and temporary safety issues would be created, but no hazardous or unsafe conditions would be created.

Road Maintenance and Load Limits

Construction activity would have impacts on upgraded roads, but increased traffic and travel on these roads by heavy vehicles would contribute to local roadway degradation resulting in the need for additional road maintenance. The weight of heavy equipment and transmission structures being transported to and from construction areas may exceed the load limits specified for some roads in the analysis area. TWE would have to obtain permits from state, county, and local roadway authorities to transport heavy equipment and transmission structures. Road maintenance agreements with the applicable roadway authorities also may be required. The agreements would address the potential for:

- Road damage and corresponding liability for damage and repairs;
- Compliance failures following completion of the Road Access Plans and local permitting processes; and
- Compliance monitoring, including the need for third party monitors paid for by the Project proponent, with the third party reporting to BLM and other agencies.

Maintenance requirements for new steep and mountainous access roadways would be higher due to the higher potential for erosion and road damage during wet or icy conditions. These conditions could lead to rockfall and rutting of the travel surface. Road repair also would be more difficult and costly under these conditions, compared to routine repair on rolling and flat roads. Implementation of design features (TWE-5, TWE-6) and agency BMPs (TRAN-1 and TRAN-2) would address the need for and assure completion of required road maintenance.

Summary: After considering design features, agency BMPs, and other project approval requirements, overall impacts on road maintenance would be minor in flat and rolling terrain and moderate in steep and mountainous terrain.

Capacity and Congestion

Project construction would create minor and incidental increases in local traffic, but is not expected to create substantial congestion for extended periods. Anticipated traffic would not exceed level of service standards established by the local governments or state transportation agencies. This occurs primarily because of high existing levels of service on the local roadway network (low volumes relative to available capacity) and the relatively broad distribution of construction traffic throughout the day and within the roadway network.

Incidental congestion and delay would be expected from the following:

- Slow moving trucks and construction vehicles;
- Vehicle turning movements where construction occurs near and parallel to roadways; and
- Travel delays and detours associated with transmission line installation in some locations.

Temporary travel delays involving major roads (Interstate Highways, U.S. highways, and state highways) and railroads may occur for line installation at crossings. Shorter duration delays or no delays are anticipated where lines cross narrower roads with lower traffic volumes.

Design features (TWE-5 and TWE-6), as well as the following construction processes are included in the Project POD to address impacts from lines crossing roads and railroads during construction.

- For protection of the public during wire installation, guard structures would be erected over highways, railroads, power lines, structures, and other barriers. Guard structures would consist of H-frame wood poles placed on either side of the barriers or by using boom trucks raising a guard cross beam. These structures would prevent ground wires, conductors, or equipment from falling across obstacles.

- Equipment for erecting guard structures would include augers, backhoes, line trucks, boom trucks, pole trailers, and cranes. Guard structures may not be required for small roads. In such cases, other safety measures such as barriers, flagmen, or other traffic controls would be used. Following stringing and tensioning of all ground wires and conductors, the guard structures would be removed and the area restored. Pilot lines would be pulled (strung) from tower to tower by either a helicopter or land operated equipment, and threaded through.
- The proposed line crossings would be coordinated with the appropriate entity and TWE would obtain all required licenses, permits, or agreements.

Agencies providing approvals for road construction would define best management practices and adherence to agency BMPs (PHS-5, PHS-6, TRAN-2, and TRAN-3), ensure traveler safety, provide for emergency response vehicle access through construction areas, and minimize delays.

The following discussion provides additional detail to clarify the extent and magnitude of potential delays and related measures to minimize safety risks and travel delays for motorists.

Interruption of road traffic is not anticipated during conductor stringing and tensioning activities unless required under the terms and conditions of a specific road or highway crossing permit. As described in Section 3.5.2.5 of the PDTR (**Appendix D**), pilot lines would be pulled from tower to tower by either a helicopter (most commonly) or land operated equipment. The use of a helicopter to pull the pilot lines is commonly used so that impacts to road traffic are minimized or avoided. For safety and efficiency reasons, conductor stringing and tensioning activities are typically performed during daylight hours and are scheduled to coincide to the extent practical with periods of least road traffic in order to minimize traffic disruptions.

For public protection during stringing activities, temporary guard structures would be erected at road crossing locations, where necessary. As described in the PDTR, these temporary guard structures would be placed on either side of the road to prevent shield wire, conductors, or equipment from falling on underlying facilities and disrupting traffic. Typically, guard structures are installed just outside of the road ROW. Although the preference is for access to each of these guard structure locations to be located outside of the road ROW, it may be necessary for the access to be within the road ROW depending upon topography and access restrictions imposed by the regulatory agencies (i.e., State DOTs, county road and bridge departments, etc.). Access use within road ROWs would be performed in compliance with the stipulations of road crossing permits and regulatory agency requirements.

Site-specific road crossing locations with excessive widths (generally greater than 200 to 300 feet), such as those at interstate highways, would require installation of temporary guard structures in medians between opposite traffic flow lanes. Although TWE does not currently anticipate needing guard structures in medians, as final engineering design progresses, locations requiring center median guard structures may be identified. The erection and dismantling of these temporary guard structures may require traffic diversions. These traffic diversions, which may last from a few hours to a day, involve closure of the shoulder of the road or, in more congested locations, might consist of the closure of one lane of traffic. Complete closure of one direction of traffic is not anticipated. Temporary traffic diversion signs, signals, markers, barriers and traffic control personnel, if required by the state DOT, would be employed. These activities would be coordinated with the appropriate state DOTs. Traffic disruptions would be kept to a minimum and TWE would comply with crossing permit requirements, which typically limit durations of traffic interruptions.

In urban locations or for extremely high volume roadways (such as interstate highways), the state DOTs may require the installation of protective steel netting above the roadway for the duration of conductor stringing and tensioning operations (generally a few days to 2 to 3 weeks). The installation of this protective steel netting requires a brief closure of the roadway (generally a few minutes to 15 to 20 minutes) while the netting is pulled across the roadway and hoisted onto the temporary support structures. This process is repeated when the netting is removed. Because of the heavy traffic volume and the impact of stopping traffic, these nettings are typically installed during the lowest traffic period (normally 3am to 5am on a Sunday morning) per the requirements of the state DOTs. Although not anticipated, any traffic stoppage would employ all appropriate state DOT traffic safety requirements (signage, flagmen, lighting, signals, temporary barriers, law enforcement, etc.).

The delivery of large pieces of equipment or material as part of the construction process may slow or interrupt traffic on state or county roads on an intermittent basis. The durations of these types of traffic disruptions are typically very short, a few minutes or less, while the delivery truck passes down a roadway or turns a corner. The limited number of large pieces of equipment or materials that are delivered to any one portion of the Project tends to make traffic disruptions infrequent and generally unnoticeable by the motoring public.

Summary: After considering design features, agency BMPs, and other project approval requirements, the following conclusion can be made. The Project may create minor delays during installation of lines over major roadways. Incidental travel time delays are not expected to influence emergency response times substantially and would not substantially inconvenience travelers using the roadway network.

Road Access

Road construction may require incidental road closures and/or detours that temporarily create access difficulties and/or restrictions that limit access to public and private property, but adherence to design features (TWE-6) and agency BMPs (TRAN-1, TRAN-2, and TRAN-3) would help to limit and plan for the closures. Access restrictions such as those associated with roadless areas and areas with seasonal access limits are addressed in Section 3.13, Recreation Resources, and Section 3.14, Land Use.

Increased access and improved travel conditions would result from roadway network improvements as construction proceeds. This would incrementally improve emergency response times and provide access to previously inaccessible areas; however, increased access would enhance the potential for unauthorized road and trail network expansions (Section 3.13, Recreation Resources, and Section 3.14, Land Use). Increased access could lead to unplanned and prohibited access. These issues are addressed as a potential recreation impact in Section 3.13, Recreation Resources.

Summary: After considering design features, agency BMPs, and other project approval requirements, the Project would create minor access difficulties and/or restrictions that may temporarily limit access to public and private property.

Railroad Crossings

Road and transmission line construction involving railroad crossings is common. The use of existing at grade road/railroad crossings and adding new railroad/transmission line crossings create potential safety issues. As a result, a wide range of procedures and construction practices aimed at minimizing construction and post-construction impacts on motorists, railroad operations, and transmission line operations have been developed and are implemented as Project requirements. These measures focus on safety and specify design standards that must be met before construction begins. They also include construction period protocol and post-construction practices to follow to avoid vehicle, railroad, and transmission line conflicts.

Railroad crossing operations and procedures are controlled by and permitted through the railroad company operating the rail line. Terms and conditions to be followed are specified in the crossing permit. Typically, stoppage of railroad traffic is not required during construction or conductor stringing and tensioning activities. Crossing activities are similar to those for road crossings as described in the

PDTR and typically involve the use of guard structures. Stringing and tensioning activities would be performed in coordination with the appropriate railroad authorities. For safety and efficiency, stringing and tensioning activities are performed during daylight periods and scheduled to coincide with times of least railroad traffic. The railroad would typically provide a switchman who is present at all times when work is being performed near or over any railroad line.

Summary: The Project may create minor railroad operation and safety issues during installation of lines over railroad tracks, but implementation of the design features and agency BMPs discussed above under "*Capacity and Congestion*" would help to minimize those issues.

Airport and Airspace Proximity

Transmission line towers and lines are a navigation issue and become a hazard if they are located too close to airport operations or military airspace operating areas. Transmission line construction in the vicinity of an airport presents the potential for new flight safety issues. The key determinant for an effect is proximity between flight paths and transmission line locations and heights (see Section 3.16.4.4, Military Airspace Operating Areas) and compliance with applicable requirements. The TWE Project would be designed to comply with FAA regulations, including lighting regulations, to avoid potential safety issues associated with proximity to airports, military bases or training areas, or landing strips. In addition, coordination with military areas is required to avoid conflicts.

Summary: The Project may create operation and safety issues near airports and may create unresolved conflicts in military airspace operating areas, but incorporation of TWE design features (TWE-55) and implementation of agency BMPs (GEN-9, AC-1, AC-4, and PHS-3) are expected to lessen the extent of the safety issues to permissible levels. If not, it is currently assumed that any routes with irresolvable issues related to airports or airspace would require additional mitigation to be applied, including the possibility of suggested reroutes.

<u>Operational Impacts</u>

Incidental and minor safety impacts could occur in relation to slow moving Project vehicles on steep roads with limited sight distance destined for the transmission lines and related facilities, but the travel volumes would be far lower and more distributed over time than those associated with the construction phase. Impacts on maintenance requirements would be negligible. These impacts would be associated with normal travel to and from the transmission lines for inspections and repairs.

Based on the number of trips generated during the operational period and their distribution within the roadway network, substantial capacity and congestion impacts are not anticipated. Incidental congestion and delay would be expected from the following:

- Slow moving trucks and service vehicles; and
- Vehicle turning movements where activities occur near and parallel to roadways.

Incidental travel time delays are not expected to substantially influence emergency response times or local travel.

Access roads not required for facility operation and maintenance would be closed or closed and reclaimed/restored. Permanent roads built for the Project on NFS lands and BLM administered lands also would be closed to the public if determined necessary by the local land management agency. Signs would indicate the restriction or regulation, location, penalty for violation, and appropriate contact information for reporting violations. These signs would be maintained and replaced as part of the routine maintenance. The proponent would monitor permanent roads on NFS land and BLM-administered lands yearly, and the applicable land-managing agency would be provided with annual monitoring reports. Roads would be maintained as required by applicable Special Use Permits or BLM ROW grants.

Railroad impacts would involve infrequent crossings by construction vehicles and occasional inspections and repairs in the vicinity of railroad tracks. Impacts to railroad operations could occur if a repair is needed over an active track, but this would be rare.

Impacts on airports would not change during the operational phase.

Summary: Operational phase transportation and access impacts would be similar to construction phase impacts, but the magnitude of those impacts would be less and minor.

Decommissioning Impacts

Impacts during decommissioning would be similar to those anticipated during construction. Implementation of agency BMP MIT-3, which requires that all control and mitigation measures established for the Project in the POD and other required plans must be incorporated into a decommissioning plan that would be approved by the federal land managers, would assure minimization of impacts. For access roads serving the transmission line, the Applicant is responsible for the decommissioning and reclamation of access roads following abandonment in accordance with the landowner's or land agency's direction. Roadway reclamation would reduce motor vehicle access and return the transportation network back to pre-construction conditions. Temporary access roads may be left intact through mutual agreement of the appropriate local, state and federal road and land management agencies, landowners, the tenants, and Project proponents. Removal of transmission line towers and lines would eliminate navigation hazards.

Summary: After considering design features, agency BMPs, and other project approval requirements, decommissioning impacts would be similar to those identified for the construction phase, above. Some impacts would occur after removal of the transmission lines.

3.16.6.3 Region I

Table 3.16-4 provides a tabulation of impacts associated with the alternative routes in Region I.

Table 3.16-4 Summary of Region I Alternative Route Impact Parameters

Parameter	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
New Permanent Access Roads: Miles (Flat)	67	102	79	136
New Permanent Access Roads: Miles (Rolling)	94	82	123	65
New Permanent Access Roads: Miles (Steep)	63	39	67	41
New Permanent Access Roads: Miles (Mountainous)	3	0	0	0
Total Miles of New Permanent Access Roads	227	223	269	242
Interstate Highway Crossings	0	0	0	0
U.S. Highway Crossings	1 – U.S. 40	1 – U.S. 40	1 – U.S. 40	1 – U.S. 40
State Highway Crossings	3 - 71, 318, 789	3 - 71, 789, 318	4 - 13 (x2), 70, 71	3 - 71, 318, 789
Railroad Crossings	0	0	3	0
Center Line Passing Through Public Land (miles)	117	118	100	133
Center Line Passing Through Private Land (miles)	38	41	86	39

Table 3.16-4 Summary of Region I Alternative Route Impact Parameters

Parameter	Alternative I-A	Alternative I-B	Alternative I-C	Alternative I-D
Number of Airports within 5 Miles	2 Rawlins Muni / Harvey Field Memorial Hospital (H)	2 Rawlins Muni / Harvey Field Memorial Hospital (H)	6 Rawlins Muni / Harvey Field Memorial Hospital (H) Craig Moffat Craig (H) Mesa View Ranch Dixon	2 Rawlins Muni / Harvey Field Memorial Hospital (H)
MOAs within 20 Miles	0	0	0	0
MOAs with 250-Foot-Wide Transmission Line ROW Overlap	0	0	0	0

(H) Heliport

Alternative I-A (Applicant Proposed)

Key Parameters Summary

Alternative I-A would require construction of 227 miles of new roadway including 66 miles in steep and mountainous terrain. Four major roads would be crossed. No railroads would be crossed. The centerline would pass through 117 miles of public land and 38 miles of private land. Two airports are located within 5 miles. No military operations are located nearby. After considering design features, BMPs, and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. Only minor delays from road crossings might occur. Access impacts would be temporary and minor. No impacts on airports or MOAs would occur.

Alternative I-B

Key Parameters Summary

Alternatives I-B would require construction of 223 miles of new roadway including 39 miles in steep terrain. Four major roads would be crossed. No railroads would be crossed. The centerline would pass through 118 miles of public land and 41 miles of private land. Two airports are located within 5 miles. No military operations are located nearby. After considering design features, BMPs, and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. Only minor delays from road crossings might occur. Access impacts would be temporary and minor. No impacts on airports or MOAs would occur.

Alternative I-C

Key Parameters Summary

Alternatives I-C would require construction of 269 miles of new roadway including 67 miles in steep terrain. Five major road crossings and three railroad crossings are required. The centerline would pass through 100 miles of public land and 86 miles of private land. Six small airports are located within 5 miles. No military operations are located nearby. After considering design features, BMPs, and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. Only minor delays from road and railroad crossings might occur. Access impacts would be temporary and minor. No impacts on airports would occur because each airport facility is located far enough away from the centerline to avoid creating a navigation hazard or FAA reporting requirements. No impacts on MOAs would occur.

Alternative I-D (Agency Preferred)

Key Parameters Summary

Alternatives I-D would require construction of 242 miles of new roadway including 41 miles in steep terrain. Four major road crossings and no railroad crossings are required. The centerline would pass through 133 miles of public land and 39 miles of private land. Two small airports are located within 5 miles. No military operations are located nearby. After considering design features, BMPs, and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. Only minor delays from road and railroad crossings might occur. Access impacts would be temporary and minor. No impacts on airports would occur because each airport facility is located far enough away from the centerline to avoid creating a navigation hazard or FAA reporting requirements. No impacts on MOAs would occur.

Tuttle Easement micro-siting options 2 and 3 would add highway crossings which are not included in Option 1. Option 2 would add 2 additional highway crossings. Option 3 would add 1 crossing. Overall, there are no substantive transportation or access advantages to any of the options within Tuttle Easement micro-siting when compared to Alternative I-D.

Alternative Connectors in Region I

The Mexican Flats Alternative Connector would add 13 flat miles to the roadway network on only public land and would cross SH 789.

The Baggs Alternative Connector would add 31 rolling miles to the road network on primarily public land and would cross SH 789. A connector at this point would provide no transportation and access advantages.

The Fivemile Point North Connector would add 4 flat miles to the roadway network on primarily public land and would cross SH 789.

The Fivemile Point South Connector would add 3 flat miles to the roadway network on primarily public land and would cross SH 789.

There are no distinct transportation advantages or disadvantages to the alternatives achieved through the use of any alternate connector.

Alternative Ground Electrode Systems in Region I

It would be necessary to locate the northern ground electrode system within 100 miles of the Northern terminal as discussed in Chapter 2.0. Although the location for this system has not been determined, conceptual locations and connections to the alternative routes have been provided by the proponent. **Table 3.16-5** provides a comparison of alternative electrode bed locations proposed near the northern terminal.

Table 3.16-5 Summary of Region I Alternative Ground Electrode System Location Impacts for Transportation and Access

Alternative Ground Electrode System Locations	Analysis and Conclusions
Separation Flat – All Alternative Routes	Approximately 13 miles from the 250-foot-wide transmission line ROW (all alternative routes), requires 17 miles of access road construction, low voltage line crosses I-80 and the railroad, expands road network, creates moderate safety and maintenance effects.

Table 3.16-5 Summary of Region I Alternative Ground Electrode System Location Impacts for Transportation and Access

Alternative Ground Electrode System Locations	Analysis and Conclusions
Separation Creek – All Alternative Routes	Partially located within the 250-foot-wide transmission line ROW, may require up to 20 miles of access road construction, has proximity to I-80, expands road network, creates moderate safety and maintenance effects.
Eight Mile Basin – All Alternative Routes	Approximately 4 miles from Alternative I-A may require up to 6 miles of access road construction, located directly off State Highway 71, creates minor safety and maintenance effects.
Shell Creek (Alternatives I-A and I-D)	Approximately 33 miles from the Alternative I-A, requires 43 miles of access road construction, requires extensive travel on unimproved roads, expands the road network the most, creates the most safety and maintenance effects.
Little Snake East (Alternatives I-A, I-B, and I-D)	Approximately 9 miles from Alternative I-A, requires 12 miles of access road construction, involves travel on existing county roads, alternative access routes available, minor safety and maintenance effects (**Best for I-A**).
Little Snake West (Alternative I-A)	Approximately 10 miles from Alternative I-A, requires 14 miles of access road construction, involves travel on existing county roads, alternative access routes available, minor safety and maintenance effects.
Shell Creek (Alternative I-B)	Approximately 26 miles from the Alternative I-B, requires 34 miles of access road construction, requires extensive travel on unimproved roads, expands the road network the most, and creates the most safety and maintenance effects.
Little Snake West (Alternatives I-B and I-D)	Approximately 5 miles from Alternative I-B, requires 7 miles of access road construction, involves travel on existing county roads, alternative access routes available, minor safety and maintenance effects (**Best for I-B**).

<u>Region I Conclusion</u>

Based on the information shown in **Table 3.16-4**, Alternatives I-C and I-D provide the most enhancements to the roadway network. Alternatives I-B and I-D provides the least impact from new/improved steep and mountainous roads. All other parameters are virtually equal across all alternatives.

3.16.6.4 Region II

Table 3.16-6 provides a tabulation of impacts associated with the alternative routes in Region II.

Table 3.16-6 Transportation and Access Evaluation Factors for the Alternatives in Region II

Evaluation Factors	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
New Permanent Access Roads: Miles (Flat)	89	142	206	57	96	62
New Permanent Access Roads: Miles (Rolling)	136	168	159	147	126	128
New Permanent Access Roads: Miles (Steep)	33	98	122	83	67	39
New Permanent Access Roads: Miles (Mountainous)	206	172	70	188	183	297

Table 3.16-6 Transportation and Access Evaluation Factors for the Alternatives in Region II

Evaluation Factors	Alternative II-A	Alternative II-B	Alternative II-C	Alternative II-D	Alternative II-E	Alternative II-F
Total Miles of New Permanent Access Roads	463	580	556	474	471	526
Number of Interstate Highway Crossings	1 - I-15	5 - I-15, 70 (x4)	9 - I-15, 70 (x8)	1 - I-15	1 - I-15	1 - I-15
Number of U.S. Highway Crossings	5 – 6 (x2), 40 (x2), 89	2 – 6, 89	4 - 6, 50 (x2), 89	3 – 6 (x2), 89	6 – 6 (x2), 40 (x2), 89, 191	8- 6 (x6), 89, 191
Number of State Highway Crossings	15 – 35, 41, 45, 64, 87 (x3), 88, 91, 132 (x4), 174, 208	9 – 10, 28, 31, 64, 122, 125, 132, 139, 174	6 – 10, 64, 100, 125, 139, 322	12 – 28, 31 (x4), 45, 64, 132 (x2), 174, 264 (x2)	10 – 28, 45, 64, 87 (x2), 88, 96, 132 (x2), 174	7- 64, 45, 96,132, 28, 125,174
Number of Railroad Crossings	4	21	10	8	8	11
Center Line Passing Through Public Land (miles)	153	269	287	190	160	188
Center Line Passing Through Private Land (miles)	104	76	77	72	107	79
Number of Airports within 5 miles	6 Pelican Lake Roosevelt Muni Duchesne Muni Thunder Ridge Duchesne County Hospital (H) Nephi Muni	9 Green River Muni Westwater Baxter Pass (H) Rangely District Hospital (H) Rangely Huntington Muni Mount Pleasant Nephi Muni	7 Green River Muni Westwater Baxter Pass (H) Rangely District Hospital (H) Rangely Delta Muni	2 Bonanza Power Plant Nephi Muni	3 Pelican Lake Roosevelt Muni Nephi Muni	3 Bonanza Nephi Muni Desert Aviation
MOAs within 20 Miles	1 – Hill AFB Sevier	2 – Hill AFB Sevier Utah Launch Complex	2 – Hill AFB Sevier Utah Launch Complex	1 – Hill AFB Sevier	1 – Hill AFB Sevier	1 – Hill AFB Sevier
MOAs with 250-Foot-Wide Transmission ROW Overlap	1 – Hill AFB Sevier	2 - Utah Launch Complex Hill AFB Sevier	2 - Utah Launch Complex Hill AFB Sevier	1 - Hill AFB Sevier	1 – Hill AFB Sevier	1 – Hill AFB Sevier

(H) Heliport

Alternative II-A (Applicant Proposed)

Key Parameters Summary

Alternative II-A would require construction of 463 miles of new roadway including 239 miles in steep and mountainous terrain. A total of 21 major road crossings and 4 railroad crossings are required. The centerline would pass through 153 miles of public land and 104 miles of private land. Six airports are located within 5 miles. Alternative II-A enters into the Hill AFB Sevier B&D MOA for 3.4 miles where there is no existing transmission line within a WWEC designated corridor. Alternative II-A contains the Cedar Knoll and Strawberry IRA micro-siting adjustments, all within the transmission line corridor.

After considering design features, BMPs, and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. Only minor delays from road and railroad crossings might occur. Access impacts would be temporary and minor. No impacts on airports would occur because each airport facility is located far enough away from the centerline to avoid creating a navigation hazard or FAA reporting requirements. No impacts on the Utah Launch Complex/White Sands Missile Range would be anticipated. The impacts of entering into the Hill AFB Sevier B&D MOA are described in the Region III discussion where the impacts are more substantial. Micro-siting adjustments provide no transportation and access benefits.

There are no substantive transportation or access advantages to any of the options within Strawberry IRA micro-siting when compared to Alternative II-A.

Alternative II-B

Key Parameters Summary

Alternative II-B would require construction of 580 miles of new roadway including 270 miles in steep and mountainous terrain. A total of 16 major road crossings and 21 railroad crossings are required. The centerline would pass through 269 miles of public land and 76 miles of private land. Nine airports are located within 5 miles. Alternative II-B passes through the former Utah Launch Complex/White Sands Missile Range MOA co-located with an existing transmission line within RMP and WWEC designated corridors. Alternative II-B enters into the Hill AFB Sevier B&D MOA for 1 mile co-located with an existing transmission line within a RMP designated corridor.

After considering design features, BMPs, and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. Only minor delays from road and railroad crossings might occur. Access impacts would be temporary and minor. No impacts on airports would occur because each airport facility is located far enough away from the centerline to avoid creating a navigation hazard or FAA reporting requirements. No military airspace impacts on the Utah Launch Complex/White Sands Missile Range would be expected. The impacts of entering into the Hill AFB Sevier B&D MOA are described in the Region III discussion where the impacts are more substantial.

No military airspace impacts on the Hill AFB Sevier MOA would be expected. Direct conflicts with possible future military airspace operations and/or other operations involving the Utah Launch Complex/White Sands Missile Range could occur even though Alternative II-B is located within existing utility corridors where it passes through this facility.

Alternative II-C

Key Parameters Summary

Alternative II-C would require construction of 556 miles of new roadway including 192 miles in steep and mountainous terrain. A total of 19 major road crossings and 10 railroad crossings are required. The centerline would pass through 287 miles of public land and 77 miles of private land. Seven airports are located within 5 miles. Alternative II-C passes through the former Utah Launch Complex/White Sands Missile Range co-located with an existing transmission line within RMP and WWEC designated corridors. Alternative II-C enters into the Hill AFB Sevier B&D MOA for 1 mile co-located with an existing transmission line within a RMP designated corridor.

After considering design features, BMPs, and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. Only minor delays from road and railroad crossings might occur. Access impacts would be temporary and minor. No impacts on airports would occur because each airport facility is located far enough away from the centerline to avoid creating a navigation hazard or FAA reporting requirements. No military airspace impacts on the Utah Launch Complex/White Sands Missile Range would be expected. The impacts of entering into the Hill AFB Sevier B&D MOA are described in the Region III discussion where the impacts are more substantial.

No military airspace impacts on the Hill AFB Sevier MOA would be expected. Direct conflicts with possible future military airspace operations and/or other operations involving the Utah Launch Complex/White Sands Missile Range could occur even though Alternative II-C is located within existing utility corridors where it passes through this facility.

Alternative II-D

Key Parameters Summary

Alternative II-D would require construction of 474 miles of new roadway including 271 miles in steep and mountainous terrain. A total of 16 major road crossings and 8 railroad crossings are required. The centerline would pass through 190 miles of public land and 72 miles of private land. Two airports are located within 5 miles. Alternative II-D enters into the Hill AFB Sevier B&D MOA for 3 miles where there is no existing transmission line within a WWEC designated corridor.

After considering design features, BMPs, and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. Only minor delays from road and railroad crossings might occur. Access impacts would be temporary and minor. No impacts on airports would occur because each airport facility is located far enough away from the centerline to avoid creating a navigation hazard or FAA reporting requirements. No military airspace impacts on the Utah Launch Complex/White Sands Missile Range would be expected. The impacts of entering into the Hill AFB Sevier B&D MOA are described in the Region III discussion where the impacts are more substantial.

Alternative II-E

Key Parameters Summary

Alternative II-E would require construction of 471 miles of new roadway including 250 miles in steep and mountainous terrain. A total of 17 major road crossings and eight railroad crossings are required. The centerline would pass through 160 miles of public land and 107 miles of private land. Three airports are located within 5 miles. Alternative II-E enters into the Hill AFB Sevier B&D MOA for 3 miles where there is no existing transmission line within a WWEC designated corridor. Alternative II-E contains the Cedar Knoll micro-siting adjustments, both within transmission line corridor.

After considering design features, BMPs, and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. Only minor delays from road and railroad crossings might occur. Access impacts would be temporary and minor. No impacts on airports would occur because each airport facility is located far enough away from the centerline to avoid creating a navigation hazard or FAA reporting requirements. No military airspace impacts on the Utah Launch Complex/White Sands Missile Range would be expected. The impacts of entering into the Hill AFB Sevier B&D MOA are described in the Region III discussion where the impacts are more substantial. Micro-siting adjustments provide no transportation and access benefits.

Alternative II-F (Agency Preferred)

Key Parameters Summary

Alternative II-F would require construction of 526 miles of new roadway including 336 miles in steep and mountainous terrain. A total of 16 major road crossings and 11 railroad crossings are required. The centerline would pass through 188 miles of public land and 79 miles of private land. Three airports are located within 5 miles. Alternative II-F passes through the Hill Sevier B&D MOA for 1 mile co-located with an existing transmission line within a RMP designated corridor. Alternative II-F contains the Cedar Knoll micro-siting adjustments, both within transmission line corridor.

After considering design features, BMPs, and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. Only minor delays from road and railroad crossings might occur. Access impacts would be temporary and minor. No impacts on airports would occur because each airport facility is located far enough away from the centerline to avoid creating a navigation hazard or FAA reporting requirements. No military airspace impacts on the Utah Launch Complex/White Sands Missile Range would be expected. Micro-siting adjustments provide no transportation and access benefits.

Cedar Knoll IRA micro-siting Option 2 is slightly closer to Highway 89 which would result in less access road mileage needed to reach the site. Overall, there are no substantive transportation or access advantages to any of the options within the Cedar Knoll IRA micro-siting options when compared to Alternative II-F.

Alternative Variation in Region II

Emma Park Alternative Variation

The Emma Park Alternative Variation is approximately 3 miles longer than the comparable portion of Alternative II-F, but requires 4 fewer miles of new access roads. The Emma Park Alternative Variation adds 7 additional miles of private land along the transmission line relative to Alternative II-F. This variation has 1 major roadway crossing, which is the same as Alternative II-F. The Emma Park Alternative Variation provides no substantive transportation or access advantages when compared to Alternative II-F.

Alternative Connectors in Region II

The Castle Dale Alternative Connector adds 20 road miles involving a mix of flat miles (10 miles) and mountainous miles (10 miles). The Castle Dale Alternative Connector passes through 7 miles of public land and 4 miles of private land.

The Price Alternative Connector adds 31 mostly steep (21 miles) access road miles and passes through 15 miles of public land and 4 miles of private land. Two railroad crossings are required.

The Lynndyl Alternative Connector adds 34 mostly flat and rolling access road miles and passes through 15 miles of private land and 9 miles of public land. The connector requires one major road crossing and no railroad or airport conflicts. This connection provides a north/south route with no substantive transportation and access advantages.

The IPP East Alternative Connector involves 3 flat access road miles and passes through 3 miles of public land with no road, railroad, or airport conflicts. This connector provides a conflict free north/south route.

The Highway 191 Alternative Connector adds 13 road miles of mountainous roads. The Highway 191 Alternative Connector passes through 3 miles of public land and 2 miles of private land. This connector also has 1 major roadway crossing, Highway 191. Use of this connector provides no substantive transportation or access advantages.

There are no distinct transportation advantages or disadvantages to the alternatives achieved through the use of any alternate connector.

Region II Conclusion

Based on the information shown in **Table 3.16-6**, Alternative II-C provides the most enhancements to the roadway network and the least impact from new/improved steep and mountainous roads. All other parameters are virtually equal across all alternatives.

3.16.6.5 Region III

Table 3.16-7 provides a tabulation of impacts associated with the alternative routes in Region III.

Table 3.16-7 Transportation and Access Evaluation factors for the Alternatives in Region III

Evaluation Factors	Alternative III-A	Alternative III-B	Alternative III-C
New Permanent Access Roads: Miles (Flat)	223	262	279
New Permanent Access Roads: Miles (Rolling)	15	73	56
New Permanent Access Roads: Miles (Steep)	135	39	96
New Permanent Access Roads: Miles (Mountainous)	50	27	3
Total Miles of New Permanent Access Roads	423	401	433
Interstate Highway Crossings	1 – I-15	1 – I-15	1 – I-15
U.S. Highway Crossings	4 – U.S. 6, Old 6/50 (x2), 40	2 – U.S. 6/50, Old 6/50	5 – U.S. 6/50, Old 6/50, U.S. 93 (x3)
State Highway Crossings	7 – 12, 18 (x3), 21, 56, 144	4 – 21, 56, 78, 168	3, 21, 56, 168
Railroad Crossings	4	10	11
Center Line Passing Through Public Land (miles)	239	236	247
Center Line Passing Through Private Land (miles)	37	48	61
Number of Airports within 5 miles	1 Milford Muni / Briscoe Field	2 Milford Muni / Briscoe Field Sun Valley Estates	2 Milford Muni / Briscoe Field Sun Valley Estates
MOAs within 20 Miles	4 Hill AFB Sevier MOA Wendover MOA Nellis Desert MOA Nellis MOA	4 Hill AFB Sevier MOA Wendover MOA Nellis Desert MOA Nellis MOA	5 Hill AFB Sevier MOA Wendover MOA Nellis Desert MOA Nellis MOA
MOAs with 250-Foot-Wide Transmission ROW Overlap	Hill AFB Sevier B MOA (Most Overlap)	Hill AFB Sevier B MOA Nellis Desert MOA (Conflict)	Hill AFB Sevier B MOA Nellis Desert MOA (Most Conflict)

Alternative III-A (Applicant Proposed)

Key Parameters Summary

Alternative III-A would require construction of 423 miles of new roadway including 185 miles in steep and mountainous terrain. A total of 12 major road crossings and 4 railroad crossings are required. The centerline would pass through 239 miles of public land and 37 miles of private land. One airport is located within 5 miles. After considering design features, BMPs, and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. Only minor delays from road and railroad crossings might occur. Access impacts would be temporary and minor. No impacts on airports would occur. Alternative III-A passes through the Hill AFB Sevier B MOA within existing utility corridors and is located within 20 miles of the Nellis AFB Desert MOA boundary. Alternative III-A also is located within close proximity to MTR IR-293 within the Hill AFB Sevier B MOA, crosses MTR VR-209 in Millard County, Utah outside of the Hill AFB Sevier B MOA, and is in close proximity to (parallel) and crosses over MTR VR-209 outside of the Desert MOA in Clark County, Nevada. In each case, existing utility corridors are present.

Alternative III-A passes through the Hill AFB Sevier B MOA and is co-located with an existing transmission line for approximately 8 miles and then not co-located for the remaining 30 miles through the MOA, but generally is within existing RMP and WWEC corridors when not co-located with other transmission lines. Alternative III-A also is located within close proximity to MTR IR-293 within the Hill AFB Sevier B MOA, crosses MTR VR-209 in Millard County, Utah, outside of the Hill AFB Sevier MOA, and is in close proximity to (parallel) and crosses over MTR VR-209 outside of the Desert MOA. The MTR VR-209 crossover is located in Lincoln County, Nevada. Alternative III-A is in close proximity to MTR VR-209 in Washington County, Utah, and in Lincoln and Clark counties, Nevada. In each case, existing utility corridors are present.

The use of existing utility corridors within military MOAs creates minor to severe impacts on military operations and the military's mission (refer to the discussion under Alternative III-B for related details).

<u>Alternative III-B (Agency Preferred)</u>

Key Parameters Summary

Alternative III-B would require construction of 401 miles of new roadway including 66 miles in steep and mountainous terrain. A total of 7 major road crossings and 10 railroad crossings are required. The centerline would pass through 236 miles of public land and 48 miles of private land. Two airports are located within 5 miles. After considering design features, BMPs, and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. Only minor delays from road and railroad crossings might occur. Access impacts would be temporary and minor. No impacts on airports would occur because the small airport facility is located far enough away from the centerline to avoid creating a navigation hazard or FAA reporting requirements.

Alternative III-B passes through the Hill AFB Sevier B MOA inside and outside of established utility corridors. Alternative III-B crosses MTR VR-209 in Millard County, Utah, outside of the Hill AFB Sevier B MOA, and is in close proximity to (parallel) and crosses over MTR VR-209 outside of the Desert MOA in Lincoln and Clark counties, Nevada. In each case, existing utility corridors are present.

Alternative III-B passes through the Nellis AFB Desert MOA within and outside of RMP and WWEC corridors. Alternative III-B is not co-located with an existing transmission line or aligned with existing utility corridors for 51.5 miles.

The addition of transmission lines within MOAs where no existing transmission lines are present and no existing utility corridors have been designated creates practical and regulatory conflicts with military air space operations and may require a BLM RMP Amendment depending on the RMP affected. This situation would be addressed on a case-by-case basis, ensuring coordination, as needed, with the military and the State of Utah. Final resolution of this issue is required as Alternative III-B has been selected as the Agency Preferred Alternative.

At the Hill AFB Sevier B MOA, the proposed transmission line structures would exceed the 100-foot vertical height restriction. This and the presence of new transmission lines in corridors without overhead lines would interfere with the military's ability to train pilots at extremely low levels and would impact cruise missile testing. To address this issue, DOD has requested that all stanchions, poles, and other transmission-related infrastructure (regardless of height and location) be lighted, marked, and charted on FAA flight sectionals, maps, and other appropriate navigation reference material to ensure flight safety and proper VFR/IFR de-confliction on/near the UTTR. The IPP transmission line also exceeds the 100-foot height restriction, but it is not lighted. Adding light to each TWE structure through the Sevier B MOA may cause impacts to the University of Utah's Telescope Array Project, which requires dark night skies.

The presence of transmission line personnel within MOAs at Hill AFB Sevier B MOA may require rescheduling maneuvers. All construction activities in MOAs would require coordination and scheduling with the military to avoid potential conflicts. All transmission line helicopter activity would require flight plan coordination and formal notification. All transmission line personnel planning to enter MOAs would be reported to the military with adequate lead time. The notifications would provide specific locations and timeframes for their activities.

Transmission line equipment that emits radio frequencies may interfere with military communications and operations. As a result, specific radio frequencies emitted by the Project's microwave communication facilities would be selected based on coordination with the military to avoid any conflict with radio communications at Hill AFB Sevier B MOA and the UTTR. The use of transmission line cameras also would require coordination with the military.

At Nellis AFB, the transmission line would impact military operations at Nellis AFB, the NTTR and the Nellis Small Arms Range (SAR)/Jettison Hill boundaries. Measures referenced in the Hill AFB Sevier B MOA discussion also would apply to impacts created within Nellis AFB. However, even after implementation of these measures, various impacts would be expected.

The transmission lines would disrupt military activity and could be damaged by military activity creating financial and system reliability impacts. In addition, transmission line repair and maintenance may be prevented by military operations. The presence of transmission lines also may impact low-level fixed and rotary wing flying operations.

The line would cross the Nellis SAR in the Las Vegas Valley. The presence of a transmission line in this location is incompatible with authorized emergency jettison procedures (Jettison Hill), low-level rotary and fixed wing arrival and departure routes, and live fire operations conducted in the area. Transmission line facilities may be damaged by authorized live fire and/or jettison activities in the area. The proximity of military operations can limit the transmission line operator's ability to respond to contingency problems or emergency situations.

Authorized Low Altitude Tactical Navigation (LATN) airspace and MTRs are located directly above the 250-foot-wide transmission line ROW extending from the Beryl, Utah, area to the northeastern edge of Las Vegas. The segment of transmission line between these two locations would impact low-flying military aircraft and navigation operations. In addition, authorized (LATN) airspace and property used for training is located along the southeastern edge of Las Vegas, in the Gold Butte area. Alternate routes extending along the western edge of Lake Mead would negatively impact helicopter training and LATN capabilities.

The authorized emergency aircraft evacuation/ejection area (i.e., location where pilots exit the aircraft and allow the airplane to fly uncontrolled until the aircraft impacts the ground) is located in the Dry Lake area where the line would be located. Transmission infrastructure built within the emergency aircraft ditch area may be interrupted, severely damaged, or potentially destroyed during an in-flight emergency due to uncontrolled aircraft flight into the structures.

The line would be located within operational areas for A-10 aircraft and helicopters. These areas are used as practice landing areas for training. Apex Hill (just south of U.S. 93) would be an area of concern because it is within an approach and departure zone. These zones are fixed and the east-to-west routes that are not located adjacent to existing transmission lines and may pose a safety hazard for pilots.

The transmission lines may interfere with sensitive flight instruments including navigational aids and aircraft radar. The conditions that exist in and around the test and training range are one-of-a-kind and offer exceptional radar/communication response that cannot be duplicated anywhere else. The applicant would take steps to address this issue. One step includes the use of steel pole, rather than lattice structures.

Uncoordinated construction activity on or near Nellis AFB, Creech AFB and the NTTR, such as usage of cranes and other heavy equipment high enough to penetrate airspace or cause visible distractions like excessive exhaust emissions or dust near airfield operations, is incompatible with military operations. The use of helicopters for the purpose of line construction, maintenance, and inspection on all routes would impact military flying operations on or near Nellis, Creech, and the NTTR to include low-level flight areas, LATN, MTRs, MOAs, and advanced military fixed/rotary wing testing and training missions. Additionally, civilian helicopters used for construction may be impacted by low-level supersonic over flight.

Terminal Instrument Procedures (TERPs) will be impacted at the southern end of Region III where Alternative III-B and III-C intersect and just to the west of this intersection along the Alternative III-C alignment. TERPs address “surfaces” constructed from the electronic signals transmitted by ground and space based air navigation electronic equipment. TERPs are the instrument procedures that aircraft pilots use to fly between airports and land on runways. Each approach and departure is divided into segments as an aircraft proceeds to a safe landing or departure. Each segment is a trapezoid or “trap,” roughly shaped. Within each trap a TERPs expert must ensure an aircraft, at the extreme limits of its authorized altitudes within the trap, has obstacle clearance. The proposed transmission lines and towers conflict with existing departure traps in the two locations. The Air Force will need to review the final transmission line route and TERPs if the line passes through either or both of the two departure trap areas. This review will include final pole locations.

The addition of new transmission line corridors located outside of established corridors conflicts with substantial past and future investments in military facilities by making what is available to the military less usable and less safe.

<u>Alternative III-C</u>

Key Parameters Summary

Alternative III-C would require construction of 433 miles of new roadway including 99 miles in steep and mountainous terrain. A total of 9 major road crossings and 11 railroad crossings are required. The centerline would pass through 247 miles of public land and 61 miles of private land. Two airports are located within 5 miles. After considering design features, BMP and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. Only minor delays from road and railroad crossings might occur. Access impacts would be temporary and minor. No impacts on airport areas would occur because the airport facility is located far enough away from the centerline to avoid creating a navigation hazard or FAA reporting requirements.

Alternative III-C passes through the Hill AFB Sevier B MOA within established utility corridors. Alternative III-C crosses MTR VR-209 in Millard County, Utah, outside of the Hill AFB Sevier MOA, and crosses MTR VR-209 inside of the Desert MOA in Lincoln County, Nevada. Alternative III-C crosses the Panaca area, where the DOD has no height restrictions for aircraft. In each case, existing utility corridors are present.

Alternative III-C passes through the Nellis AFB Desert MOA within and outside of RMP and WWEC corridors. Alternative III-C is not co-located with an existing transmission line or aligned with existing utility corridors for 69 miles. Alternative III-C passes within 1 mile of the unimproved airstrips used by the military within the Desert MOA. One airstrip is located in the Delamar dry lake bed. The other is located south of U.S. 93 on the eastern side of Delamar Valley.

The addition of transmission lines within MOAs where no existing transmission lines are present and no existing utility corridors have been designated creates practical and regulatory conflicts with military air space operations and may require a BLM RMP Amendment depending on the RMP affected. This situation would be addressed on a case-by-case basis, ensuring coordination, as needed, with the military and the State of Utah. The discussion under Alternative III-B, above, regarding Hill AFB Sevier B and Nellis AFB Desert MOA also would apply to Alternative III-C. However, the effects on the Desert MOA would be increased by Alternative III-C due to the 17 additional miles of transmission line located outside of existing designated corridors, that military flights are closer to the ground, and the proximity of the Nellis AFB drop zone (10 miles). Transmission line lighting would help mitigate drop zone proximity effects. The addition of new transmission line corridors located outside of established corridors conflicts with substantial past and future investments in military facilities by making what is available to the military less usable and less safe (refer to the discussion under Alternative III-B for related details).

Alternative Variations in Region III

The Ox Valley East and Ox Valley West Variations are slightly less than 2 miles longer than the comparable portion of Alternative III-A. The terrain differences in miles are as follows:

	Flat	Rolling	Steep	Mountainous
Ox Valley East Alternative Variation	0	0	16	19
Ox Valley West Alternative Variation	0	1	15	19
Comparable (Alternative III-A)	1	0	9	23

These terrain differences are minor and would result in few if any real transportation advantages. Both variations primarily pass through public lands with one major roadway crossing.

The Pinto Variation has only 1 mile less road than the comparable portion of Alternative III-A. The terrain differences in miles are as follows:

	Flat	Rolling	Steep	Mountainous
Pinto Alternative Variation	0	27	19	0
Comparable (Alternative III-A)	9	1	14	22

The Pinto Alternative Variation includes slightly more steep terrain and no mountainous terrain. Overall, this difference provides some advantages relative to the comparable portion of Alternative III-A. This variation primarily passes through public lands with one major roadway crossing. One key disadvantage of the Pinto Alternative Variation is that it encroaches into MTR VR-209 (refer to the previous discussion of MOA and MTR conflicts caused by the Alternatives in Region III).

Alternative Connectors in Region III

The Avon Alternative Connector adds 10 flat miles with 5 miles passing through public lands and 3 miles passing through private lands with no major roadway crossings. The Sun Valley Estates airport is located within 5 miles.

The Moapa Alternative Connector adds 17 miles of new primarily flat road with two major road crossings and one railroad crossing, all on public land. One railroad crossing is required.

Alternative Ground Electrode Systems in Region III

It would be necessary to locate the southern ground electrode system within 100 miles of the Southern Terminal as discussed in Chapter 2.0. Although the location for this system has not been determined, conceptual locations and connections to the alternative routes have been provided by the proponent.

Table 3.16-8 provides a comparison of alternative electrode bed locations proposed near the Southern Terminal. Some locations might serve multiple alternative routes, while others could only be associated with a certain alternative route.

Table 3.16-8 Summary of Region III Alternative Ground Electrode System Location Impacts for Transportation and Access

Alternative Ground Electrode System Locations	Analysis and Conclusion
Mormon Mesa- Carp Elgin Rd (Alternative III-A)	Approximately 6 miles from Alternative III-A, requires 7 miles of access road construction, expands road network, and creates minor safety and maintenance impacts.
Halfway Wash-Virgin River (Alternative III-A)	Approximately 4 miles from Alternative III-A, requires 5 miles of access road construction, expands road network, has proximity to I-15, and creates minor safety and maintenance impacts.
Halfway Wash-East (Alternative III-A)	Approximately 8 miles from Alternative III-A, requires 10 miles of access road construction, expands road network, has proximity to I-15, and creates minor safety and maintenance impacts.
Mormon Mesa- Carp Elgin Rd (Alternative III-B)	Approximately 8 miles from Alternative III-B, requires 10 miles of access road construction, expands road network, has proximity to I-15, and creates minor safety and maintenance impacts.
Halfway Wash –Virgin River (Alternative III-B)	Approximately 6 miles from Alternative III-B, requires 7 miles of access road construction, expands road network, has proximity to I-15, and creates minor safety and maintenance impacts.
Halfway Wash East (Alternative III-B)	Approximately 8 miles from Alternative III-A, requires 10 miles of access road construction, expands road network, has proximity to I-15, and creates minor safety and maintenance impacts.
Meadow Valley II (Alternative III-C)	Approximately 22 miles from Alternative III-C, access via SH 168, with 29 miles of access road construction to reach the site, minor roadway network expansion and minor increase in safety and maintenance impacts.

Region III Conclusion

Based on the information shown in **Table 3.16-7**, Alternative III-B provides the most enhancements to the roadway network and the least impact from new/improved steep and mountainous roads when compared to Alternative III-A. The main deciding factor between alternatives is their impacts on DOD land. Alternative III-C creates the most conflict. Alternative III-A creates the least conflict.

3.16.6.6 Region IV

Table 3.16-9 provides a comparison of impacts associated with the alternative routes in Region IV.

Table 3.16-9 Transportation and Access Evaluation factors for the Alternatives in Region IV

Evaluation Factors	Alternative IV-A	Alternative IV-B	Alternative IV-C
New Permanent Access Roads: Miles (Flat)	9	15	27
New Permanent Access Roads: Miles (Rolling)	26	19	16
New Permanent Access Roads: Miles (Steep)	11	5	6
New Permanent Access Roads: Miles (Mountainous)	14	32	26
Total Miles of New Permanent Access Roads	60	71	74

Table 3.16-9 Transportation and Access Evaluation factors for the Alternatives in Region IV

Evaluation Factors	Alternative IV-A	Alternative IV-B	Alternative IV-C
Interstate Highway Crossings	0	0	0
U.S. Highway Crossings	2 – 93 (x2)	3 - 93 (x2), 95	2 - 93, 95
State Highway Crossings	3 – 146 (x2), 147	4 – 146, 166 (x2), 167	4 – 146, 166 (x2), 167
Railroad Crossings	2	2	1
Center Line Passing Through Public Land (miles)	31	23	24
Center Line Passing Through Private Land (miles)	6	16	21
Number of Airports within 5 miles	4 St. Rose Dominican Hospital (H) Car Country (H) Boulder City Muni Eldorado Substation (H)	2 Boulder City Muni Car Country (H) Eldorado Substation (H)	2 Eldorado Substation (H) Boulder City Muni
MOAs within 20 Miles	Nellis AFB	Nellis AFB	Nellis AFB
MOAs with 250-Foot-Wide Transmission Line ROW Overlap	0	0	0

(H) Heliport

Alternative IV-A (Applicant Proposed and Agency Preferred)

Key Parameters Summary

Alternative IV-A would require construction of 60 miles of new roadway including 25 miles in steep and mountainous terrain. A total of 5 major road crossings and two railroad crossings are required. The centerline would pass through 31 miles of public land and 6 miles of private land. Four airports are located within 5 miles. The alternative is within 20 miles of Nellis AFB, but is not within 20 miles of the Desert MOA. After considering design features, BMPs, and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. Only minor delays from road and railroad crossings might occur. Access impacts would be temporary and minor. No impacts on airports areas would occur because the airport facility is located far enough away from the centerline to avoid creating a navigation hazard or FAA reporting requirements. No impacts on MOAs would occur.

Alternative IV-B

Key Parameters Summary

Alternative IV-B would require construction of 71 miles of new roadway including 37 miles in steep and mountainous terrain. A total of 7 major road crossings and two railroad crossing are required. The centerline would pass through 23 miles of public land and 16 miles of private land. Two airports are located within 5 miles. The Project is within 20 miles of Nellis AFB, but is not within 20 miles of the Desert MOA. After considering design features, BMPs, and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. Only minor delays from road and railroad crossings might occur. Access impacts would be temporary and minor. No impacts on airports or MOAs would occur.

Alternative IV-C

Key Parameters Summary

Alternative IV-C would require construction of 74 miles of new roadway including 32 miles in steep and mountainous terrain. A total of 6 major road crossings and one railroad crossing are required. The centerline would pass through 24 miles of public land and 21 miles of private land. Two airports are located within 5 miles. The Project is within 20 miles of Nellis AFB, but is not within 20 miles of the Desert MOA. After considering design features, BMPs, and other project approval requirements, the following conclusions can be made. Incremental increases in traffic would not cause congestion that exceeds appropriate levels of service. Only minor delays from road crossings might occur. Access impacts would be temporary and minor. No impacts on airports or MOAs would occur.

Alternative Variations in Region IV

The transportation and access characteristics of the Marketplace Variation are virtually identical to the comparable portion of Alternative IV-B except that the Marketplace Variation is about one mile longer and requires more new access road construction. The Eldorado Substation heliport, Boulder City Municipal airport, and the Car Country heliport are located within 5 miles. There are no apparent unique constraints or opportunities for transportation or access by utilizing the variation.

Alternative Connectors in Region IV

The Sunrise Mountain Alternative Connector adds 4 miles of new flat and rolling road on public land with no major road or railroad crossings. There are no apparent unique constraints or opportunities for transportation or access by utilizing this connector.

The Lake Las Vegas Alternative Connector adds 7 miles of new steep road through mostly public land with no major road or railroad crossings. The Car Country heliport is located within 5 miles. There are no apparent unique constraints or opportunities for transportation or access by utilizing this connector

The Three Kids Mine Alternative Connector adds 12 miles of new mostly mountainous road through mostly public land with no major road or railroad crossings. The Car Country and St. Rose Dominican Hospital heliports are located within 5 miles. There are no apparent unique constraints or opportunities for transportation or access by utilizing this connector

The River Mountains Alternative Connector adds 19 miles of mountainous roads on public land with no major road or railroad crossings. The Car Country and St. Rose Dominican Hospital heliports are located within 5 miles. There are no apparent unique constraints or opportunities for transportation or access by utilizing this more mountainous connector.

The Railroad Pass Alternative Connector adds 6 miles of mostly mountainous roads on private land with one major road crossing and one railroad crossing. The Boulder City Municipal airport and the Car Country heliport are located within 5 miles. There are no apparent unique constraints or opportunities for transportation or access by utilizing this more mountainous connector.

Region IV Conclusion

Based on the information shown in **Table 3.16-9**, Alternatives IV-B and IV-C provide the most enhancements to the roadway network while Alternative IV-A provides the least impact from new/improved steep and mountainous roads. All other parameters are virtually equal across all alternatives.

3.16.6.7 Residual Impacts

The following residual transportation and access impacts would be expected after mitigation:

- The local roadway network would be expanded and improved creating increased access, improved travel conditions, improved roadway safety, and reduced short-term maintenance requirements (Beneficial);
- Travel volumes on the local roadway network would increase creating traffic conflicts (Minor Adverse Impact); and
- Alternatives that directly or indirectly conflict with MOAs and/or MTRs would create aviation and military operation conflicts (Substantial Adverse Impact).

3.16.6.8 Impacts to Transportation and Access from the No Action Alternative

The No Action Alternative would not generate the transportation network impacts associated with road improvements and would avoid the construction period incidental transportation impacts described for the Action Alternatives. Minor delays associated with road and transmission line construction would be avoided. Temporary property access disruptions and travel safety issues associated with higher vehicle volumes and heavy, slow moving trucks would be avoided. Road maintenance benefits from improvements and the potential for added road maintenance from the use of local roads by heavy vehicles would not occur. Transmission line railroad crossings and airport navigation hazards from transmission line towers and wires would not be created.

3.16.6.9 Irreversible and Irretrievable Commitment of Resources

The following irreversible and irretrievable commitments of transportation and access resources would be expected from the proposed action and alternatives:

- A portion of the local roadway network capacity would be lost during the construction period. This loss would be irretrievable;
- The use of non-renewable resources and resources that cannot be recycled would occur as a result of roadway construction. This use of these resources would be considered irreversible; and
- Military airspace, military aviation possibilities, and military training operation capabilities would be lost as a result of alternatives that directly or indirectly conflict with MOAs and MTRs. This loss would be substantial and irretrievable during the life of the Project. These impacts would not be irreversible as these capabilities would be available once the transmission line is decommissioned.

3.16.6.10 Relationship Between Local Short-Term Uses and Long-Term Productivity

The proposed action and alternatives would reduce the short-term uses of the local roadway network during construction, but would increase long-term productivity by enhancing connectivity and improving travel conditions.