Netcher 2011

3.10 Transportation Resources

3.10.1 Affected Environment

3.10.1.1 Overview

Transportation systems within the project area include roads and highways and other transportation modes, such as railroads and airports. A road is defined as a travel route that has been improved and maintained by mechanical means to ensure relatively regular and continuous use. For the purposes of this document, the DOI definitions of road types are used (Form DI 1876, Revised 4/1/2008). These definitions are:

- Paved Road – Twenty feet or more in width. Pavement may be concrete, asphalt or macadam. Curbs and gutters not required.
- Unpaved but Improved Road – Graded, drained, and has a surface other than pavement (i.e., stone, gravel, etc.) of any width. Capable of accommodating at least one full-size passenger car.
- Unimproved Road – May or may not be graded and has a dirt surface of any width.

Transportation data were obtained from Topologically Integrated Geographic Encoding and Referencing (TIGER®) files from the U.S. Census Bureau and the National Transportation Atlas Databases. Unimproved routes used for OHV travel are addressed in the recreation section (Section 3.9, Recreation).

QUICK REFERENCE

AADT – Annual Average Daily Traffic
AFB – Air Force Base
GIS – Geographical Information Systems
NDOT – Nevada Department of Transportation
OHV – Off-Highway Vehicle
RFFA – Reasonably Foreseeable Future Actions
SH – State Highway
TIGER® – Topologically Integrated Geographic Encoding and Referencing

Transportation Resources include roads, highways, railroads, and airports; all of which occur within the project area.

3.10.1.2 Region of Study

The region of study for transportation includes those roads and railroads that would be crossed by the proposed ROWs and ancillary facilities and groundwater development areas, as well as airports, roads, and railroads that are located within 2 miles of power lines and could be used during construction and operation of the Proposed Action or alternatives (**Figure 3.10-1**). No additional region of study is relevant for transportation because the indirect effects of groundwater drawdown are not an issue for this resource.

3.10.1.3 Rights-of-way and Ancillary Facilities

Highways and Roads

The region of study is characterized as having a few primary roads and several secondary rural roads. The major roads that would be encountered by the ROWs are a mixture of U.S. and SH. The majority of the ROWs and ancillary facilities would be in rural areas where existing traffic volumes are low. However, the ROWs and ancillary facilities would cross or be adjacent to several transportation corridors that have higher traffic volumes. These roads are shown in **Table 3.10-1**, along with their annual average daily traffic (AADT) count from 2007 and 2008 (NDOT 2008). U.S. 93 recorded the highest AADT counts, followed by U.S. 6/50 and SH 486.

Figure 3.10-1 Transportation Network

Table 3.10-1 Major Roads and Annual Average Daily Traffic (2007 and 2008) for Roads within or Intersecting the Rights-of-way and Ancillary Facilities for the Proposed Action and Alternatives

Highway or Road	AADT 2007 (Vehicles per Day)	AADT 2008 (Vehicles per Day)
Nevada SH 486	250 (estimated)	210
Nevada SH 487	180 (estimated)	170
Nevada SH 894	50 (estimated)	40
U.S. Highway 6/50, 6 miles east of Ely	1,300	1,200
U.S. Highway 6/50, near SH 893	820 (estimated)	740
U.S. Highway 93, south of McGill	3,400	3,200
U.S. Highway 93, White Pine County, south of U.S. 50	370 (estimated)	360
U.S. Highway 93, Lincoln County, north of Pioche	540	500
U.S. Highway 93, Lincoln County, west of Caliente	770	720
U.S. Highway 93, southern Lincoln County	1,700	1,700
U.S. Highway 93, north of I-15	2,100	2,100

The ROWs also cross BLM and county roads in Lincoln and White Pine counties. For the most part, these roads are maintained by the counties in which they are located. The BLM roads commonly are maintained by the counties under contract with the federal agency.

Railroads

The Union Pacific Railroad mainline from Salt Lake City, Utah to Los Angeles, California (**Figure 3.10-1**) does not cross the ROWs or ancillary facilities for any of the studied alternatives including the Proposed Action. The ROWs for the Proposed Action and alternatives would be west of the railroad, with the closest being just north of Las Vegas. The proposed power line ROW would cross the Nevada Northern Railway in two locations northeast of Ely.

It is anticipated that pipe and other major materials and equipment for the GWD Project would be delivered to a railroad siding near Caliente on the Union Pacific Railroad. From there, materials would be moved to a nearby construction support and staging area.

Airports

There are no major airports within 2 miles of the ROWs or ancillary facilities for the Proposed Action and alternatives. The nearest airport to a ROW is the Ely airport, which is approximately 2.1 miles from the proposed power line. The power line would be within a designated utility corridor at this location.

3.10.1.4 Groundwater Development Areas

Highways and Roads

Numerous unpaved but improved roads occur within the project study area. These roads are maintained by the respective county, the BLM, or both the county and the BLM. Road system maintenance is determined on an as-needed basis, depending on traffic and weather events.

In White Pine, Lincoln, and Clark counties, the BLM has observed an increase in highway and OHV travel on unpaved but improved roads and a proliferation of informal travel routes as a result of increased access from unpaved but improved roads. Some of these informal travel routes are connections between paved or unpaved but improved roads and designated OHV areas, such as the proposed Silver State Off Highway Vehicle Trail Backcountry Byway in northern Lincoln County, between highways U.S. 93 and SH 318. This travel is caused

mainly by recreational use, which can be correlated with increases in population and OHV ownership. Designated OHV areas are discussed in Section 3.9, Recreation.

Several major road crossings occur within the groundwater development areas in White Pine County. These crossings include the following:

- U.S. 6/50 and 93; and
- SHs 487, 893, and 894.

U.S. 93—one of the region's major thoroughfares—is a north-to-south route that connects Las Vegas to Ely. U.S. 6 and 50 traverse east to west and southwest to northeast, respectively, with a common alignment through a portion of the groundwater development area east of Ely. Most of these roads receive light rural traffic.

Railroads

The Union Pacific Railroad mainline from Salt Lake City, Utah to Los Angeles, California crosses the project area from northeast to southwest, passing through Caliente and Las Vegas (**Figure 3.10-1**). However, the rail line does not cross the groundwater development areas.

Airports

Five primary airports are within the region of interest: Ely, Lincoln County, Henderson Executive Airport, North Las Vegas, and McCarran International airports (**Figure 3.10-1**).

- The Ely Airport (Yelland Field), located north of Ely, receives limited commercial service;
- The Lincoln County Airport, located just west of Panaca along U.S. 93, accepts small, two-engine aircraft; and
- North Las Vegas Airport and McCarran International Airport, located north and south of Las Vegas, respectively, service Las Vegas and are south of the Proposed Action and alternatives.

Henderson Executive Airport services mainly corporate aircraft needs. The airport has a terminal building, private aircraft storage hangers, and a stand-alone air traffic control tower. The airport is located south and west of the city of Henderson and south of the project area.

In addition, Nellis AFB, on the north side of Las Vegas, supports a variety of military operations including supersonic aircraft. For this reason, large portions of Lincoln and Clark counties are designated as Military Operations Areas. A variety of aircraft that operate from Nellis AFB regularly use this airspace during training operations. The southern terminus of the Proposed Action and alternatives is in the vicinity of Nellis AFB.

An unmaintained, emergency, dirt airstrip—the Caliente Flight Strip—is in southern Dry Lake Valley, near the pipeline alignment for the Proposed Action and the alignment options (except the North Delamar alternative). However, the airstrip is not located within the groundwater development areas. This was one of many airstrips that were constructed during World War II for the emergency use of military aircraft. The airstrip was closed prior to 2000.

3.10.2 Environmental Consequences

3.10.2.1 Rights-of-way and Ancillary Facilities

Issues

The following issues for transportation are discussed as part of the impact analysis for construction and operation.

- Potential effects of increased traffic during the construction period.
- Temporary loss of access because of construction or maintenance activities.
- Potential effects of unauthorized OHV use on temporary roads and designated access roads.

Assumptions

The following assumptions were used in the impact analysis for transportation:

- Vehicle traffic on major roads that cross proposed construction areas could be affected during construction or maintenance operations. Increased construction traffic might affect the safety of the traveling public.
- SNWA would either maintain traffic safety where pipelines and power lines cross construction roads and railroads or would provide alternate routes.
- SNWA would take measures to reduce the impacts of increased traffic that would result from project worker travel, materials delivery, and other construction activities.
- Project access roads would not be available for public use and SNWA would take measures to limit public use of these roads.

Methodology for Analysis

All potential crossings of roads and constructed ROWs and facilities were identified through GIS analysis to identify areas where traffic delays and congestion could occur. It was then determined which primary roads would be used by construction equipment and workers to access project sites using estimates of worker and heavy-machinery traffic.

3.10.2.2 Proposed Action, Alternatives A through C

Construction and Facility Maintenance

Potential Effects of Increased Traffic during the Construction Period

Construction activities could result in short-term impacts on transportation infrastructure. These impacts could include disruption to traffic flow due to the movement of construction equipment, materials, and crew members; construction of pipeline and power line facilities across existing roads and railways; and damage to local roads from the movement of heavy construction equipment and materials. The number of major road crossings is listed in **Table 3.10-2**. The pipeline and power line ROW would cross existing roads in several locations. While Lincoln County roads bear the majority of the ROW crossings, U.S. 93 is the highway most transected by both pipelines and power lines. Major road crossing locations are identified in **Figure 3.10-1**.

Construction across paved roads, unpaved roads where traffic cannot be interrupted, and railroads would result in short-term impacts on public transportation while construction activities pass through the project area. Such crossings generally would be completed by boring under the feature. There would be little or no disruption of traffic at road or railroad crossings by use of this technique. Jack and bore construction is anticipated at crossings with U.S. Highways 93 and 6/50. Jack and bore also may be used to cross state highways (SH 486, 487, 894) depending on NDOT requirements. Most unpaved but improved roads would be crossed using the open-cut method, requiring a temporary road closure and establishment of detours or one-lane closure with traffic management.

Table 3.10-2 Major Road Crossings near Construction Activities for the Proposed Action and Alternatives A through C

Road	Number of Crossings		
	Pipeline Centerline	Power Line Centerline	Total
SR 486	0	1	**1**
SR 487	1	1	**2**
SR 894	4	2	**6**
U.S. 6/50	1	2	**3**
U.S. 93	7	6	**13**
BLM in White Pine County	2	3	**5**
BLM in Lincoln County	18	13	**31**
White Pine County	4	4	**8**
Lincoln County	17	15	**32**
Clark County	10	4	**14**
USFS in White Pine County	3	5	**8**
USFS in Lincoln County	0	1	**1**

The proposed power line would cross the Northern Nevada Railway in two locations northeast of Ely, but construction methods should eliminate any impacts to rail transportation in this area. The pipeline construction ROW would come within 100 feet of an existing siding of the Union Pacific railway near the southern terminus of the project but would not cross the railway. No impacts are expected to occur to rail transportation in this area.

Although the proposed project does not cross any major highways, near the construction support site (near U.S. 93 and SH 317, west of Caliente), increased traffic would be generated on these major roads during the movement of equipment and materials. The Caliente area construction support site may be used during construction for pipe fabrication, pipe and equipment storage, temporary construction management offices, and other construction support activities. Materials, including pipe, would be delivered to the Caliente site from an existing railroad line. A primary access road would be constructed within the pipeline ROW, which would be used for transport of equipment, materials, and personnel during construction.

Projected construction employment during the course of the project is summarized in **Table 3.10-3**. The peak construction workforce is projected to be no more than 950 people in a given year. Construction personnel would be distributed throughout several regions, with the majority of workers being employed on the main pipeline and the facilities in Hidden, Garnet, and Las Vegas valleys. The GWD Project would make use of carpooling or transporting workers by bus to reduce traffic. Assuming an average of 2.5 workers per car per trip, there would be an average of 373 worker roundtrips in the peak construction year. As identified in Section 3.18, Socioeconomics and Environmental Justice, initially most workers would be from or live in Clark County, commuting daily to their job sites. Over time, most construction workers would seek temporary housing in Lincoln and White Pine Counties. U.S. 93 would bear the majority of worker trips to the construction support site and project access roads. The use of buses would further reduce worker trips.

Table 3.10-3 Estimated Peak Construction Workforce, by Year (Number of Personnel) for the Proposed Action and Alternatives A through C

Construction by Region	Year of Project Development Activity											
	Construction Begins	**+1**	**+2**	**+3**	**+4**	**+5**	**+6**	**+7**	**+8**	**+9**	**+10**	**+11**
Main pipeline	5	154	332	451	364	267	130	0	0	0	0	0
Main power line	0	0	88	89	89	89	48	0	0	0	0	0
Snake Valley North facilities and Snake Valley lateral	0	0	0	0	0	0	0	0	0	0	98	135
Snake Valley South facilities and Snake Valley lateral	0	0	0	0	0	0	0	0	0	272	317	131
Spring Valley North facilities and Spring Valley lateral	0	0	0	0	0	41	42	132	71	0	0	0
Spring Valley South facilities	0	0	0	0	71	139	234	151	0	0	0	0
Lake and Cave valleys facilities and Cave Valley lateral	0	0	0	0	72	72	0	0	0	0	0	0
Dry Lake Valley facilities	0	0	45	46	32	0	0	0	0	0	0	0
Delamar and Coyote Spring valleys facilities	0	0	99	104	0	0	0	0	0	0	0	0
Hidden, Garnet, and Las Vegas valleys facilities	0	70	203	242	285	0	0	0	0	0	0	0
Estimated Total Per Year	**5**	**224**	**767**	**932**	**913**	**608**	**454**	**283**	**71**	**272**	**415**	**266**

Source: SNWA 2011.

In addition, there would be traffic during construction associated with the transport of construction equipment and materials for the pipelines, power lines, and ancillary facilities. Most of the equipment and materials would be received at the construction support site near Caliente and then transported on U.S. 93 to connect with appropriate secondary roads near the desired destination points or staging sites along the ROW. Material deliveries would include backfill and bedding soil materials between the proposed borrow pits and points along the ROW, building materials (sections of pipe, pumps, motors, concrete block, cement, reinforcing steel bars, gravel, and sand), fuel for construction equipment, water for dust control and construction uses, and maintenance trucks for sanitary facilities. For the purposes of analysis, it is assumed that construction traffic associated with movement of equipment and deliveries would constitute an average of 125 roundtrips per day during peak construction.

The combination of worker trips and construction traffic, estimated to be about 500 roundtrips per day during peak construction, could create temporary congestion and delays on the access roads that are identified on **Figure 2.5-5** and on other roads that would be used to transport workers and equipment, such as the following:

- I-15;
- U.S. Highways 93, 6 and 50; and
- Nevada State Highways 168, 317, 318, 319, 320, 487 893, and 894.

Several other unpaved roads that Lincoln and White Pine counties maintain also might be used:

- Cave Valley Road (from Ely into Cave Valley);
- Atlanta Road (from U.S. 93 to the pipeline alignment in Spring Valley);
- Stampede Road (from Pioche to the pipeline alignment in Dry Lake Valley);
- Pan American/Ely Springs Road (from Pioche to the pipeline alignment in Dry Lake Valley); and
- Alamo Canyon Road (from Alamo to the pipeline alignment in Delamar Valley).

During operation and maintenance of the ROWs and facilities, only minimal traffic that coincides with the current levels of traffic would be anticipated.

Applicant committed measures:

ACMs would be implemented for all alternatives to avoid or minimize construction-related effects on transportation. A Construction Traffic Management plan would be developed before the start of construction for each major phase of the project to minimize the number of trips by construction workers through carpooling, construction shuttles, scheduling of work shifts and materials deliveries, designation of access routes, and other measures (ACM A.1.28). Public access routes within or across the ROWs would be maintained, or detour routes would be identified during construction activities, in coordination with the BLM and local authorities (ACM A.1.30). Signing and traffic controls would be placed well in advance of the construction area to warn motorists of any detours during construction (ACM A.1.31). Signs and persons with flags also would be used within the construction area to direct traffic as necessary (ACM A.1.32).

SNWA would use jack-and-bore construction to cross U.S. highways and potentially would use this method to cross SR 894 to minimize traffic disruption.

Proposed mitigation measures:

ROW-T-1: **Traffic Management Plan**. SNWA has committed in ACMs A.1.1 and A.1.28 to prepare a detailed Traffic Management Plan that addresses operating procedures and coordination approaches with the BLM and other appropriate agencies to minimize traffic congestion, roads needing improvement and repair, and safety measures during construction. The Plan also would include:

- An assessment of public road bridge weight restrictions and measures to reduce the risk of damage to existing bridges and road culverts.
- A commitment to monitor and repair federal, state, and county roads that are used for delivering construction materials.
- Communication procedures for notifying the public and responsible agencies of anticipated construction-related traffic and transportation issues such as temporary road closures, movement of major equipment on public roadways, and unusual levels of construction-related traffic.
- Measures to manage recreational OHV use during construction, information on how closed roadways would be managed (including signage), and how roadways would be restored to prevent unauthorized OHV uses.
- Submittal of the Traffic Management Plan for review and approval by the BLM and responsible county and state agencies.

Effectiveness: This mitigation measure would be effective. Creation and application of a traffic management plan would substantially reduce impacts to public highway traffic during the construction period and ensure that roads and bridges are repaired to current standards. There would be a continued risk of unauthorized OHV use, regardless of the closure measures implemented. Effects on other resources: There would be no additional effects of implementing this measure on environmental resources.

Conclusion: Mitigation would reduce, but not eliminate, delays that would occur as a result of construction and construction-related traffic.

Residual impacts include:

- There would be temporary delays caused by construction and construction-related traffic.

Temporary Loss of Access from Construction or Maintenance Activities

The movement of construction equipment and increased, construction-related traffic throughout the project area could cause delays, congestion, and potential collisions.

Applicant committed measures:

ACMs A.1.28, A.1.30, A.1.31, and A.1.32 would be implemented for all alternatives to avoid or minimize construction-related effects on transportation.

SNWA would use jack-and-bore construction to cross U.S. highways and potentially would use this method to cross SR 894 to minimize traffic disruption.

Proposed mitigation measures:

ROW-T-1: Traffic Management Plan. ROW-T-1 would be applied to address the issue of temporary loss of transportation access on roads.

Conclusion. Construction activities could cause temporary limitations in access. This would be offset, in part, by mitigation measures.

Residual impacts include:

- Reduced access over approximately a 12-year period during construction in areas where the pipeline and power lines cross roads.

Potential Effects of Improved Roads and Unauthorized OHV Use on Temporary Roads and Designated Access Roads

The majority of the pipeline and power line alignments are located along or adjacent to existing roads, including paved highways and improved and unimproved dirt roads. Where existing roads are within the pipeline ROW, those existing roads would be used or improved as necessary. A primary access road would be constructed within the pipeline ROW, which would be used for transport of equipment, materials, and personnel during construction. At the completion of construction, the access roads would remain for facility inspections and operations access. Access roads required for construction and operation of project facilities are shown in **Table 3.10-4**.

Table 3.10-4 Miles of Access Roads Required Under the Proposed Action and Alternatives A through C

Road Category	Existing	New	Total
Paved Road	13	5	**18**
Unpaved but Improved Road	89	197	**286**
Unimproved	27	20	**47**
Total	**129**	**222**	**351**

All roads that would be modified would be permanent and would add to transportation resources. Road ROWs would be obtained for all access roads on public land that would be used or constructed for the purposes of the project. Despite the fact that roads would be improved in conjunction with the project, long-term beneficial impacts to transportation from these improvements would be negligible because the roads would be located in fairly remote areas

that would not be anticipated to be heavily traveled. However, the improved access roads could lead to better access for unauthorized OHV use.

Applicant committed measures:

At the completion of construction, existing access roads would be restored to preconstruction conditions or better (A.1.37). All access roads would be maintained and reclaimed to the BLM's BMPs as summarized in **Table 2.3-1** and the ACMs summarized in Chapter 2. SNWA would consult with the BLM to identify all temporary construction access roads that would be reclaimed and returned to their natural state to reduce the proliferation of roads (especially where construction access roads are parallel to existing roads).

Proposed mitigation measures:

None.

Conclusion. The availability of new ROWs in proximity to existing OHV routes would likely result in unauthorized use of the project ROWs by OHVs.

Residual impacts include:

- An increase or persistent continuation of unauthorized OHV use on project ROWs due to additional opportunities for ROW access.

3.10.2.3 Alternative D

Construction and Facility Maintenance

Potential Effects of Increased Traffic during the Construction Period

Construction activities could result in short-term impacts on transportation infrastructure. These impacts could include disruption to traffic flow due to the movement of construction equipment, materials, and crew members; construction of pipeline and power line facilities across existing roads and railways; and damage to local roads from the movement of heavy construction equipment and materials. The number of major road crossings is listed in **Table 3.10-5**. The pipeline and power line ROWs would cross existing roads in several locations. While Lincoln County roads bear the majority of the ROW crossings, U.S. 93 is the highway most transected by both pipelines and power lines. Major road crossing locations are identified in **Figure 3.10-1**.

Table 3.10-5 Major Road Crossings near Construction Activities for Alternative D

Road	Number of Crossings		
	Pipeline Centerline	Power Line Centerline	Total
U.S. 93	7	5	**12**
BLM in Lincoln Co.	12	10	**22**
Lincoln County	17	15	**32**
Clark County	10	4	**14**

Construction across paved roads, unpaved roads where traffic cannot be interrupted, and railroads would result in short-term impacts on public transportation while construction activities pass through the project area. Such crossings generally would be completed by boring under the feature. There would be little or no disruption of traffic at road or railroad crossings by use of this technique. Jack and bore construction is anticipated at crossings with U.S. Highway 93. Most unpaved but unimproved roads would be crossed using the open-cut method, requiring a temporary road closure and establishment of detours or one-lane closure with traffic control.

The pipeline construction ROW would come within 100 feet of an existing siding of the Union Pacific railway near the southern terminus of the project but would not cross the railway. No impacts are expected to occur to rail transportation in this area.

Although the proposed project does not cross any major highways near the construction support site (near U.S. 93 and SH 317, west of Caliente), increased traffic would be generated on these major roads during the movement of equipment and materials. Increased traffic would not occur in White Pine County under this alternative. The Caliente area construction support site may be used during construction for pipe fabrication, pipe and equipment storage, temporary construction management offices, and other construction support activities. Materials, including pipe, would be delivered to the Caliente site from an existing railroad line. A primary access road would be constructed within the pipeline ROW, which would be used for transport of equipment, materials, and personnel during construction.

Projected construction employment during the course of the project would be less than that under the Proposed Action because construction traffic would not occur in White Pine County (**Table 3.10-6)**. The peak construction workforce is projected to be no more than 950 people in any given year. Construction personnel would be distributed throughout several regions, with the majority of workers being employed on the main pipeline and the facilities in Hidden, Garnet, and Las Vegas valleys. The GWD Project would make use of carpooling or transporting workers by bus to reduce traffic. Assuming an average of 2.5 workers per car per trip, there would be an average of 373 worker roundtrips in the peak construction year 2014. As identified in Section 3.18, Socioeconomics and Environmental Justice, initially most workers would be from or live in Clark County, commuting daily to their job sites. Over time, most construction workers would seek temporary housing in Lincoln County. U.S. 93 would bear the majority of worker trips to the construction support site and project access roads. The use of buses would further reduce worker trips.

In addition, there would be traffic during construction associated with the transport of construction equipment and materials for the pipelines, power lines, and ancillary facilities. Most of the equipment and material would be received at the construction support site near Caliente and then transported on U.S. 93 to connect with appropriate secondary roads near the desired destination points or staging sites along the ROW. Material deliveries would include backfill and bedding soil materials between the proposed borrow pits and points along the ROW, building materials (sections of pipe, pumps, motors, concrete block, cement, reinforcing steel bars, gravel, and sand), fuel for construction equipment, water for dust control and construction uses, and maintenance trucks for sanitary facilities. For the purposes of analysis, it is assumed that construction traffic associated with movement of equipment and deliveries would constitute an average of 125 roundtrips per day during peak construction.

Table 3.10-6 Estimated Peak Construction Workforce, by Year (Number of Personnel) for Alternative D

Construction by Region	Year of Project Development Activity							
	Construction Begins	**+1**	**+2**	**+3**	**+4**	**+5**	**+6**	**+7**
Main pipeline	5	154	332	451	364	267	130	0
Main power line	0	0	88	89	89	89	48	0
Spring Valley South facilities	0	0	0	0	71	139	234	151
Lake and Cave valleys facilities and Cave Valley lateral	0	0	0	0	72	72	0	0
Dry Lake Valley facilities	0	0	45	46	32	0	0	0
Delamar and Coyote Spring valleys facilities	0	0	99	104	0	0	0	0
Hidden, Garnet, and Las Vegas valleys facilities	0	70	203	242	285	0	0	0
Estimated Total Per Year	**5**	**224**	**767**	**932**	**913**	**567**	**412**	**157**

Source: SNWA 2011, Table 4-2. Estimates for facility construction in Snake Valley and Spring Valley north have been removed to reflect this alternative.

The combination of worker trips and construction traffic, estimated to be about 500 roundtrips per day during peak construction, could create temporary congestion and delays on the access roads that are identified on **Figure 2.5-5** and on other roads that would be used to transport workers and equipment, such as the following:

- I-15;
- U.S. Highway 93; and
- Nevada State Highways 168, 317, 318, 319, and 320.

Several other unpaved roads that Lincoln County maintains also might be used:

- Cave Valley Road (from Ely into Cave Valley);
- Stampede Road (from Pioche to the pipeline alignment in Dry Lake Valley);
- Pan American/Ely Springs Road (from Pioche to the pipeline alignment in Dry Lake Valley); and
- Alamo Canyon Road (from Alamo to the pipeline alignment in Delamar Valley).

During operation and maintenance of the ROWs and facilities, only minimal traffic that coincides with the current levels of traffic would be anticipated.

Applicant committed measures:

The same ACMs discussed for the Proposed Action would be applied to traffic effects associated with Alternative D.

Proposed mitigation measures:

ROW-T-1: Traffic Management Plan. ROW-T-1 would be applied to Alternative D.

Conclusion. Mitigation would reduce, but would not eliminate delays that would occur as a result of construction and construction-related traffic. Traffic impacts in White Pine County would not occur under this alternative, as only minor traffic associated with deliveries could be anticipated.

Residual impacts include:

- Temporary delays caused by construction and construction-related traffic. These impacts would be less than the Proposed Action and Alternatives A through C because the project would not extend into White Pine County.

Temporary Loss of Access due to Construction or Maintenance Activities

The movement of construction equipment and increased, construction-related traffic throughout the project area could cause delays, congestion, and potential collisions.

Applicant-committed measures:

The same ACMs discussed for the Proposed Action for vehicle access effects would be applied to Alternative D.

Proposed mitigation measures:

ROW-T-1: Traffic Management Plan. ROW-T-1 would be applied to Alternative D for the issue involving vehicle access effects.

Conclusion. Construction activities could cause temporary limitations in access. This would be offset, in part, by mitigation measures.

Residual impacts include:

- Reduction in access during construction in some areas where the pipeline and power line cross roads. Impacts under this alternative would be less than those under the Proposed Action and Alternatives A through C because the project would not extend into White Pine County and the construction timeframe would be reduced by 4 years.

Potential Effects of Improved Roads and Unauthorized Off-highway Vehicle Use on Temporary Roads and Designated Access Roads

The majority of the pipeline and power line alignments are located along or adjacent to existing roads, including paved highways and improved and unimproved dirt roads. Where existing roads are within the pipeline ROW, those existing roads would be used or improved as necessary. A primary access road would be constructed within the pipeline ROW, which would be used for transport of equipment, materials, and personnel during construction. At the completion of construction, the access roads would remain for facility inspections and operations access. Access roads required for construction and operation of project facilities are shown in **Table 3.10-7**.

Table 3.10-7 Miles of Access Roads Required Under Alternative D

Road Category	Existing	New	Total
Paved Road	3	0	**3**
Unpaved but Improved Road	70	229	**299**
Unimproved	14	0	**14**
Total	**87**	**229**	**316**

All roads that would be modified would be permanent and would add to transportation resources. Road ROWs would be obtained for all access roads on public land that would be used or constructed for the purposes of the project. Despite the fact that roads would be improved in conjunction with the project, long-term beneficial impacts to transportation from these improvements would be negligible because the roads would be located in fairly remote areas that would not be anticipated to be heavily traveled. However, the improved access roads could lead to better access for unauthorized OHV use.

Applicant committed measures:

The same ACMs discussed for the Proposed Action involving OHV use would be applied to Alternative D.

Proposed mitigation measures:

None.

Conclusion. The availability of new ROWs in proximity to existing OHV routes would likely result in unauthorized use of the project ROWs by OHVs.

Residual impacts include:

- An increase or persistent continuation of unauthorized OHV use on project ROWs because of additional opportunities for ROW access. These impacts would be less than under the Proposed Action and Alternatives A through C because the project would not extend into White Pine County.

3.10.2.4 Alternatives E and F

Construction and Facility Maintenance

Potential Effects of Increased Traffic during the Construction Period

Construction activities could result in short-term impacts on transportation infrastructure. These impacts could include disruption to traffic flow due to the movement of construction equipment, materials, and crew members;

construction of pipeline and power line facilities across existing roads and railways; and damage to local roads from the movement of heavy construction equipment and materials. The number of major road crossings is listed in **Table 3.10-8**. The pipeline and power line ROWs would cross existing roads in several locations. While Lincoln County roads bear the majority of the ROW crossings, U.S. 93 is the highway most transected by both pipelines and power lines. Major road crossing locations are identified in **Figure 3.10-1**.

Construction across paved roads, unpaved roads where traffic cannot be interrupted, and railroads would result in short-term impacts on public transportation while construction activities pass through the project area. Such crossings would generally be completed by boring under the feature. There would be little or no disruption of traffic at road or railroad crossings by use of this technique. Jack and bore construction is anticipated at crossings with U.S. Highways 93 and 6/50. Jack and bore also may be used to cross state highways depending on NDOT requirements and would be crossed using the open-cut method, requiring a temporary road closure and establishment of detours or one-lane closure with traffic control.

Table 3.10-8 Major Road Crossings near Construction Activities for Alternatives E and F

Road	Number of Crossings		
	Pipeline Centerline	**Power Line Centerline**	**Total**
SR 486	0	1	**1**
SR 894	1	1	**2**
U.S. 6/50	1	2	**3**
U.S. 93	7	6	**13**
BLM in White Pine County	0	3	**3**
BLM in Lincoln County	12	10	**22**
White Pine County	2	3	**5**
Lincoln County	17	15	**32**
Clark County	10	4	**14**
USFS in White Pine County	2	4	**6**

The proposed power line would cross the Northern Nevada Railway in two locations northeast of Ely, but construction methods should eliminate any impacts to rail transportation in this area. The pipeline construction ROW would come within 100 feet of an existing siding of the Union Pacific railway near the southern terminus of the project but would not cross the railway. No impacts are expected to occur to rail transportation in this area.

Although the proposed project does not cross any major highways near the construction support site (near U.S. 93 and SH 317, west of Caliente), increased traffic would be generated on these major roads during the movement of equipment and materials. The Caliente area construction support site may be used during construction for pipe fabrication, pipe and equipment storage, temporary construction management offices, and other construction support activities. Materials, including pipe, would be delivered to the Caliente site from an existing railroad line. A primary access road would be constructed within the pipeline ROW, which would be used for transport of equipment, materials, and personnel during construction.

Projected construction employment during the course of the project would be less than that under the Proposed Action because construction traffic would not occur in Snake Valley (**Table 3.10-9)**. The peak construction workforce is projected to be no more than 950 people in any given year. Construction personnel would be distributed throughout several regions, with the majority of workers being employed on the main pipeline and the facilities in Hidden, Garnet, and Las Vegas valleys. The GWD Project would make use of carpooling or transporting workers by bus to reduce traffic. Assuming an average of 2.5 workers per car per trip, there would be an average of 373 worker roundtrips in the peak construction year 4. As identified in Section 3.18, Socioeconomics and Environmental Justice, initially most workers would be from or live in Clark County, commuting daily to their job sites. Over time, most construction workers would seek temporary housing in Lincoln and White Pine counties. U.S.

93 would bear the majority of worker trips to the construction support site and project access roads. The use of buses would reduce worker trips further.

In addition, there would be traffic during construction associated with the transport of construction equipment and materials for the pipelines, power lines, and ancillary facilities. Most of the equipment and materials would be received at the construction support site near Caliente and then transported on U.S. 93 to connect with appropriate secondary roads near the desired destination points or staging sites along the ROW. Material deliveries would include haulage of backfill and bedding soil materials between the seven proposed borrow pits and points along the ROW, building materials (sections of pipe, pumps, motors, concrete block, cement, reinforcing steel bars, gravel, and sand), fuel for construction equipment, water for dust control and construction uses, and maintenance trucks for sanitary facilities. For the purposes of analysis, it is assumed that construction traffic associated with movement of equipment and deliveries would constitute an average of 125 roundtrips per day during peak construction.

Table 3.10-9 Estimated Peak Construction Workforce, by Year (Number of Personnel) for Alternatives E and F

	Year of Project Development Activity								
Construction by Region	**Construction Begins**	**+1**	**+2**	**+3**	**+4**	**+5**	**+6**	**+7**	**+8**
Main pipeline	5	154	332	451	364	267	130	0	0
Main power line	0	0	88	89	89	89	48	0	0
Spring Valley North facilities and Spring Valley lateral	0	0	0	0	0	41	42	132	71
Spring Valley South facilities	0	0	0	0	71	139	234	151	0
Lake and Cave valleys facilities and Cave Valley lateral	0	0	0	0	72	72	0	0	0
Dry Lake Valley facilities	0	0	45	46	32	0	0	0	0
Delamar and Coyote Spring valleys facilities	0	0	99	104	0	0	0	0	0
Hidden, Garnet, and Las Vegas valleys facilities	0	70	203	242	285	0	0	0	0
Estimated Total Per Year	**5**	**224**	**767**	**932**	**913**	**608**	**454**	**283**	**71**

Source: SNWA 2011, Table 4-2. Estimates for facility construction in Snake Valley have been removed to reflect this alternative.

The combination of worker trips and construction traffic, estimated to be about 500 roundtrips per day during peak construction could create temporary congestion and delays on the access roads that are identified on **Figure 2.5-5** and on other roads that would be used to transport workers and equipment, such as the following:

- I-15;
- U.S. Highways 93 and 6/50; and
- Nevada State Highways 168, 317, 318, 319, 320, 487, 893, and 894.

Several other unpaved roads that Lincoln and White Pine counties maintain also could be used:

- Cave Valley Road (from Ely into Cave Valley);
- Atlanta Road (from U.S. 93 to the pipeline alignment in Spring Valley);
- Stampede Road (from Pioche to the pipeline alignment in Dry Lake Valley);
- Pan American/Ely Springs Road (from Pioche to the pipeline alignment in Dry Lake Valley); and
- Alamo Canyon Road (from Alamo to the pipeline alignment in Delamar Valley).

During operation and maintenance of the ROWs and facilities, only minimal traffic that coincides with the current levels of traffic would be anticipated.

Applicant committed measures:

The same ACMs discussed for the Proposed Action involving increased traffic would be applied to Alternatives E and F.

Proposed mitigation measures:

ROW-T-1: Traffic Management Plan. ROW-T-1 would be applied to the issue involving increased traffic effects on roads.

Conclusion. Mitigation would reduce, but not eliminate, delays that would occur as a result of construction and construction-related traffic. Increased traffic would not be experienced in Snake Valley from construction.

Residual impacts include:

- Temporary delays caused by construction and construction-related traffic.

Temporary Loss of Access from Construction or Maintenance Activities

The movement of construction equipment and increased, construction-related traffic throughout the project area could cause delays, congestion, and potential collisions.

Applicant committed measures:

The same ACMs discussed for the Proposed Action involving effects on road access would be applied to Alternatives E and F.

Proposed mitigation measures:

ROW-T-1: Traffic Management Plan. ROW-T-1 would be applied to the issue involving effects on road access.

Conclusion. Construction activities could cause temporary limitations in access. This would be offset, in part, by mitigation measures.

Residual impacts include:

- Reduction in access during construction in some areas where the pipeline and power line cross roads. Impacts under this alternative would be less than those under the Proposed Action and Alternatives A through C because the project would not extend into Snake Valley and the construction timeframe would be reduced by 3 years.

Potential Effects of Improved Roads and Unauthorized Off-highway Vehicle Use on Temporary Roads and Designated Access Roads

The majority of the pipeline and power line alignments are located along or adjacent to existing roads, including paved highways and improved and unimproved dirt roads. Where existing roads are within the pipeline ROW, those existing roads would be used or improved as necessary. A primary access road would be constructed within the pipeline ROW, which would be used for transport of equipment, materials, and personnel during construction. At the completion of construction, the access roads would remain for facility inspections and operations access. Access roads required for construction and operation of project facilities are shown in **Table 3.10-10**.

Table 3.10-10 Miles of Access Roads Required Under Alternatives E and F

Road Category	Existing	New	Total
Paved Road	14	0	**14**
Unpaved but Improved Road	70	257	**327**
Unimproved	27	20	**47**
Total	**111**	**277**	**388**

All roads that would be modified would be permanent and would add to transportation resources. Road ROWs would be obtained for all access roads on public land that would be used or constructed for the purposes of the project. Despite the fact that roads would be improved in conjunction with the project, long-term beneficial impacts to transportation from these improvements would be negligible because the roads would be located in fairly remote areas that would not be anticipated to be heavily traveled. However, the improved access roads could lead to better access for unauthorized OHV use.

Applicant committed measures:

The same ACMs discussed for the Proposed Action involving OHV use would be applied to Alternatives E and F.

Proposed mitigation measures:

None.

Conclusion. The availability of new ROWs in proximity to existing OHV routes would likely result in unauthorized use of the project ROWs by OHVs.

Residual impacts include:

- An increase or persistent continuation of unauthorized OHV use on project ROWs because of additional opportunities for ROW access. These impacts would be less than under the Proposed Action and Alternatives A through C because the project would not extend into Snake Valley.

3.10.2.5 Alignment Options 1 through 4

Impacts for the Alignment Options (1 through 4) are identified in relation to the relevant segment of the Proposed Action and Alternatives A through C (**Table 3.10-11**).

Table 3.10-11 Transportation Impact Summary for Alignment Options 1 through 4

Alignment Option	Analysis
Alignment Option 1 (Humboldt-Toiybe Power Line Alignment) **Option Description**: Change the locations of a portion of the 230-kV power line from Gonder Substation near Ely to Spring Valley. **Applicable To**: Proposed Action, Alternatives A through C, E, and F.	Impacts associated with increased road crossings, traffic, and unauthorized OHV use for Alignment Option 1 would be the same as the comparable Proposed Action segment. This option would decrease access roads needed to 410 miles.
Alignment Option 2 (North Lake Valley Pipeline Alignment) **Option Description**: Change the locations of portions of the mainline pipeline and electrical transmission line in North Lake Valley. **Applicable To**: Proposed Action, Alternatives A through C, E, and F.	Impacts associated with Alignment Option 2 would involve increased congestion and potential traffic delays within the additional segment (approximately 8 miles) where the pipeline and power line would parallel U.S. 93. This option would decrease access roads needed to 398 miles.

Table 3.10-11 Transportation Impact Summary for Alignment Options 1 through 4 (Continued)

Alignment Option	Analysis
Alignment Option 3 (Muleshoe Substation and Power Line Alignment) **Option Description**: Eliminate the Gonder to Spring Valley transmission line, and construct a substation with an interconnection with an interstate, high voltage power line in Muleshole Valley. **Applicable To**: Proposed Action, Alternatives A through C, E, and F.	Impacts for Alignment Option 3 would be similar to those described for the Proposed Action, except that the power line construction from Gonder to Spring Valley would be eliminated along with one proposed crossing of this power line over U.S. 93/6/50 and several crossings of secondary roads in the 34-mile length. This option would decrease access roads needed to 397 miles.
Alignment Option 4 (North Delamar Valley Pipeline and Power Line Alignment) **Option Description**: Change the location of a short section of mainline pipeline in Delamar Valley to follow an existing transmission line. **Applicable To**: All alternatives.	Impacts for Alignment Option 4 would be similar to those described for the Proposed Action, except that approximately 3 miles of pipeline construction adjacent to U.S. 93 between Dry Lake Valley and Delamar Valley would be eliminated with the change in alignment. This would reduce traffic congestion and transportation demands on that segment. This option would decrease access roads needed to 363 miles.

3.10.2.6 No Action Alternative

Under the No Action Alternative, the proposed project would not be constructed or operated. No project-related transportation would occur from the GWD Project.

3.10.2.7 Comparison of Alternatives

Table 3.10-12 compares the impacts to transportation from ROW alternatives and alignment options.

Table 3.10-12 Comparison of Alternatives

Parameter	Proposed Action and Alternatives A through C	Alternative D	Alternatives E and F
Effects on Increased Traffic	Temporary increased traffic.	Same as Proposed Action with fewer impacts to White Pine County.	Same as Proposed Action with fewer impacts to Snake Valley.
Temporary Loss of Road Access	Temporary limitation of access.	Same as Proposed Action with fewer impacts to White Pine County.	Same as Proposed Action with fewer impacts to Snake Valley.
Access Roads	430 miles	316 miles	388 miles
Unauthorized Vehicle Use on Access Roads	Increased potential for unauthorized OHV use.	Same as Proposed Action with no impacts to White Pine County.	Same as Proposed Action except with no impacts to Snake Valley.

3.10.2.8 Groundwater Development and Groundwater Pumping

Issues

- Potential effects of increased traffic during the construction period.
- Temporary loss of access because of construction or maintenance activities.
- Potential effects of unauthorized OHV use on temporary roads and designated access roads.

Assumptions

The following assumptions were used in the impact analysis for transportation:

- Vehicle traffic on major roads that cross proposed construction areas could be affected during construction or maintenance operations. Increased construction traffic might affect the safety of the traveling public.
- SNWA would either maintain traffic safety where pipelines and power line cross construction roads and railroads or would provide alternate routes.
- SNWA would take measures to reduce the impacts of increased traffic that would result from project worker travel, materials delivery, and other construction activities.
- Project access roads would not be available for public use and SNWA would take measures to limit public use of these roads.

Methodology for Analysis

All potential crossings of groundwater development areas were identified through GIS analysis to identify areas where traffic delays and congestion could occur. It was then determined which primary roads would be used by construction equipment and workers to access project sites. Since details regarding construction access roads and traffic estimates for the groundwater development areas are not available at this time, the analysis is more qualitative and comparative. Future NEPA documentation would require more detail to analyze the associated impacts to the transportation system thoroughly.

Mitigation measures discussed in this resource section focus on new measures. Where applicable, some of the ROW mitigation measures may apply to surface disturbance activities associated with groundwater development. These ROW mitigation measures also would be considered in subsequent NEPA tiers.

3.10.2.9 Proposed Action

Groundwater Development Area

The specific locations of future collector pipelines and access roads for construction of the groundwater development areas are currently unknown. However, the types of impacts from the construction of the groundwater development areas would be similar to those that are described for the construction of ROWs and ancillary facilities. The majority of groundwater development areas would occur away from major roads, shifting the traffic burden to local roads and project-created access roads.

The miles of major roads crossing the proposed groundwater development areas are listed in **Table 3.10-13**. The boundaries of the Proposed Action groundwater development areas encompass a total of 108 miles of major highways and 468 miles of BLM roads, USFS roads, and county roads—the majority of which would occur in Spring Valley. Depending on the location of new wells and associated facilities, some of these roads would be affected by increased traffic and temporary detours during construction. Major road locations are identified in **Figure 3.10-1**.

Applicant committed measures:

The same ACMs discussed for the ROWs and ancillary facilities would be applied to the groundwater development areas.

Proposed mitigation measures:

ROW-T-1: Traffic Management Plan. ROW-T-1 would be applied to the groundwater development areas.

Table 3.10-13 Major Road Crossings With Groundwater Development Areas for the Proposed Action

Groundwater Development Area	Road	Miles of Crossing
Snake Valley	U.S. 6	5
	SH 21	0
	SH 487	11
	BLM road	12
	USFS road	8
	County road (White Pine County)	19
Spring Valley	U.S. 93	19
	U.S. 6	15
	SH 893	31
	SH 894	27
	BLM road	15
	USFS road	21
	County road (Lincoln County)	15
	County road (White Pine County)	69
Cave Valley	BLM road	22
	USFS road	0
	County road (Lincoln County)	15
Dry Lake Valley	BLM road	38
	USFS road	0
	County road (Lincoln County)	81
Delamar Valley	BLM road	26
	USFS road	0
	County road (Lincoln County)	34

Conclusion. The ACMs and recommended mitigation would reduce, but would not eliminate congestion and access limitations as a result of construction and construction-related traffic.

Potential residual impacts include:

Temporary delays caused by construction and construction-related traffic in the groundwater development areas. These impacts are expected to be infrequent and of short-term duration. An increase or persistent continuation of unauthorized OHV use on project access roads would continue to lead to proliferation of OHV routes.

Groundwater Pumping

There are no anticipated impacts to transportation from groundwater pumping.

3.10.2.10 Alternatives A through F

Groundwater Development Area

Impacts from implementing Alternatives A through F are summarized in **Table 3.10-14**.

Groundwater Pumping

There are no anticipated impacts to transportation from groundwater pumping. Impacts to transportation infrastructure from potential subsidence are addressed in Section 3.2, Geologic Resources.

Table 3.10-14 Summary of Transportation Impacts, Proposed Mitigation, and Residual Effects for Alternatives A through F, Groundwater Development Area Construction, Operation, and Maintenance

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Construction and Facility Maintenance					
Same as Proposed Action	Slightly less than Proposed Action due to more concentrated points of development.	Same as Proposed Action.	Less than Proposed Action due to project not extending into White Pine County; groundwater development areas encompass a total of 235 miles of BLM roads, USFS roads, and county roads and no major highways.	Less than Proposed Action due to project not extending into Snake Valley; groundwater development areas encompass a total of 76 miles of major highways and 336 miles of BLM roads, USFS roads, and county roads.	Less than Proposed Action due to project not extending into Snake Valley; groundwater development areas encompass a total of 76 miles of major highways and 336 miles of BLM roads, USFS roads, and county roads.
Operation and Maintenance					
Same as Proposed Action	Slightly less than Proposed Action due to more concentrated points of development.	Same as Proposed Action.	Less than Proposed Action due to project not extending into White Pine County.	Less than Proposed Action due to project not extending into Snake Valley.	Less than Proposed Action due to project not extending into Snake Valley.
Additional Mitigation					
ROW-T-1 (Traffic Management Plan)					
Conclusion					
This alternative would have similar impacts compared to the Proposed Action.	This alternative would have similar impacts compared to the Proposed Action, although there may be slightly less impacts to transportation due to more concentrated points of development.	This alternative would have similar impacts compared to the Proposed Action.	This alternative would have fewer impacts compared to the Proposed Action. There would be no need for construction and maintenance activities in White Pine County.	This alternative would have fewer impacts compared to the Proposed Action. There would be no need for construction and maintenance activities in Snake Valley.	This alternative would have fewer impacts compared to the Proposed Action. There would be no need for construction and maintenance activities in Snake Valley.
Residual Impacts					
Temporary disruption of traffic during construction activities. Potential for unauthorized OHV use on project ROWs.			Temporary disruption of traffic and access during construction activities, although to a much lesser extent in White Pine County. Potential for unauthorized OHV use on project ROWs.	Temporary disruption of traffic and access during construction activities, although to a much lesser extent in Snake Valley. Potential for unauthorized OHV use on project ROWs.	

3.10.2.11 No Action

Groundwater Development Area

Under the No Action Alternative, the proposed project would not be constructed or operated. No project-related traffic effects would occur as a result of the proposed GWD Project.

Groundwater Pumping

There are no anticipated impacts to transportation from groundwater pumping.

3.10.2.12 Alternatives Comparison

Table 3.10-15 compares the impacts to transportation from groundwater development and groundwater pumping.

Table 3.10-15 Comparison of Alternatives—Groundwater Development and Groundwater Pumping

Parameter	Proposed Action	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Effects on Increased Traffic	Temporary increased traffic.	Same as Proposed Action.	Slightly less than Proposed Action due to more concentrated points of development.	Same as Proposed Action.	Same as Proposed Action with fewer impacts to White Pine County.	Same as Proposed Action with fewer impacts to Snake Valley.	Same as Proposed Action with fewer impacts to Snake Valley.
Temporary Loss of Road Access	Temporary limitation of access.	Same as Proposed Action.	Slightly less than Proposed Action due to more concentrated points of development.	Same as Proposed Action.	Same as Proposed Action with fewer impacts to White Pine County.	Same as Proposed Action with fewer impacts to Snake Valley.	Same as Proposed Action with fewer impacts to Snake Valley.
Miles of Major Road Crossings	108 miles of major highways and 468 miles of BLM, USFS, and county roads.	Same as Proposed Action.	Same as Proposed Action.	Same as Proposed Action.	3 miles of major highways and 235 miles of BLM, USFS, and county roads.	92 miles of major highways and 412 miles of BLM, USFS, and county roads.	92 miles of major highways and 412 miles of BLM, USFS, and county roads.
Unauthorized Vehicle Use on Access Roads	Increased potential for unauthorized OHV use.	Same as Proposed Action.	Slightly less than Proposed Action due to more concentrated points of development.	Same as Proposed Action.	Same as Proposed Action with no impacts to White Pine County.	Same as Proposed Action except with no impacts to Snake Valley.	Same as Proposed Action except with no impacts to Snake Valley.
Effects From Groundwater Pumping	No impacts to transportation. Subsidence addressed in Section 3.2, Geologic Resources.	No impacts to transportation. Subsidence addressed in Section 3.2, Geologic Resources.	No impacts to transportation. Subsidence addressed in Section 3.2, Geologic Resources.	No impacts to transportation. Subsidence addressed in Section 3.2, Geologic Resources.	No impacts to transportation. Subsidence addressed in Section 3.2, Geologic Resources.	No impacts to transportation. Subsidence addressed in Section 3.2, Geologic Resources.	No impacts to transportation. Subsidence addressed in Section 3.2, Geologic Resources.

3.10.3 Cumulative Impacts

3.10.3.1 Impacts Common to All Alternatives

Climate Change Effects

Climate change already appears to be influencing both natural and managed ecosystems of the American Southwest (Breshears et al. 2005, Westerling et al. 2006, Seager et al. 2007) and models indicate the likelihood of the Southwest being a climate change "hotspot" in the coming decades (Diffenbaugh et al. 2008). Recent warming in the Southwest is among the most rapid in the nation, significantly more than the global average in some areas (USGCRP 2009). Projections suggest continued strong warming in the region, with significant increases in temperature (USGCRP 2009) and decreases in precipitation (Seager et al. 2007). A warmer atmosphere and an intensified water cycle are likely to mean not only a greater likelihood of drought for the Southwest, but also an increased risk of flooding (USGCRP 2009). Greater variability in patterns of precipitation can be anticipated in the future. In the coming century, mean global temperature could increase significantly, with an associated increase in both the frequency of extreme events (heat waves, droughts, storms) and the frequency and extent of wildfire (IPCC 2007; Westerling & Bryant 2008; Krawchuk et al. 2009). Under such conditions, future impacts could be substantial for some resources, impacting biodiversity, protected areas, and agricultural lands.

Climate Change Effects to Transportation

Climate change effects were not evaluated for this resource because potential effects to transportation as a result of climate change cannot be directly quantified.

3.10.3.2 Issues

- Potential effects of increased traffic during the construction period.
- Temporary loss of access because of construction or maintenance activities.
- Potential effects of unauthorized OHV use on temporary roads and designated access roads.

3.10.3.3 Assumptions

The following assumptions were used in the impact analysis for transportation:

- Vehicle traffic on major roads that cross proposed construction areas could be affected during construction or maintenance operations. Increased construction traffic might affect the safety of the traveling public.
- SNWA would either maintain traffic safety where pipelines and power line cross construction roads and railroads or would provide alternate routes.
- SNWA would take measures to reduce the impacts of increased traffic that would result from project worker travel, materials delivery, and other construction activities.

3.10.3.4 Methodology for Analysis

Using the impact analysis for the ROWs and groundwater development areas, impacts from other RFFAs identified in Chapter 2 were considered. Since construction timeframes and associated traffic volumes for the RFFAs were unavailable for most projects, the analysis was based on possible scenarios and consideration of other project approvals and transportation permits.

3.10.3.5 No Action

Under the No Action Alternative, the proposed project would not be constructed or operated. No project-related traffic effects would occur as a result of the proposed GWD Project.

3.10.3.6 Proposed Action

In the peak construction year (year 4), the GWD Project would add an estimated 500 additional daily trips to local roads and highways. The majority of this increased traffic would be associated with construction workers commuting on U.S. 93 to Caliente. Estimated daily construction traffic on local roads could double traffic volumes in some areas. Cumulative impacts to transportation would occur should the construction activities to implement the RFFAs occur

concurrently or sequentially and if they would affect the same transportation routes. Travelers could experience multiple stops and delays with concurrent projects, or a prolonged period of time during which they would experience stops and delays for sequentially occurring projects. However, the majority of the transportation routes affected by the GWD Project are located in relatively rural, undeveloped areas where traffic on roadways is minimal.

It is anticipated that the peak GWD Project construction periods would occur after the peak RFFA project construction periods (**Table 2.9-1**). It is expected that the ON Line Transmission Line Project and Eastern Nevada Transmission Line Project would be completed in the LCCRDA corridor before major GWD Project ROW work would begin in Hidden, Garnet, and Coyote Spring valleys. It is expected that the currently proposed wind energy development projects in Spring and Lake valleys would be completed well before the GWD Project construction period in these valleys. If RFFA projects construction schedules were to change and overlap with peak year construction of the GWD Project, traffic volumes on U.S. 93 between Las Vegas and Caliente would noticeably increase but the cumulative traffic volume would not be anticipated to create unacceptable levels of highway congestion due to the low traffic volumes on this stretch of U.S 93. The likelihood of concurrent construction in terms of timing and location is low and effects would be limited given the relatively rural, undeveloped area where traffic on roadways is minimal.

Anticipated cumulative impacts would be short-term, occurring during peak construction years of the GWD Project (a 5-year period from years 3 through 7 with construction traffic peaking in 2014), and localized. Long-term demands on the transportation system resulting from the GWD Project would not be anticipated. All permitted projects that undergo federal, state, or local review would be required to assess the project's demands on the transportation system and projects with long-term transportation demands would be required to upgrade the transportation system as deemed appropriate by the approving authority. Future facilities for the GWD Project should take into account all actions that might affect transportation capacity and vehicle traffic levels and safety in the project region. So long as construction of new facilities complies with local, state, and federal agency guidelines for traffic control and vehicle safety, additional adverse impacts to transportation are expected to be of limited magnitude.

All roads that would be modified would be permanent and would add to transportation resources. Road ROWs would be obtained for all access roads on public land that would be used or constructed for the purposes of the project. Despite the fact that roads would be improved in conjunction with the project, long-term beneficial impacts to transportation from these improvements would be negligible because the roads would be located in fairly remote areas that would not be anticipated to be heavily traveled. However, the improved access roads could lead to better access for unauthorized OHV use. The majority of these new roads associated with RFFAs in the southern portions of the project area could cumulatively contribute to the potential for unauthorized OHV use on project access roads and route proliferation.

Conclusion. The ACMs and recommended mitigation would reduce, but not eliminate, cumulative impacts associated with congestion and access limitations on the transportation system as a result of construction and construction-related traffic.

3.10.3.7 Alternatives A through F

Table 3.10-16 summarizes the cumulative impacts associated with Alternatives A through F.

Table 3.10-16 Summary of Cumulative Transportation Impacts, Proposed Mitigation, and Residual Effects for Alternatives A through F

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Construction and Facility Maintenance					
Same as Proposed Action	Slightly less than Proposed Action due to more concentrated points of development.	Same as Proposed Action.	Less than Proposed Action due to project not extending into White Pine County.	Less than Proposed Action due to project not extending into Snake Valley.	Less than Proposed Action due to project not extending into Snake Valley.
Operation and Maintenance					
Same as Proposed Action	Slightly less than Proposed Action due to more concentrated points of development.	Same as Proposed Action.	Less than Proposed Action due to project not extending into White Pine County.	Less than Proposed Action due to project not extending into Snake Valley.	Less than Proposed Action due to project not extending into Snake Valley.
Conclusion					
This alternative would have similar impacts compared to the Proposed Action.	This alternative would have similar or slightly less impacts compared to the Proposed Action, due to wells associated with the project being located more closely together.	This alternative would have similar impacts compared to the Proposed Action.	This alternative would have less impacts compared to the Proposed Action. There would be no need for construction and maintenance activities in White Pine County.	This alternative would have less impacts compared to the Proposed Action. There would be no need for construction and maintenance activities in Snake Valley.	This alternative would have less impacts compared to the Proposed Action. There would be no need for construction and maintenance activities in Snake Valley.