Chokecherry and Sierra Madre Wind Energy Project

Transportation Management Plan

Prepared for

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1. Introduction[1]

Power Company of Wyoming LLC (PCW) proposes to construct and operate the Chokecherry and Sierra Madre Wind Energy Project (CCSM Project), located in Carbon County, Wyoming. The CCSM Project consists of up to 1,000 wind turbines capable of generating approximately 2,000 to 3,000 megawatt (MW) of clean, renewable wind energy. The primary components of the CCSM Project include the wind turbine generators, an internal road network, a rail facility, an internal electrical collection and transmission system, substations, and operations and maintenance buildings.

The CCSM Project is located south of the city of Rawlins, primarily within the bounds of the Overland Trail Ranch (Ranch). See Figure 1. The Ranch is owned and operated by PCW affiliate, The Overland Trail Cattle Company (TOTCO). The Ranch is situated within an area of alternating sections of private and federal lands commonly referred to as the "checkerboard." The vast majority of the private lands are owned by TOTCO and the federal lands are administered by the Bureau of Land Management (BLM) Rawlins Field Office. A small percentage of the land within the Ranch is owned by the State of Wyoming and is administered by the State Board of Land Commissioners. Finally, Anadarko Land Corporation owns some sections located on the periphery of the northwest boundary of the Ranch.

In 2008, PCW applied to BLM for right-of-way grants to construct, operate, maintain and decommission the CCSM Project on federal lands within the CCSM Project Area. On June 29, 2012, the Notice of Availability for the Final EIS concerning the CCSM Project was published in the Federal Register (77 FR 63328). On October 9, 2012 the Secretary of the Interior signed the Record of Decision (ROD). In the ROD, BLM determined that over 200,000 acres within the CCSM Project Area are suitable for wind energy development subject to the requirements described under the Selected Alternative in the ROD. The area that was determined to be suitable for wind energy development consists of two wind development areas (WDAs) in which turbines would be located. The northern WDA is known as Chokecherry and the southern WDA is known as Sierra Madre. The WDAs are located approximately 9 miles apart.

Prior to issuing right-of-way grants for the CCSM Project, BLM will conduct subsequent environmental analysis of site-specific plans of development submitted by PCW. The site-specific plans of development will be screened against the analysis conducted in the EIS and the

[1] This TMP for the CCSM Project was originally created in July 2013. In light of modifications to the CCSM Project schedule, PCW reviewed this TMP in January 2015. PCW concluded that this TMP is representative and remains valid for the CCSM Project.

requirements described under the Selected Alternative in the ROD. PCW anticipates submitting five (5) site-specific plans of development to BLM, consisting of the following:

1. Phase I Haul Road and Facilities
2. West Sinclair Rail Facility
3. Road Rock Quarry
4. Phase I Wind Development
5. Phase II Wind Development (including Phase II Haul Road and Facilities)

Transportation requirements are a primary consideration for the construction, operation, maintenance and decommissioning of the CCSM Project, including each site-specific plan of development. This transportation management plan (TMP) evaluates the transportation requirements of the CCSM Project, the existing and proposed infrastructure in the vicinity of the CCSM Project Site, and existing and anticipated traffic conditions to develop strategies to avoid and minimize transportation impacts from the CCSM Project to the extent practicable.

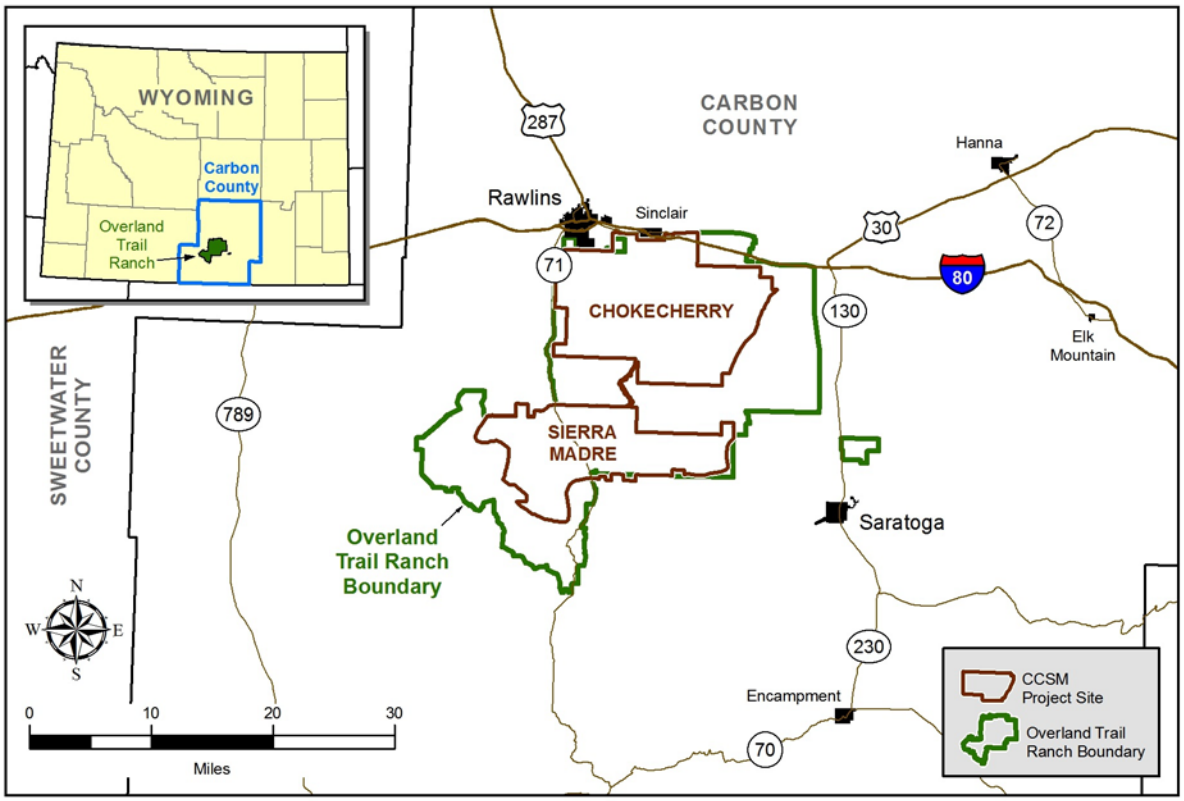

Figure 1. CCSM Project Location

2. Transportation Strategy

PCW has developed a transportation strategy to cost-effectively use local resources and minimize transportation impacts to the extent practicable during construction, operations, maintenance and decommissioning of the CCSM Project. The objective of the transportation

strategy is to keep deliveries internal to the CCSM Project Site when possible. To meet this objective, PCW's preference is to: (1) source material on-site where suitable and practicable; (2) deliver components and material by rail to the extent practicable; and (3) obtain any remaining materials and components by truck, prioritizing local sources, to reduce emissions and provide additional benefits to the local economy.

To develop a transportation plan that implements PCW's transportation strategy, PCW first established the transportation requirements of the CCSM Project. Following evaluation of the CCSM Project requirements, PCW reviewed the existing transportation infrastructure and proposed new facilities and upgrades as needed. Finally, PCW re-evaluated the CCSM Project transportation requirements to assign delivery methods to each off-site delivery in accordance with the transportation strategy.

3. Transportation Requirements

PCW evaluated the CCSM Project to identify the transportation requirements during construction, operations, maintenance, and decommissioning. Transportation needs for the CCSM Project are expected to be most complex during construction; therefore, construction is the focus of the transportation plan. PCW does not anticipate that additional transportation infrastructure or management strategies will be required during operations, maintenance, and decommissioning of the CCSM Project. To identify potential transportation impacts of the CCSM Project during construction, PCW estimated the construction delivery and workforce commuting requirements, as described below.

3.1 Off-Site Deliveries

The scope of this TMP is to analyze potential off-site transportation impacts from the CCSM Project; therefore, PCW has reviewed the CCSM Project design and schedule to estimate the off-site delivery requirements for the primary components and materials required to construct the CCSM Project (Table 1)[2].

[2] PCW arrived at the off-site delivery requirements for the CCSM Project by taking the total CCSM Project material requirements and subtracting the aggregate and water that would be obtained on-site, as described in section 4.1.

Table 1. CCSM Project Delivery Requirements from Off-Site Sources

Item	Units	2014	2015	2016	2017	PII Year 1	PII Year 2	PII Year 3	CCSM PROJECT TOTAL
Wind Turbine Components									
Nacelles	ea	0	0	243	257	0	243	257	1,000
Hubs	ea	0	0	243	257	0	243	257	1,000
Tower Sections	ea	0	0	891	942	0	891	942	3,666
Blades	ea	0	0	729	771	0	729	771	3,000
Manifest Items									
Rebar	tons	0	9,000	20,000	12,000	8,000	20,000	12,000	81,000
Steel	tons	0	0	325	200	0	100	100	725
Cable Reels	ea	0	779	1,423	1,187	888	586	427	5,290
Sub Transformers	ea	0	0	8	4	0	2	2	16
WTG Transformers	ea	0	0	243	257	0	243	257	1,000
Poles	ea	0	0	2,200	2,000	0	2000	1800	8,000
Junction Boxes	ea	0	270	404	312	285	446	255	1,972
Construction Material									
Road Cap	cu yd	64,000	127,000	39,000	25,000	62,000	25,000	33,000	375,000
Road Stabilization	cu yd	2,500	17,300	6,400	3,100	5,800	6,200	2,600	43,900
Rail Ballast	cu yd	0	51,000	0	0	0	0	0	51,000

Item	Units	2014	2015	2016	2017	PII Year 1	PII Year 2	PII Year 3	CCSM PROJECT TOTAL
Rail Sub-Ballast	cu yd	0	148,000	0	0	0	0	0	148,000
Laydown Yard Aggregate	cu yd	3,000	126,000	0	0	0	0	0	129,000
Substation Aggregate	cu yd	0	28,000	12,000	0	6,000	6,000	0	52,000
Thermal Backfill	cu yd	0	18,000	46,000	28,000	22,500	45,000	22,500	182,000
Rip-Rap	cu yd	9,100	39,500	20,300	9,800	15,100	19,300	8,100	121,200
Aggregate – Concrete	cu yd	700	52,500	103,300	56,400	48,700	114,200	37,800	413,600
Sand	cu yd	300	32,900	65,400	35,500	31,500	72,400	24,200	262,200
Cement	cu yd	0	16,286	36,492	22,619	14,778	37,849	22,770	150,794
Fly Ash	cu yd	0	2,077	4,654	2,885	1,885	4,827	2,904	19,232
Water (from off-site)	ac ft	26	22	0	0	0	0	0	48
Construction Equipment									
Equipment	ea	88	342	437	431	88	342	437	2,165
Trailers	ea	25	25	25	25	25	25	25	175

Notes: 1. PII = Phase II of the CCSM Project
2. The material estimates presented for Phase II assume that a portion of the aggregate will be obtained on-site.

3.2 Workforce

To further evaluate the CCSM Project transportation requirements during construction, PCW estimated the workforce that will commute to the CCSM Project Site from nearby communities. PCW may elect to house a portion of the workforce in an on-site construction camp; however, for the purposes of this analysis, PCW conservatively assumed that the entire workforce will commute to the CCSM Project Site.

Table 2 summarizes the anticipated peak workforce by month for the CCSM Project including both construction and operations personnel. The construction workforce for Phase I of the CCSM Project reaches a peak of 945 workers in 2017. Operations personnel will commence work as project components (i.e., the rail facility and quarry) become operational. This TMP analyzes a combined peak workforce of 1,290 occurring in August of 2017.

Table 2. Peak Labor Force by Month

Month	2014	2015	2016	2017	Phase II Year 1	Phase II Year 2	Phase II Year 3
Jan	0	14	17	57	76	81	101
Feb	0	14	17	57	76	81	101
Mar	0	14	32	72	81	96	116
Apr	0	32	62	95	99	126	139
May	0	59	157	219	111	319	261
June	0	121	926	602	144	917	666
July	0	408	1,253	1,285	319	1,185	1,060
Aug	0	**487**	**1,258**	**1,290**	**416**	**1,190**	**1,065**
Sep	**107**	427	999	1,167	356	976	1,082
Oct	107	309	392	560	248	461	516
Nov	107	136	178	299	125	227	283
Dec	12	29	64	103	83	113	139

4. Infrastructure

Following establishment of the CCSM Project transportation strategy and requirements, PCW evaluated on-site material sources and reviewed the existing transportation infrastructure in the vicinity of the CCSM Project (Figure 2). PCW proposed new infrastructure, as well as upgrades to existing infrastructure, as needed to accommodate the CCSM Project and implement the transportation strategy (Figure 3). A detailed analysis of the transportation infrastructure in the vicinity of the CCSM Project is included in Attachment A; a summary is provided below.

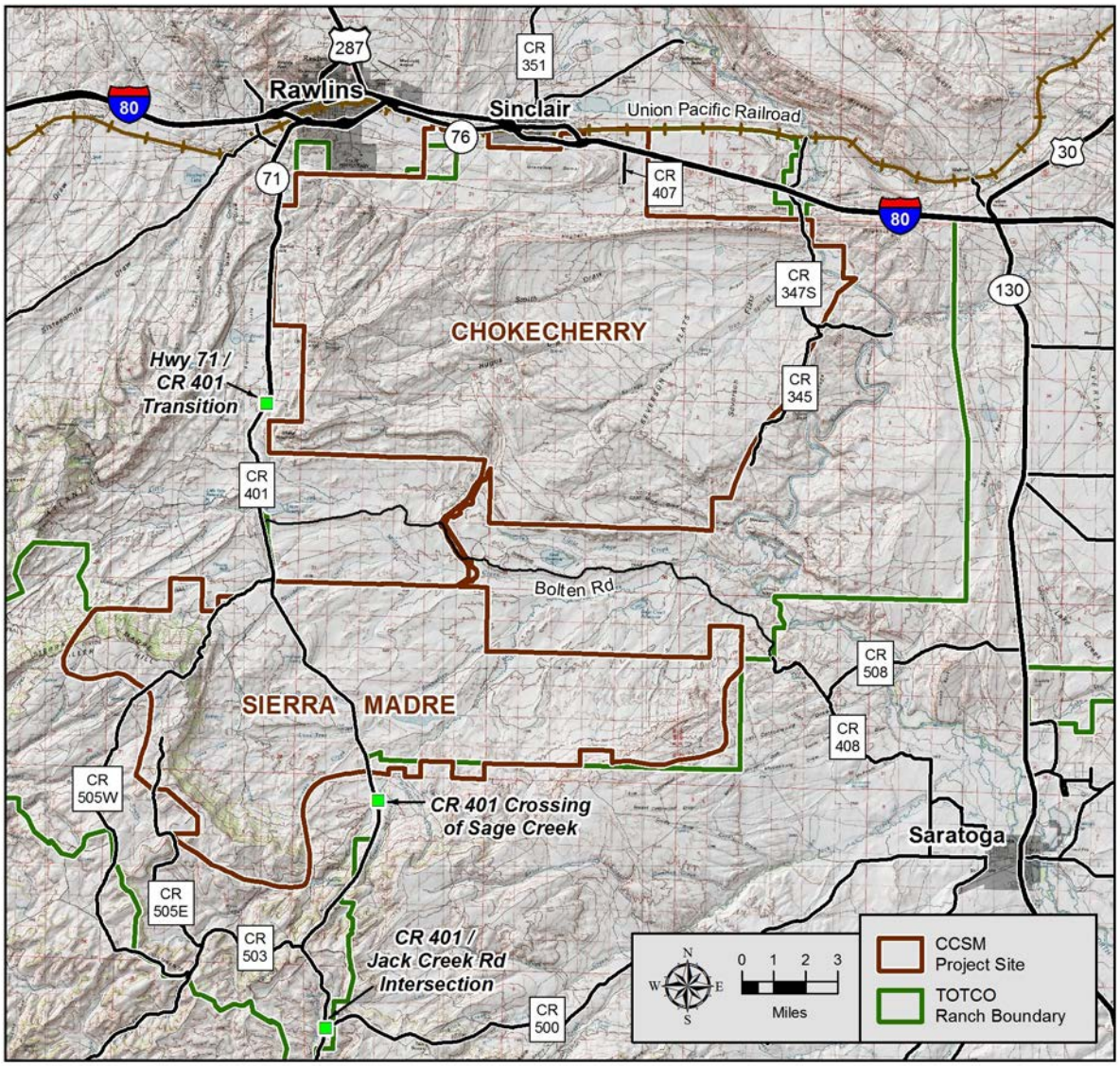

Figure 2. Existing Transportation Infrastructure

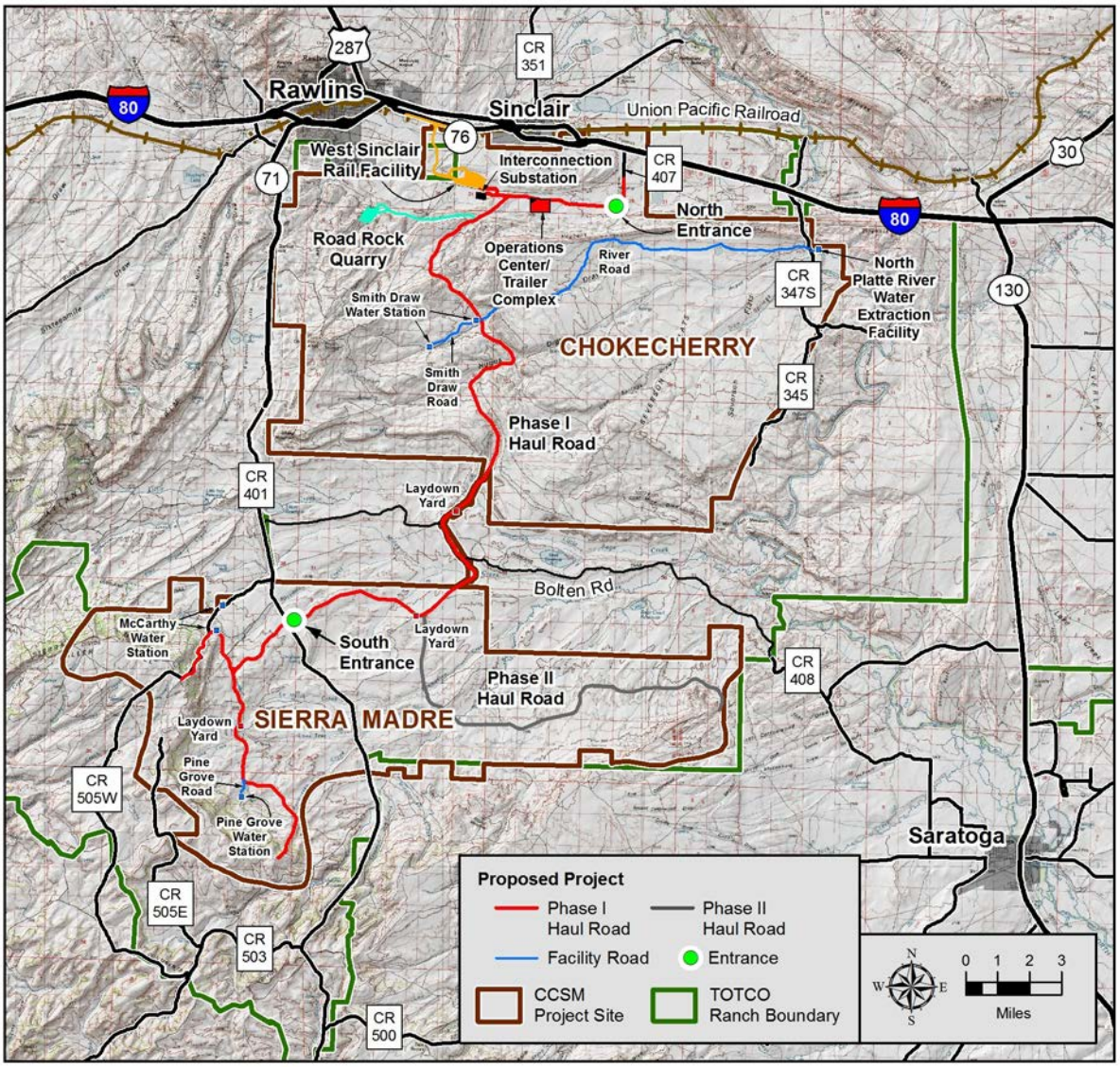

Figure 3. Proposed Transportation Infrastructure

4.1 On-site Material Sources

In accordance with the CCSM Project transportation strategy, PCW evaluated the CCSM Project Site to identify opportunities to use on-site materials where suitable and practicable. PCW's evaluation resulted in the identification of two materials that could feasibly be sourced on-site; water and base aggregate.

For the CCSM Project's water requirements, PCW identified groundwater and surface water rights within the CCSM Project Site that will be used along with locally available municipal supplies to construct, operate, maintain and decommission the CCSM Project. PCW proposes to construct a water system for the CCSM Project to bring water from these sources to five

water stations within the CCSM Project Site where water trucks will be filled (Figure 3). While on-site water sources have been identified, PCW may need to deliver water by truck during construction of the CCSM Project water system. The off-site transportation requirements described in section 3.1 account for the portion of the water that may be obtained off-site. Details on the CCSM Project water sources and water stations are included in the Phase I Haul Road and Facilities Site Specific Plan of Development.

A geotechnical investigation of the CCSM Project Site determined that the most feasible option for obtaining base aggregate on-site is the Road Rock Quarry. The location, a previously established quarry, has sufficient quantities of sandstone to meet a significant portion of the CCSM Project need for base aggregate. PCW proposes to construct, operate, maintain and decommission the Road Rock Quarry to obtain this base aggregate. The Road Rock Quarry is located in the northern portion of the CCSM Project Site and will connect to the CCSM Project internal road network (Figure 3). Details on the Road Rock Quarry are included in the Road Rock Quarry Site Specific Plan of Development.

4.2 Rail

Rail is a key component of PCW's transportation strategy. Many of the components required to build the CCSM Project will be transported long distances; PCW reviewed these components and found that most can be delivered by rail. While it is not economical to bring in all material and components by rail, the use of rail delivery for a large portion of the components reduces transportation impacts and provides an economic benefit to the CCSM Project.

The Union Pacific "Overland Route" corridor, the original "Transcontinental Railroad" completed in 1869, is located along the northern boundary of the CCSM Project Site. The location of the railroad adjacent to the CCSM Project Site presents a unique opportunity for PCW to minimize transportation impacts by delivering materials and components for the CCSM Project by train. While the Overland Route main line is heavily used, Union Pacific has indicated that additional trains used to deliver components to the CCSM Project would not cause any significant impacts to the system. PCW and Union Pacific have estimated that peak rail deliveries to the CCSM Project Site would still be less than a 0.2% increase to daily rail traffic.

PCW conducted a survey of existing rail facilities in the region surrounding the CCSM Project Site. To evaluate the suitability of the existing rail facilities, PCW considered that: (1) many of the wind turbine components will arrive in dedicated unit trains of up to 6,500 feet in length; (2) the CCSM Project has a limited annual working season that requires components to arrive in a shortened window; (3) components may arrive from up to three manufacturers during the working season; and (4) to safely receive, store, unload, and release unit trains requires in excess of 26,000 feet (equivalent to 4 unit trains) of track. All existing rail facilities surveyed in the region surrounding the CCSM Project Site were either too small to be used by the CCSM Project or would require significant expansion and long-distance trucking; therefore, PCW

determined that none of these facilities meet the CCSM Project transportation strategy objective (Attachment A).

To meet the objective of the CCSM Project transportation strategy, maximizing the use of rail delivery, PCW proposes to construct, operate, maintain and decommission a new rail facility, the West Sinclair Rail Facility (Figure 3). The West Sinclair Rail Facility will connect to the UPRR main line between Rawlins and Sinclair and includes a rail loop, various unloading tracks and adjacent laydown yards. An overview of the West Sinclair Rail Facility is included in Figure 4 below. Design details are included in the West Sinclair Rail Facility Site Specific Plan of Development.

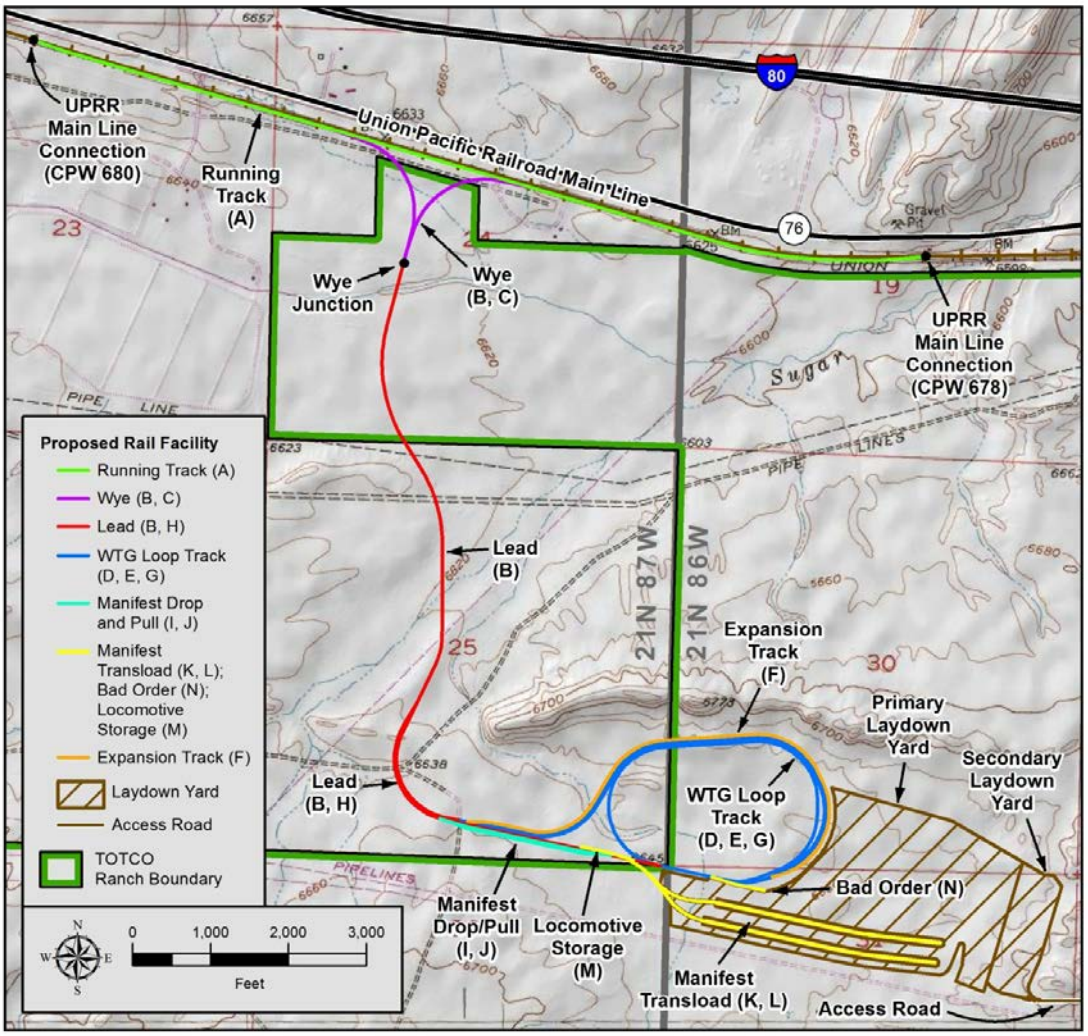

Figure 4. West Sinclair Rail Facility Layout

4.3 Roads

Materials and components that cannot be obtained on-site or by rail will be delivered by truck; these materials primarily consist of aggregate, sand, cement, and fly ash, many of which can be obtained locally or regionally along Interstate 80. Consistent with the transportation strategy, PCW will obtain these materials locally when possible, benefiting local businesses and reducing transportation distances. Some components cannot feasibly be obtained locally; these components will be delivered by long-distance trucking.

To determine transportation options for vehicles, PCW evaluated the location, condition, and physical and legal restrictions of existing roads in the vicinity of the CCSM Project Site, as described in Attachment A and shown in Figure 2. Generally, all of the roads evaluated are sufficient for workforce commuting purposes and other standard vehicles and loads. The majority of the deliveries entering and exiting the CCSM Project are expected to use Interstate 80 to access the CCSM Project North Entrance (Figure 3). PCW may make use of certain existing roads for material delivery, as detailed in Attachment A; however, the use is expected to be minimal.

To minimize the use of public roads for the delivery of materials and components, PCW proposes to construct, operate maintain and decommission the CCSM Project Haul Road that can be accessed from Interstate 80 Exit 221. The CCSM Project Haul Road is the primary route for all material and component delivery traffic to access the wind development areas (Figure 3). The Haul Road connects to Interstate 80 Exit 221 via the CIG Road (CR 407). The Haul Road connects the West Sinclair Rail Facility and the Road Rock Quarry to the wind development areas. Construction of the Haul Road minimizes the use of public roads for deliveries once they enter the CCSM Project Site. Details on the design of Phase I of the CCSM Project Haul Road are included in the Phase I Haul Road and Facilities Site Specific Plan of Development.

In addition to constructing the CCSM Project Haul Road, PCW proposes temporary improvements to Interstate 80 Exit 221, such as shoulder widening, to accommodate extra-long loads. The proposed improvements will be performed within the existing easements and will be removed at the end of CCSM Project construction.

5. Transportation Plan

Using the transportation requirements for the CCSM Project and the existing and proposed infrastructure, PCW developed a transportation plan to meet the objective of the CCSM Project transportation strategy, i.e. keeping deliveries internal to the CCSM Project. The off-site deliveries associated with the CCSM Project were allocated to a transportation mode, i.e. rail or truck, as shown in Table 3 and Table 4. Table 3 and Table 4 constitute the transportation plan for the CCSM Project.

Table 3. CCSM Project Off-Site Deliveries by Rail

Item	Units	2014	2015	2016	2017	PII Year 1	PII Year 2	PII Year 3	CCSM PROJECT TOTAL
Wind Turbine Components									
Nacelles	ea	0	0	243	257	0	243	257	1,000
Hubs	ea	0	0	162	171	0	162	171	666
Tower Sections	ea	0	0	810	856	0	810	856	3,332
Blades	ea	0	0	486	514	0	486	514	2,000
Manifest Items									
Rebar	tons	0	0	18,000	10,800	7,200	18,000	10,800	64,800
Steel	tons	0	0	325	200	0	100	100	725
Cable Reels	ea	0	0	1,290	1,068	800	527	384	4,069
Sub Transformers	ea	0	0	8	4	0	2	2	16
WTG Transformers	ea	0	0	219	231	0	219	231	900
Poles	ea	0	0	1,980	1,800	0	1,800	1,620	7,200
Junction Boxes	ea	0	135	364	281	256	401	229	1,666

Notes: 1. PII = Phase II of the CCSM Project
2. The material estimates presented for Phase II assume that a portion of the aggregate will be obtained on-site.

Table 4. CCSM Project Off-Site Deliveries by Truck (in quantities of material)

Item	Units	2014	2015	2016	2017	PII Year 1	PII Year 2	PII Year 3	CCSM PROJECT TOTAL
Wind Turbine Components									
Nacelles	ea	0	0	0	0	0	0	0	-
Hubs	ea	0	0	81	86	0	81	86	334
Tower Sections	ea	0	0	81	86	0	81	86	334
Blades	ea	0	0	243	257	0	243	257	1,000
Manifest Items									
Rebar	tons	0	9,000	2,000	1,200	800	2,000	1,200	16,200
Steel	tons	0	0	0	0	0	0	0	-
Cable Reels	ea	0	800	142	119	89	59	43	1,252
Sub Transformers	ea	0	0	0	0	0	0	0	-
WTG Transformers	ea	0	0	24	26	0	24	26	100
Poles	ea	0	0	220	200	0	200	180	800
Junction Boxes	ea	0	135	40	31	29	45	26	306
Construction Material									
Road Cap	cu yd	64,000	127,000	39,000	25,000	62,000	25,000	33,000	375,000
Road Stabilization	cu yd	2,500	17,300	6,400	3,100	5,800	6,200	2,600	43,900
Rail Ballast	cu yd	-	51,000	-	-	-	-	-	51,000

Item	Units	2014	2015	2016	2017	PII Year 1	PII Year 2	PII Year 3	CCSM PROJECT TOTAL
Rail Sub-Ballast	cu yd	-	148,000	-	-	-	-	-	148,000
Laydown Yard Aggregate	cu yd	3,000	126,000	-	-	-	-	-	129,000
Substation Aggregate	cu yd	-	28,000	12,000	-	6,000	6,000	-	52,000
Thermal Backfill	cu yd	-	18,000	46,000	28,000	22,500	45,000	22,500	182,000
Rip-Rap	cu yd	9,100	39,500	20,300	9,800	15,100	19,300	8,100	121,200
Aggregate – Concrete	cu yd	700	52,500	103,300	56,400	48,700	114,200	37,800	413,600
Sand	cu yd	300	32,900	65,400	35,500	31,500	72,400	24,200	262,200
Cement	cu yd	-	16,286	36,492	22,619	14,778	37,849	22,770	150,794
Fly Ash	cu yd	-	2,077	4,654	2,885	1,885	4,827	2,904	19,232
Water (from off-site)	ac ft	26	22	0	0	0	0	0	48
Construction Equipment									
Equipment	ea	88	342	437	431	88	342	437	2,165
Trailers	ea	25	25	25	25	25	25	25	175

Notes: 1. PII = Phase II of the CCSM Project
2. The material estimates presented for Phase II assume that a portion of the aggregate will be obtained on-site.

6. Traffic Study

Following development of the CCSM Project transportation plan (section 5), PCW completed a traffic study (Attachment B) to identify traffic impacts from the CCSM Project. A summary of the traffic study is provided in this section. To evaluate the transportation plan in the traffic study, off-site deliveries occurring by truck were converted into equivalent truckloads (Table 5).

The traffic study for the CCSM Project estimates a traffic profile (deliveries and commuting) for construction, operations and maintenance, and decommissioning based on the delivery schedule and workforce requirements. The peak traffic levels are identified and compared to existing traffic levels on roadways and intersections in the vicinity of the CCSM Project Site. The traffic study evaluates the use of the existing and the new or improved infrastructure described in section 4.

Most of the intersections evaluated in the CCSM Project traffic study are classified as passive two-way stop controlled, meaning stop signs are used to control traffic rather than traffic signals. Evaluation of the traffic profiles and peak traffic levels for the CCSM Project determined instances during construction, where traffic generated by the CCSM Project may exceed the capacity of the nearby road network causing the level of service to be degraded at some of these passive intersections. PCW has determined a number of feasible traffic control measures to reduce the effect on these intersections during peak traffic periods when these impacts are anticipated to occur.

During peak traffic periods, PCW will use temporary active traffic control measures, such as flaggers or temporary traffic signals, as needed to reduce wait times for public traffic to acceptable levels. PCW will also use flaggers to control traffic when extra-long or extra-wide loads are delivered to the CCSM Project Site, and where the Haul Road crosses public roads. If needed, PCW will also stagger the shift start and end times for the labor force on the CCSM Project, e.g. PCW would divide the shift into two equal groups with the second starting and ending one hour later than the first.

The effectiveness of staggering the shift times was analyzed in the traffic study and resulted in significant improvements to impacted intersections. The effectiveness of active traffic control measures, such as flaggers, cannot be quantified within the framework of the traffic study; however, practical experience indicates that both flaggers and temporary traffic signals are effective in controlling traffic and reducing impacts. In fact, the ability of flaggers to be flexible and adaptive in traffic management by allowing longer queues of vehicles to clear intersections as needed is generally superior to the addition of temporary timed traffic lights.

The traffic study does not indicate that traffic control measures will be needed during operations and maintenance or decommissioning. With the implementation of the traffic

control measures described above during construction, PCW does not anticipate significant impacts to public traffic.

Table 5. CCSM Project Off-Site Deliveries by Truck (in truckloads)

Item	2014	2015	2016	2017	PII Year 1	PII Year 2	PII Year 3	CCSM PROJECT TOTAL
Local Truck Deliveries								
Road Cap	3,114	6,178	1,897	1,216	3,016	1,216	1,605	18,243
Road Stabilization	122	842	311	151	282	302	126	2,136
Rail Ballast	0	2,068	0	0	0	0	0	2,068
Rail Sub-Ballast	0	7,200	0	0	0	0	0	7,200
Laydown Yard Aggregate	146	6,130	0	0	0	0	0	6,276
Substation Aggregate	0	1,362	584	0	292	292	0	2,530
Thermal Backfill	0	778	1,989	1,211	973	1,946	973	7,870
Rip-Rap	332	1,441	741	358	551	704	296	4,422
Aggregate – Concrete	26	1,986	3,909	2,134	1,843	4,321	1,430	15,650
Sand	13	1,423	2,828	1,535	1,362	3,131	1,046	11,338
Water	700	583	0	0	0	0	0	1,283
TOTAL LOCAL TRUCK DELIVERIES	**4,453**	**29,991**	**12,259**	**6,605**	**8,319**	**11,912**	**5,477**	**79,015**
Long Distance Truck Deliveries								
Hubs	0	0	81	86	0	81	86	334
Tower Sections	0	0	81	86	0	81	86	334

Item	2014	2015	2016	2017	PII Year 1	PII Year 2	PII Year 3	CCSM PROJECT TOTAL
Blades	0	0	243	257	0	243	257	1,000
Rebar	0	360	80	48	32	80	48	648
Cable Reels	0	200	36	30	22	15	11	313
Poles	0	0	44	40	0	40	36	160
WTG Transformers	0	0	24	26	0	24	26	100
Junction Boxes	0	135	40	31	29	45	26	306
Cement	0	821	1,839	1,140	745	1,908	1,148	7,600
Fly Ash	0	151	339	210	137	351	211	1,400
Equipment	88	342	437	431	88	342	437	2,165
Trailers	25	25	25	25	25	25	25	175
TOTAL LONG DISTANCE TRUCK DELIVERIES	**113**	**2,034**	**3,269**	**2,410**	**1,078**	**3,235**	**2,397**	**14,535**

Notes: 1. PII = Phase II of the CCSM Project
2. The material estimates presented for Phase II assume that a portion of the aggregate will be obtained on-site.

Attachment A. Transportation Infrastructure Assessment

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Table 1. Union Pacific Network Corridor Line Categories A-4

1.0 Existing Infrastructure

To support the CCSM Project and identify transportation infrastructure needs, PCW analyzed the existing transportation infrastructure in the vicinity of the CCSM Project, specifically the Union Pacific Railroad (UPRR), Interstate 80, and other surrounding roads. PCW reviewed the location, condition, and current use of the infrastructure and identified potential uses. The existing transportation infrastructure in the vicinity of the CCSM Project is described below.

1.1 Rail

Rail is a key component of PCW's transportation strategy. The Union Pacific "Overland Route" corridor, the original "Transcontinental Railroad" completed in 1869 is located along the northern boundary of the CCSM Project Site. The location of the railroad adjacent to the CCSM Project Site presents a unique opportunity for PCW to minimize transportation impacts by delivering a portion of the CCSM project components and materials by train.

The Overland Route is a dual-track mainline corridor representing the primary east-west link between the West Coast and Chicago with over 100 trains passing per day. Many of these trains are unit trains carrying coal (up to 8,000 feet long) or intermodal trains carrying overseas containers (up to 10,000 feet long). The speed limit for trains on the tracks between Sinclair and Rawlins is primarily 70 mph, with a 20 mph limit through a portion of Rawlins. The grade is gentle and increases in elevation east to west by approximately 160 feet between Sinclair and Rawlins. There are also three sidings in this area for holding trains or railcar management.

Union Pacific has designated each of its mainline corridors into one of three categories for industry access under their Network Corridor Line Categorization system, as summarized in Table 1 and displayed in Figure 1. The main line near the CCSM Project Site is classified as a "Restricted Access Corridor." This is the most restrictive category, requiring new industry track facilities to invest in significant infrastructure improvements including new switches, signals, and tracks. These rail system upgrades ensure that any new industry track facilities do not hinder existing railroad operations or traffic.

To meet Union Pacific operational requirements, sufficient running track parallel to the main line must be constructed in order for arriving trains to safely decelerate into and for departing trains to accelerate from an industry track facility.

While the main line in the vicinity of the CCSM Project Site is heavily used, Union Pacific has indicated that additional trains used to deliver project components would not cause any significant impacts to the system. PCW and Union Pacific have estimated that peak rail deliveries to the CCSM Project Site would still be less than a 0.2% increase to daily rail traffic.

Table 1. Union Pacific Network Corridor Line Categories

	Restricted Access	Controlled Access	Allowable Access
Volume	High Volume	Medium Volume	Low Volume
Priority	High Priority	Medium Priority	Low Priority
Stopping	No Stopping	Limited Stopping	Many Stops

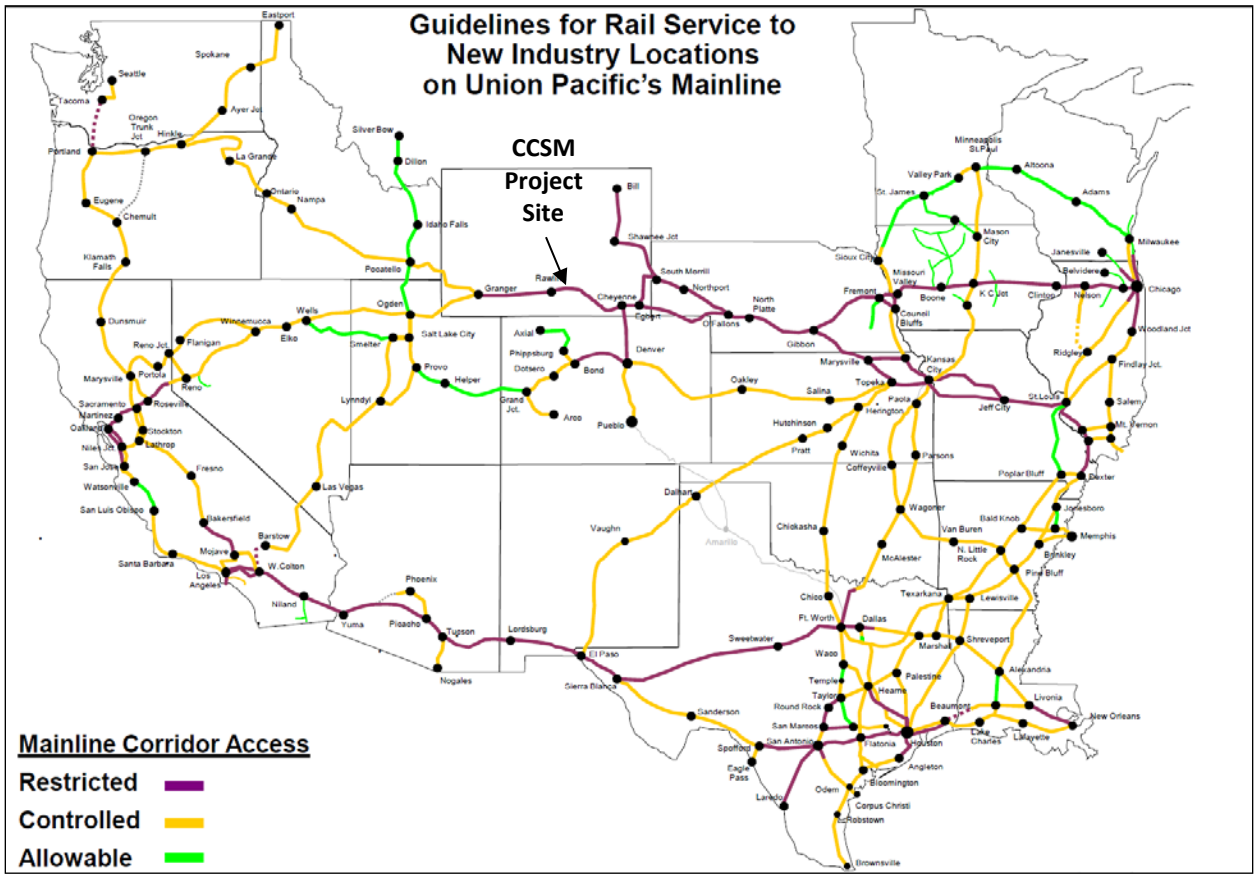

Figure 1. Union Pacific Mainline Corridors

PCW conducted a survey of existing rail facilities in the region surrounding the CCSM Project Site. To evaluate the suitability of the existing rail facilities, PCW considered that: (1) many of the wind turbine components will arrive in dedicated unit trains of up to 6,500 feet in length; (2) the CCSM Project has a limited annual working season that requires components to arrive in a shortened window; (3) components may arrive from up to three manufacturers during the working season; and (4) to safely receive, store, unload, and release unit trains requires in excess of 26,000 feet (equivalent to 4 unit trains) of track.

PCW surveyed, identified, and evaluated the existing rail facilities in the region as summarized below:

- **Rawlins:** There is an existing rail yard in Rawlins that is used primarily for crew changes and fueling. There is insufficient track or space at that location to support the CCSM Project. Use of this facility is not feasible.
- **Sinclair Refinery:** The refinery has a small, privately owned spur that is inadequate in availability or infrastructure for the CCSM Project. Use of this facility is not feasible.
- **Laramie:** This rail yard had sufficient space to take at least some CCSM Project deliveries; however, the yard is 100 miles from the CCSM Project Site and would require long-distance trucking.
- **IDS (Casper):** This is a privately owned and operated transload facility located 135 miles away from the CCSM Project Site, the use of this facility for the CCSM Project would require expansion and long-distance trucking.

All existing rail facilities in the region surrounding the CCSM Project Site were either too small to be used by the CCSM Project or would require significant expansion and long-distance trucking; therefore, PCW determined that none of these facilities meet the needs of the CCSM Project.

1.2 Roads

PCW evaluated the location and condition of the existing roads that can be used to access the CCSM Project. The existing routes that may be used by the CCSM Project are described below and shown in Figure 2. The conditions of the roadways surrounding the Project were initially reviewed by PCW in 2009, and have been periodically observed since.

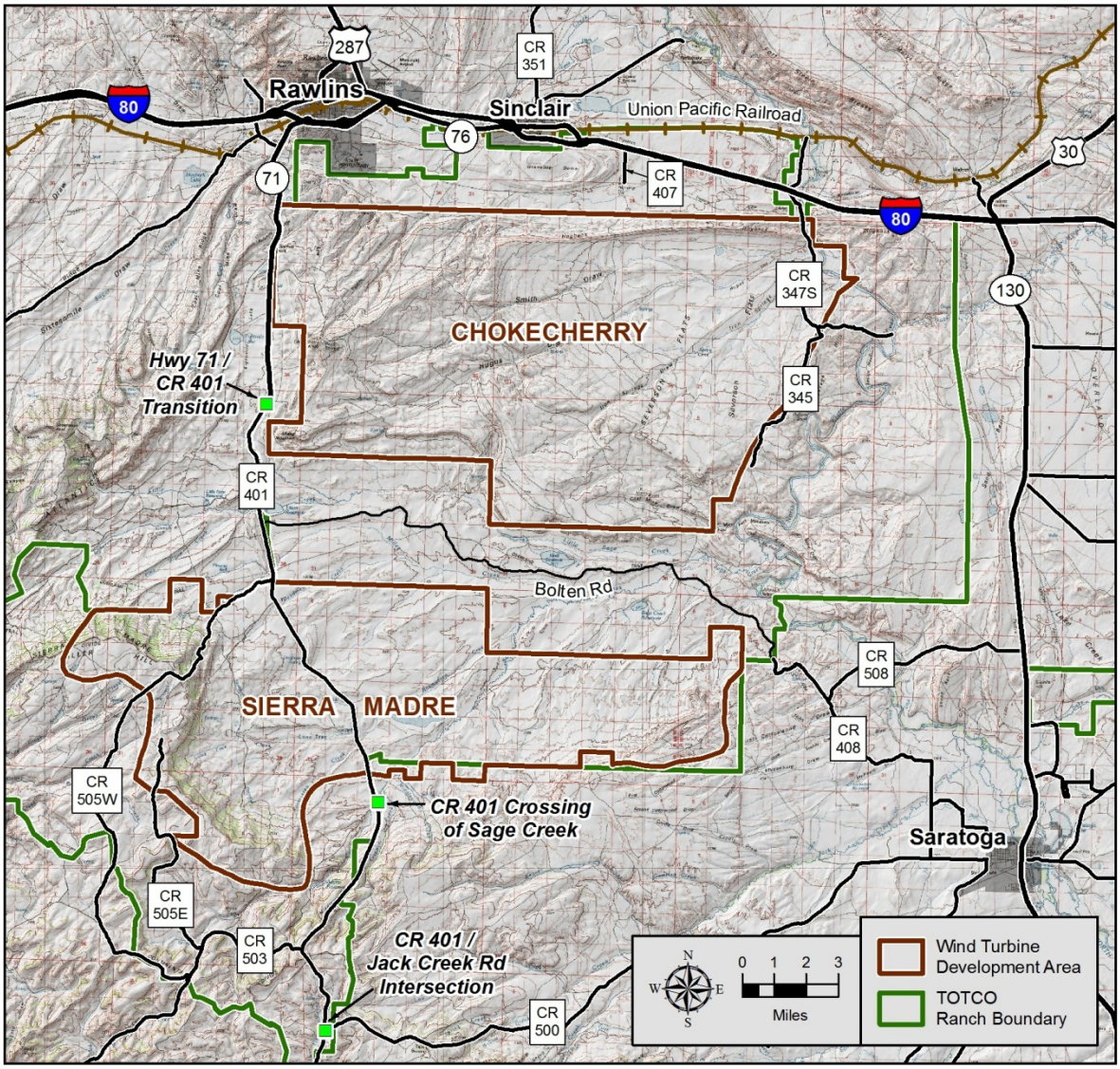

Figure 2. Existing Roadway Network

1.2.1 Condition and Use

Interstate 80

Interstate 80 is a four-lane divided highway with 12-foot lanes, approximately 8-foot shoulders, and is the primary east-west route through southern Wyoming. In the vicinity of the CCSM Project Site, Interstate 80 has one exit west of Rawlins, (exit 209), three exits to Rawlins (exits 211, 214, and 215), two exits to Sinclair (exits 219 and 221) , and an additional exit north of the CCSM Project Site at Fort Steele (exit 228). Walcott Junction (exit 235) is located east of the CCSM Project Site and leads to Saratoga via Wyoming Highway 130 (WY130). All of the interstate exits are diamond interchanges with the exception of exit 215 at Rawlins, which is a trumpet interchange with free movements in all directions (Figure 3). The on- and off-ramps do not typically have acceleration or deceleration lanes on the interstate, but the ramps are

typically at least 1,700 feet, which is an adequate length to allow vehicles to accelerate or decelerate. Interstate 80 has asphalt pavement that is in good condition; due to traffic and weather conditions, Interstate 80 surface improvements occur often to maintain the condition.

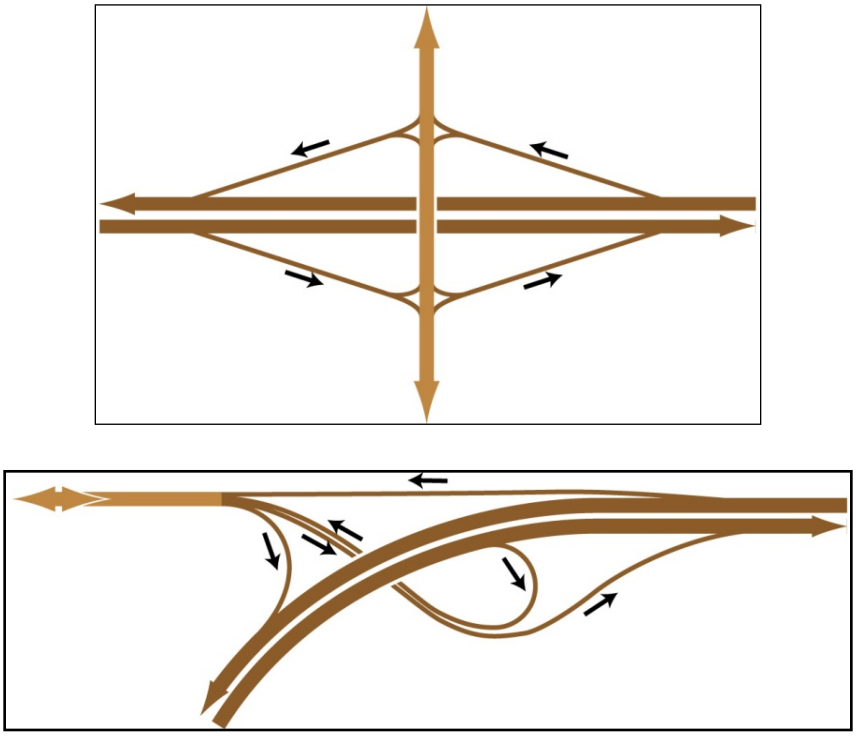

Figure 3. Typical Diamond and Trumpet Interchange Schematics

US287

United States Route 287 (US287) is a major route that carries traffic north and south through Rawlins. The road is a two-lane undivided paved highway with auxiliary lanes through Rawlins with lane widths of at least 12 feet and shoulder widths varying from 1 foot to 4 feet. This road intersects with multiple streets carrying both residential and commercial traffic through town. At the northern end of Rawlins, US287 divides into a business route and a bypass, with the eastern section carrying the bypass traffic that leads to Interstate 80 exit 214 and the western section designated as the business route that leads through town and to Interstate 80 exit 211. From exit 214 eastbound, Interstate 80/US287 is a shared route until US287 splits off in Laramie, Wyoming.

WY130

Wyoming Highway 130 (WY130) is a two-lane undivided highway east of the CCSM Project Site with 12-foot lanes and typically 4-foot shoulders. The segment of this highway from Saratoga to Interstate 80 is a north-south rural route with high speeds, low volumes, and an asphalt surface that is in good condition. This highway does not provide direct access to the CCSM Project Site, but may be used as a commuter route for workers residing in Saratoga.

WY76

Wyoming Highway 76 (WY76) is a two-lane undivided highway that is the primary non-interstate connection between Rawlins and Sinclair. This highway has an asphalt surface in good condition. WY76 will be used by Union Pacific to access their right of way during construction activities associated with the CCSM Project's West Sinclair Rail Facility and may be used as a commuter route for workers residing in Rawlins.

WY71/CR401 (Sage Creek Road)

Wyoming Highway 71 (WY71)/ Carbon County Road 401 (CR401), referred to locally as Sage Creek Road or the South Highway, is a primarily north-south route that is located west of the Chokecherry wind development area and that bisects the Sierra Madre wind development area. WY71 begins in Rawlins just north of Interstate 80 exit 214 and travels along the south side of Rawlins for the first mile in an east-west direction. This section of WY71 does not provide direct access to residences; however, there are collector roads (Davis Street, Jackson Street and Washington Street) that intersect WY71 along the first mile. WY71 then passes under Interstate 80 and primarily becomes a north-south route for the remainder of its length. South of Interstate 80, WY71 is a rural highway with a typical posted speed limit of 65 miles per hour. There are intermittent residential driveways that provide direct access to WY71, as well as multiple county roads, two-track roads, and gated accesses to pastures and fields. There are segments of WY71 with steep vertical curves and limited vertical and horizontal sight distance. Adjacent to the Chokecherry wind development area, state maintenance of the road ends, and the road becomes CR401. CR401 is rural with minimal traffic. The lane widths are typically 12 feet along WY71, and the shoulders vary by section from no shoulders to 3-foot wide shoulders.

WY71/CR401 has various pavement conditions (see Figure 4), with portions being reconstructed in 2012 and 2013. Approximately the first 1.5 miles of WY71 (from Higley Boulevard to the Interstate 80 overpass) is asphalt in good condition. The second segment of WY71 (from the Interstate 80 overpass to the end of WY71 over a distance of 9.5 miles) is a new overlay of asphalt in excellent condition. The remainder of this road (CR401) is being reconstructed into a gravel road with a wider overall driving surface (approximately 40 feet) and updated drainage features. The first segment of CR401 (from the WY71/CR401 transition point to the Sage Creek crossing) was reconstructed in 2012 and is currently in good condition. The second segment of CR401 (from the Sage Creek crossing to at least the intersection with CR500) is currently undergoing reconstruction, and is expected to be in good condition prior to the start of CCSM Project construction.

Figure 4. WY71/CR401 Road Conditions

The CCSM Project's Haul Road will cross CR401 at one location (within the first segment of CR401 described above). Additionally, WY71/CR401 will likely be used as a commuter route for workers residing in Rawlins or working in the Sierra Madre wind development area.

CR505W (Miller Hill Road) and CR505E

Carbon County Road 505W (CR505W), commonly referred to as Miller Hill Road, is the primary access route from CR401 to the top of Miller Hill. It is a low-use gravel road in fair condition. The portion of the road within the CCSM Project Site includes a steep section (approximately 17% grade), and is generally closed due to snow drifts during the winter and spring months.

Carbon County Road 505E (CR505E) is an unsurfaced road on top of Miller Hill. The road dead ends and has very low use.

CR407 (CIG Road)

At Interstate 80 exit 221, Carbon County Road 407 (CR407), commonly referred to as CIG Road, begins south of Interstate 80 (where WY76 ends), travels east and then south and provides access to the Colorado Interstate Gas Energy Plant (CIG Plant). The CR407 from Interstate 80 to CIG Plant (approximately 2.25 miles) has 12-foot lanes with no shoulders, is paved and is in fair to good condition. This portion of CR407 is maintained by both the Wyoming Department of Transportation (WYDOT) and Carbon County. South of the CIG Energy Plant, CR407 ends. PCW anticipates building the CCSM Project's North Road starting at the south end of CR407 to provide access to the North Entrance to the CCSM Project Site. CCSM Project traffic coming in the North Entrance would therefore use CR407.

CR347

Interstate 80 exit 228 (Fort Steele) is near the northern edge of the Chokecherry wind development area. This interchange connects to Carbon County Road 347 (CR347), which travels south along the North Platte River and leads into the Chokecherry wind development area. CR347 is unpaved, less than two lanes wide, and has several instances of steep grades and sharp turns. The use of CR347 for CCSM Project traffic would likely require extensive improvements; therefore, PCW does not anticipate using CR347.

CR500

Carbon County Road 500 (CR500), referred to as Jack Creek Road, is a two-lane gravel road connecting CR401 to Saratoga. Portions of this road are in fair condition, but the condition of the road tends to vary over the course of the year. PCW does not anticipate using CR500 due to concerns regarding its condition and maintenance.

CR408 and CR508

Carbon County Road 408 (CR408) and Carbon County Road 508 (CR508) are two-lane gravel roads that connect Saratoga to the eastern boundary of the CCSM Project Site. There will not be a CCSM Project entrance on the eastern boundary of the CCSM Project Site; therefore, PCW does not expect the CR408 or CR508 will be used by CCSM Project traffic and did not evaluate these roads.

1.2.2 Restrictions

To further evaluate the suitability of the existing road infrastructure for use by the CCSM Project, PCW evaluated the restrictions for use of the roadways in the vicinity of the CCSM Project Site. Road restrictions are described below.

Physical

Physical restrictions are defined as limits to the width, height, or length of trucks or loads. Turbine loads are the most likely to exceed physical restrictions for the CCSM Project. PCW has not yet selected final turbine models for use on the CCSM Project, so to evaluate physical restrictions PCW reviewed the range of candidate turbine models to develop the following maximum physical dimensions:

Height: 18’0”
Width: 17’7”
Length: 180’11”

On WY71, there is an existing underpass at Interstate 80 with a maximum clearance of 15 feet 2 inches. This limitation would likely effect WTG tower base sections and other extra-large components. PCW also predicts that several hills and some curves on WY71/CR401 will be outside the requirements of many wind turbine vendors’ transport guidelines. It is not anticipated that WY71 will be used for large deliveries.

Within Rawlins, there are restrictions for trucks on Washington Street at the UPRR underpass due to a clearance of less than 12 feet. No vehicles other than passenger vehicles or pickup trucks are anticipated on this route.

On 6th Street in Rawlins, there is a bridge crossing the UPRR. There is a truck restriction in place for the bridge that allows local deliveries only. Both the underpass and bridge have relatively

narrow lanes with minimal or no shoulders and are not viable routes for CCSM Project vehicles other than passenger vehicles or pickup trucks.

Weight

In the vicinity of the CCSM Project Site, there are no bridges along or over Interstate 80 or on WY71 that have posted weight restrictions. An annual bridge condition report prepared by WYDOT District 1 in 2009 indicates the WY76 bridge over Interstate 80 at exit 221 (Sinclair) is rated as "fair" overall. Deck, superstructure, and substructure are all rated as "good." The posted status of the bridge is "Open, no restriction." PCW will conduct bridge loading and equivalent single axle load (ESAL) calculations and provide any other pertinent information to determine the suitability of the bridge for CCSM Project deliveries, as required to obtain approval from WYDOT for use of the bridge. This analysis will likely occur during the WYDOT permitting process described below.

Timing

PCW is not aware of any timing-based restrictions on the use of the roads discussed above.

Load Type Restrictions

Load type restrictions are not anticipated for the vast majority of the CCSM Project loads. PCW is not aware of any CCSM project loads that are restricted; however, it is possible that some loads, such as fuel or dust mitigation chemicals, may have permitting requirements and route restriction based on load-type.

1.2.3 Permits

Transportation permits will likely be required for some CCSM Project loads and access roads. These permits may include restrictions. Common permit requirements that may apply to the CCSM Project loads, access roads and highways are described below.

Access Permits

PCW anticipates that the CCSM Project will require access at locations along CR401. New access points along Carbon County roads require review by the Carbon County's Department of Roads and Bridges. This review, patterned after the WYDOT access permitting process, requires that a new access point likely to see more than 50 trips per day have a traffic study performed. The data required for this permit is included in the CCSM Project traffic study.

WYDOT Permits

As indicated above, some of the vehicles transporting equipment to and from the CCSM Project Site are anticipated to be oversized. Vehicles traveling on the interstate and state highway system will comply with WYDOT standards for oversize loads.

Wyoming issues permits for oversize and heavy-load vehicles that are up to 18 feet in width, 17 feet in height, and 90 feet in length for single trailers or 110 feet in length for double trailers. The weight limit for heavy-load vehicles is 150,000 pounds gross vehicle weight (additional guidelines are identified on the state's website). Vehicles that exceed these requirements will

require additional permits to travel on the interstate and state highway system. Additional requirements and restrictions such as escort vehicles, travel hours (i.e. daylight), and convoy size may apply and will be determined during the permitting process.

2.0 Proposed Infrastructure and Improvements

Following evaluation of the existing transportation infrastructure in the vicinity of the CCSM Project, PCW proposed new infrastructure, as well as upgrades to existing infrastructure, to accommodate the CCSM Project.

2.1.1 West Sinclair Rail Facility

To meet the needs of the CCSM Project, PCW proposes to construct, operate, maintain and decommission a new rail facility, the West Sinclair Rail Facility. The West Sinclair Rail Facility will connect to the UPRR main line between Rawlins and Sinclair, and will include a running track and wye junction. Trains delivering CCSM Project components and materials will travel along a lead track to the rail loop and various unloading tracks. A laydown yard will be located within the Rail Facility adjacent to the unloading tracks. An overview of the West Sinclair Rail Facility is included in Figure 5 below. Additional information on the design and anticipated operation of the West Sinclair Rail Facility is included in the West Sinclair Rail Facility Site Specific Plan of Development.

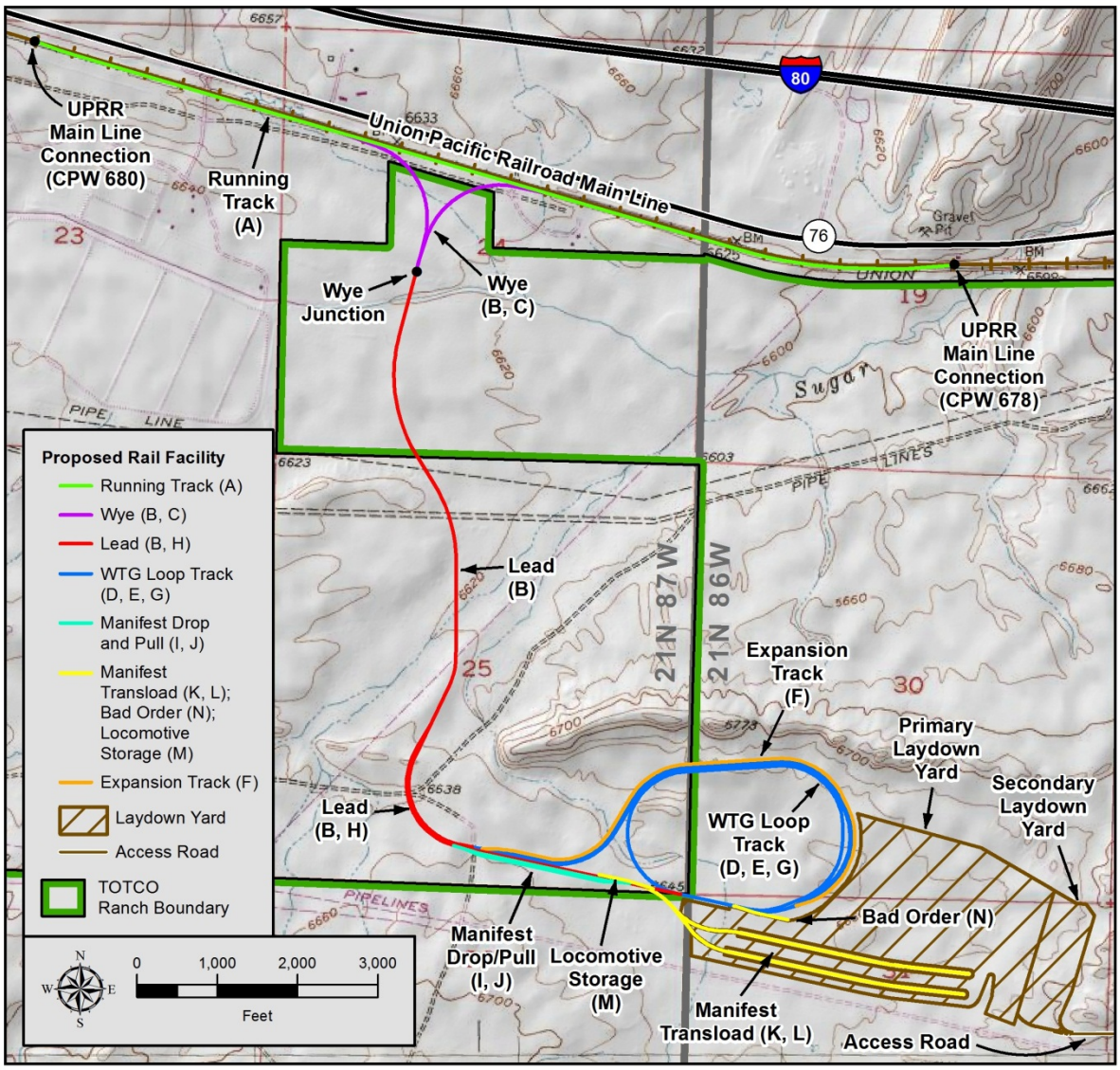

Figure 5. West Sinclair Rail Facility Layout

2.1.2 CCSM Project Haul Road

To keep CCSM Project traffic internal to the extent possible, PCW proposes to construct, operate, maintain, and decommission the CCSM Project Haul Road. The Haul Road is the primary access route for all delivery traffic to the various wind development areas. The Haul Road is accessed using Interstate 80 Exit 221 and CIG Road. The Haul Road connects the West Sinclair Rail Facility and the Road Rock Quarry to the Chokecherry and Sierra Madre wind development areas. The Haul Road minimizes the use of public roads for delivery of materials once they arrive at the CCSM Project Site. The Haul Road crosses CR 401 (Sage Creek Road) in a single location and follows portions of CR505W and CR 407 (Figure 6). Additional information

on the design of the CCSM Project Haul Road is included in the Phase I Haul Road and Facilities Site Specific Plan of Development.

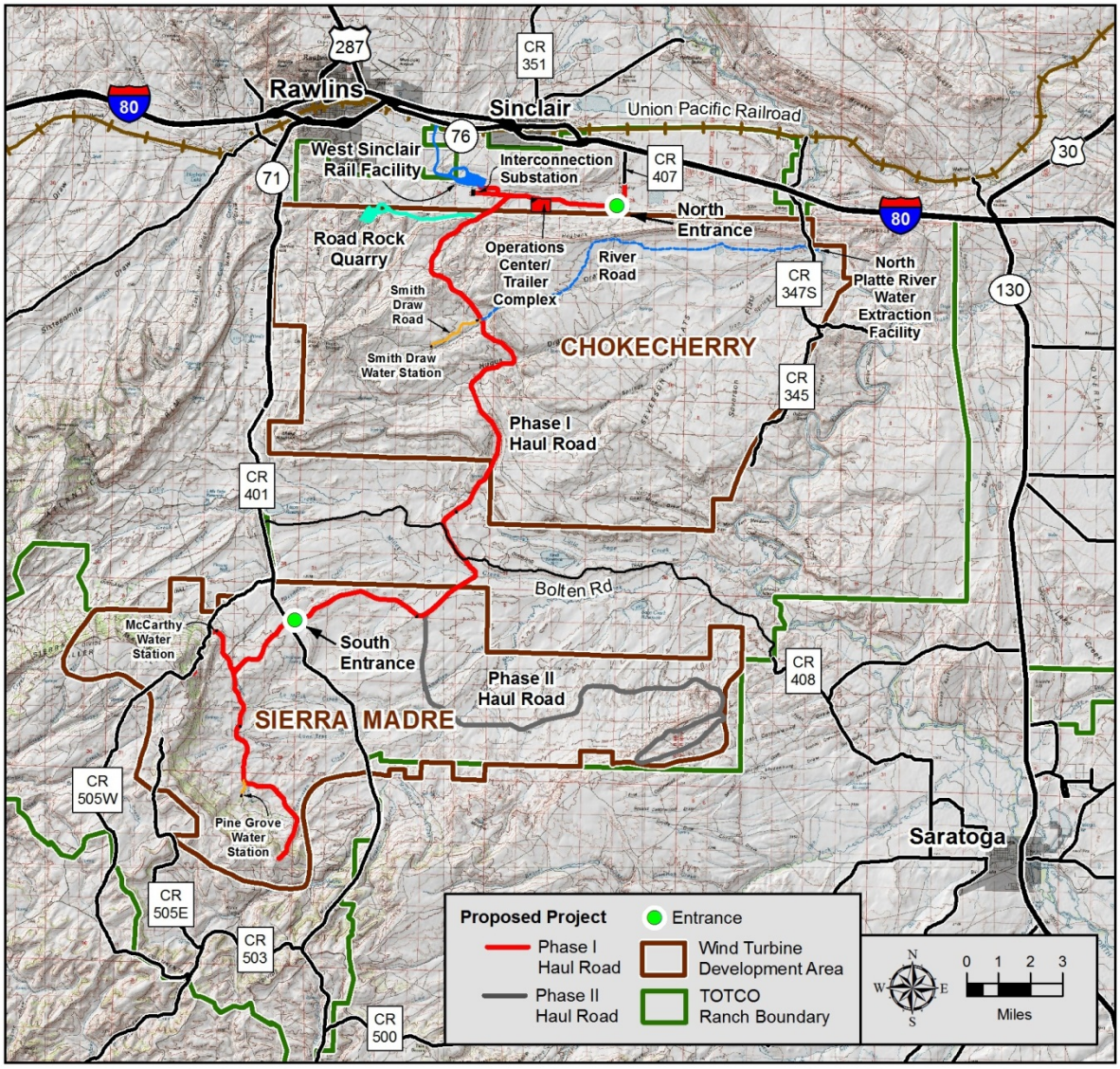

Figure 6. New CCSM Project Infrastructure

2.1.3 Temporary Improvements to Exit 221

While no permanent changes to Interstate 80 Exit 221 are required for the CCSM Project, PCW anticipates that some temporary physical changes may be required to deliver extra-long loads. PCW anticipates shoulder widening of the westbound off-ramp to allow a wider turn radius to the south, and widening of the eastbound off-ramp to avoid the jog onto CIG Road (Figure 7). Also, some minor widening of the 90-degree turn in CIG Road will be beneficial for the extra-long trucks. All of these improvements can be performed within the existing easements for the

public roads, and will be removed at the end of CCSM Project construction. PCW will obtain all necessary permits from WYDOT and Carbon County before installing temporary improvements.

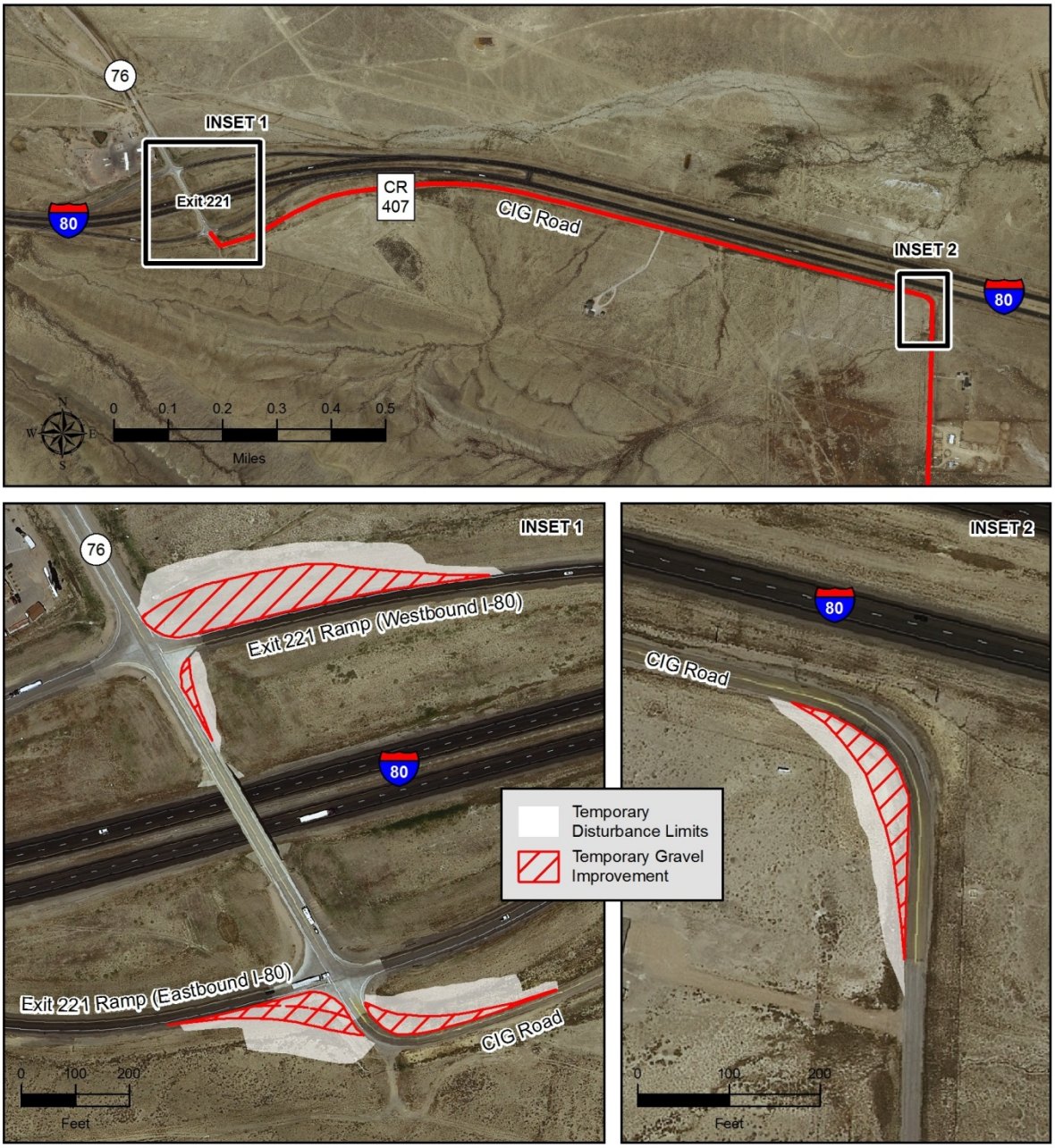

Figure 7. Interstate 80 Exit 221 Temporary Improvements

Attachment B. Traffic Study

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Acronym List

ADT	average daily traffic
CCSM	Chokecherry and Sierra Madre
CCSM Project	Chokecherry and Sierra Madre Wind Energy Project
EIS	Environmental Impact Statement
HCM	Highway Capacity Manual
LOS	level of service
pc/h/ln	passenger cars/hour/lane
PCW	Power Company of Wyoming LLC
ROD	Record of Decision
TMC	turning movement counts
TRB	Transportation Research Board
TWSC	two-way stop controlled
WYDOT	Wyoming Department of Transportation

1.0 Introduction

PCW studied traffic on public roads in the vicinity of the CCSM Project Site to identify potential impacts from construction, operations, maintenance and decommissioning. This traffic study accounts for:

- Existing traffic levels;
- CCSM Project deliveries and workforce commuting;
- PCW's transportation pan; and
- New and improved infrastructure proposed for the CCSM Project.

To complete the traffic analysis, traffic profiles were created and reviewed for the peak years during construction, operations, maintenance and decommissioning of the CCSM Project. The CCSM Project peak years are estimated to be the following:

- 2015 (Construction Year Two): peak of construction traffic before the West Sinclair Rail Facility begins operations
- 2016 (Construction Year Three): peak of construction traffic with the West Sinclair Rail Facility in operation, and when most of the workforce traffic is using the CCSM Project South Entrance
- 2017 (Construction Year Four): peak of construction traffic with the West Sinclair Rail Facility in operation, and when most of the workforce traffic is using the CCSM Project North Entrance
- Operations and Maintenance Typical Year: significant peaks are not anticipated during operations and maintenance
- Decommissioning Year Two: peak of decommissioning traffic

Following establishment of the CCSM Project peak years, peak traffic hours were identified and evaluated. A common method for evaluating the effectiveness of transportation infrastructure against traffic volumes is by level of service (LOS). Defined within the *Highway Capacity Manual* (HCM) (TRB 2010), the LOS rating system is a measure of motorist perception of travel time, traffic density, and delay. Ratings range from LOS A (free flow, very low density, no delays) to LOS F (highly restricted flow, very high density, significant delays). Evaluation of the peak traffic hours for the CCSM Project determined instances during construction where traffic generated by the CCSM Project may exceed the capacity of the nearby road network causing the level of service at some intersections to exceed LOS D. As such, PCW identified methods for mitigating these instances. Outside of peak hours, traffic will be far lower and is not expected to change current conditions or levels of service; therefore, off-peak traffic mitigation is not necessary.

In determining traffic effects of the CCSM Project, this traffic study evaluates only the traffic directly generated by the CCSM Project. Traffic caused indirectly by the CCSM Project due to induced businesses or other socioeconomic effects is not included due to the uncertainty of what that indirect traffic may be. However, while the traffic study focuses only on direct effects, it was designed to be conservative. The study assumes that workers commuting to and

from the CCSM Project Site will commute during existing peak hours and that the construction schedule each year will be compressed based on the BLM timing stipulations in the ROD. While it is not likely that the CCSM Project morning and evening commuting peak will coincide with the current local peaks or that all timing stipulations in the ROD will apply each year and in all locations, PCW intentionally applied these assumptions to create a more conservative analysis.

2.0 Existing Traffic

PCW conducted an infrastructure analysis to identify roads in the vicinity of the CCSM Project Site that may be used in connection with the CCSM Project, i.e. for deliveries or workforce commuting (Attachment A to the CCSM Project Transportation Management Plan). Once the type and locations of the roads around the CCSM Project Site were identified, PCW evaluated the current use of these roads, including traffic volumes and traffic operations, as described below.

2.1 Volume

As part of this traffic study, PCW performed an analysis of the existing traffic conditions in the vicinity of the CCSM Project Site. Existing traffic volume data was collected at multiple key intersections along potential travel routes through Rawlins and Sinclair during the morning (AM) and evening (PM) peak weekday hours. The data collected in December 2008 for these intersections included turning movement counts (TMC) and daily traffic data. Additional average daily traffic (ADT) volumes for the summer were collected in August 2010.

The TMC data provide distribution information for vehicles entering and exiting key intersections to determine the existing travel patterns in the area. The intersections where counts were taken are all public roads, including the Interstate 80 on- and off-ramps at exits 211, 214, and 221, and several intersections that may be affected by construction traffic along US287 and WY71, as shown in Figure 1 of Exhibit A (Traffic Volume Diagrams). The figure also shows the number of vehicles making each movement during the existing AM and PM peak hours. These volumes serve as the basis for the existing conditions analysis.

Daily counts are used to identify the average daily through-traffic along a corridor throughout an entire day. Table 1 shows the bi-directional (eastbound plus westbound, or northbound plus southbound) daily traffic volumes at several locations near the CCSM Project Site. These values represent a typical weekday traffic level for the road. The daily counts shown in Table 1 were extrapolated from data collected by PCW in December 2008 and August 2010, and data collected by WYDOT in 2009 (WYDOT 2009).

Table 1. Daily Count Data

Count Location	Nearby Intersection	December ADT	August (Peak) ADT
Interstate 80 at MP 208.65[1]	Spruce Street interchange	9,000[3]	14,400[3]
Spruce Street[1]	West of 4th Street	5,500[3]	9,100[3]
WY71	South of Interstate 80 bridge	250[2]	450[4]
WY76	North of truck stop	N/A	490[4]
WY76	North of westbound off-ramp	N/A	1,830[4]
CR407 (CIG Road)	South of Interstate 80	N/A	120[4]

Notes: [1] http://www.dot.state.wy.us/home/planning_projects/Traffic_Data.default.html
[2] Collected in 2008
[3] Collected in 2009
[4] Collected in 2010

Based on the assumption that peak hour traffic volumes are roughly 10 percent of daily totals, Interstate 80 is expected to have traffic volumes of approximately 1,500 vehicles per hour in both directions (375 passenger cars/hour/lane (pc/h/ln)), assuming equal distribution) at peak times. Using the HCM methodology, a four-lane interstate like Interstate 80 (two lanes in each direction) with an estimated free flow speed of 70 miles per hour has a maximum capacity of 770 pc/h/ln to maintain a LOS A rating, and 1,690 pc/h/ln to maintain the minimally acceptable LOS C rating. For this analysis, 375 pc/h/ln is clearly within the LOS A rating.

According to the HCM, two-lane highways have a typical capacity of 1,700 passenger cars per hour per direction to maintain a LOS C rating or better. The ADT volume on WY71, based on data collected in December 2008, is 450 vehicles, which is a LOS A rating and well under capacity for a two-lane highway.

In addition to the data shown in Table 1, PCW collected daily traffic volumes at two locations between September and November of 2010 and between April and October of 2011 to determine the traffic fluctuations due to seasonal and recreational traffic. These additional counts were collected at WY71 just south of Interstate 80 overpass (2010 only), and CR401 near the proposed Haul Road crossing location.

For the data collected in 2010, a significant peak occurred along WY71 and CR401 during two weekends in October. The maximum volume was nearly 800 vehicles per day on WY71 and 580 vehicles per day at on CR401. The maximum hourly volume during the two-month period of combined northbound and southbound traffic was 60 vehicles per hour on WY71 and 45

vehicles per hour on CR401. These peak traffic volumes were short-lived and only occurred on two weekends in October.

Aside from the two peak weekends in 2010, the ADT on WY 71 was 465 vehicles per day consistent with the data collected in December 2008. On CR401, the ADT in 2010 was 230 vehicles per day with an average combined northbound and southbound peak hour volume of 10 vehicles per hour in the AM peak and 15 vehicles per hour in the PM peak. The data collected over six months in 2011 on CR401 had an even lower daily traffic volume (160 vehicles per day). The 2010 and 2011 data in conjunction with the 2008 data show that even during the peak times, the maximum volume of traffic is still well under the capacity of a two-lane road and WY71 and CR401 operate at a LOS A rating.

2.2 Operating Conditions

In accordance with the HCM, operating conditions on roads are a function of the delay experienced by drivers at intersections. Traffic operations for key signalized and un-signalized intersections in the vicinity of the CCSM Project Site were analyzed using the methods described in the HCM. Essentially, the traffic data were input into analysis software (HCS+ for stop-controlled intersections and Synchro for signalized intersections) to determine the LOS rating. For signalized intersections, the delay for each individual turning movement is evaluated, then approaches are graded, and finally the intersection as a whole is given a single LOS rating. For two-way stop controlled (TWSC) intersections, each intersection is assigned a single LOS rating based on the minor approach with the lowest LOS. Table 2 shows the criteria used to assign a LOS to each intersection.

Table 2. LOS Criteria for Signalized and TWSC Intersections

LOS	Control Delay per Vehicle (sec)	
	Signalized	Unsignalized
A	≤ 10	0 – 10
B	> 10 – 20	> 10 – 15
C	> 20 – 35	> 15 – 25
D	> 35 – 55	> 25 – 35
E	> 55 – 80	> 35 – 50
F	> 80	> 50

The existing average AM and PM peak hour intersection LOS rating and delay (average delay in seconds per vehicle) are listed in Table 3. Based on the results of the analysis, all of the intersections operate at LOS B or better during the peak hours of the day, indicating that there are no existing operational deficiencies. The analysis of the existing operating conditions for roads in the vicinity of the CCSM Project Site did not identify any roads with levels of congestion that warrant additional capacity.

Table 3. Public Intersection LOS Analysis – Existing Conditions (2008)

Intersection	Morning Peak (AM)		Afternoon Peak (PM)	
	Delay (sec)	LOS	Delay (sec)	LOS
US287 Bypass/Higley Boulevard and 3rd Street	10.1	B	10.1	B
US287 Bypass/Higley Boulevard and Cedar Street[1]	15.0	B	15.5	B
WY71 and Jackson Street	9.0	A	9.0	A
WY71 and Washington Street	9.1	A	9.3	A
WY71/Locust Street and South Higley Boulevard	10.1	B	10.1	B
Interstate 80 EB and Spruce Street	9.2	A	10.6	B
Interstate 80 WB and Spruce Street	8.9	A	9.7	A
Interstate 80 EB and South Higley Boulevard	10.3	B	10.4	B
Interstate 80 WB and South Higley Boulevard	11.2	B	11.9	B
Interstate 80 EB and WY76	9.1	A	9.2	A
Interstate 80 WB and WY76	8.7	A	8.8	A
Interstate 80 WB and Johnson Road	9.4	A	10.2	B
Interstate 80 EB and Johnson Road	10.3	B	11.7	B
Notes: [1]Signalized intersection				

3.0 Construction Traffic Effects

After analyzing the existing traffic on the roads in the vicinity of the CCSM Project Site, PCW evaluated the effects of traffic generated by the CCSM Project during construction. This section includes a description of the type of traffic that will be generated by the CCSM Project and an evaluation of the CCSM Project traffic effects.

3.1 Construction Traffic

To understand the potential effects of CCSM Project operations and maintenance traffic, PCW evaluated the type and amount of traffic the CCSM Project is expected to generate. PCW has defined two general types of trips generated by the CCSM Project during construction:

1. The delivery of equipment, components, service vehicles, and materials to the CCSM Project Site; and
2. The daily commute of the labor force to the CCSM Project Site.

3.1.1 Deliveries

PCW intends to bring much of the construction materials, components and equipment to the CCSM Project Site via rail. These items will arrive at the West Sinclair Rail Facility and will be off-loaded to an adjacent laydown yard for storage until they are transported by truck to locations within the CCSM Project Site. The vehicles and equipment necessary to transport deliveries from off-site, as well as from the West Sinclair Rail Facility are described below.

Wind Turbine Components

Each complete wind turbine generator (WTG) consists of three or four tower sections, three blades, a nacelle, a hub, a rotor cover, and smaller miscellaneous parts and equipment. PCW estimates that the majority of WTG components (approximately 80%) will arrive at the CCSM Project Site via the West Sinclair Rail Facility. However, some wind turbine components may not meet railroad requirements and will need to be delivered to the CCSM Project Site by long-distance trucking over public roads. Also, near the end of each construction season there may be instances where some additional components are required to complete the remaining turbines, but not in sufficient quantities to fill a unit train. In those instances, the required components will be transported to the CCSM Project Site using long-distance trucking.

The WTG components that are oversize typically have specialized trailers attached to heavy-haul semi tractors. Nacelles use lowboy/flatbed trailers, often with 19 axles or more. Tower sections may also use flatbed trailers, with base sections often transported using Schnabel-type trailer attachments. Blades will use telescoping trailers and will be transported individually or in pairs. For purposes of this traffic study, it was assumed that blades will be transported individually.

Aggregate

For this traffic study, PCW assumed that aggregate would be hauled by belly-dump trucks with a 24 cubic yard volume. Various classifications of aggregate will be used for the construction of the CCSM Project as described in the Road Rock Quarry Site-specific Plan of Development. Some aggregate will be sourced from the Road Rock Quarry, and some from sources outside the CCSM Project Site. Trucks bringing aggregate from off-site are assumed to enter the CCSM Project Site from Interstate 80, exit 221, the North Entrance.

Additional Materials

A variety of other vehicles will deliver the remaining construction materials required for the CCSM Project. Many, like cement, sand, and fly ash and aggregates needed for the concrete batch plants, will use trucks with dump trailers suitable for the loads they are carrying. Prior to construction of the West Sinclair Rail Facility, materials like steel rebar and electrical components will be transported to the CCSM Project Site on flatbed trailers. After the rail facility is built and becomes operational, these components will be delivered primarily by rail.

In 2014 and 2015, water trucks (likely 12,000 gallon capacity) with dispersion nozzles may haul water from off-site sources likely in Rawlins or Sinclair to the CCSM Project Site. This water will be used for dust control and road construction. After the water facilities within the CCSM Project Site become operational, it was assumed that water will be derived from on-site sources.

Heavy Equipment

Heavy equipment consists of WTG assembly haul trucks, graders, dozers, rippers, backhoes, and front-end loaders, as well as mobile cranes that will be used for WTG erection. These pieces of heavy equipment will be transported to the CCSM Project Site by trucks with suitably-designed trailers such as low boys. There will be a peak of approximately 300 pieces of heavy equipment on the CCSM Project Site during construction. Most of this equipment will be trucked to the CCSM Project Site over the course of the first few months of the construction season and hauled back out at the end of the construction year. It is assumed that once these pieces of heavy equipment are delivered to the CCSM Project Site, they will remain on site until they are no longer required and will be incrementally removed as the demand for heavy equipment winds down over the course of the construction year.

3.1.2 Truckloads

Based on the CCSM Project construction schedule and delivery requirements described above, PCW developed the estimated total number of truckloads required to build the CCSM Project by year (section 6.0 of the Transportation Management Plan). The total truckloads include construction materials, components, and equipment transported to the CCSM Project Site, as well as trips made off-site by personnel in the course of completing their work, i.e. not commuting. The truckloads listed in section 6.0 of the Transportation Management Plan also account for any subsequent hauling of components and materials to their final destination within the CCSM Project Site; including internal movements from the West Sinclair Rail Facility, Road Rock Quarry, water stations, batch plants and laydown areas. On-site trucking was

included in the analysis to evaluate potential impacts to CR401 at the Haul Road crossing. It is important to note that the truckloads are not equivalent to trips, as trucks will need to return to their origin after delivering their load.

3.1.3 Labor Force

Another significant source of traffic during construction of the CCSM Project is the daily commute to the CCSM Project Site by the labor force. PCW expects the labor force to use a variety of personal vehicles to commute to the CCSM Project Site. Once workers arrive on-site, they will use CCSM Project pick-up trucks or vans to move to locations within the CCSM Project Site. Daily commuting traffic is expected to make up between 60 and 80 percent of the total construction traffic. The labor force breakdown included in section 3.2 of the Transportation Management Plan was used to determine the total number of workers arriving at the CCSM Project Site daily during construction.

For purposes of this traffic study, PCW conservatively assumed that the construction labor force will commute each day from the surrounding communities, rather than originating from temporary on-site housing, or using public transportation or local bussing. For purposes of this study, PCW assumed the labor force would be housed in the surrounding communities as:

- 50 percent: Rawlins Area
- 40 percent: East of Rawlins (Laramie area)
- 10 percent: South of Rawlins (Saratoga area)

The percentages are assumed to be constant regardless of the labor force size or year of construction. It is further assumed that each worker will make one trip to and one trip from the CCSM Project Site per day. For the workers traveling from outside the Rawlins area, it is assumed that there will be 1.5 workers per vehicle due to carpooling.

For workers originating in Rawlins, the general assumptions made regarding what parts of town they would be coming from (based upon locations of residential properties and hotels) are:

- 56 percent: Near 287/Cedar
- 24 percent: South of Railroad, north of Interstate 80
- 20 percent: Near Spruce Street

PCW intends to allow the construction workforce to report to whichever CCSM Project Site entrance is closest to their work, i.e. the North Entrance off Interstate 80 at Exit 221 (Figure 1) or the South Entrance off CR401 (Figure 2). To support the traffic study, PCW developed an estimate of the construction workforce that would muster at each entrance based on the yearly construction schedule (Table 4).

3.1.4 Other

While there will likely be other types of traffic associated with construction of the CCSM Project (e.g., courier deliveries and inspections), such traffic is not of sufficient volume to affect the traffic study findings and was therefore not considered in the analysis.

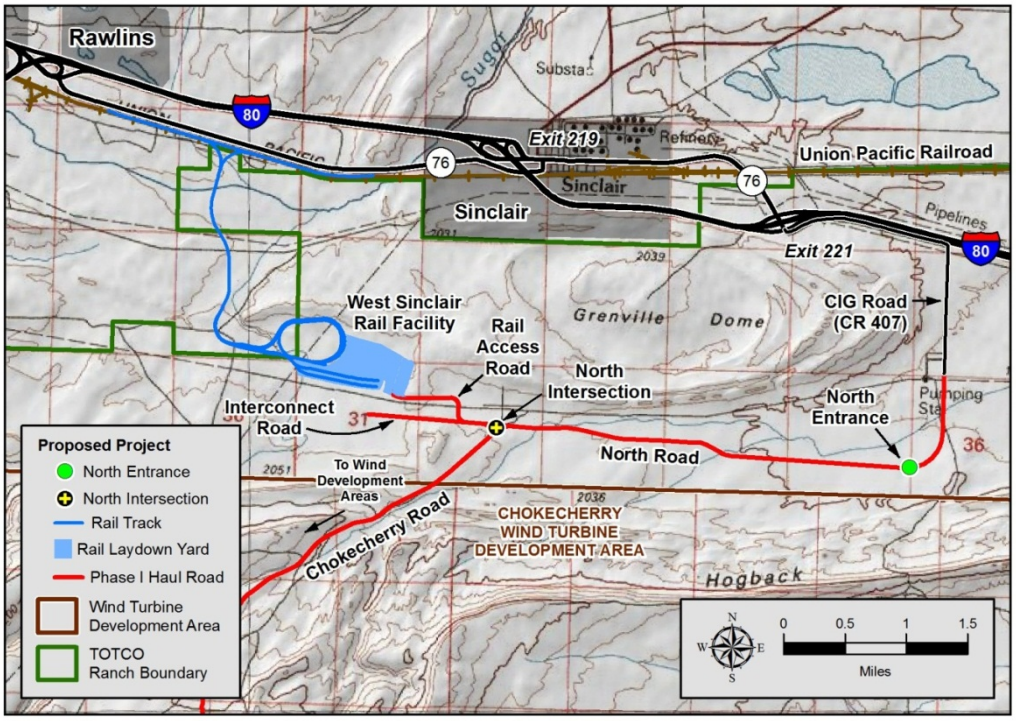

Figure 1. CCSM Project North Entrance

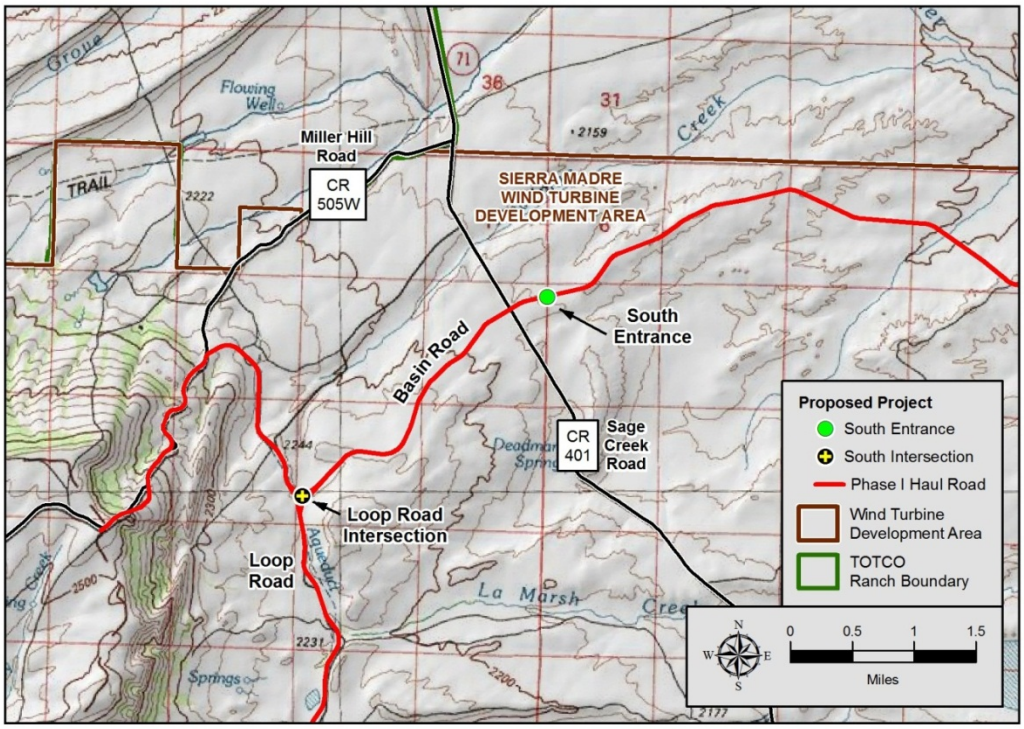

Figure 2. CCSM Project South Entrance

Table 4. Percent of Workforce By Entrance

Year (during peak)	North Entrance	South Entrance
2014	82%	18%
2015	31%	69%
2016	30%	70%
2017	78%	22%
Phase II Year 1	26%	74%
Phase II Year 2	37%	63%
Phase II Year 3	100%	0%

3.2 Daily Traffic Projection

Based on the construction traffic analysis and the CCSM Project schedule, a projection of the average daily traffic during construction of the CCSM Project was created. Using the truckload estimate described in section 3.1.2, each truckload was assigned to a month based on the CCSM Project schedule and then truck trips were calculated by assuming that each truckload generates two trips, one delivery and one return. The monthly truck trips were then assumed to be evenly distributed throughout the month and were divided by the total number of working days in each month to determine the daily trips. Similarly, the monthly workforce numbers described in section 3.1.3 were used to determine daily worker trips. The daily commuting trips were generated by assuming that each worker generates two trips (one entering and one exiting) each day. The trips generated by workers outside the Rawlins area were then decreased by one-third to account for carpooling of 1.5 workers per vehicle. Table 5 and Table 6 show the average daily traffic projection for construction of Phase I and Phase II of the CCSM Project, respectively.

The traffic patterns in 2014 and 2015 differ somewhat from the other construction years due to the availability of the Road Rock Quarry (later in 2014) and the West Sinclair Rail Facility (end of 2015). During this time, the percentage of the CCSM Project traffic related to the transport of construction components and materials is far higher than in later years. To insure that the traffic effects of construction of the CCSM Project were fully analyzed, PCW chose to study the construction traffic impacts of three peak months due to the difference in the traffic characteristics. PCW analyzed the following traffic cases for construction of the CCSM Project:

- 2015 (Construction Year Two): peak of construction traffic before the West Sinclair Rail Facility begins operations
- 2016 (Construction Year Three): peak of construction traffic with the West Sinclair Rail Facility in operation, and when most of the workforce traffic is using the CCSM Project South Entrance

- 2017 (Construction Year Four): peak of construction traffic with the West Sinclair Rail Facility in operation, and when most of the workforce traffic is using the CCSM Project North Entrance

Table 5. Total Daily Traffic Projection – Phase I Construction

Traffic Type	Trips						
	May	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**
2014							
Delivery Trucks[1]	0	0	0	0	37	37	20
Aggregate	*0*	*0*	*0*	*0*	*37*	*37*	*20*
WTG Components[2]	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Other Deliveries	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Labor Force Commute	0	0	0	0	107	107	107
Total	**0**	**0**	**0**	**0**	**144**	**144**	**127**
2015							
Delivery Trucks[1]	0	0	331	291	183	51	0
Aggregate	0	0	330	285	177	46	0
WTG Components[2]	0	0	0	0	0	0	0
Other Deliveries	0	0	1	6	6	5	0
Labor Force Commute	59	121	408	487	427	309	136
Total	**59**	**121**	**739**	**778**	**610**	**360**	**136**
2016							
Delivery Trucks[1]	14	22	204	188	105	91	0
Aggregate	0	0	171	158	84	81	0
WTG Components[2]	12	21	22	20	11	0	0
Other Deliveries	2	1	11	10	10	10	0
Labor Force Commute	157	926	1,253	1,258	999	392	178
Total	**171**	**948**	**1,457**	**1,446**	**1,104**	**483**	**178**

Traffic Type	Trips						
	May	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**
2017							
Delivery Trucks[1]	15	22	139	129	91	0	0
Aggregate	0	0	109	101	69	0	0
WTG Components[2]	14	21	22	20	14	0	0
Other Deliveries	1	1	8	8	8	0	0
Labor Force Commute	219	602	1,285	1,290	1,167	560	299
Total	**234**	**624**	**1,424**	**1,419**	**1,258**	**560**	**299**
Notes: [1]Sum of all delivery trucks, including aggregate, WTG components, and other. [2]Excludes pilot cars							

Table 6. Total Daily Traffic Projection – Phase II Construction

Traffic Type	Trips						
	May	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**
Phase II - Year 1							
Delivery Trucks[1]	0	0	1	45	114	70	0
Aggregate	*0*	*0*	*0*	*44*	*107*	*63*	*0*
WTG Components[2]	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Other Deliveries	*0*	*0*	*1*	*1*	*7*	*7*	*0*
Labor Force Commute	111	144	319	416	356	248	125
Total	**111**	**144**	**320**	**461**	**470**	**318**	**125**
Phase II - Year 2							
Delivery Trucks[1]	65	124	259	259	183	0	0
Aggregate	0	0	146	146	107	0	0
WTG Components[2]	65	100	100	100	63	0	0
Other Deliveries	0	2	13	13	13	0	0
Labor Force Commute	319	917	1,185	1,190	976	461	227
Total	**384**	**1,041**	**1,444**	**1,449**	**1,159**	**461**	**227**

Traffic Type	Trips						
	May	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**
Phase II - Year 3							
Delivery Trucks[1]	53	102	206	206	158	0	0
Aggregate	0	0	98	98	98	0	0
WTG Components[2]	53	100	100	100	52	0	0
Other Deliveries	0	2	8	8	8	0	0
Labor Force Commute	261	666	1,060	1,065	1,082	516	283
Total	**314**	**768**	**1,266**	**1,271**	**1,240**	**516**	**283**

Notes: [1]Sum of all delivery trucks, including aggregate, WTG components, and other.
[2]Excludes pilot cars

3.3 August 2015 Traffic Case

Using the daily traffic projection from section 3.2 and the existing conditions defined in section 2.0, PCW studied the effects of the CCSM Project construction on the public roads in the vicinity of the CCSM Project Site. The analysis for the peak of construction prior to operation of the West Sinclair Rail Facility (August 2015) is presented below.

3.3.1 Trip Generation

The first step in analyzing the traffic impacts to public roads in the vicinity of the CCSM Project Site is to estimate the daily trips required. This data is presented in Table 5 above for construction of Phase I of the CCSM Project. For the August 2015 traffic case, PCW used the August 2015 data. The daily truck trips were then split into eleven equal hours to signify an even distribution over an eleven-hour work day and the total daily AM worker trips were grouped for the morning peak hour and the total daily PM worker trips were grouped for the evening peak hour. All construction material trips were assumed to occur by truck because the West Sinclair Rail Facility would still be under construction.

3.3.2 Trip Distribution

The origin and destination for each trip was determined for each CCSM Project construction trip in the peak month. Labor force commute trips were determined based upon the origin assumptions and destination options described in Section 3.1.3. During 2015, PCW estimates that 31% of the workforce will commute to the CCSM Project's North Entrance via CIG Road, and 69% will use the Southern Entrance via Sage Creek Road.

3.3.3 Trip Assignment

After trips were distributed between likely origins and destinations, they were assigned to specific roads and added to existing traffic levels to allow for analysis of the resulting intersection conditions. Construction delivery vehicles arriving from east or west of Rawlins,

were routed on Interstate 80, exiting on WY76 (exit 221), and traveling along CIG Road to the CCSM Project's North Entrance where they accessed the CCSM Project Haul Road. Local aggregate deliveries from off-site were assumed to avoid the City of Rawlins by entering Interstate 80 at exit 209 and then traveling east to exit 221, and then along CIG road to the CCSM Project Haul Road. No delivery traffic was assumed to arrive from south of the CCSM Project Site or north of Rawlins. It was assumed that workers accessing the CCSM Project North Entrance would use CR407 and the workers accessing the CCSM project South Entrance would use CR401.

3.3.4 Analysis Results

Once the turning movement volumes were generated for the existing traffic and the CCSM Project traffic, an operating condition analysis was completed for the peak case of August 2015. The existing plus CCSM Project traffic analysis used the same methods for calculating intersection LOS as described in Section 2.2. The LOS and delay (in seconds per vehicle) resulting from the analysis for the peak of 2015 is listed in Table 7 and shown in Figure 2 of Exhibit A. In 2015, the operations of all intersections will operate at LOS C or better. As such, no mitigation measures will likely be required.

Table 7. Public Intersection LOS Analysis – August 2015 Peak

Intersection	Morning Peak (AM)		Afternoon Peak (PM)	
	Delay (sec)	LOS	Delay (sec)	LOS
US287 Bypass/Higley Boulevard and 3rd Street	10.1	B	10.1	B
US287 Bypass/Higley Boulevard and Cedar Street[1]	14.2	B	16.0	B
WY71 and Jackson Street	16.9	C	14.0	B
WY71 and Washington Street	14.8	B	16.8	C
WY71/Locust Street and South Higley Boulevard	13.4	B	11.0	B
Interstate 80 EB and Spruce Street	9.6	A	10.6	B
Interstate 80 WB and Spruce Street	8.9	A	9.7	A
Interstate 80 EB and South Higley Boulevard	10.5	B	13.2	B
Interstate 80 WB and South Higley Boulevard	11.2	B	12.9	B
Interstate 80 EB and WY76	10.5	B	12.6	B
Interstate 80 WB and WY76	9.1	A	10.1	B
Interstate 80 WB and Johnson Road	9.6	A	10.4	B
Interstate 80 EB and Johnson Road	10.6	B	12.0	B
Notes: [1]Signalized intersection				

3.4 July 2016 Traffic Case

Using the traffic projection from section 3.2 and the existing conditions defined in section 2.0, PCW studied the effects of the CCSM Project construction on the public roads in the vicinity of the CCSM Project Site. The analysis for the peak of construction during the highest month of construction activity (July 2016) while the majority of the workforce is using the South Entrance is presented below. This analysis used the same process described in Section 3.3.

3.4.1 Trip Generation

Peak hour workforce commuting and delivery trips were determined in the same manner described in Section 3.3 using the July 2016 data from Table 5.

3.4.2 Trip Distribution

PCW determined the likely origin and destination for each CCSM Project construction trip based on the type of component or material. Labor force commuting trips were determined based on the assumptions described in Section 3.1.3. During 2016, PCW estimates that 30% of the

workforce will commute to the CCSM Project North Entrance via CR407, and 70% will use CR401 to reach the CCSM Project South Entrance. The truck deliveries were assumed to use the CCSM Project North Entrance.

3.4.3 Trip Assignment

After trips were distributed between likely origins and destinations, they were assigned to specific roads and added to existing traffic to allow analysis of road operating conditions. The majority of the construction delivery vehicles arriving from east or west of Rawlins, were routed on Interstate 80, exiting on WY76 (exit 221), and traveling along CIG Road to the CCSM Project's North Entrance where they accessed the CCSM Project Haul Road. A small number of delivery vehicles were assumed to arrive from north of Rawlins, using the US287 bypass to Cedar Street, then onto Interstate 80 east to exit 221, and then to CR407 and the CCSM Project Haul Road. No delivery traffic was assumed to arrive from south of the CCSM Project Site. Trucks destined for the Miller Hill area of the Sierra Madre wind development area were assumed to use the Haul Road and cross CR401.

3.4.4 Analysis Results

The LOS and delay (in seconds per vehicle) resulting from the July 2016 case are listed in Table 8 and associated traffic volumes are shown in Figure 3 of Exhibit A. The operating conditions for most of the intersections are at LOS C or better with the addition of project traffic for both peak periods, meaning no mitigation measures for these intersections should be required.

The WY71 intersections at Jackson Street and Washington Street may see significant wait times during both morning and evening commutes, and the intersection at Locust Street/South Higley Boulevard are expected to be at LOS D during the morning peak. Additionally, the Interstate 80 eastbound ramp at South Higley Boulevard is anticipated to be at LOS D during the evening commute. The intersections with LOS D and F ratings will be mitigated as described in Section 6.0.

Table 8. Public Intersection LOS Analysis – July 2016 Peak

Intersection	Morning Peak (AM)		Afternoon Peak (PM)	
	Delay (sec)	LOS	Delay (sec)	LOS
US287 Bypass/Higley Boulevard and 3rd Street	10.1	B	10.1	B
US287 Bypass/Higley Boulevard and Cedar Street[1]	13.3	B	16.8	B
WY71 and Jackson Street	**884.6**	**F**	**51.2**	**F**
WY71 and Washington Street	**425.8**	**F**	**135.4**	**F**
WY71/Locust Street and South Higley Boulevard	**25.9**	**D**	13.7	B
Interstate 80 EB and Spruce Street	10.2	B	10.6	B
Interstate 80 WB and Spruce Street	9.0	A	9.8	A
Interstate 80 EB and South Higley Boulevard	10.8	B	**29.4**	**D**
Interstate 80 WB and South Higley Boulevard	12.9	B	15.4	C
Interstate 80 EB and WY76	14.6	B	20.3	C
Interstate 80 WB and WY76	9.7	A	12.2	B
Interstate 80 WB and Johnson Road	9.5	A	10.3	B
Interstate 80 EB and Johnson Road	10.6	B	11.9	B
Notes: [1]Signalized intersection				

3.5 July 2017 Traffic Case

Using the traffic projection from section 3.2 and the existing conditions defined in section 2.0, PCW studied the effects of the CCSM Project construction on the public roads in the vicinity of the CCSM Project Site. The analysis for the peak of construction during the highest month of construction activity (July 2017) while the majority of the workforce is using the North Entrance is presented below. This analysis used the same process described in Section 3.3.

3.5.1 Trip Generation

Peak hour workforce commuting and delivery trips were determined in the same manner described in Section 3.3 using the July 2017 data from Table 5.

3.5.2 Trip Distribution

PCW determined the likely origin and destination for each CCSM Project construction trip based on the type of component or material. Labor force commuting trips were determined based on the assumptions described in Section 3.1.3. During 2017, PCW estimates that 78% of the

workforce will commute to the CCSM Project North Entrance via CR407, and 22% will use CR401 to reach the CCSM Project South Entrance. The truck deliveries were assumed to use the CCSM Project North Entrance.

3.5.3 Trip Assignment

Trip assignments are the same as those described in section 3.4.3.

3.5.4 Analysis Results

The LOS and delay (in seconds per vehicle) resulting from the July 2017 case are listed in Table 9 and associated volumes are shown in Figure 4 of Exhibit A. The Interstate 80 eastbound exit at Wyoming Highway 76 was found to have an LOS F rating during both the morning and afternoon peaks, and the westbound ramp at the same intersection also had a LOS F rating during the afternoon peak. The intersections with LOS F ratings will be mitigated as described in section 6.0.

Table 9. Public Intersection LOS Analysis – July 2017 Peak

Intersection	Morning Peak (AM)		Afternoon Peak (PM)	
	Delay (sec)	LOS	Delay (sec)	LOS
US287 Bypass/Higley Boulevard and 3rd Street	10.1	B	10.1	B
US287 Bypass/Higley Boulevard and Cedar Street[1]	12.2	B	19.0	B
WY71 and Jackson Street	15.1	C	13.1	B
WY71 and Washington Street	14.6	B	15.8	C
WY71/Locust Street and South Higley Boulevard	15.3	C	12.8	B
Interstate 80 EB and Spruce Street	12.7	B	10.6	B
Interstate 80 WB and Spruce Street	9.3	A	10.3	B
Interstate 80 EB and South Higley Boulevard	12.1	B	12.6	B
Interstate 80 WB and South Higley Boulevard	12.5	B	13.8	B
Interstate 80 EB and WY76	**960.1**	**F**	**271.0**	**F**
Interstate 80 WB and WY76	14.8	B	**52.2**	**F**
Interstate 80 WB and Johnson Road	9.5	A	10.2	B
Interstate 80 EB and Johnson Road	10.4	B	11.7	B

Notes: [1]Signalized intersection

4.0 Operations and Maintenance Traffic Effects

After analyzing the existing traffic on the roads in the vicinity of the CCSM Project Site, PCW evaluated the effects of traffic generated by the CCSM Project during operations and maintenance. This section includes a description of the type of traffic that will be generated by the CCSM Project and an evaluation of the CCSM Project traffic effects.

4.1 Operations and Maintenance Traffic

To understand the potential effects of CCSM Project operations and maintenance traffic, PCW evaluated the type and amount of traffic the CCSM Project is expected to generate. They types of trips generated during operations are likely to be the same as those generated during construction; however they will be substantially smaller in volume. PCW has defined two general types of trips generated by the CCSM Project during operations and maintenance:

1. The delivery of equipment, components, service vehicles, and materials to the CCSM Project Site; and
2. The daily commute of the labor force to the CCSM Project Site.

4.1.1 Types of Trips

During operations and maintenance, the traffic expected on a daily basis will be almost entirely from the labor force, either reporting to and from the site or making trips during the business day. Some additional deliveries of large components will occur at times, however not on such a frequent basis as to affect the daily traffic patterns of the surrounding public roads. To create a conservative analysis, PCW assumed that the entire operations and maintenance labor force would commute to the CCSM Project Site from Rawlins.

4.1.2 Labor Force

PCW is estimating that the Project will have a staff of approximately 114 full-time employees during operations. The labor force is expected to commute to the CCSM Project Site using personal vehicles. For the purposes of this traffic study, it was assumed that all labor force traffic will use Interstate 80 exit 221 to access the CCSM Project Site. Trips made by the labor force during the business day are expected to occur in Project pick-up trucks. Additional trips caused by deliveries to the CCSM Project Site will be few in number and occur only on an as-needed basis.

4.2 Operations and Maintenance Typical Year Traffic Case

Based on the operations and maintenance activities and the type of traffic anticipated, PCW estimated the volume of traffic generated by the CCSM Project and the subsequent effects on the public roads in the vicinity of the CCSM Project Site. This analysis used the same process described in Section 3.3.

4.2.1 Trip Generation

Traffic during CCSM Project operations and maintenance is not expected to have significant peaks; therefore, PCW performed the traffic analysis on a typical day. This included the daily

commute of 114 employees, which for the purposes of this traffic study are assumed to work a single shift, meaning all workers arrive to and depart from the site during the same peak hours. PCW also assumed that the labor force may make additional trips to and from the CCSM Project Site to the surrounding communities during the business day. Assuming each employee makes two such off-site trips per day, these would not occur during the peak hour and would not change the peak traffic levels; therefore, the peak commuting hours were the volumes used in this analysis.

4.2.1 Trip Distribution

For purposes of this analysis, PCW assumed that 100 percent of the operations and maintenance workforce will commute to the CCSM Project North Entrance.

4.2.2 Trip Assignment

It was assumed that workers accessing the CCSM Project North Entrance would use CR407.

4.2.3 Analysis Results

The LOS and delay (in seconds per vehicle) resulting from the July 2017 case are listed in Table 10 and associated volumes are shown in Figure 5 of Exhibit A. The analysis concluded that the operations for all intersections studied are at LOS B or better, which indicates that operations and maintenance of the CCSM Project will have little overall effect to the public roads in the vicinity of the CCSM Project Site and that no mitigation measures are required.

Table 10. Public Intersection LOS Analysis – Operations

Intersection	Morning Peak (AM)		Afternoon Peak (PM)	
	Delay (sec)	LOS	Delay (sec)	LOS
US287 Bypass/Higley Boulevard and 3rd Street	10.1	B	10.1	B
US287 Bypass/Higley Boulevard and Cedar Street[1]	13.9	B	16.3	B
WY71 and Jackson Street	9.0	A	9.0	A
WY71 and Washington Street	9.2	A	9.4	A
WY71/Locust Street and South Higley Boulevard	10.5	B	10.5	B
Interstate 80 EB and Spruce Street	9.8	A	10.6	B
Interstate 80 WB and Spruce Street	9.0	A	9.7	A
Interstate 80 EB and South Higley Boulevard	10.6	B	10.4	B
Interstate 80 WB and South Higley Boulevard	11.6	B	11.7	B
Interstate 80 EB and WY76	9.1	A	11.5	B
Interstate 80 WB and WY76	8.7	A	8.8	A
Interstate 80 WB and Johnson Road	9.4	A	10.2	B
Interstate 80 EB and Johnson Road	10.3	B	11.7	B
Notes: [1]Signalized intersection				

5.0 Decommissioning Traffic Effects

After analyzing the existing traffic on the roads in the vicinity of the CCSM Project Site, PCW evaluated the effects of traffic generated by the CCSM Project during decommissioning. This section includes a description of the type of traffic that will be generated by the CCSM Project and an evaluation of the CCSM Project traffic effects.

5.1 Decommissioning Traffic

To understand the potential effects of CCSM Project decommissioning traffic, PCW evaluated the type and amount of traffic the CCSM Project is expected to generate. They types of trips generated during decommissioning are the same as those generated during construction; however, since the CCSM Project's decommissioning is anticipated to occur in thirty years, existing traffic volumes were inflated by 2 percent to account for growth in the region. This growth rate is based on growth projections for Carbon County by the Wyoming Department of

Administration and Information. PCW has defined two general types of trips generated by the CCSM Project during decommissioning:

1. The delivery and removal of equipment, components, service vehicles, and materials to the CCSM Project Site; and
2. The daily commute of the labor force to the CCSM Project Site.

5.1.1 Material/Component Requirements

The vehicles and equipment necessary to transport the decommissioning material, components, equipment, and labor force to and from the CCSM Project Site are assumed to be the same as those for construction, as described in section 3.1.

Table 11 below lists the estimated total number of truckloads required to decommission the CCSM Project, consistent with values in the EIS. These truckloads include the materials, components, and equipment to be removed from the site, as well as trips made off-site by decommissioning personnel.

For the purposes of this analysis, it is assumed that decommissioned turbine components and related materials will leave the site by truck and that the truckloads for the materials that can be recycled (steel towers, nacelles, cables) will be divided evenly, with roughly half travelling east on Interstate 80 and the other half travelling west on Interstate 80. Materials going to landfill were assumed to all travel west on Interstate 80 based upon current information regarding landfill options.

The on-site truckloads in Table 11 represent the movement of materials within the CCSM Project Site. Water trucks will move water from water stations to areas within the CCSM Project Site for dust control and revegetation. Neither the water nor aggregate truckloads are anticipated to affect the level of service at public road intersections.

TOTCO has requested that all aggregate removed from decommissioned roads be left on-site and stockpiled on TOTCO property for use during maintenance of Ranch roads. Aggregate trucks will move decommissioned aggregate to stockpiles near the Rail Facility and Operations Center sites. This was used as the base case in the analysis; however, PCW also evaluated the potential impacts if the decommissioned aggregate was removed off-site to a location near Interstate 80 exit 209. While there was a slight increase in delay there was no change in the LOS; therefore, only the base case is discussed below in section 5.2.4.

Table 11. Total Truckloads of Project Decommissioning Material

Items	Year 1	Year 2	Year 3	TOTAL
Loads Moved Off-Site				
Wind Turbine Components	5,220	5,220	4,560	**15,000**
Concrete Removal	2,231	2,148	1,862	**6,242**
Collection System Cables/Structures	81	82	71	**233**
Transmission Line Cables/Structures	644	647	559	**1,850**
Substation Components	20	54	36	**110**
Buildings/Trailers	30	20	30	**80**
Other Materials	3,719	2,960	3,321	**10,000**
Equipment Removal	1,180	1,180	1,180	**3,540**
Personnel Off-Site Trips	439	329	47	**815**
TOTAL REMOVED	**13,563**	**12,639**	**11,667**	**37,869**
On-Site Loads				
Aggregate	19,038	29,041	40,822	**88,900**
Water	2,715	2,715	2,715	**8,145**

5.1.2 Labor Force

The other significant source of traffic during decommissioning of the CCSM Project will be the daily commute to the CCSM Project Site by the labor force. Daily commuting traffic is expected to make up over 90 percent of the peak hour CCSM Project decommissioning traffic. Based on current estimates of required workers, this traffic study assumed the breakdown in Table 12 for the total labor force during decommissioning.

The routing options for the CCSM Project decommissioning workforce are assumed to be the same as those for the CCSM Project construction (section 3.1.3); however, given the lower labor force requirements, PCW made the conservative assumption that only the CCSM Project North Entrance, Interstate 80 exit 221, would be used by the decommissioning labor force.

Table 12. Peak Decommissioning Labor Force by Month

Month	Year 1	Year 2	Year 3
July	378	379	374
Aug	387	396	382
Sep	380	396	385
Oct	378	295	376
Nov	369	355	368

5.2 Decommissioning Year Two Traffic Case

Based on the decommissioning activities and the type of traffic anticipated, PCW estimated the volume of traffic generated by the CCSM Project and the subsequent effects on the public roads in the vicinity of the CCSM Project Site. This analysis used the same process described in Section 3.3.

5.2.1 Trip Generation

The estimated daily off-site trips required for each month of the CCSM Project decommissioning is provided in Table 13. The highest overall volumes of traffic occur in October of Year Two, with an average of 927 off-site vehicles trips per day. Approximately 85 percent of the traffic is due to the labor force commute, with nearly 400 trips for the AM and PM commutes. The remaining 126 daily trips associated with material removal and are assumed to occur throughout the work day. It is important to note that half of all truckloads for all decommissioning vehicles will be empty, so only half of the oversized truckloads traveling over structures will be heavy loads.

Table 13. Total Daily Traffic Projection – Decommissioning

Traffic Type	Trips						
	May	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**
Decommissioning Year One							
Removal Trucks[1]	0	0	103	105	127	142	128
Labor Force Commute	0	0	757	773	761	757	739
Total	**0**	**0**	**860**	**878**	**888**	**899**	**867**
Decommissioning Year Two							
Removal Trucks[1]	0	0	101	100	122	136	122
Labor Force Commute	0	0	757	793	793	791	710
Total	**0**	**0**	**858**	**893**	**915**	**927**	**832**
Decommissioning Year Three							
Removal Trucks[1]	0	0	90	92	116	126	122
Labor Force Commute	0	0	748	764	770	751	737
Total	**0**	**0**	**838**	**856**	**886**	**877**	**859**

Notes: [1]Sum of removal trucks, including those removing WTG components, and other material and equipment.

5.2.2 Trip Distribution

The origin and destination of each decommissioning trip in the peak month was determined based on the type of load. Labor force commute trips were determined based upon the origin assumptions and destination options described in Section 3.1.3. To create a conservative traffic analysis, it was assumed that all workers would report to the CCSM Project North Entrance. Long haul truck trips directional estimates on Interstate 80 are as described in section 5.2.1.

5.2.3 Trip Assignment

After trips were distributed between likely origins and destinations, they were assigned to specific roads and added to existing traffic to allow analysis of operational conditions during the CCSM Project decommissioning. Decommissioning vehicles departing to the east or west of Rawlins were assumed to travel CIG Road to Interstate 80 exit 221 (WY76). A small amount of vehicle traffic was assumed to depart to the north using the US287 bypass. No traffic was assumed to depart to the south of the CCSM Project Site.

5.2.4 Analysis Results

The LOS and delay (in seconds per vehicle) resulting from the decommissioning year two case are listed in Table 14 and associated volumes are shown in Figure 6 of Exhibit A. While the delay at one intersection (Interstate 80 westbound at South Higley Boulevard) did extend to LOS D, the operations for all other intersections studied are at LOS C or better. Due to the conservative assumptions used in the analysis, PCW does not anticipate that mitigation measures will be required during decommissioning; however, if mitigation measures are required they will be implemented as described in section 6.0 using any experience gained during construction.

Table 14. Public Intersection LOS Analysis – Decommissioning

Intersection	Morning Peak (AM)		Afternoon Peak (PM)	
	Delay (sec)	LOS	Delay (sec)	LOS
US 287 Bypass/Higley Boulevard and 3rd Street	12.9	B	13.2	B
US 287 Bypass/Higley Boulevard and Cedar Street	14.9	B	20.9	C
WY71 and Jackson Street	9.6	A	9.6	A
WY71 and Washington Street	10.0	A	10.4	B
WY71/Locust Street and South Higley Boulevard	13.3	B	13.2	B
Interstate 80 EB and Spruce Street	11.1	B	14.8	B
Interstate 80 WB and Spruce Street	9.4	A	11.6	B
Interstate 80 EB and South Higley Boulevard	13.7	B	13.8	B
Interstate 80 WB and South Higley Boulevard	19.8	C	30.8	**D**
Interstate 80 EB and WY76	16.1	C	21.8	C
Interstate 80 WB and WY76	10.4	B	15.2	C
Interstate 80 WB and Johnson Road	10.0	B	12.1	B
Interstate 80 EB and Johnson Road	11.9	B	17.3	C
Notes: [1]Signalized intersection				

6.0 Potential Mitigation Options

Using the traffic analysis described above, PCW identified potential effects to the public roads in the vicinity of the CCSM Project Site due to the CCSM Project's expected. Based on the traffic analysis, PCW anticipates that four intersections during the July 2016 case and two intersections during the July 2017 case will receive LOS ratings of D or lower ratings and will

require mitigation.[1] PCW has explored options to mitigate and improve these LOS ratings, and determined that the use of active traffic control and shifting traffic to off-peak times are both effective mitigation techniques. PCW anticipates that these options will be sufficient to avoid the need for any temporary or permanent changes to the affected intersections to mitigate traffic levels, although some temporary geometric improvements may be necessary to accommodate oversize truck deliveries (Appendix A to the Transportation Management Plan).

6.1.1 Active Traffic Control

For purposes of the traffic analysis, PCW assumed the existing traffic control measures would remain in effect. For every intersection where service was estimated to drop to an LOS D rating or lower, the intersections are controlled through stop signs rather than traffic lights. Delays at these intersections were due mostly to large truck deliveries, and high traffic volumes from workforce commuting. Trucks making deliveries of large materials or components (often oversize or heavy) are slow to accelerate and generally make wide turns compared to passenger vehicles. One of these trucks completing a turn will cause traffic in all other directions to stop for several seconds until the truck clears the intersection. This combined with higher-than-typical traffic volumes caused by workforce commuting was anticipated to lead to the longer delay times at the affected intersections.

One of the most common and effective methods for mitigating these types of traffic delays is active traffic control. Flaggers are typically used to manage the flow of traffic and avoid the longer delays. Flaggers can see trucks approaching an intersection and stop traffic in other directions to keep the truck moving, thereby avoiding the long delay of the truck starting from a complete stop. The use of flaggers also avoids the inherent delay caused by all vehicles needing to come to a stop at an intersection with four-way stop signs.

Whenever a significant volume of CCSM Project traffic is using the Haul Road and crossing CR401, PCW expects to use flaggers to control this intersection. PCW intends to instruct the flaggers to favor stopping CCSM Project traffic when public vehicles arrive rather than the reverse. This will minimize any delays to the public traffic while having little effect on CCSM Project traffic as the volume of public traffic on CR401 is very low.

Due to limitations within the available traffic analysis software, PCW was not able to directly quantify the effect that flaggers will have on intersection traffic; however, experience has shown that the ability of flaggers to be flexible and adaptive in traffic management by allowing longer queues of vehicles to clear intersections as needed is superior to the addition of temporary timed traffic lights.

[1] While a LOS D rating was identified at one intersection during decommissioning, this is likely due to the conservative assumptions of the analysis and not mitigation is anticipated to be required during decommissioning.

6.1.2 Shifting Traffic to Off-Peak Times

The traffic analysis determined that the LOS rating impacts of the studied intersections was caused primarily by the entire workforce commuting to the CCSM Project Site over the same one hour period as the existing peak traffic, an intentionally conservative assumption. During peak periods of the CCSM Project construction, the number of workers reporting to the CCSM Project Site at the same time involves more vehicles than the intersections are designed to accommodate. An option identified by PCW would be to stagger the start- and end-shift times for the labor force on the CCSM Project. Rather than requiring the entire labor force to report to the site at the same time, PCW examined the effect of dividing the shift into two equal groups, with the second starting and ending one hour later than the first. As shown in Table 15 and Figures 7 and 8 of Exhibit A, the effect of this change onto the Interstate 80/WY76 intersection was dramatic, reducing the delay times substantially and improving the expected LOS at significantly impacted intersections one or two levels during the peak traffic times.

Based on these results, PCW does not anticipate further mitigation measures will be required; however, if wait times during construction are found to significantly exceed expectations, PCW will explore additional mitigation measures such as three start times, carpooling or bussing the members of the workforce (especially those commuting from Laramie) and restricting all truck deliveries to off-peak times.

Table 15. Level of Service Improvements Due To Mitigation

Intersection	Peak Time	Single Start		Staggered Start	
		Delay (sec)	LOS	Delay (sec)	LOS
July 2016 Peak Case					
WY71 & Jackson St.	Morning Peak	>880	F	28.8	D
WY71 & Jackson St.	Afternoon Peak	>50	F	16.9	C
WY71 & Washington St.	Morning Peak	>425	F	24.0	C
WY71 & Washington St.	Afternoon Peak	>135	F	22.0	C
WY71 & Locust/S. Higley	Morning Peak	>25	D	14.9	B
Interstate 80 EB & S. Higley	Afternoon Peak	>25	D	10.4	B
July 2017 Peak Case					
Interstate 80 EB & Hwy 76	Morning Peak	>960	F	21.1	C
Interstate 80 EB & Hwy 76	Afternoon Peak	>270	F	28.4	D
Interstate 80 WB & Hwy 76	Afternoon Peak	>52	F	14.3	B

7.0 References

Transportation Research Board (TRB). 2010. Highway Capacity Manual 2010. Transportation Research Board of the National Academies. January 2010

Wyoming Department of Transportation (WYDOT). 2009. Traffic Data. http://www.dot.state.wy.us/home/planning_projects/Traffic_Data.default.html. Accessed July 16, 2013.

Exhibit 1

Traffic Volume Diagrams

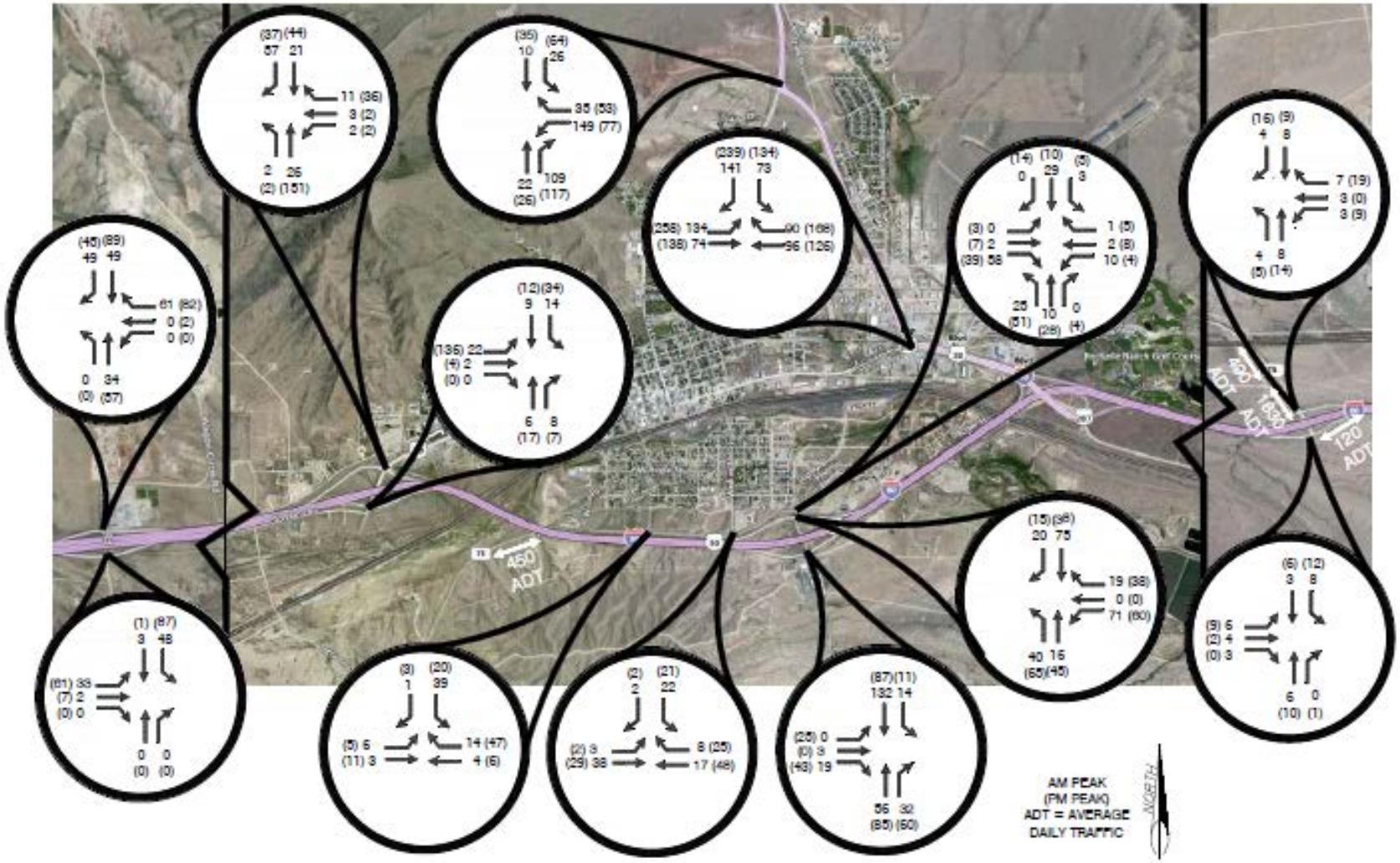

Figure 1. Traffic Volumes - Existing

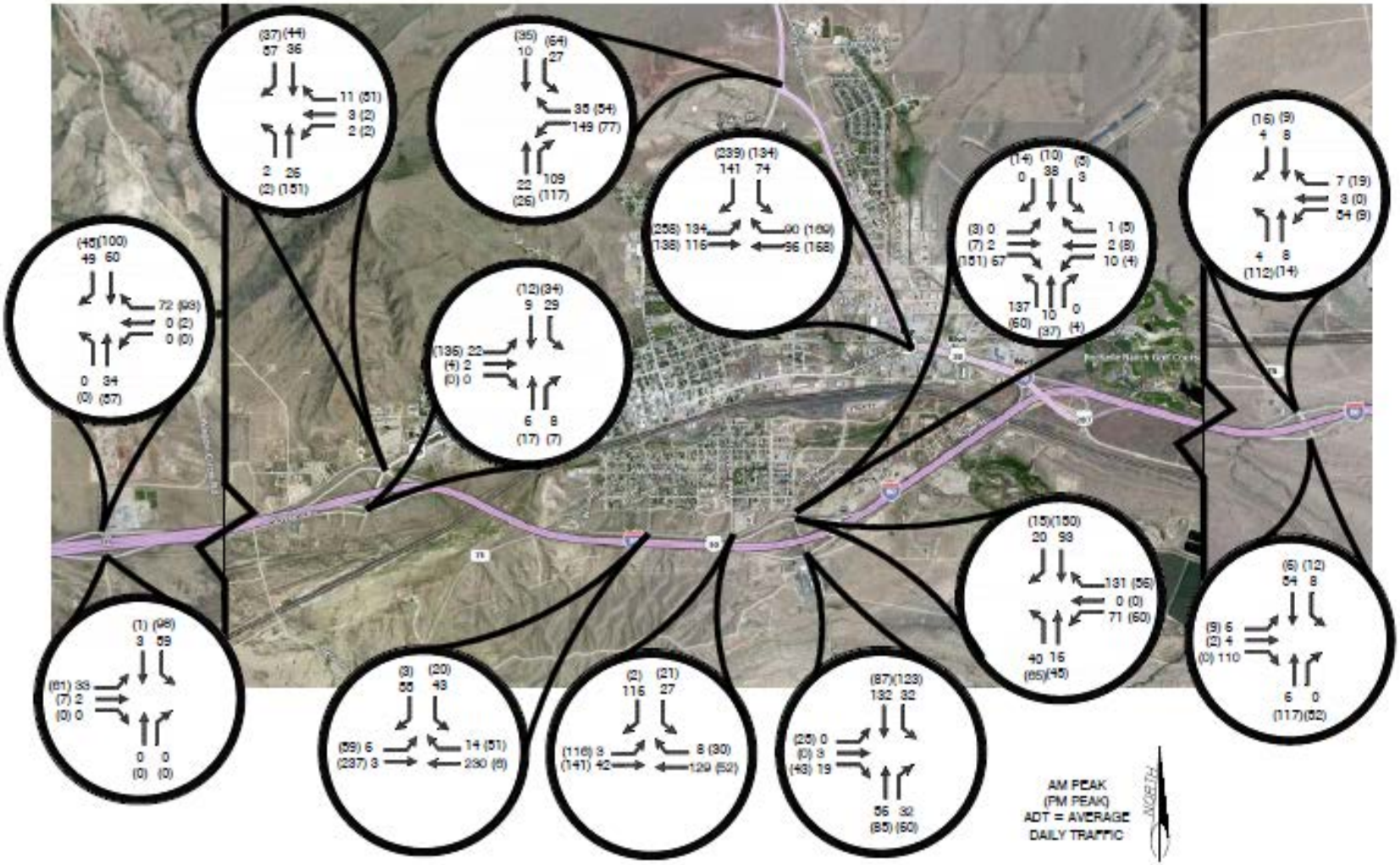

Figure 2. Traffic Volumes – Construction Year 2015 (August)

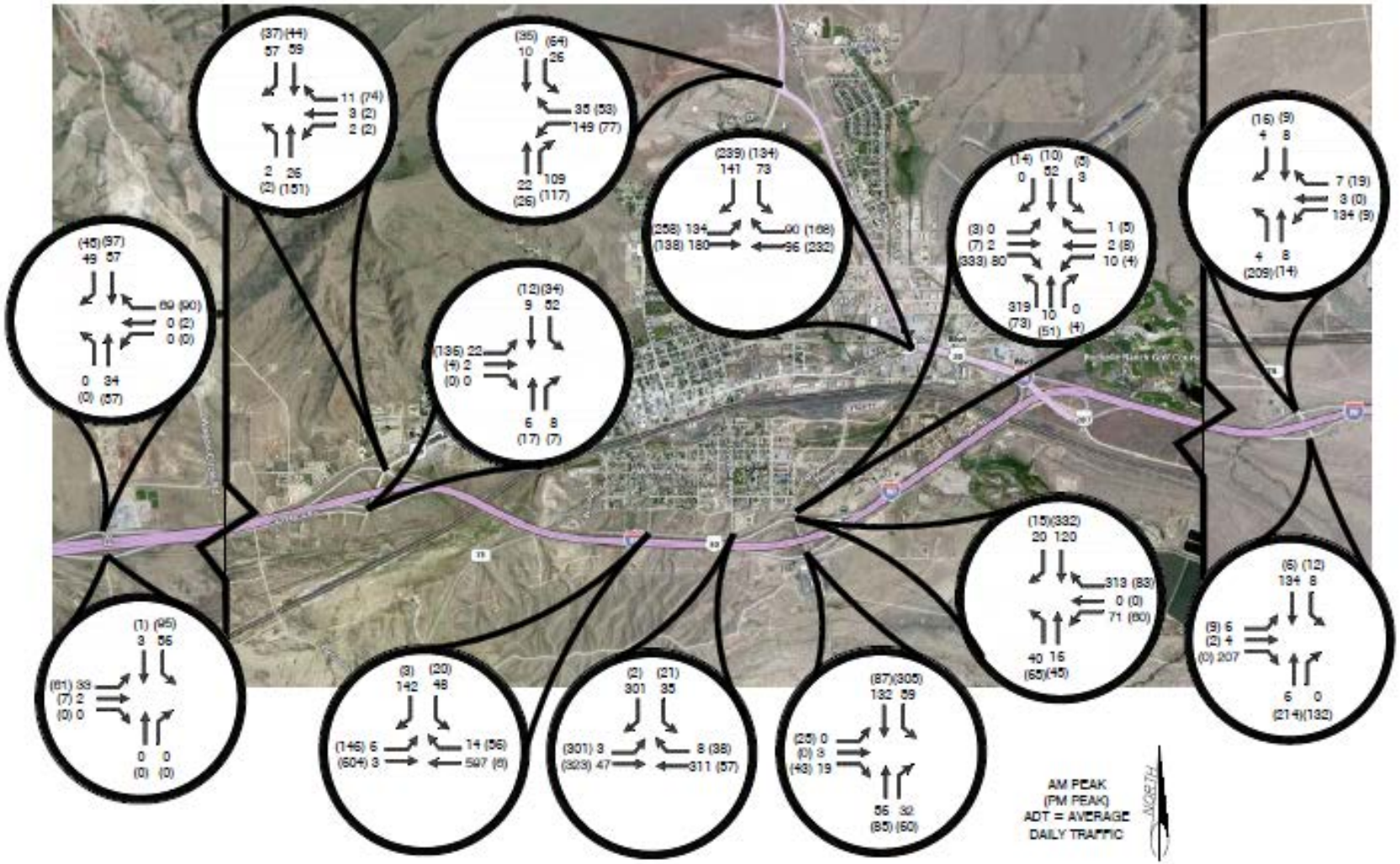

Figure 3. Traffic Volumes – Construction Year 2016 (July)

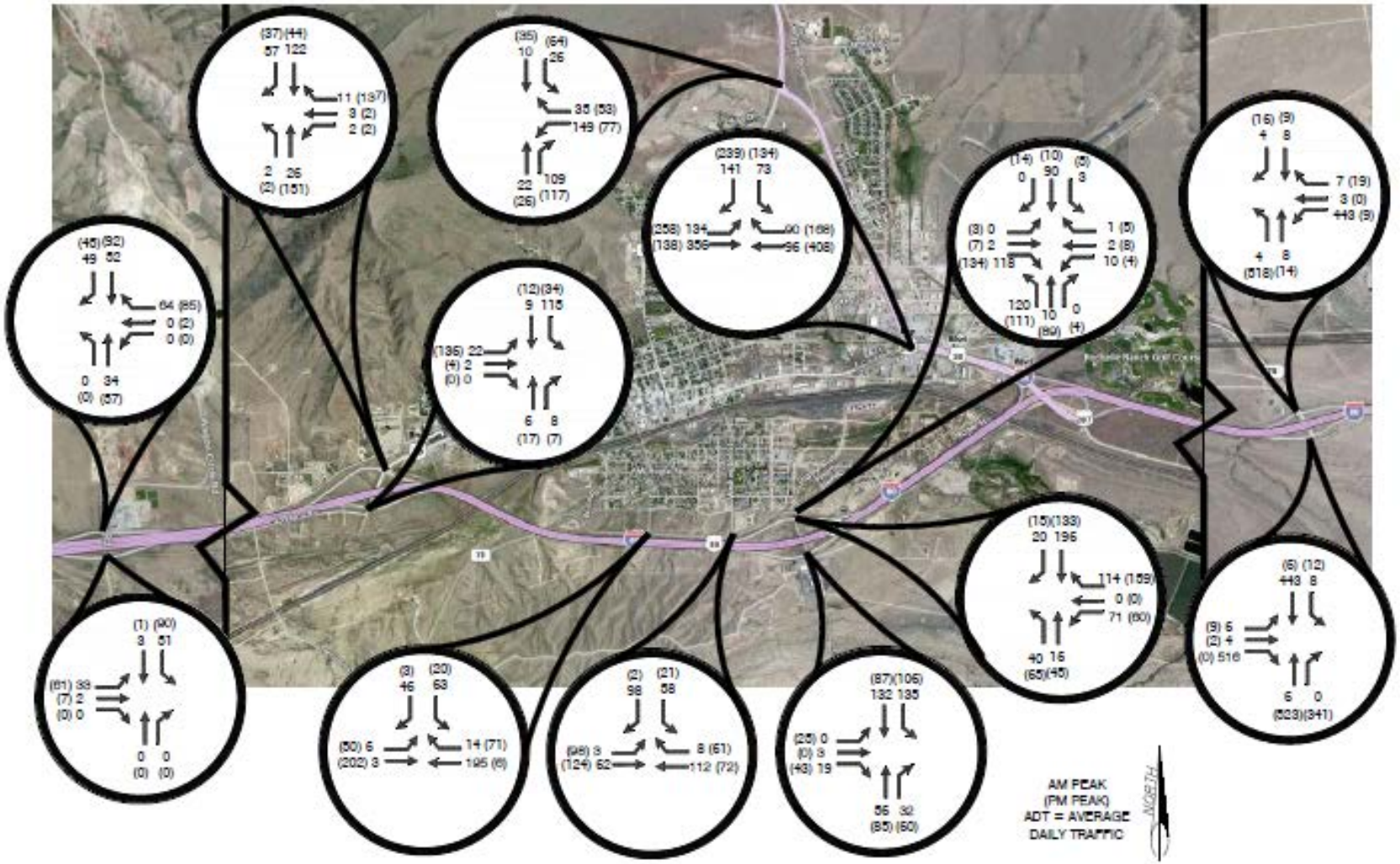

Figure 4. Traffic Volumes – Construction Year 2017 (July)

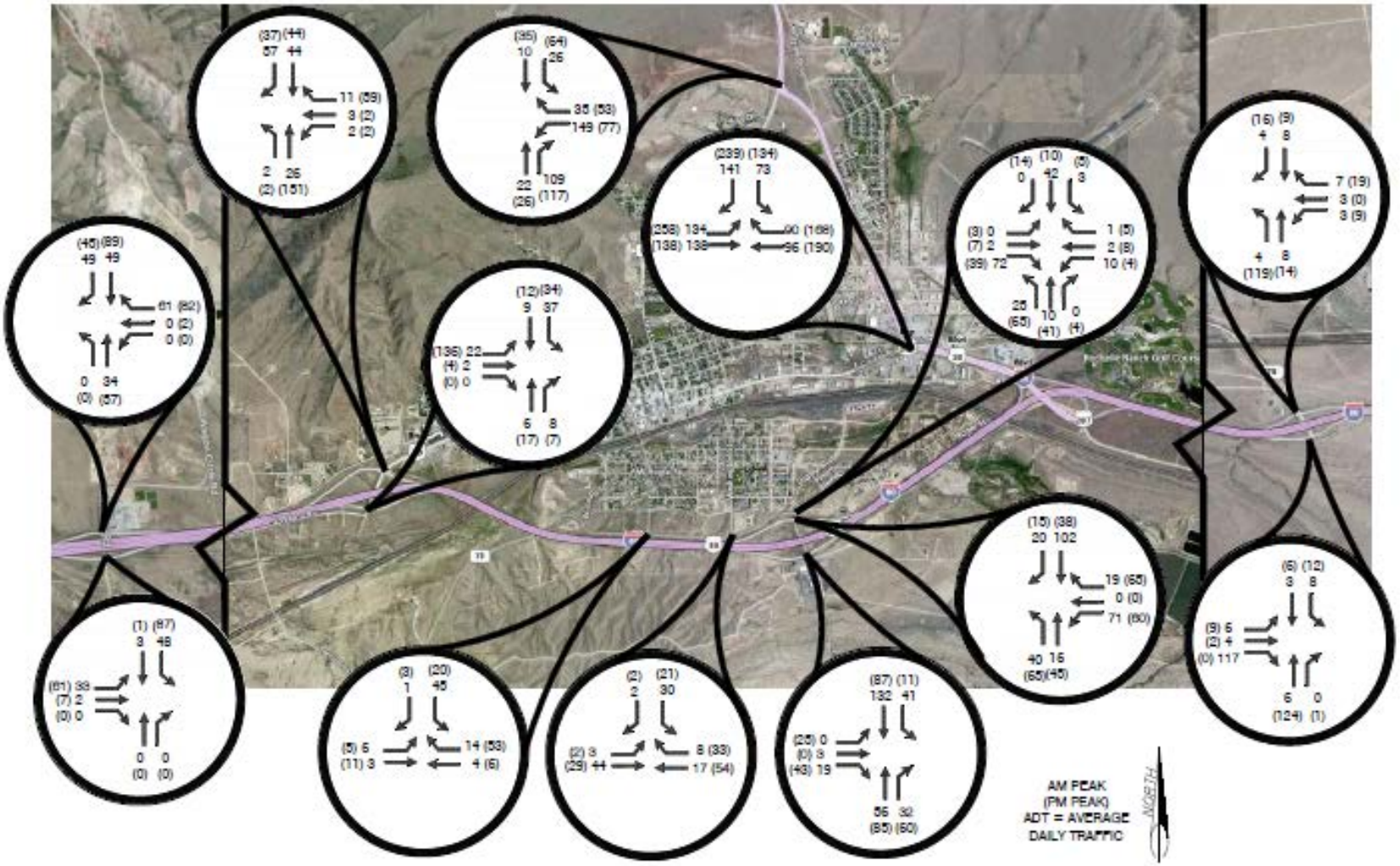

Figure 5. Traffic Volumes – Operations and Maintenance

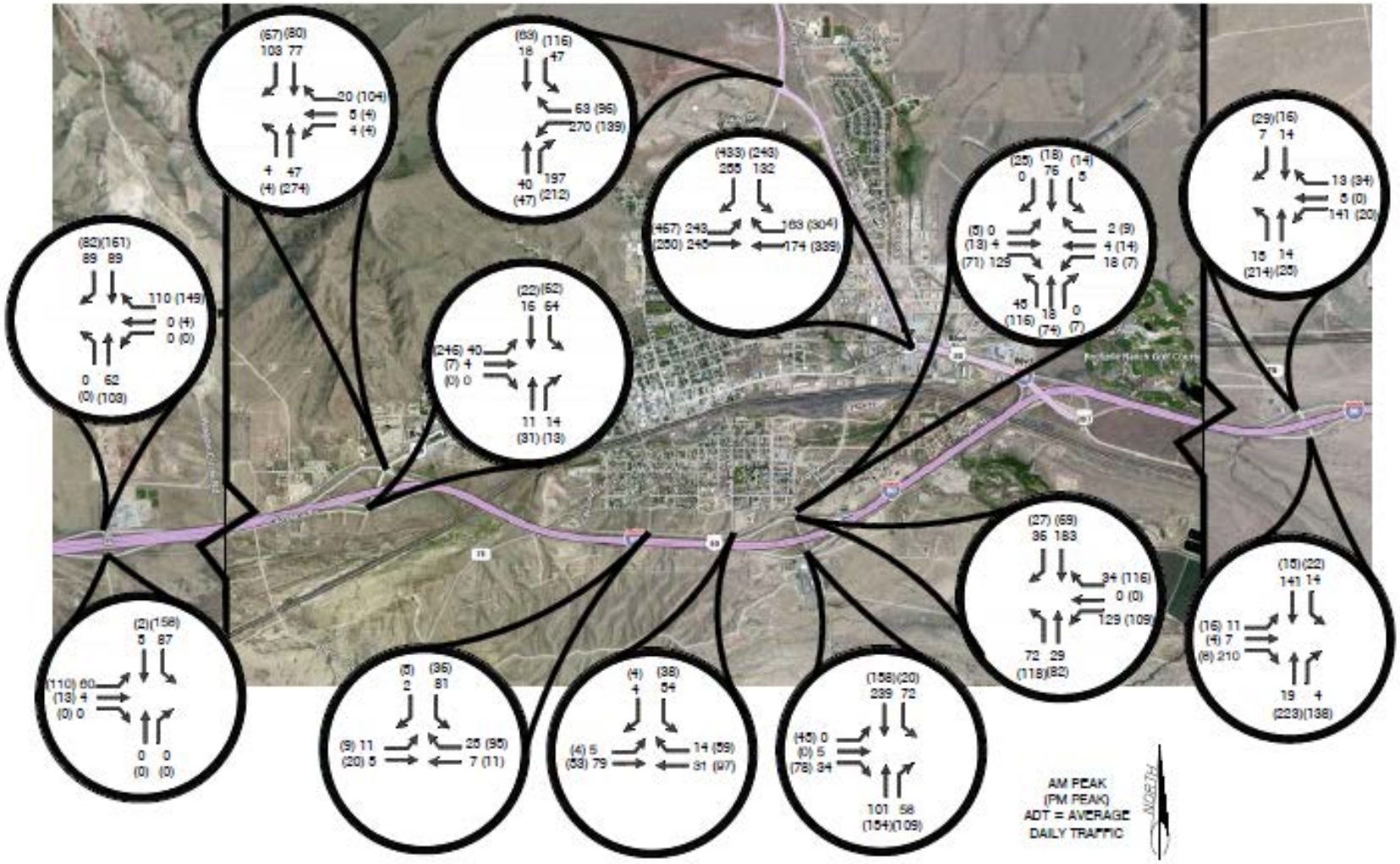

Figure 6. Traffic Volumes – Decommissioning Year Two Peak

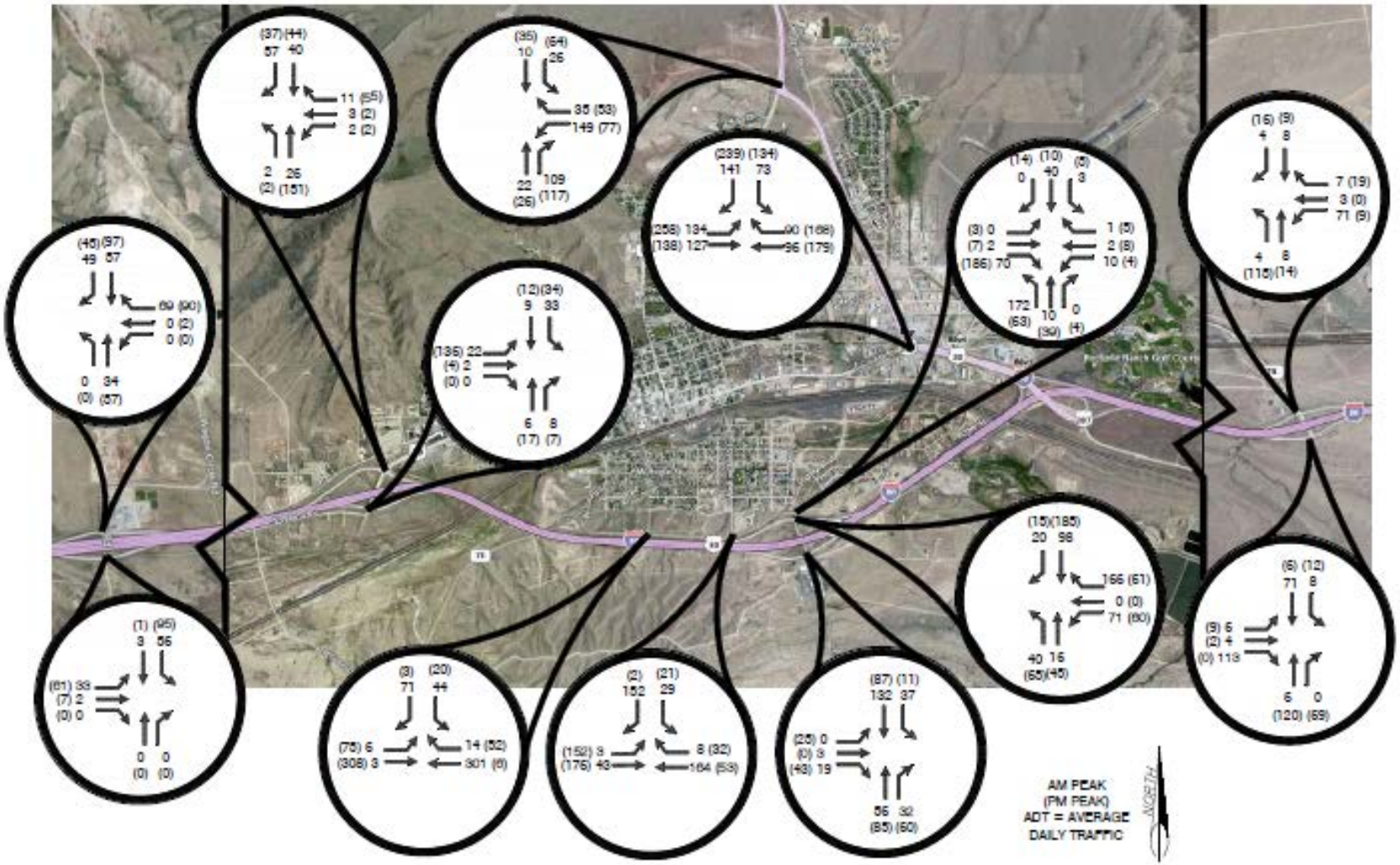

Figure 7. Traffic Volumes – Construction Year 2016 (July) with Staggered Shifts

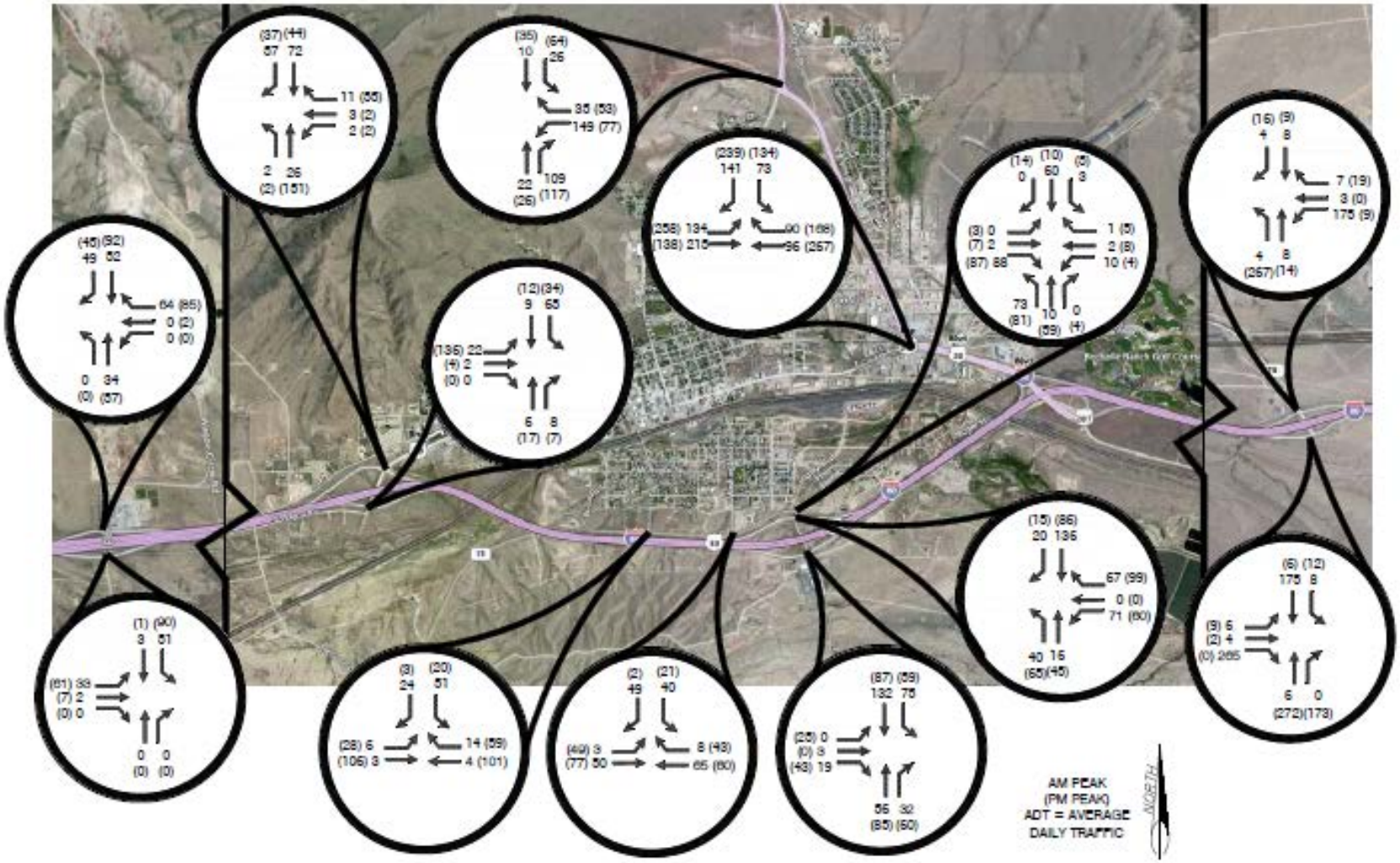

Figure 8. Traffic Volumes – Construction Year 2017 (July) with Staggered Shifts