Uinta Basin Railroad Feasibility Study
Summary Report

Uinta Basin Rail

Utah Department of Transportation
UDOT Project Number S-R399(169)

January 9, 2015

Prepared by
HDR Engineering, Inc.
3949 South 700 East, Suite 500
Salt Lake City, UT 84107

Contents

Tables

Figures

Appendixes

Acronyms and Abbreviations

APE	area of potential effects
AREMA	American Railway Engineering and Maintenance-of-Way Association
BLM	Bureau of Land Management
BNSF	BNSF Railway
CAPEX	capital cost
CEVP	Cost Estimating Validation Process
CTC	Centralized Traffic Control
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
FRA	Federal Railroad Administration
HDR	HDR Engineering, Inc.
mph	miles per hour
OPEX	operating and maintenance cost
PBA	public benefit analysis
PTC	Positive Train Control
PV	present value
RTC	Rail Traffic Controller (RTC) software
S.R. 88	State Route 88
SHPO	State Historic Preservation Office
STB	Surface Transportation Board
SUWA	Southern Utah Wilderness Alliance
U.S. 191	U.S. Highway 191
U.S. 40	U.S. Highway 40
U.S. 6	U.S. Highway 6
UBETS	Uinta Basin Energy and Transportation Study
UBRR	Uinta Basin Railroad
UDOT	Utah Department of Transportation
UDWR	Utah Division of Wildlife Resources
UP	Union Pacific Railroad
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

This page is intentionally blank.

1.0 Introduction

In 2013, the Utah state legislature funded a study by the Utah Department of Transportation (UDOT) to explore potential transportation improvements in the Uinta Basin. Uintah and Duchesne Counties directed the effort and identified the need to explore the feasibility of a new freight rail line (Uinta Basin Railroad, or UBRR) in and out of the basin and requested that UDOT use the funding to provide technical support to determine the feasibility. If a freight rail line was found to be feasible, the Counties requested that UDOT support development of an Environmental Impact Statement (EIS) that would evaluate the expected impacts and obtain the necessary approvals to build the rail line.

What is the UBRR team?

The UBRR team consists of Uintah and Duchesne Counties, UDOT, and rail and environmental planning consultants.

This summary report provides the history of the Uinta Basin Rail Feasibility Study and summarizes the work that was completed to determine the feasibility of the project. The Uinta Basin Rail Feasibility Study evaluated a proposed 100-mile rail line designed to provide freight rail service between the Uinta Basin and the two national freight rail lines that pass through Utah about 50 miles to the south (Figure 1). The results of the feasibility analysis showed that two alignments are feasible to construct, with one alignment being preferred (Alternative 2 along U.S. Highway 191). However, on December 1, 2014, Uintah and Duchesne Counties informed UDOT of their determination that the return on investment for the rail line was insufficient to justify the expense of construction. Consequently, a notice of intent to prepare an EIS was never released.

2.0 History

The Uinta Basin—known since pioneer times as the Isolated Empire—contains extensive deposits of economically valuable minerals, including large deposits of soda ash and phosphate. Also found within this region are substantial deposits of crude oil, natural gas, oil shale, oil sands, gilsonite, natural asphalt, limestone, bentonite, heavy clay, aggregate materials, bauxite, and low-sulfur coal. Agriculture is also an important part of the Uinta Basin's economy and includes cattle, alfalfa, corn, potatoes, and other field and orchard crops. At present, the Uinta Basin is isolated from the national rail network.

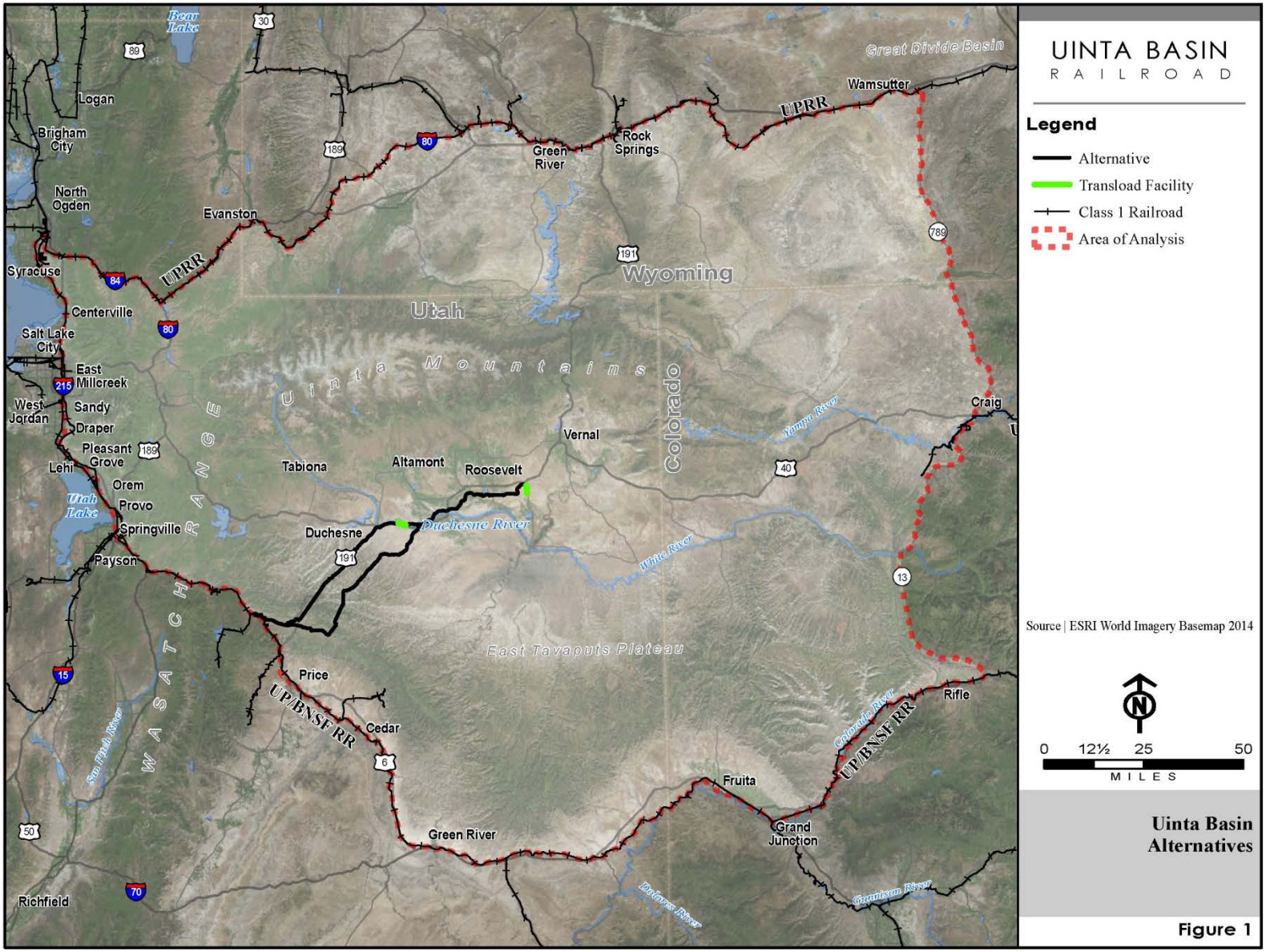
What are Class 1 railroads?

Class 1 railroads are carriers with annual carrier operating revenues of $433.2 million or more.

Past studies evaluated the potential for rail alignments into the basin. In 2001, the Utah Department of Community and Economic Development studied the feasibility of constructing a freight rail line (the Isolated Empire Rail) into northeastern Utah (Uinta Basin) and northwestern Colorado (DMJM Harris 2001). The primary need identified for a new rail line was that northeastern Utah and northwestern Colorado do not have the rail, highway, or waterway transportation infrastructure that is required to link their natural resources to markets in the rest of the United States. Although feasible rail alignments that connected to competing Class 1 railroads were identified in the DMJM Harris report, no rail line was constructed.

With the more recent increase in gas and oil production, the State of Utah again began to investigate transportation options into the basin starting with the Uinta Basin Energy and Transportation Study in 2013 and the Uinta Basin Rail Feasibility Study in 2014. These studies are described in more detail below.

Figure 1. Uinta Basin Alternatives



2.1 Uinta Basin Energy and Transportation Study (UBETS)

In 2013 and prior to the Uinta Basin Rail Feasibility Study, UDOT prepared the Uinta Basin Energy and Transportation Study (UBETS). UBETS was needed to understand the effect of transportation limitations in Duchesne and Uintah Counties on future oil and gas production in the Uinta Basin. The study was sponsored by Duchesne County, Uintah County, the Uintah Transportation Special Service District, and UDOT. It sought to answer three questions:

- What is the likely path of growth for energy production in the basin?
- Is transportation capacity limiting future energy production?
- If so, what is the opportunity cost of failing to address transportation system limitations?

UBETS was designed to ensure a rigorous, credible, conservative estimate of future production value as well as the potential loss to the state's economy due to transportation constraints. Additionally:

- The study was based on data collected from the U.S. Geological Survey, the Utah Geological Survey, the U.S. Energy Information Administration, UDOT, and respected academic institutes.
- The study included multiple rounds of stakeholder workshops and engaged a large number of producers and other industry participants through an extensive interview process.
- The results were a product of quantitative risk analysis, including assessment of a wide variety of production constraints, price uncertainty, production input requirements, and mode substitution.

The study showed that 2012 basin-area oil and gas production was worth about $2.5 billion; extraction was expected to grow quickly. The product of the study was an estimate of the value of potential extraction lost due specifically to transportation constraints—more than $30 billion of lost oil and gas production over 30 years (undiscounted). The study also estimated the opportunity cost resulting from the constrained transportation system in terms of tax revenue, private rents and royalties, jobs, transportation user cost savings, and environmental and safety effects to be a present value of more than $10 billion of net benefits and almost 27,000 long-term, high quality jobs (Table 1).

Table 1. Opportunity Cost of Constrained Oil and Gas Transportation Capacity in the Uinta Basin, Present Value[a] (over 30 Years)

Revenues and User Benefits (millions)		Environmental and Social Costs (millions)		Macroeconomic Impact	
Profit, rents, dividends, and private royalties [b]	$3,784	Site emissions and ecological impacts	($1,246)	Total regional output (millions)	$34,794
State and local tax revenue	$2,756	Vehicle emissions	($24)	Total labor income (millions)	$11,791
User cost savings	$4,943	Safety impacts	($101)	Long-term jobs [c]	26,802
Total	**$11,483**	**Total**	**($1,371)**		

[a] 3% discount rate.
[b] Represents the portion of total macroeconomic output that is additional private citizen/corporate "profit" net of expenses and resource depletion.
[c] Assumes a 10-year term of employment.

The study indicated potentially significant returns resulting from additional strategic investment in transportation infrastructure in the basin. The added annual oil and gas production represents about 7% of the state's gross domestic product (GDP). Of the $180 million average annual added tax revenues, the Utah School and Institutional Trust Lands Administration royalties alone would add about $25 million

per year directly to public education. The study noted that, in order to capture these opportunities and realize the lost revenues, further assessment of transportation investment options, production regulation and policies, and environmental impact mitigation strategies would be necessary.

2.2 Uinta Basin Rail Feasibility Study

Motivated by the results of UBETS, the Utah state legislature funded an environmental study to look at transportation investment options and the associated environmental impacts. The funds were directed through UDOT to support Duchesne and Uintah Counties in looking at potential options. Based on the need to reduce energy transportation cost, expand transportation capacity, and improve market reach, the Counties decided to undertake the Uinta Basin Rail Feasibility Study.

The study was designed to determine whether it is feasible to construct a rail line into and out of the basin. It included a cost-benefit analysis to determine the rail line's return on investment. If the rail line were determined to be feasible, a notice of intent to start an EIS process would be issued. The Surface Transportation Board (STB), which responsible for approving any freight rail connection to the existing national rail network, was invited to lead the EIS effort. STB confirmed that it would be the lead federal agency if an EIS process were initiated.

The feasibility process started in November 2013 and concluded in December 2014.

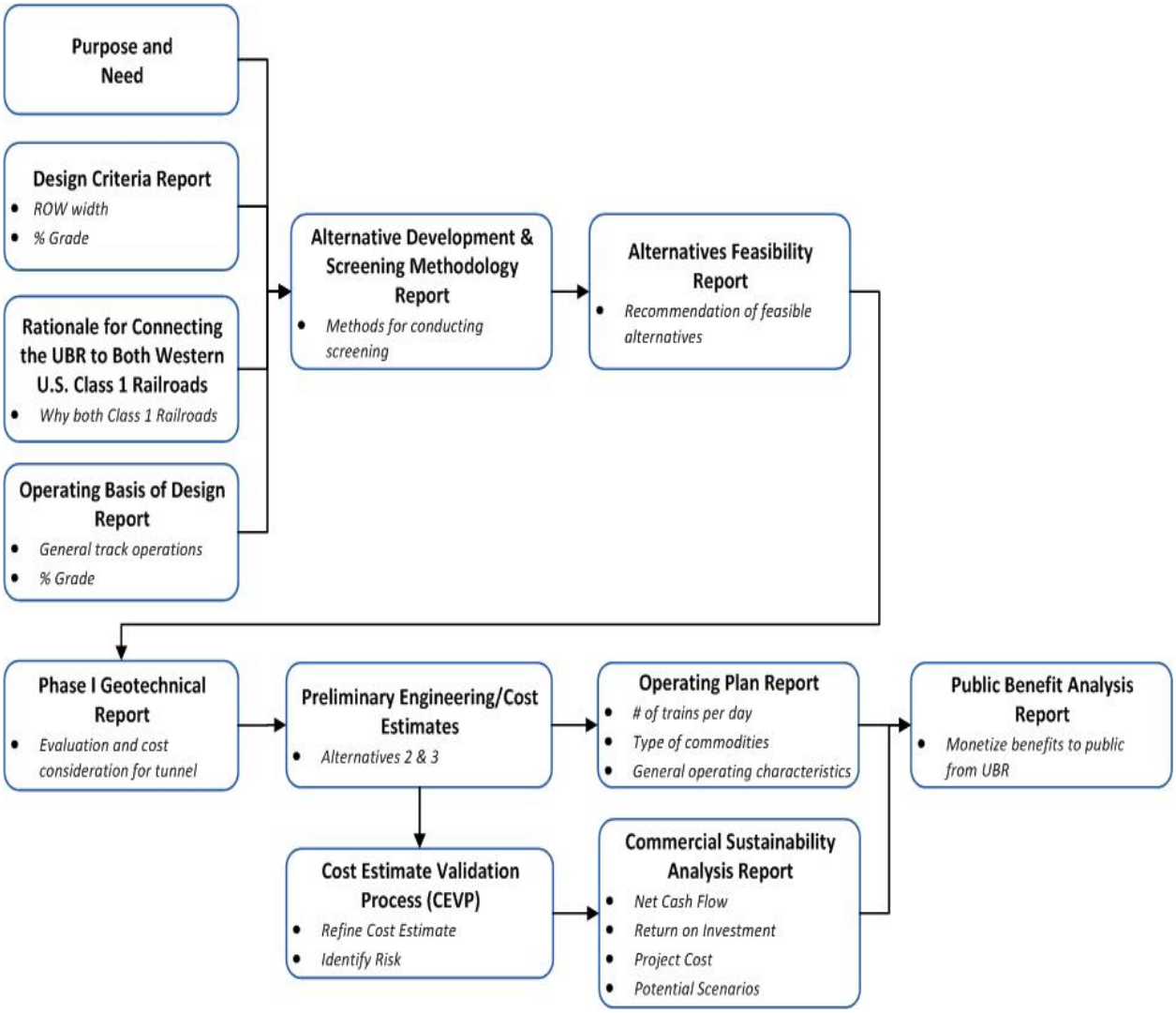
3.0 Overview of the Uinta Basin Rail Feasibility Study Process

For the Uinta Basin Rail Feasibility Study, a series of studies and technical reports were prepared to assist decision-makers in evaluating the proposed rail project and to make a decision regarding the feasibility based on the information provided. This section provides a summary of each report.

The technical reports are divided between Phase 1 (Alternatives Development and Feasibility) and Phase 2 (Field Studies and Environmental Discipline Reports). The primary purpose of the technical reports was to determine the engineering feasibility of the project and, if feasible, to provide information to STB so that an EIS could be prepared for the UBRR. During Phase 1 (April 2014), UDOT determined that two alternatives were feasible from an engineering standpoint (economic evaluation was not completed until November 2014). UDOT decided to conduct environmental field surveys of those alignments prior to the winter of 2014 so that, if an EIS were started, there would be no schedule delay due to missing a summer field survey season.

The technical reports for Phase 1 are shown in Figure 2 below. The primary purpose of Phase 1 was to determine whether there are feasible rail alternatives into the Uinta Basin and, if so, to develop preliminary engineering and cost estimates for those alternatives. In addition, Phase 1 provided a preliminary evaluation of how the rail line would be operated, the commercial analysis or return on investment, and what would be the public benefit of the rail line.

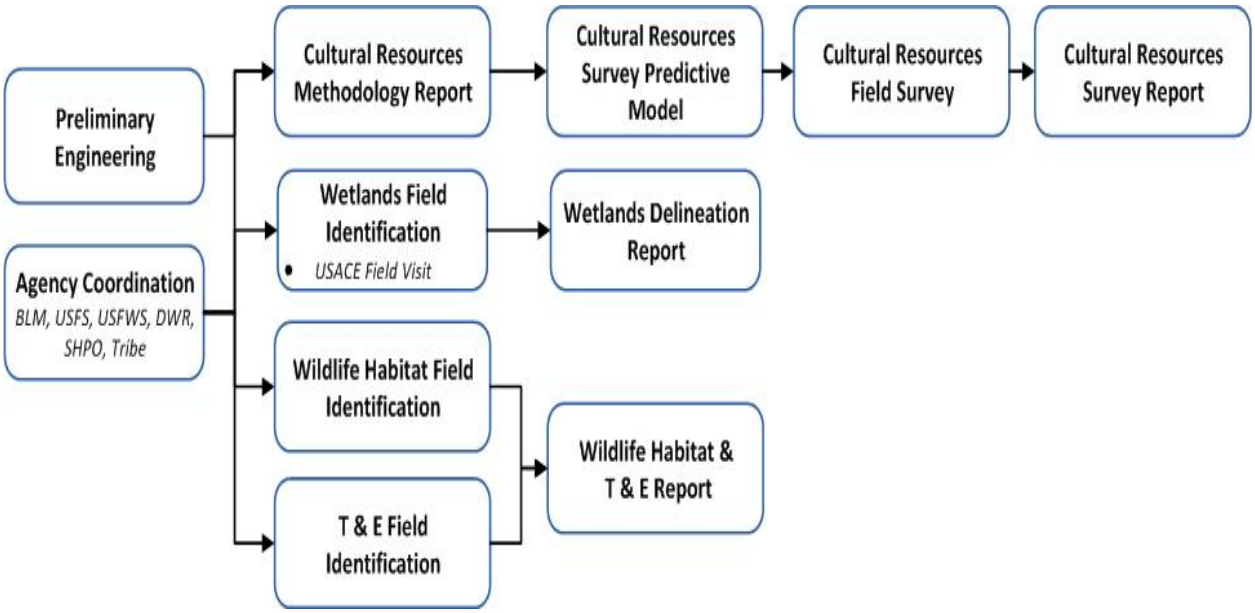
Figure 2. Phase 1 Alternative Development and Feasibility Reports



Phase 2 included conducting the environmental field surveys for the feasible alternatives and developing the baseline environmental discipline reports. Figure 3 below shows the process for developing this information.

During Phases 1 and 2, UDOT collected a substantial amount of data in GIS (geographic information systems) format from resource agencies and during the field surveys to help prepare the technical reports. The technical reports are provided in the appendices of this summary report.

Figure 3. Phase 2 Field Surveys and Resource Reports



3.1 Phase 1 Reports

3.1.1 Purpose of and Need for the Uinta Basin Railroad

This report identified why the UBRR is needed and the purpose of the project. The purpose of and need for the project are summarized below.

Need for the Project

The Uinta Basin is a geographical area in east-central Utah that includes the communities of Vernal, Duchesne, Roosevelt, Altamont, Myton, Ballard, Naples, and Tabiona as well as smaller, unincorporated communities. The basin contains extensive deposits of economically valuable minerals, including large deposits of soda ash and phosphate. Also found within this region are substantial deposits of crude oil, natural gas, oil shale, oil sands, gilsonite, natural asphalt, limestone, bentonite, heavy clay, aggregate materials, bauxite, and low-sulfur coal. Agriculture is also an important part of the Uinta Basin's economy and includes cattle, alfalfa, corn, potatoes, and other field and orchard crops. The above types of commodities benefit from being transported in large bulk shipments to market by rail, which provides transportation efficiency and reduces cost.

The needs for the project include the need for reduced shipping rates for commodities transported to and from the Uinta Basin and the need for expanded market access for the commodities produced in the Uinta Basin. The Uinta Basin does not have access to rail service except via lengthy intermediate truck or pipeline haulage between the basin and the national rail network beyond the basin. The cost of the intermediate truck haulage combined with the commodity, network, and capacity limitations of pipelines result in higher costs of transportation for commodities transported to and from the Uinta Basin and limit the access to markets for commodities produced in the basin (commodities such as oil, gilsonite, and grain) compared to the access that would be expected if the basin had direct access to the national rail network.

In general, as transportation costs increase, economic competitiveness decreases, economic potential is reduced, and economic activity decreases. Freight rail service provides producers with cost-effective transportation, especially for heavy and bulky commodities. The need for the project is summarized below.

- **No rail service.** There is no rail service to the Uinta Basin.
- **Higher cost to ship by truck.** Commodities are transported into and out of the basin primarily by truck. The average revenue per ton-mile for rail-hauled freight in the United States is $0.0376, whereas the average revenue per ton-mile for truck-hauled freight in the United States is $0.1654 (U.S. Department of Transportation, Bureau of Transportation Statistics 2007). The lower cost of rail transportation means that a producer can transport a commodity 4.3 times farther by rail than by truck for the same cost.
- **Distance to the national rail network.** Transportation of commodities that are not suitable for pipeline transportation between the Uinta Basin and national markets requires either a truck haul between the commodity's origin and destination or a truck haul for the portion of the commodity's route between the Uinta Basin and a transload facility on the national rail network. The nearest rail lines are between 112 and 154 miles on rural highways from Vernal, the largest city in the basin.
- **Limited ability for pipelines to ship all commodities.** Pipelines are not suitable for transporting the wide variety of commodities, such as aggregate and agricultural products, produced and consumed in the Uinta Basin. In addition, the capacity and market reach of the existing pipeline network is limited by having relatively fixed origins and destinations. Pipelines are technically limited in the variety of commodities they can carry.
- **Limited market access.** The use of trucks to ship many commodities into and out of the Uinta Basin limits large-scale access to the national market because of the higher transportation cost of trucks and the reduced technical ability to ship some commodities.
- **Limited capacity to ship by truck.** Truck shipments into and out of the basin are capacity-constrained to the size of the truck. This constraint can be overcome only by using more trucks to ship the commodity, which increases the transportation cost. A rail line would enable commodities to be moved without being subject to the same capacity constraints and at a reduced transportation cost.

Purpose of the Project

Based on the need, the purpose of the UBRR project is to reduce shipping costs and expand market access for commodities transported to and from the Uinta Basin by constructing a freight rail line that connects the Uinta Basin to the national common-carrier freight railroad system, with direct access to the two western U.S. Class 1 railroads (BNSF Railway and Union Pacific Railroad).

The project purpose was used to assist the UBRR team in screening potential alternatives to determine which alternative(s) would be feasible.

The complete report is provided in Appendix A, Purpose of and Need for the Uinta Basin Railroad.

3.1.2 Design Criteria Report

This report described the design standards that were used to develop the proposed UBRR. The design standards informed the refinement of alternatives and the conceptual engineering. The track components conformed to the latest version of the American Railway Engineering and Maintenance-of-Way Association's (AREMA) standards. The design of track components was compatible with existing components whenever appropriate. Track design at a minimum met or exceeded Federal Railroad Administration (FRA) Class 4 track safety standards. Communications and signal design took into account the best practices in the AREMA *C&S Manual* and would comply with FRA standards.

The report described the design requirements for horizontal and vertical alignments, turnout requirements, clearances, roadbed, at-grade crossings, access and maintenance roads, yard design, sidings, train control, signaling and communications, drainage and bridge structures, and tunnels. The complete report is provided in Appendix B, Design Criteria Report.

3.1.3 Rationale for Connecting the Uinta Basin Railroad to Both Western U.S. Class 1 Railroads Report

This report described why the purpose of and need for the UBRR states that the UBRR should connect to both of the western U.S. Class 1 railroads. There are two Class 1 railroads that serve the majority of the western United States: BNSF Railway (BNSF) and Union Pacific Railroad (UP). The rationale for connecting to both of the western U.S. Class 1 railroads was that this would enable the UBRR to have competitive access to the national rail network. If the UBRR were to connect to only one of the two railroads, there would be no competition for rail service to the UBRR, and the single railroad to which the UBRR would connect would, if it chose, be able to dictate terms and conditions of service that could be economically damaging to the UBRR.

Access to only one Class 1 would create a substantial risk that shippers on the UBRR would pay greater costs for rail transportation than if it were to connect to both of the two western Class 1 railroads. This would conflict with another principle of the purpose and need for the UBRR: that it must enable shippers to reduce transportation costs.

Figure 4 below shows the Class 1 railroads that surround the basin. Figure 5 below shows the proposed UBRR connection to the UP rail line adjacent to U.S. 6.

Figure 4. Area of Analysis

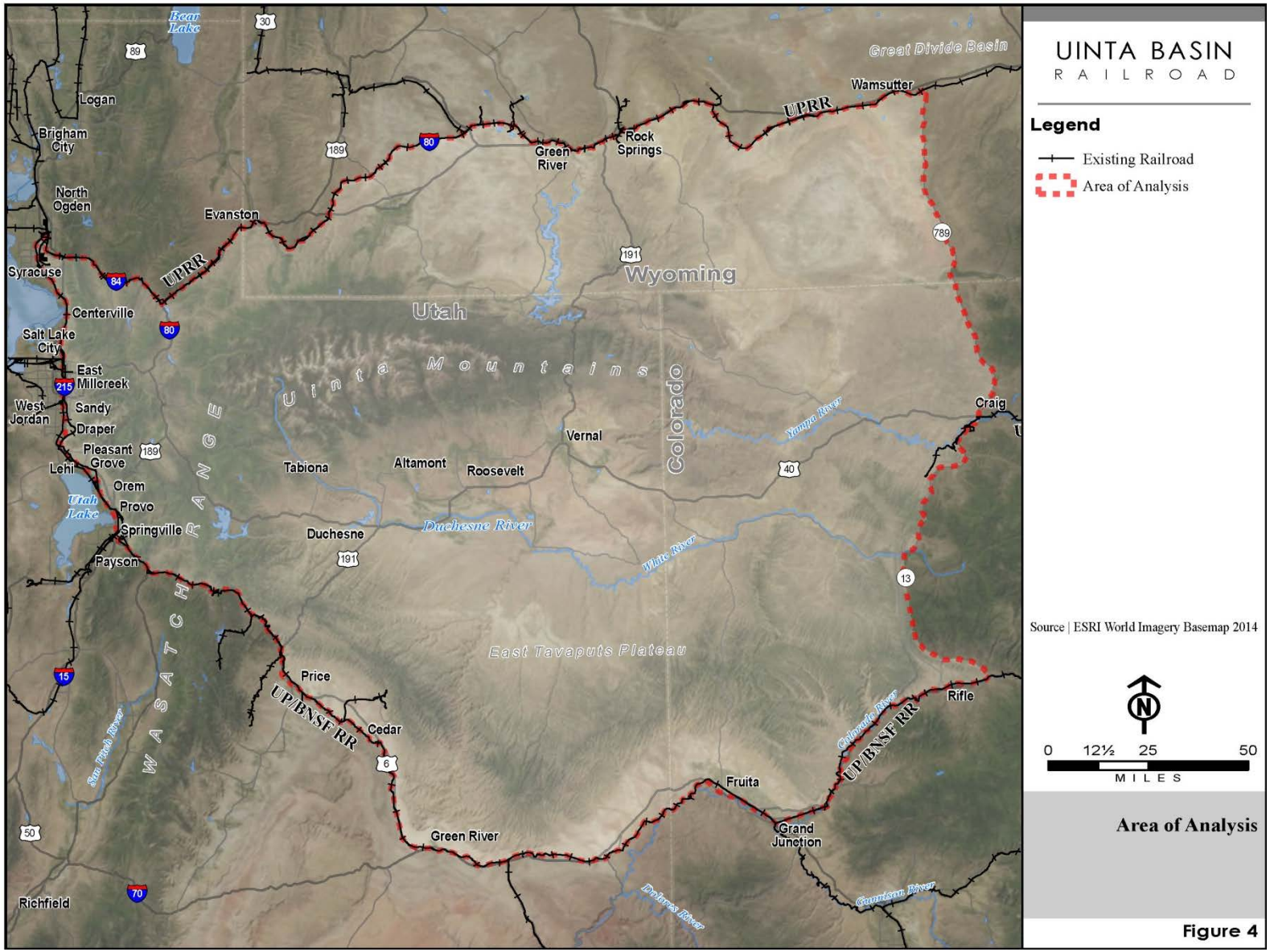
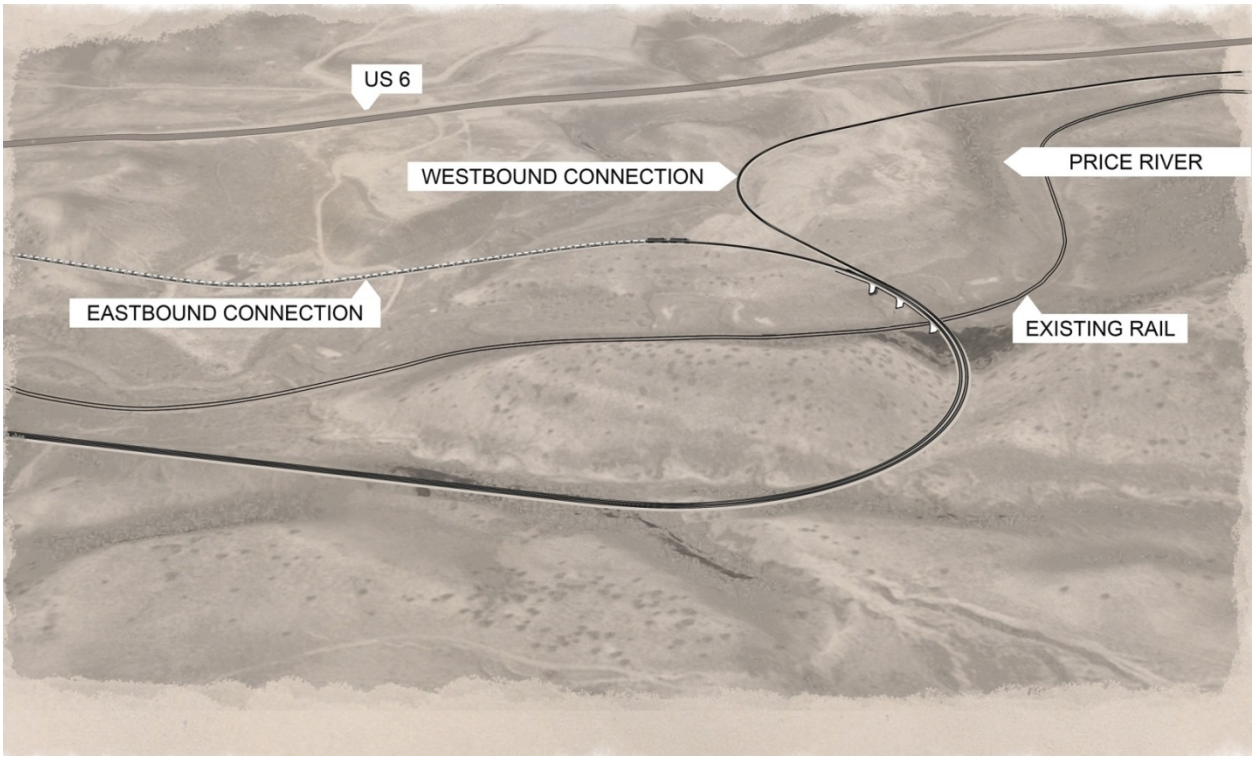


Figure 5. UBRR Connection to the Class 1 Rail Network



The complete report is provided in Appendix C, Rationale for Connecting the Uinta Basin Railroad to Both Western U.S. Class 1 Railroads.

3.1.4 Operating Basis of Design Report

This report described the Operating Basis of Design for the proposed UBRR. An Operating Basis of Design is a statement of the functional and operating requirements of a railroad that influences engineering design decisions. Examples of functional and operating requirements include ruling grade, average speed of trains, typical maximum length of trains, and number and type of trains per day. Engineering decisions based on these functional and operating requirements include maximum grades, maximum degree of curvature, length and number of sidings, and number of main tracks.

The UBRR team determined that the UBRR would be a freight-only railroad (no passenger-rail service) based on the project's need to reduce freight-rail transportation cost. The two freight train types anticipated for the UBRR were (1) unit (or bulk) trains that haul a single commodity in one uniform car type for a single shipper between one origin-and-destination pair and (2) manifest (or mixed freight) trains that haul many commodities in carload volumes, each carload with its own shipper and origin-and-destination pair. No intermodal, automotive, or perishable trains were anticipated.

Based on the potential commodity shipments, the UBRR team determined that up to 11 trains a day would use the UBRR, which meant that it would require only a single-track railroad. The maximum ruling grade was determined to be 2.4%, with the main track design speed on the basis of curvature not less than 25 miles per hour (mph) in mountainous terrain and 60 mph in non-mountainous terrain.

The complete report is provided in Appendix D, Operating Basis of Design Report.

3.1.5 Alternatives-Development and Screening Methodology Report

The purpose of this report was to describe the proposed alternatives-development and screening process and methodology that was used for the UBRR alternatives feasibility process (see Section 3.1.6, Alternatives Feasibility Report). The report was provided to stakeholders prior to the alternatives-development and screening process to get buy-in on the methods used to develop and screen alternatives. The process consisted of the following five basic phases:

1. Developing preliminary project railroad alternatives
2. Applying first-level (Level 1 – Purpose and Need) screening criteria, identifying alternatives that will move to the next level (Level 2), and refining alternatives that pass the first-level screening
3. Applying second-level (Level 2 – Construction and Operation Feasibility) screening criteria based on initial desktop review of constructability and rail operations feasibility to identify alternatives that pass Level 2 screening and will be analyzed in Level 3 screening
4. Applying third-level (Level 3 – Natural and Built Environment) screening criteria based on impacts to the natural and human environment to identify alternatives that will under go a final field verification constructability review (Level 4)
5. Applying a field review (Level 4 – Alternative Feasibility) of the potential constructability of the alternatives to determine which alternatives are feasible and practicable

The report describes the screening criteria that were established for each of the five phases to determine the feasible alternatives and the data and tools used. Figure 4 above shows the study area used to develop feasible alternatives. The area is defined by the existing Class 1 railroads that surround the Uinta Basin as follows:

- **North border:** The UP main track between its intersection with Wyoming State Highway 789 and Ogden, Utah
- **East border:** Wyoming State Highway 789 between its intersection with the UP main track east of Wamsutter, Wyoming, and the Colorado border, and Colorado State Highway 13 between the Wyoming border and its intersection with the UP main track near Rifle, Colorado
- **South border:** The UP[1] main track between Rifle, Colorado, and Provo, Utah
- **West border:** The UP main track between Provo, Utah, and Ogden, Utah

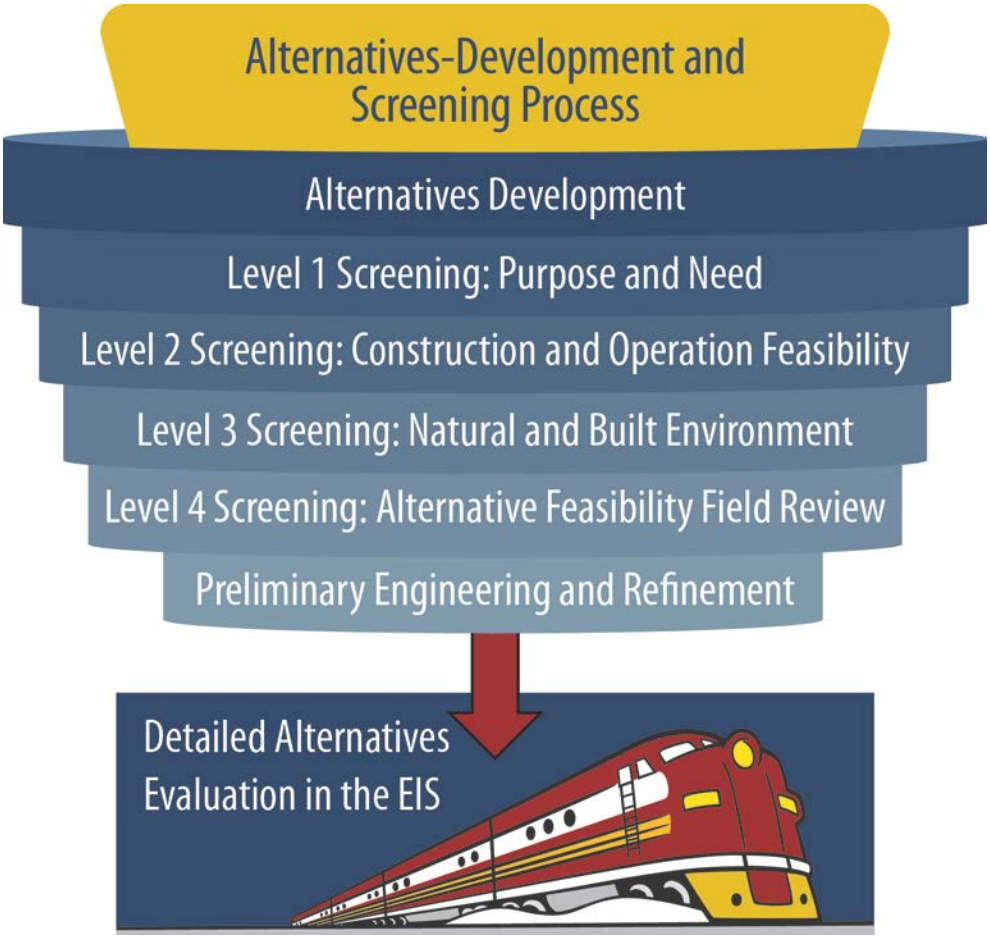
The complete report is provided in Appendix E, Alternatives-Development and Screening Methodology Report.

3.1.6 Alternatives Feasibility Report

This report documented the alternatives feasibility evaluation process using the screening criteria developed in the Alternatives-Development and Screening Methodology Report. The report documented the processes and conclusions from each step of the screening process shown in Figure 6 below.

[1] BNSF maintains track rights with the UP main track on the southern and western borders of the analysis area.

Figure 6. Alternatives-Development and Screening Process

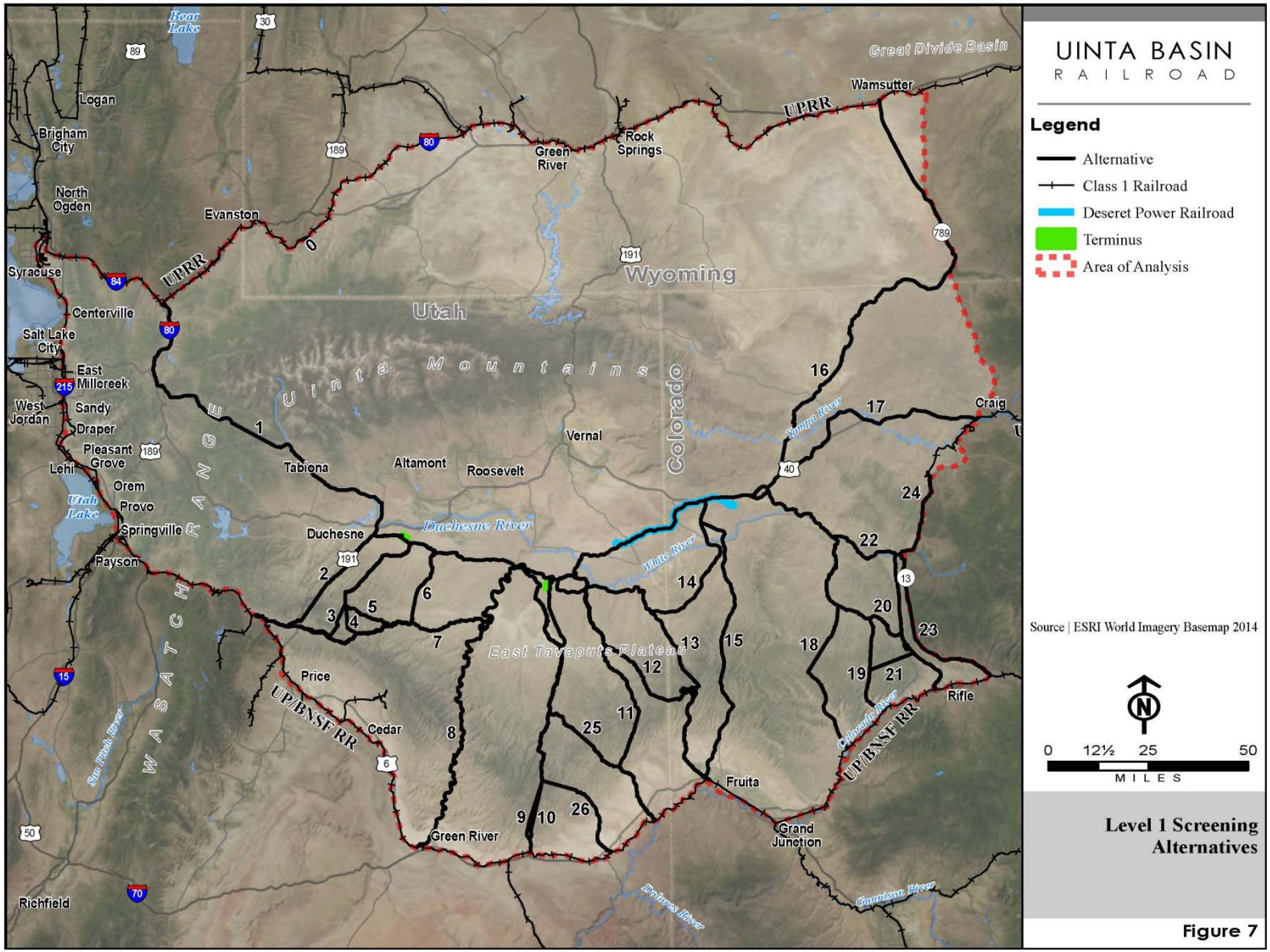


Alternatives Developed

In all, 26 alternatives were developed within the area of analysis to evaluate in the screening process (Figure 7 below). First, the UBRR team included the alternatives developed as part of the Isolated Empire Rail Project (DMJM Harris 2001). The purpose of this project was to review the feasibility of extending a heavy-duty commercial freight rail line to connect the remote areas of northwestern Colorado and northeastern Utah to the national rail network. The project evaluated 16 alignments, all of which were included in the alternatives-development and screening process for the UBRR project. After reviewing these alternatives, the UBRR team developed 10 additional alternatives. The main criteria used to develop these alternatives are as follows:

- The freight rail alternatives must connect to an existing rail line within the area of analysis in order to provide a connection to the national rail network.
- The freight rail alternatives must meet basic topography requirements such as minimizing the need to traverse steep terrain.
- The freight rail alternatives must reduce local truck travel distances to the rail line to the greatest degree economically practical with acknowledgement that future development could occur in different locations in the Uinta Basin. The alternative must also provide a range of access across the basin to support the economic viability of the railroad for all commodities.

Figure 7. Level 1 Screening Alternatives



Alternatives-Screening Process

During the alternatives-screening process, the four levels of screening were applied to the 26 alternatives. The two criteria that had the greatest effect on screening were:

- **The Level 1 criterion that the alternative must provide the Uinta Basin with two-carrier access by connecting to existing rail lines served by both UP and BNSF.** This will provide the opportunity for competitive pricing between railroads by providing competitive freight transportation services to the shippers and receivers in the Uinta Basin. This criterion eliminated four alternatives: 1, 16, 17, and 24.
- **The Level 2 criterion that the UBRR have a grade of no more than 2.4%.** For main-track railways in North America intended for heavy and frequent trains, a grade of 2.4% has historically been considered the steepest grade that is economically and safely operable. The *de facto* standard ruling grade in the United States is slightly less, at 2.2% (for more information, see the Alternatives-Development and Screening Methodology Report). This criterion eliminated 13 alternatives: 6, 9, 10, 11, 13, 14, 15, 19, 20, 21, 22, 23, and 26. In order to maintain the 2.4% grade, all of the alternatives that passed Level 2 screening required tunnels between 7 and 9 miles long.

In addition to the alternatives eliminated by the above criteria, two were eliminated because they were within the Green River canyon, and the floodplain and steep canyon walls would make it impracticable to build a rail line (Alternatives 7 and 8). During Level 3 screening, Natural and Built Environment, three alternatives were eliminated. Two alternatives were eliminated because they were within Nine Mile Canyon, which is known for its extensive rock art and other cultural resources created by the Fremont culture and the Ute people. They also had greater wetland impacts than another nearby alternative (Alternatives 4 and 5). The final alternative was eliminated from consideration for having the greatest wetland impacts, the greatest impacts on sensitive wildlife habitat, the greatest impacts on irrigated prime and unique farmland, and the highest cost (Alternative 18).

From February 24 to February 26, 2014, the UBRR team conducted Level 4 screening (alternative feasibility field review) on the four alternatives that passed Level 3 screening (Alternatives 2, 3, 12, and 25). After the field review, the team developed more-refined digital maps and determined that one of the remaining four alternatives had a grade of 2.8% (Alternative 25). This grade would not pass the Level 2 grade criterion of 2.4%, so the alternative was eliminated. When considering the remaining three alternatives, the UBRR team determined that the steep slopes and loose material in the Baxter Pass area would make construction and operation of Alternative 12 not feasible or practicable.

Feasible Alternatives

Using the four-level screening process, the UBRR team determined that Alternatives 2 and 3 were both feasible and practicable alternatives and would be evaluated (see Figure 1 above, Uinta Basin Alternatives). Of the seven alternatives that met both the project purpose and the 2.4%-grade requirements from Level 1 and 2 screening, Alternatives 2 and 3 would have the least amount of impacts to wetlands, sensitive wildlife habitat, drainages, wilderness areas, Section 4(f) resources, and cultural resources.

Using the four-level screening process, the UBRR team determined that Alternative 2 (about 96 miles long with one 8-mile tunnel) and Alternative 3 (about 113 miles long with three tunnels totaling 9 miles) were the only feasible and practicable alternatives of the original 26 alternatives evaluated. Based on the alternatives-refinement process that was conducted on the two alternatives; the UBRR team

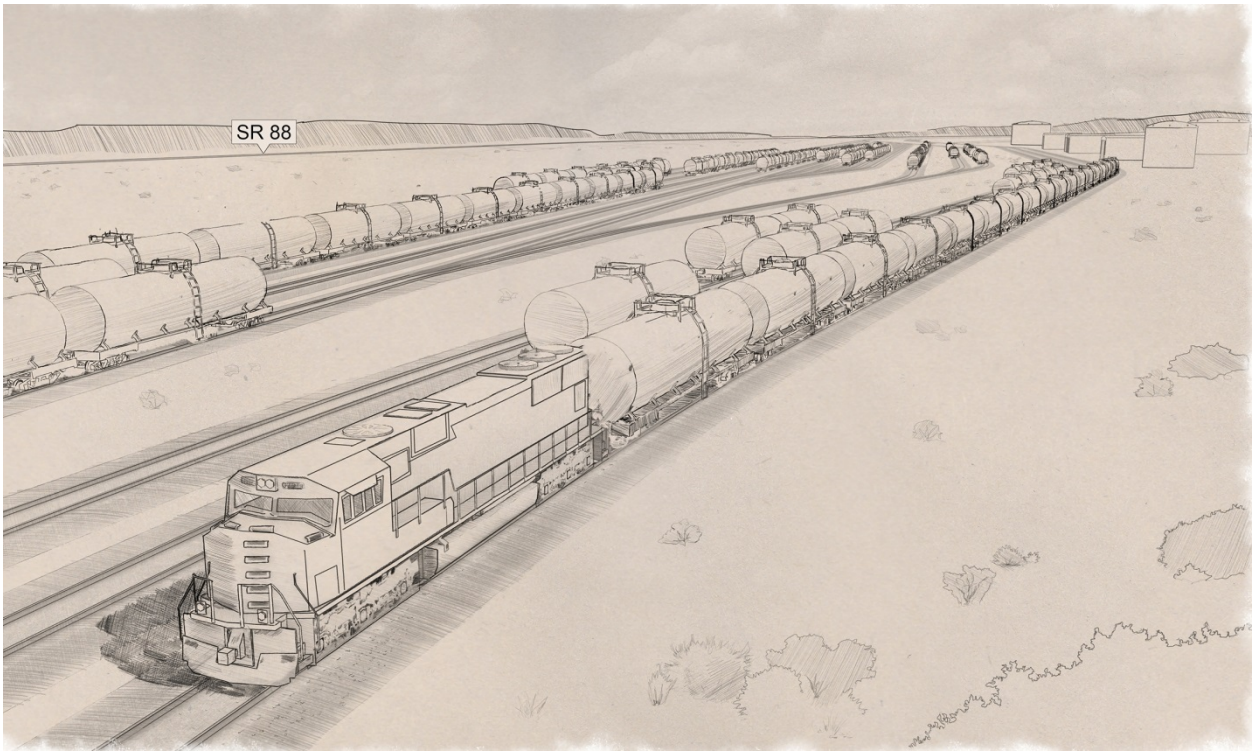
recommended that Alternative 2 be carried forward for consideration and that Alternative 3 be eliminated from detailed consideration based on its additional impacts to the natural environment and the alternative's higher cost.

Both alternatives would use similar alignments except for the portions in Indian Canyon and Sowers Canyon and would provide the same operational benefits. However, Alternative 3 would have greater impacts on wetlands (9 more acres), sensitive wildlife habitat (214 acres), and cultural resources (one more site). In addition, Alternative 3 would involve developing a new transportation facility in a relatively undisturbed canyon, whereas Alternative 2 would be built in a canyon with an existing highway that already causes transportation-related impacts to the natural environment. Finally, Alternative 2 would affect about 196 fewer acres of federal, state, tribal, and private land.

Both alternatives included rail terminals within the Uinta Basin as shown in Figure 8 and Figure 9 below.

Figure 8. Duchesne Terminal

Figure 9. U.S. 40 and S.R. 88 Terminal



The complete report is provided in Appendix F, Alternatives Feasibility Report.

3.1.7 Phase 1 Geotechnical Report

To assist with the preliminary engineering and cost estimate, a geotechnical review of the two alignments was conducted using existing literature. The main purpose of the evaluation was to look at the feasibility of the proposed tunnels and to assist in reviewing potential tunnel options.

The complete report is provided in Appendix G, Phase 1 Geotechnical Report.

3.1.8 Preliminary Engineering/Cost Estimate

Preliminary Engineering

The primary challenge for developing a feasible UBRR alignment was topography. The Uinta Basin is bounded on the north by the Uinta Mountains and on the east by the Douglas Creek Arch, with portions of the Wasatch Range and the Roan Cliffs forming its southern and western boundaries. The basin is a high desert with elevations that range from about 4,632 feet in the eastern part near the Green River to about 6,867 feet in the southwestern part near Gilsonite Draw. The Uinta Basin—known since pioneer times as the Isolated Empire— does not have an existing rail line because the mountains that surround the basin make finding a route with an acceptable grade difficult.

For the UBRR project, the criterion for the ruling grade was 2.4%. For main-track railways in North America intended for heavy and frequent trains, a grade of 2.4% has historically been considered the steepest grade that is economically and safely operable. The *de facto* standard ruling grade in the United States is slightly less, at 2.2%. A 2.4% ruling grade is at present encountered on only two major rail lines

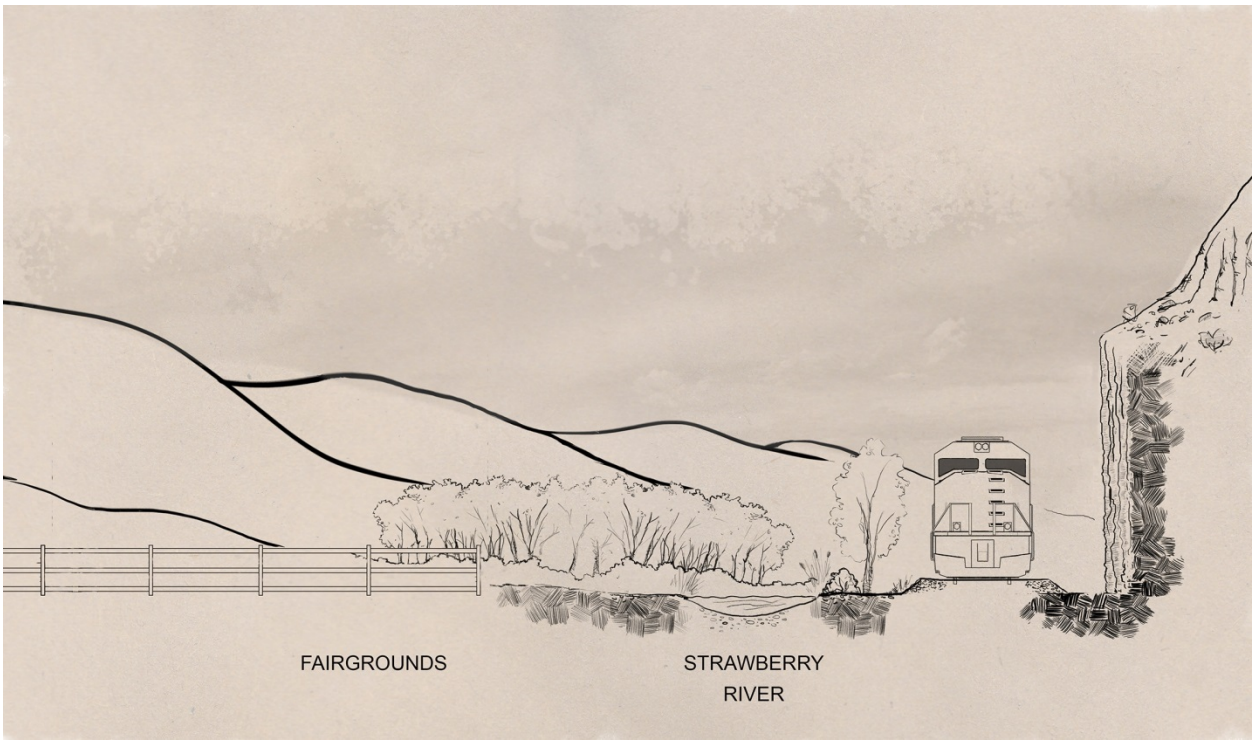
in the United States: eastward on UP's ascent of Donner Pass in California, which lies on UP's main track between northern California and Chicago, and westward on UP's ascent of Soldier Summit in Utah, which lies on UP's main track between Denver and Salt Lake City via Grand Junction, Colorado.

Trying to maintain a ruling grade of 2.4% was the limiting factor on most of the 26 alternatives evaluated. As a result, most of the alternatives required long tunnels in order to maintain the 2.4% ruling grade. Even with tunnels, 13 of the 26 alternatives were eliminated because they could not meet the 2.4% criterion.

Another engineering challenge that also contributed to high cost was the walls needed to shore up the steep terrain and loose material in many of the canyons. In many locations, avoiding the steep walls of a canyon meant placing the rail line in the bottom of the canyon, which would require relocating streams in several locations. The associated cut-and-fill requirements meant that large amounts of soil would need to be disposed of (for example, for Alternative 2).

In addition, in order for Alternative 2 to avoid tribal land near Duchesne, the rail alignment would have to be located between a steep bluff and the Strawberry River, a configuration that required an extensively high and long wall. Figure 10 shows this proposed concept. Some of the walls proposed for the project were 50 to 60 feet high and over 100 feet long.

Figure 10. Duchesne Fairground Alignment



Preliminary engineering was conducted for the two feasible alignments only (Alternatives 2 and 3). Because the project did not progress beyond the initial feasibility evaluation, the amount of preliminary engineering was conceptual (less than 5% of final engineering) and was based on available low-resolution topographical information (±15-foot contours) and approximate locations of land ownership. The process of acquiring geotechnical data consisted of reviewing existing literature on the terrain surrounding the basin. Although several tunneling techniques were discussed, because there was no detailed geotechnical information, a final technique was never developed.

The proposed tunnels were the primary reason for the high cost of the project and for extending the proposed construction schedule from 2016 to 2025. The evaluation showed that a 29-foot-diameter rail tunnel between 8 and 9 miles long could take 2 years to complete, require long lead times (a year or more) to obtain the necessary equipment, and require a large number of skilled laborers. During peak construction periods for the project, projections of 3,000 workers were estimated. This size of workforce would overwhelm the existing city infrastructure of the local small communities, requiring separate camps with upgraded infrastructure to be built to house the workers. Figure 11 and Figure 12 below show the proposed tunnel concepts.

Figure 11. South Tunnel and U.S. 191 Crossing

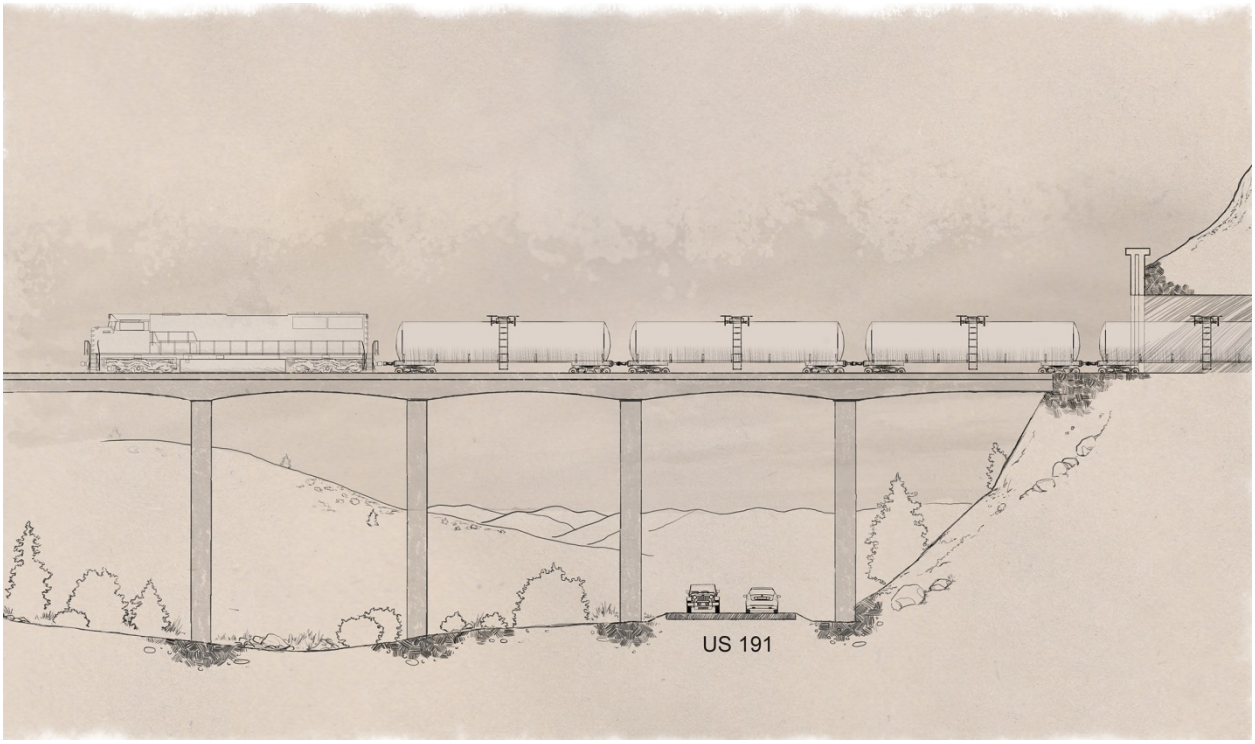
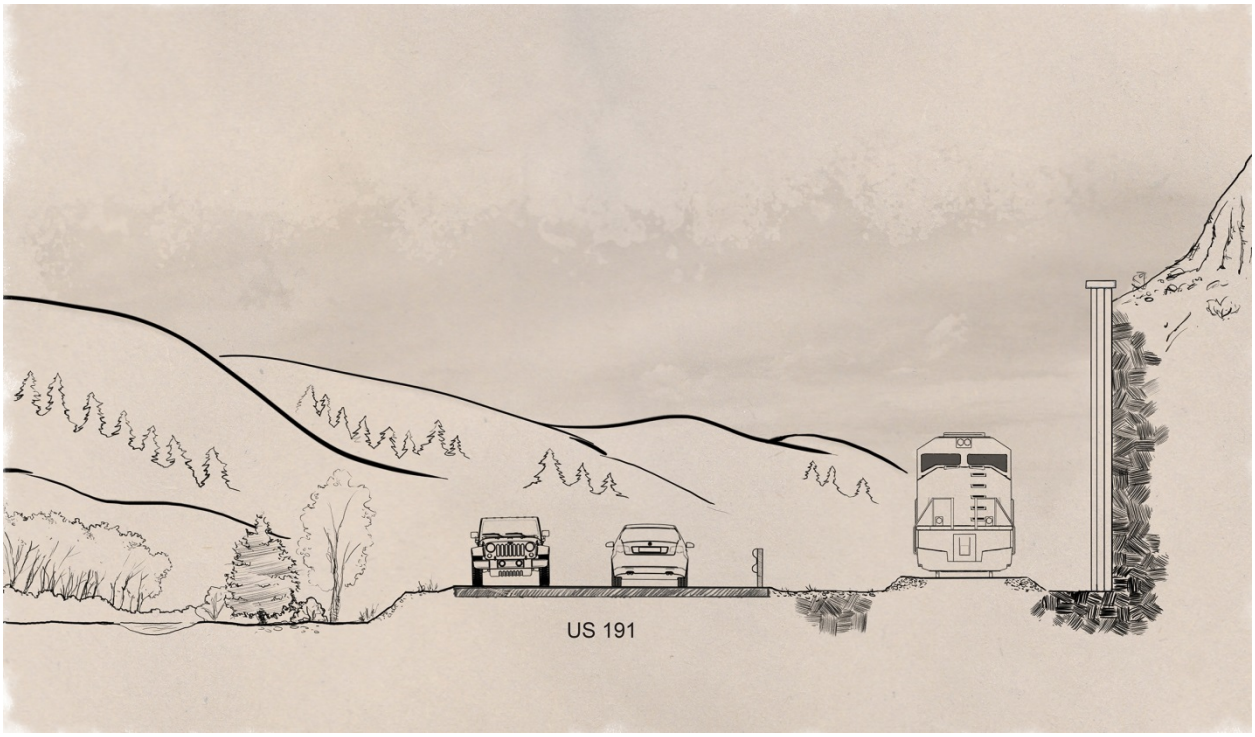


Figure 12. North Tunnel and U.S. 191 Crossing

For Alternative 2 in Indian Canyon, the UBRR team determined that UDOT owned about 100 feet of the right-of-way for U.S. 191. This included UDOT having a quick claim deed for the 100-foot right-of-way across tribal land. To avoid impacts to tribal land and private property, UDOT developed the alignment so that the rail line and highway could be co-located within the 100-foot right-of-way. Using this approach minimized impacts to adjacent properties, wetlands, farmland, stream channels, and wildlife habitat. Figure 13 below is a diagram of this approach.

Figure 13. U.S. 191 Corridor Proposed Design



Appendix H, Cost Estimates and Design Maps, provides the preliminary engineering plan sheets.

Cost Estimates

Based on the conceptual engineering, the UBRR team developed a cost estimate for Alternatives 2 and 3. Because of the conceptual nature of the engineering, a 25% contingency was added to the cost estimate. The estimates were later revised as part of the Cost Estimating Validation Process (CEVP) described in Section 3.1.10, Cost Estimating Validation Process (CEVP). The initial cost estimate for Alternative 2 was $2.97 billion and for Alternative 3 was $3.05 billion. Appendix H, Cost Estimates and Design Maps, provides the preliminary cost estimates.

Operational Planning

Operational planning for the UBRR consisted of a preliminary plan based on initial conversations with potential shippers and the connecting railroads: UP, BNSF, and Utah Railway. The Operating Plan projected tentative freight commodities, volumes, and the service need of shippers based on these conversations and comparable operations on other railways in the United States. The Operating Plan selected tentative locations for shipper facilities, types of facilities, how shippers might interact with facilities, and the tentative method of interchange with UP, BNSF, and Utah Railway, but without any definite agreement by shippers and the connecting railroads that these locations and methods would actually be implementable. In particular, the Operating Plan could not project the most important aspect of all for a rail line—who would own, operate, maintain, and market its services—since these factors were not established at the time the Operating Plan was prepared.

To advance an Operating Plan beyond the preliminary stage, commercial agreements would need to be made with shippers and connecting railroads and for a definitive plan for who would own, operate, maintain, and market the rail line.

Because the Operating Plan did not have definitive agreements in place—these agreements had not even been discussed (beyond the fact that the connecting railroads stated they would be required)—certain technical aspects of the Operating Plan remained tentative and based on comparables. These technical aspects would need to be finalized and validated before selecting a final connection point with the UP line and before selecting and designing any terminals or shipper facilities. The technical aspects could even affect the alignment and ultimate extent of the UBRR within the Uinta Basin. UP, the owner of the main track to which the UBRR was proposed to connect, stated that the following technical documentation must be prepared prior to its agreeing to interchange with or physically connect with the UBRR:

- A train dynamics study demonstrating that the in-train forces on the UBRR, and through the connection with UP, were equal to or less than the in-train forces on the UP main track between Helper and Provo, Utah. This study would baseline the UP main track's train dynamic forces for the same trains proposed to operate on the UBRR and would compare them to what would be experienced on the UBRR.
- An operations simulation model, using the Rail Traffic Controller (RTC) software, of the UP main track between Helper and Provo in conjunction with the UBRR, including a baseline model of the UP main track between Helper and Provo demonstrating that trains connecting to the UBRR would not delay or cause capacity or fluidity loss to UP, particularly at the connection, and that trains could operate on the proposed UBRR alignment and its main track/siding configuration, with adequate running speed. This model would also demonstrate running times and train delay on the UBRR, enabling a commercial agreement to be made with UP for run-through locomotives, trains, or crews, thereby avoiding a costly and inefficient interchange yard at the connection.
- Commercial agreements with shippers sufficiently advanced to describe the car supply, volumes, commodities, origin-destination pairs, trans-shipment points on the UBRR, and the nature, ownership, and configuration of shipper and receiver facilities on the UBRR.
- A formal interchange agreement with UP and a formal construction and maintenance agreement for the connection with the UP line.
- Detailed engineering documentation of the UBRR, showing:
    - Quality of track that would be constructed and maintained
    - Specification of track materials
    - Specification of engineering standards that would be followed, such as geometry, turnout size, track centerline spacing, and clearances and loading gauge
    - Signalization type, standards that would be followed, and equipment that would be used
    - Positive Train Control (PTC) and Centralized Traffic Control (CTC) systems interface with UP's systems
    - Communications systems interface with UP's systems
    - Data transfer systems interface with UP's systems
    - Interoperability of track, signalization, and Positive Train Control systems

These studies and agreements would be necessary to advance the UBRR to construction and operation. Upon development of these studies and agreements, a final Operating Plan and a System Safety Plan could be developed. These plans could change the UBRR's proposed physical plant, such as location of the main track and shipper facilities, the configuration of the main track and the locations of sidings, the vertical and horizontal alignment, the locations and configuration of terminals, and the locations and configuration of the connection with the UP line. Submission of the Operating and System Safety Plans to FRA, and approval by FRA, would be required before the UBRR could begin operation. Prior approval of FRA would be desired by UP to avoid rework or redesign.

3.1.9 Operating Plan Report

This report described the preliminary Operating Plan for the proposed UBRR. The purpose of the preliminary Operating Plan was to describe how the UBRR would be operated as a functioning railroad and to summarize the anticipated metrics of the railroad's operations in order to inform the development of the engineering design, environmental analysis, and economic and commercial analysis of the UBRR. Metrics of operations include maximum train length, anticipated train frequency, maximum and average speeds, and other basic facts that inform the analysis of the railroad's performance and its means and methods of providing transportation services. The report described the general characteristics of the UBRR, provided a detailed freight forecast for five different scenarios, described the capacity of the rail line, described its general maintenance plan, and noted special considerations for the proposed tunnel(s) that would likely be incorporated into the railroad's alignment.

Some key elements addressed in the plan include:

- The length of train would be up to 120 cars, but the UBRR would be able to handle 150 cars.
- The typical 120-car unit train on the UBRR would be 7,564 feet long (including two buffer cars), the typical 80-car manifest train would be 4,960 feet long, and the maximum 150-car manifest train would be 9,300 feet long, exclusive of locomotives. Allowing six locomotives per train at 75 feet each, manifest train lengths would normally not exceed 9,750 feet.
- The average number of trains per day forecasted for the UBRR could range from a low of 4 trains per day in Scenario 1 (low oil and gas production level) to a maximum of 10.6 trains per day in Scenario 5 (maximum oil and gas production level). This is "both ways" train volumes, so the total train trips per day. Typical peak daily train volumes might be 50% higher than the yearly average, which would equal 6.0 trains per day for Scenario 1 and 15 trains per day for Scenario 5.
- The UBRR would need only one main track with sidings located at suitable intervals for meet-and-pass events.
- The minimum clear length of sidings should be 10,000 feet.
- Operating speeds would be between 10 and 40 mph depending on grade, with a maximum allowable speed of 60 mph in flat terrain.
- UBRR's main track Method of Operation would be Centralized Traffic Control (CTC) with a Positive Train Control overlay. CTC is the U.S. standard method for operating trains on all but low-density lines; it uses signals adjacent to the track to provide instructions from dispatchers in a central office to engineers operating the trains. PTC is a system that automatically prevents trains from exceeding speed limits or exceeding their authorized track limits.
- Two terminals were proposed: one 2 miles east of Duchesne immediately south of U.S. 40 and the other south and west of the intersection of U.S. 40 and S.R. 88.

The complete report is provided in Appendix I, Operating Plan Report.

3.1.10 Cost Estimating Validation Process (CEVP)

Following the 5% preliminary engineering and cost estimate process for the feasibility study noted in Section 3.1.8, Preliminary Engineering/Cost Estimate, UDOT undertook a Cost Estimating Validation Process (CEVP) to better define the cost and risk associated with project construction. CEVP is an intense workshop where transportation projects are examined by a team of top engineers and risk managers from local and national private firms and public agencies. For the UBRR CEVP process, the participants had extensive first-hand experience with large-project programming and delivery, including freight railroad, tunneling, construction methods, and large-project program management. The CEVP workshop participants used systematic project-review and risk-assessment methods to evaluate the quality of the information and to identify and describe cost and schedule risks. Importantly, the process examined how risks could be lowered and cost vulnerabilities managed or reduced.

The UBRR team reviewed the current base cost estimate during the CEVP workshop on October 6–10, 2014. The purposes of the CEVP workshop were to:

- Quantify uncertainty in project cost and schedule
- Identify and quantify cost and schedule risks and opportunities
- Identify potential risk-mitigation strategies to set the stage for risk management

Base Cost Estimate

The UBRR team reviewed the current cost estimate during the October workshop. The "base" cost estimate resulting from the workshop was $2,665 million in 2014 dollars. This base cost reflected the cost of the UBRR if everything were to go as planned—without risk, opportunity, contingency, or inflation. The base estimate reflected the best available information concerning project scope and cost and was considered by the workshop participants to be the most appropriate estimate of the UBRR's cost.

Key Results

The CEVP results indicated, at an 80% confidence level, that the UBRR could be constructed at a total project cost of $3,146 million in 2014 dollars and $4,476 million in year-of-expenditure dollars, compared to the base cost estimate of $2,665 million in 2014 dollars.

The three largest risks associated with project cost were (1) the potential need to change the alignment in the Emma Park vicinity (mean cost impact of $121 million in 2014 dollars), (2) challenges associated with managing a project of this size and complexity (mean impact of $117 million in 2014 dollars), and (3) having to avoid or relocate oil wells for construction (mean impact of $67 million in 2014 dollars).

Cost-saving opportunities were dominated by using a tunnel-boring machine in tunnel construction (mean cost savings of $176 million in 2014 dollars). Other cost-saving opportunities were optimizing earthwork across the alignment (mean cost savings of $32 million in 2014 dollars) and modifying the alignment through Indian Canyon (mean cost savings of $25 million in 2014 dollars).

The CEVP results indicated, at an 80% confidence level, that the UBRR could be completed by September 2026 compared to the base schedule estimate (that is, without schedule risk) of September 2022. The most critical schedule risks were delays in completing the EIS (average delay to the project of 22 months) and legal challenges to the project's Record of Decision (average delay to the project of 10 months). The largest schedule opportunity could result from changing the tunneling method from using all drill-and-blast to using a tunnel-boring machine (average savings of over 6 months).

The complete report is provided in Appendix J, Cost and Risk Analysis for the Uinta Basin Rail Project.

3.1.11 Commercial Sustainability Analysis Report

The purpose of this report was to summarize the commercial sustainability and commercial feasibility of the proposed UBRR. *Commercial sustainability* is defined as the capability of the UBRR to develop sufficient revenue to internally fund its ongoing operating and maintenance cost (OPEX). *Commercial feasibility* is defined as the capability of the UBRR to develop sufficient revenue to internally fund the debt service required to repay its capital cost (CAPEX).

Traffic Forecast

In order to determine UBRR's commercial sustainability and commercial feasibility, the UBRR team developed a freight traffic forecast. *Freight traffic* is the rail industry's term for the goods and commodities presented by shippers to a railroad for transportation. The UBRR team developed five different traffic forecast scenarios using different assumptions about the future freight potential of the Uinta Basin. The freight traffic forecast was used to develop a revenue forecast. An OPEX forecast was developed for each scenario, and a CAPEX was separately determined through conceptual engineering. CAPEX was defined solely as the physical infrastructure of the UBRR rail line: its track, structures, signals and communications, and fixed facilities. Rolling stock—the locomotives and freight cars that would equip the UBRR's trains—would be provided by connecting railroads or shippers. Maintenance machinery is included in the OPEX forecast (Table 2).

Table 2. Freight Traffic Scenarios

	Revenue Scenario				
Revenue	1	2	3	4	5
Crude oil produced from conventional oil, proven reserves only	✓	✓	✓	✓	✓
Inbound oil- and gas-drilling materials required for development of proven reserves only	✓	✓	✓	✓	✓
Gilsonite	✓	✓	✓	✓	✓
Crude oil potential reserves		✓	✓	✓	✓
Inbound oil- and gas-drilling materials for recovery of potential oil reserves		✓	✓	✓	✓
Crude oil produced from oil sands			✓	✓	✓
Crude oil produced from oil shale				✓	✓
Phosphate concentrate produced from newly developed mines					✓

Return on Investment

Given the uncertainty in the UBRR's financing method, the UBRR team made various simplified assumptions to analyze the potential cost of the capital required to build the rail line. The project was assumed to be fully debt-financed by a tax-exempt issuer through 30-year bonds with a 5% coupon issued at par and a level payment structure with all proceeds received in 2018 when construction for the UBRR would begin. The interest during construction was assumed to be capitalized and pre-funded in the bond issue, which would result in higher debt service costs but would delay payments until the project started generating cash, thereby reflecting a typical revenue bond structure. Other likely pre-funded costs such as the cost of issuance and a debt reserve fund were omitted. The bond yield was assumed to be conservatively higher than current historically low market rates, but a detailed and focused analysis of financing methods would be needed to identify a true expected cost of capital.

Under these simplified financing assumptions, the total project capital costs of nearly $4.5 billion (includes $ 300 million in upfront owner cost not included in the bond par value) and capitalized interest of $1.4 billion result in a bond par value of $5.6 billion and an annual debt service of $395 million. An inflation rate of 4.6% was applied to revenues, as well as operating and maintenance costs based on the inflection factor used for the cost estimate.

As shown in Figure 14 through Figure 16 and Table 3 below, only Scenarios 4 and 5 would have a positive return on investment and net cash flow.

Figure 14. Net Present Value

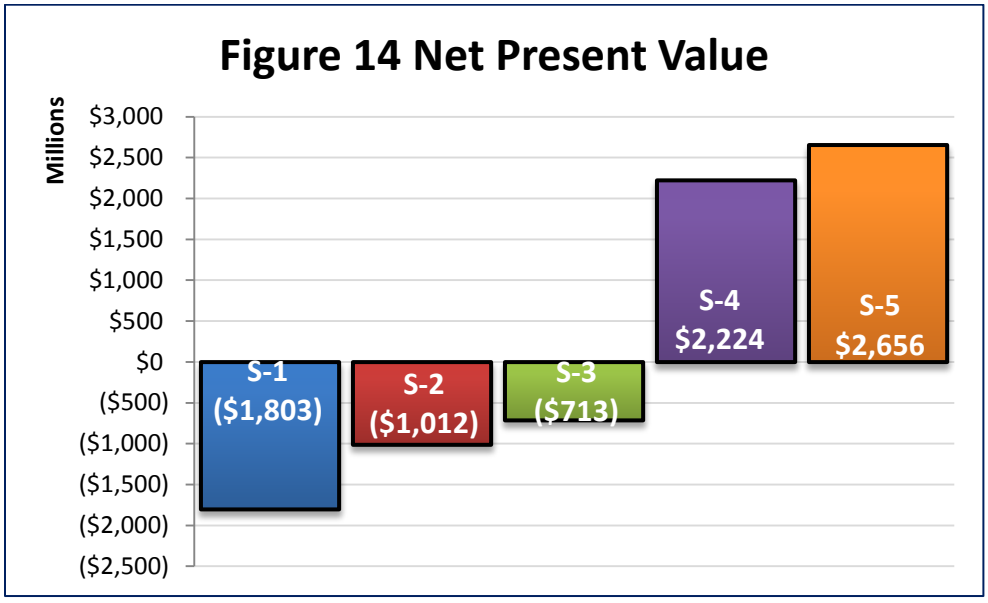


Figure 15. Return on Investment

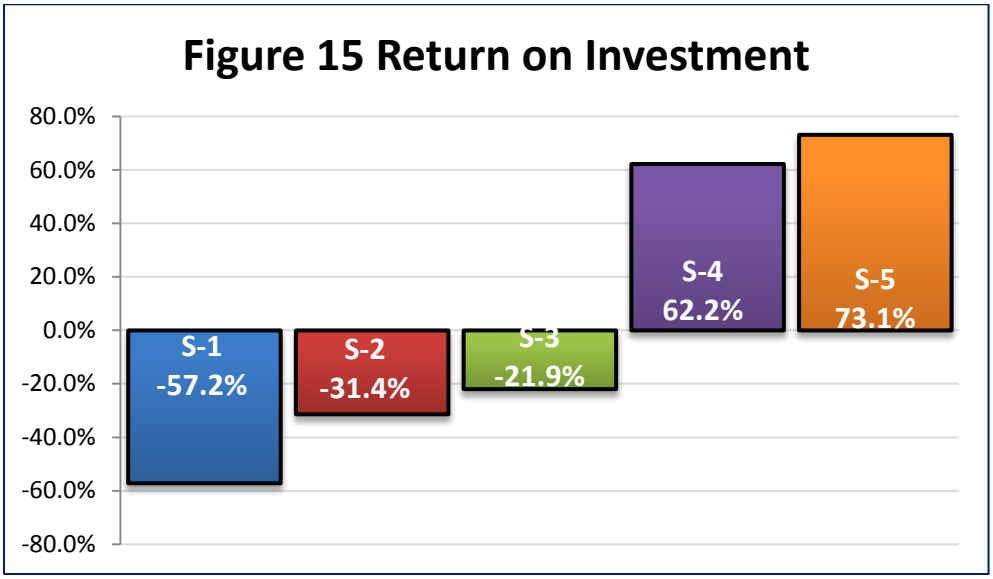
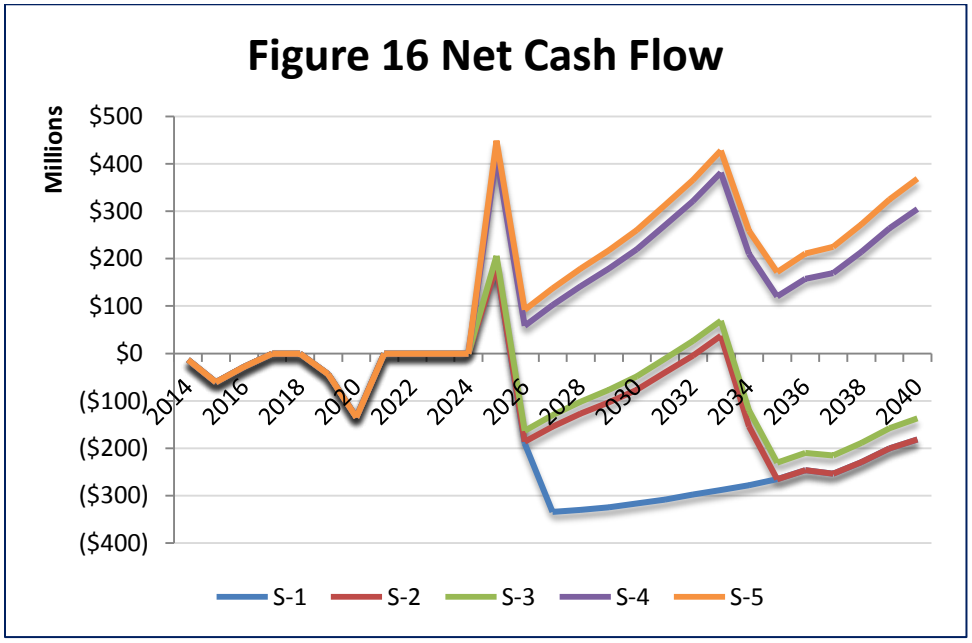


Table 3. Financial Metrics of the UBRR for Five Traffic Scenarios, 2020–2040

Scenario	Net Present Value (millions $)	Return on Investment (%)	Internal Rate of Return (%)
1	($1,803)	–57.2%	N/A
2	($1,012)	–31.4%	N/A
3	($713)	–21.9%	N/A
4	$2,224	62.2%	22.1%
5	$2,656	73.1%	23.7%

N/A = not applicable

Figure 16. Net Cash Flow



The complete report is provided in Appendix K, Commercial Sustainability Analysis Report.

3.1.12 Public Benefit Analysis Report

This report describes the methodology, data inputs, and results of a public benefit analysis (PBA) conducted for the UBRR. The purpose of a PBA is to quantify and monetize benefits that would accrue to the general public in the future from the construction of a project. Typically these are benefits that are not captured by the project itself through user fees, tolls, or use charges, but instead are outcomes that provide broad social benefits. For example, a transportation infrastructure project that avoids highway congestion due to a lower volume of heavy truck traffic provides a public benefit that is not captured by the strict financial viability of the project.

Public benefits can also be outcomes that result in avoided public expenditures. For example, a project that results in reduced highway maintenance costs—a public expenditure which is collected in part through general income tax revenues—provides a public benefit.

The following tables and figures summarize the public benefits results. The results of the PBA are expressed in terms of present value (PV) by discounting the public benefits into present-day (year 2013) dollars using both 7% (Table 4 and Figure 17 below) and 3% (Table 5 and Figure 18 below) discount rates.

Table 4. Overall Results, Benefit-Cost Analysis of Alternatives Relative to Base Case – PV (7%)

in millions of 2013 dollars

Variable	Public Benefit Analysis for Years 2014–2049 – PV (7%)				
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Transportation cost savings	$21	$38	$42	$87	$94
Congestion cost savings	$17	$29	$32	$58	$63
Pavement maintenance cost savings	$52	$90	$97	$178	$193
Accident cost savings	$19	$33	$35	$64	$69
Emission cost savings	$29	$42	$45	$73	$78
Incremental inventory costs	($0.02)	($0.06)	($0.07)	($0.29)	($0.30)
Net public benefits	**$139**	**$231**	**$250**	**$460**	**$498**

Scenario 1: Conventional Oil, Proven Reserves + Gas Materials + Gilsonite
Scenario 2: Conventional Oil, Potential Reserves + Gas Materials + Gilsonite
Scenario 3: Conventional Oil, Potential Reserves + Gas Materials + Gilsonite + Oil Sands
Scenario 4: Conventional Oil, Potential Reserves + Gas Materials + Gilsonite + Oil Sands + Oil Shale
Scenario 5: Conventional Oil, Potential Reserves + Gas Materials + Gilsonite + Oil Sands + Oil Shale + Phosphate

Figure 17. Overall Results, Benefit-Cost Analysis of Alternatives Relative to Base Case – PV (7%)

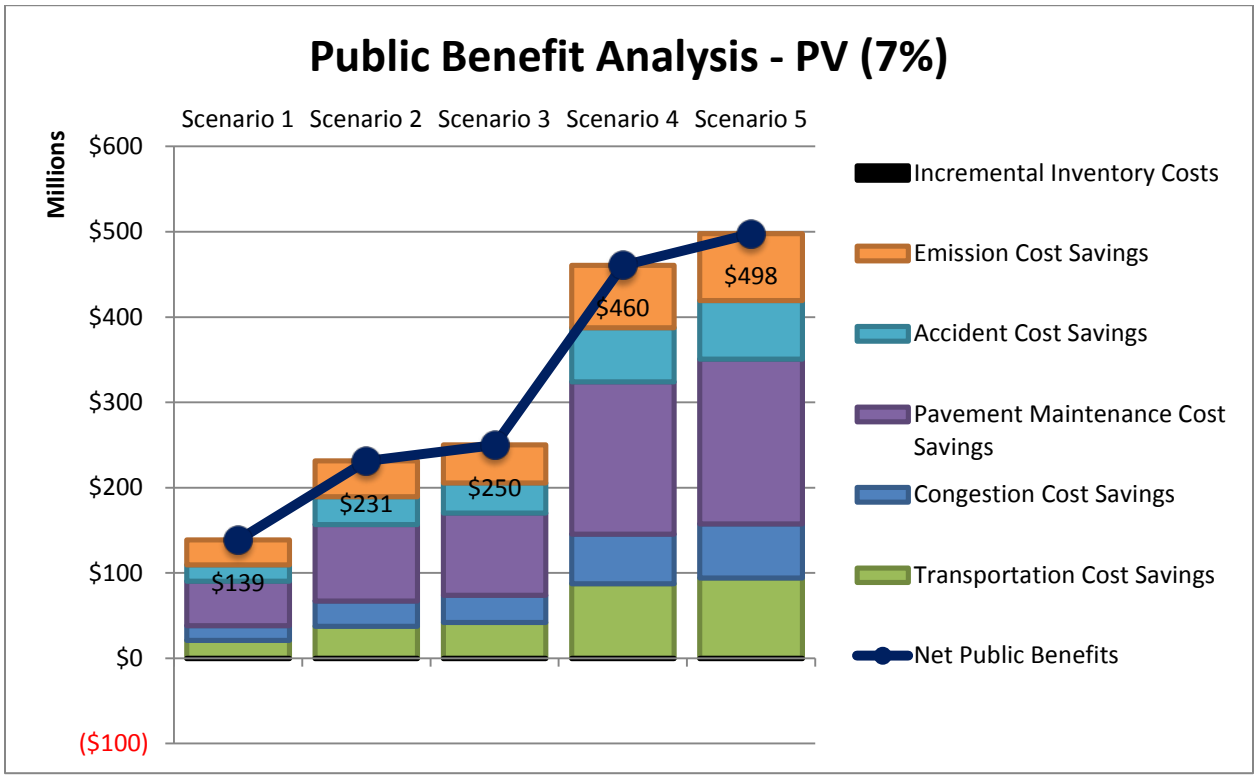


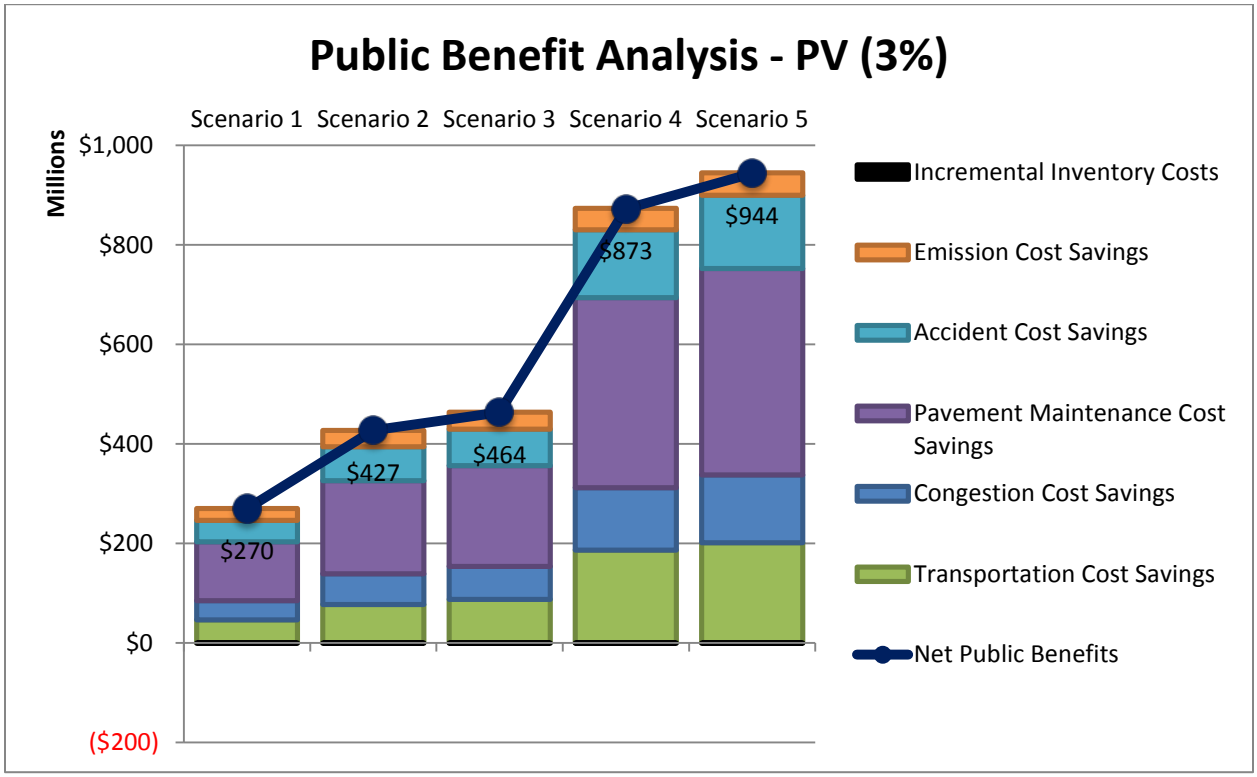
Table 5. Overall Results, Benefit-Cost Analysis of Alternatives Relative to Base Case – PV (3%)

in millions of 2013 dollars

Variable	Public Benefit Analysis for Years 2014–2049 – PV (3%)				
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Transportation cost savings	$47	$78	$87	$187	$202
Congestion cost savings	$39	$61	$66	$125	$136
Pavement maintenance cost savings	$118	$187	$202	$382	$415
Accident cost savings	$43	$68	$73	$136	$147
Emission cost savings	$24	$33	$34	$43	$45
Incremental inventory costs	($0.04)	($0.11)	($0.14)	($0.62)	($0.63)
Net public benefits	**$270**	**$427**	**$464**	**$873**	**$944**

Scenario 1: Conventional Oil, Proven Reserves + Gas Materials + Gilsonite
Scenario 2: Conventional Oil, Potential Reserves + Gas Materials + Gilsonite
Scenario 3: Conventional Oil, Potential Reserves + Gas Materials + Gilsonite + Oil Sands
Scenario 4: Conventional Oil, Potential Reserves + Gas Materials + Gilsonite + Oil Sands + Oil Shale
Scenario 5: Conventional Oil, Potential Reserves + Gas Materials + Gilsonite + Oil Sands + Oil Shale + Phosphate

Figure 18. Overall Results, Benefit-Cost Analysis of Alternatives Relative to Base Case – PV (3%)



The complete report is provided in Appendix L, Public Benefit Analysis Report.

3.2 Phase 2 Reports

3.2.1 Cultural Resources

As part of the feasibility evaluation, an archaeological, architectural, and paleontological resources survey was conducted in the summer and fall of 2014. Because of the sensitive nature of the material in these reports, they are not included in this summary report.

Cultural Resources Methods Report

The purpose of this report was to document the process proposed by UDOT to identify historic properties in the study area for the UBRR project. The report explained the methods proposed by UDOT to identify historic properties as part of the project's feasibility study process. The report was reviewed by the Utah State Historic Preservation Office (SHPO), STB, the Bureau of Land Management, and the U.S. Forest Service. All of the agencies approved the methods identified in the report for use in the feasibility process and the National Environmental Policy Act process if the project were to proceed to that phase.

Archaeological Resources Report

Archaeologists conducted a Class II, reconnaissance-level pedestrian archaeological survey of two proposed routes for the UBRR. The archaeological analysis consisted of a Class I background records search and a Class II survey of selected portions of the two proposed routes based on a predictive model created specifically for the project.

Prior to the survey, a records search and literature review was conducted. Records from the Utah SHPO in Salt Lake City indicated that numerous previous cultural resource surveys were conducted near or within the UBRR's area of potential effects (APE). In addition, multiple previously recorded archaeological sites were also located with the project's APE.

Also, as part of the UBRR project, a predictive model was created to guide the archaeological survey because completing a 100% survey of both alternatives was not feasible for this stage of the project. The predictive model for the UBRR project had a goal of identifying areas with high probabilities of containing unrecorded sites and therefore guiding future archaeological surveys to be conducted at a later stage.

Between September 9 and October 23, 2014, archaeologists conducted a Class II reconnaissance-level archaeological survey consisting of revisiting several previously recorded archaeological sites and conducting a pedestrian archaeological survey of approximately 669 acres in northeastern Utah aimed at evaluating the efficacy of the predictive model.

A total of 33 previously recorded archaeological sites were revisited. Archaeologists attempted to revisit 4 additional previously recorded sites, but were not successful. The archaeological survey resulted in the discovery and documentation of 1 new archaeological site and 20 isolated finds. In total, 19 archaeological sites were recommended eligible for the National Register of Historic Places.

Architectural Resources Report

In November 2014, a survey of architectural resources was conducted following the Utah SHPO Reconnaissance-Level Survey Standard Operating Procedure. The boundary for the survey was 0.5 mile in each direction from the centerline of Alternatives 2 and 3. During the survey, 47 properties were identified.

Of the 47 buildings of historic age that were surveyed for this project, 14 dated to 1900–1912, 18 dated to 1913–1945, and 15 dated to 1946–1972. Nearly all of the early properties (1905–1912) were vernacular log homestead cabins or log barns in rural areas, whereas those from the middle period were more commonly single-family Bungalows or Period Revival cottages in Duchesne. The Post-World War II– era properties were seven single-family dwellings, one church/meetinghouse, two bridges, and three commercial buildings. Stylistically, the post-war dwellings were dominated by single-family Ranch and Split-Level residences. More than half of the historic properties were documented in Duchesne. The early log cabins and barns were found primarily on tribal land in Uintah County and in Sowers Canyon in Duchesne County.

Of these 47 properties, six were recommended eligible/significant (ES). One of these is presently listed on the National Register of Historic Places: the Indian Canyon Guard Station at about 30000 South and U.S. 191. Of the remaining properties, 35 were recommended eligible/contributing (EC), and six were recommended ineligible/non-contributing (NC) due to loss of integrity.

Twelve properties were identified in a Preservation Pro search prior to survey. Of the 12 properties, five properties were observed to have been demolished and new structures built in their place: 205 South 500 East, 215 South 300 East, 400 East 400 South (a bridge), 510 East 400 South, and 590 East 400 South. All of the demolished properties are located in Duchesne, Utah, and the UBRR team recommends that their eligibility status be changed to ineligible. The eligibilities for the remaining 7 previously documented properties remain the same.

Paleontological Resources Report

For the UBRR project, a literature review of paleontological resources was conducted. No field survey was performed for the project. Fossil locality data for the study area were requested from the Utah Geological Survey, and known researchers in the Uinta Basin were contacted. Requests for existing paleontological records were sent to the Utah State Paleontologist, Dr. James Kirkland; Dr. Randy Irmis at Natural History Museum of Utah; Dr. Steven Sroka at the Utah Field House of Natural History State Park Museum; Martha Hayden at the Utah Geological Survey; Brooks Britt at Brigham Young University; Alex Dutchak at the University of Alberta; Gabriel Bowen at the University of Utah; and Ben Burger at Uinta Basin Applied Technology College.

The purposes of these requests were to (1) determine whether any previously recorded fossil localities were present in the study area, (2) assess the potential for disturbing these localities during construction, and (3) evaluate the paleontological sensitivity in the APE. No current research areas were discovered during the inquiry in the study area. Only Dr. Randy Irmis and Dr. Gabriel did not respond. The Utah Geological Survey database has 966 recorded fossil localities within 1 mile of the study area. Due to the high number of localities, only those within 0.5 mile of Alternatives 2 and 3were identified in the paleontological resources report. A total of 136 paleontological resources were identified within this area.

3.2.2 Wetlands Report

UDOT conducted a survey and delineation of all potential waters of the U.S., including wetlands, within the project wetland survey area. The survey area was about 12,608 acres and extended northward and eastward from the proposed Price River UP connection point east of Soldier Summit near U.S. 6 to the proposed siding next to the intersection of U.S. 40 and S.R. 88 between Roosevelt and Vernal, Utah.

All areas within the wetland survey area were assessed to the degree necessary to determine the presence or absence of jurisdictional wetlands and other waters of the U.S. per the guidelines established by the U.S. Army Corps of Engineers. Seventy wetlands totaling 96.69 acres within the survey area were delineated and mapped as potentially jurisdictional wetlands. All of these wetlands have been classified as either palustrine emergent marsh or palustrine scrub-shrub.

Other waters of the U.S. were categorized as perennial and intermittent, ephemeral, canals and ditches, and open water. Twenty-seven perennial and intermittent features totaling 172.62 acres within the survey area were mapped, and 199 ephemeral drainages totaling 19.58 acres were mapped. In terms of constructed features, 24 canals and ditches totaling 3.01 acres were mapped, along with 8 open-water ponds totaling 2.68 acres.

The complete report is provided in Appendix M, Waters of the U.S. Delineation Report.

3.2.3 Biological Resources Report

This report described the baseline environmental conditions for biological resources (excluding wetlands) within the proposed UBRR alignments. The report described the environmental setting along the rail alignments and the field methods that were sued to map land cover and evaluate habitat. The report also described the vegetation communities and other land cover types that were mapped along the UBRR alignments during field surveys conducted during 2014, the noxious-weed infestations that were observed, and the availability of potential habitat to support federally listed threatened and endangered species.

As part of the process, UBRR representatives met with representatives with the Bureau of Land Management (Vernal and Price Offices), the U.S. Forest Service, the Utah Department of Natural Resources, the Utah Division of Wildlife Resources, and the U.S. Fish and Wildlife Service to identify areas of concern. Below is a list of those concerns:

What is a lek?

A lek is a sage-grouse strutting ground used during breeding season.

- Potential impact to sage-grouse habitat and lek in the Emma Park area from temporary construction activities, and noise and visual impacts from operation.
- Potential impacts to Barneby ridge-cress in Indian Canyon from construction activity. Associated dust from operation could also be a concern.
- Potential impacts to Uinta Basin Penstemon flower, Uinta Basin hookless cactus, and Pariette cactus near the eastern portion of the alignment near the Green River from construction activity. Associated dust from operation could also be a concern.
- Potential impacts to Ute ladies'-tresses in the Duchesne River from construction and operation activities.

The UBRR would be located within the Intermountain Desert Province, which covers the physiographic section called the Great Basin and the northern Colorado Plateau in Utah. Although much of this area is

made up of separate basins with no external drainage, the project area would be within the drainage basin of the Green (and Colorado) River. The lower parts of many basins have heavy accumulations of alkaline and saline salts. Many mountains rise steeply from the semiarid, sagebrush-covered plains. These mountains are generally well covered by vegetation, and their upper elevations usually have sparse conifer forests.

Sagebrush is typical in broad basins between mountain ranges, plains, and foothills between 5,000 and 7,500 feet. Other important plants in the sagebrush belt are antelope bitterbrush (*Purshia tridentata*), shadscale (*Atriplex confertifolia*), fourwing saltbush (*Atriplex canescens*), rabbitbrush (*Ericameria* spp.), spiny hopsage (*Grayia spinosa*), and horsebrush (*Tetradymia* spp.). These shrubs tolerate alkali to varying degrees, and this tolerance is essential to their survival on the poorly drained soils widespread in the region. On soils with the highest concentrations of salt, even these shrubs are unable to grow; they are replaced by plant communities dominated by greasewood (*Sarcobatus* spp.) or saltgrass (*Distichlis spicata*).

Above the sagebrush belt at elevation 5,000 to 8,000 feet lies a woodland zone dominated by pinyon pine (*Pinus edulis*) and juniper (*Juniperus* spp.), similar to the pinyon-juniper woodland of the Colorado Plateau. In the montane belt above the woodland zone, ponderosa pine (*Pinus ponderosa*) generally occupies the lower and more exposed slopes and Douglas fir (*Pseudotsuga menziesii*) the higher and more sheltered ones. These areas range from 8,000 to 13,000 feet in elevation within the Uinta Basin. In the subalpine belt, the characteristic trees are subalpine fir (*Abies lasiocarpa*) and Engelmann spruce (*Picea engelmannii*). Only a few mountains rise high enough to support an alpine belt.

This region supports a great variety of wildlife species. In winter, seasonal changes force many birds and mammals to move from the mountains into the sagebrush semidesert, where they find suitable habitat alongside the area's permanent residents.

Common mammals are coyotes (*Canis latrans*), pronghorn antelopes (*Antilocapra americana*), mountain lions (*Puma concolor*), bobcats (*Lynx rufus*), and badgers (*Taxidea taxus*). Smaller species include whitetail prairie dogs (*Cynomys leucurus*), deer mice (*Peromyscus maniculatus*), whitetail jackrabbits (*Lepus townsendii*), and porcupines (*Erethizon dorsatum*). During severe winters, elk (*Cervus canadensis*) and mule deer (*Odocoileus hemionus*) move into the lower-elevation basins.

Bird species range from burrowing owls (*Athene cunicularia*) to such specialized species as sage sparrows (*Amphispiza belli*) and sage thrashers (*Oreoscoptes montanus*), both found only in sagebrush habitat. Common raptors include American kestrels (*Falco sparverius*) and golden eagles (*Aquila chrysaetos*) along with ferruginous hawks (*Buteo regalis*) and other species of western hawks.

The complete report is provided in Appendix N, Biological Resources Report.

4.0 Overview of the Stakeholder-Involvement Process

Internal communication among the UBRR team started before the launch of the project, with UDOT regularly meeting with key elected officials in the Uinta Basin throughout the summer of 2013. The project officially kicked off on December 17 and 18, 2013, in HDR's Salt Lake City offices with meetings that included officials from Uintah and Duchesne Counties and representatives from UDOT and HDR.

The kickoff meeting participants decided that the project's Steering Committee would meet monthly at a location in the basin. For several months, this meeting was rotated between the Uintah County offices and the Duchesne County offices. Eventually, the UBRR team decided that the Duchesne County offices were the most central location for everyone, so the monthly project coordinating meetings were held there during the last 6 months of the project.

4.1 Executive and Steering Committees

The organizational structure of the UBRR team consisted of two committees: an Executive Committee, which was given decision-making authority, and a Steering Committee, which was the larger group that attended monthly meetings with UDOT and HDR staff. The Executive Committee consisted of:

- Sen. Kevin Van Tassell (State Senate District 26)
- Commissioner Mike McKee (Uintah County Commissioner)
- Commissioner Ron Winterton (Duchesne County Commissioner)

The Steering Committee included the Executive Committee members plus the following:

- Commissioner Darlene Burns (Uintah County commissioner)
- Commissioner Mark Raymond (Uintah County commissioner)
- Commissioner Kent Peatross (Duchesne County commissioner)
- Commissioner Kirk Wood (Duchesne County commissioner)
- Tammie Lucero (Uintah County economic development director)
- Cheri McCurdy (Uintah Transportation Special Service District)
- Adam Massey (Vernal Area Chamber of Commerce)
- Bill Stringer (Uintah County land-use planner)
- Troy Ostler (Uintah County engineering, with CIVCO Engineering)
- Irene Hansen (Duchesne County economic development director)
- Mike Hyde (Duchesne County Planning and Zoning)
- Don Winterton (Duchesne Transportation Special Service District)
- John Thomas (UDOT project manager)
- Brandon Weston (UDOT environmental manager)
- Vince Izzo (HDR)
- Joanna Alvord (HDR)
- Joe Walker (HDR)

4.2 Uinta Basin Stakeholder Meetings

As a matter of communications strategy, Executive Committee members asked that team members try to keep the project low key until after a notice to intent to prepare the UBRR EIS was issued. Still, a number of meetings were held with key constituent groups in the Uinta Basin to provide project information and updates. In all of these meetings, UDOT took the lead. UDOT discussed project background, explained the methodology being used to screen the 26 alternatives, and described the preferred alternative that emerged through the feasibility process. These presentations included:

- Ute Tribe Cultural Resources (July 10, 2014)
- Uinta Basin Energy Summit (September 4, 2014)
- Vernal Area Chamber of Commerce (September 16, 2014)
- Roosevelt City Council (September 16, 2014)
- Ute Tribe Business Committee (September 17, 2014)
- Vernal City Council (September 17, 2014)
- KVEL Radio Energy Today program (September 19, 2014)
- Myton City Council (October 9, 2014)
- Duchesne City Council (October 14, 2014)

4.3 Nongovernmental Organization Meetings

A number of meetings were held with nongovernmental organizations (NGOs) that have special interest in projects such as the UBRR. Those meetings included:

- **April 22, 2014 – Meeting with the Southern Utah Wilderness Alliance (SUWA).** UDOT described the process that the project was following in establishing rail alternatives and screening for feasibility. SUWA officials asked about possible road and pipeline options. UDOT made a commitment to keep SUWA apprised of project progress.
- **May 15, 2014 – Meeting with the Salt Lake Chamber of Commerce.** A representative from UDOT made a presentation to the Chamber similar to other presentations UDOT had been giving. Building on the foundation of the UBETS, the representative spoke to the Chamber about the alternatives being explored, the screening methods being used, and the two alternatives being considered by the UBRR team.
- **June 24, 2014 – Meeting with the Sierra Club.** UDOT described the process that the project was following in establishing rail alternatives and screening for feasibility. Sierra Club officials expressed concerns about air quality issues and the risks associated with transporting crude oil by rail. UDOT made a commitment to keep the Sierra Club apprised of project progress.
- **August 7, 2014 – Follow-up meeting with SUWA.** UDOT updated SUWA officials on project progress. UDOT stated that Duchesne and Uintah County officials and UDOT agreed that there was one feasible option for the UBRR (Alternative 2). SUWA officials asked who will build the rail line. UDOT pointed out that no money for construction had been identified. UDOT determined that future discussions with SUWA would be held as the project proceeds.

4.4 Agency Meetings

During the UBRR feasibility process, UDOT held a series of meetings with resource agencies to collect data, identify areas of concern with the development of the UBRR, and seek assistance in developing methodologies in conducting field surveys for wildlife, wetlands, and cultural resources. Below is a summary of those meetings. In addition to these meetings, there were numerous conference calls with the agencies.

- May 1, 2014 – Meeting with STB and FRA in Washington, DC. Items discussed included lead and cooperating agencies for an EIS, the STB EIS process, the project applicant, federal funds, the EIS schedule, and the need for a third-party contractor.
- July 1, 2014 – Meeting with the U.S. Army Corp of Engineers (USACE) to discuss wetland survey methodologies. USACE concurred with the proposal to conduct a full wetland delineation along proposed alignments.
- July 1, 2014 – Meeting with the Utah SHPO. Purpose of the meeting was to review the cultural resources survey methodology provided to the SHPO for review. The SHPO approved the field methodology.
- July 2, 2014 – Meeting with the U.S. Fish and Wildlife Service (USFWS) to discuss threatened and endangered species. Main issues identified were air quality and noise impacts on sage-grouse, listed fish species, Ute ladies'-tresses, raptors, clay phacelia, and Uinta Basin hookless cactus.
- July 10, 2014 – Meeting with the U.S. Forest Service and the Bureau of Land Management (BLM) Vernal Office to provide an overview of the project. Issues discussed included land transfers, roadless area impacts, scenic byways, visual assessments, cultural resources, special-use permits, sage-grouse, and sensitive species.
- July 17, 2014 – STB, USACE, and Utah Division of Wildlife Resources (UDWR) field review of the UBRR alignments. Key issues discussed included sage-grouse, construction requirements, rail operations, connection to the Class 1 railroads, and river crossings.
- July 21, 2014 – Meeting with UDWR to discuss potential issues with the UBRR. Issues discussed included sage-grouse, wildlife fencing, and sensitive fish species in the Strawberry and Duchesne Rivers.
- August 11, 2014 – Meeting with the BLM Price Office to provide an overview of the project. Issues discussed included sage-grouse, cultural resources, and visual assessment.
- September 9, 2014 – Meeting with the U.S. Environmental Protection Agency (EPA) in Denver to discuss the UBRR. Issues identified included cumulative and indirect impacts, air quality, tribal permits and boundaries, and EPA permitting authority on tribal land.
- October 2, 2014 – Meeting with USFWS, BLM, and UDWR in the field at Emma Park, Utah, to discuss potential impacts and avoidance measures to sage-grouse from the UBRR.
- November 13, 2014 – Meeting with USFWS to discuss survey protocol for the Uinta Basin hookless cactus, Barneby ridge-cress, and Uinta Basin Penstemon flower.

4.5 Project Website

4.5.1 Website Structure

As part of the UBRR communications plan, a project website was created. Hosted on the UDOT server, the website (www.udot.utah.gov/uintabasinrail) was launched on September 4, 2014, with the Six-County Infrastructure Coalition identified as the project owner. The website included:

- A home page presenting project background information along with a prominent link to an interactive map of the coalition's preferred feasible alternative
- A Process page that described the study process and the environmental process that would eventually be initiated
- A Library page with links to project technical documents and maps
- An FAQ page, with answers to frequently asked questions about the project
- A Comments page, where visitors to the website could fill out a form to leave comments or ask questions about the project

4.5.2 Website Comments

Comments and questions submitted through the website went to the UBRR team via iRealm comment-tracking software. The UBRR team responded to the questions and filed the comments for future inclusion in the public record. Website comments that were processed included:

- Requests for information about how to secure work on the UBRR project
- Requests to be added to the project email update list
- Several requests for clarification of a letter from UDOT to property owners in the area informing them that engineers would be on their property to conduct environmental research
- Two comments expressing concerns about the proposed project alignment:

> Unbelievable that you would choose the route in which you did. First of all Indian Canyon is very narrow as is, adding a railroad is crazy! Yes, I grew up in Indian Canyon and the thoughts of cement walls holding up the hillside infuriate me. What about the open range, on the National Forest. Livestock are allowed by permits to graze on both sides of SR. 191, now they will have to stay out of the way of vehicle's and a train. You say that the rail will stay inside of the existing right of way, not sure how you can build such a thing without disturbing private property. One more thing is there are several roads and property access's on the proposed side of the canyon, how will I be able to access them? Now to Duchesne, we have one of the best Fairgrounds in the state. Your railroad is going to completely destroy the back drop of our grounds. When this is done all you will be able to see is a cement wall. Not to mention the homes you will be traveling by on east side of town, I am sure property values next to the rail will decrease. I know there are other options, options that don't include removing half of a canyon's hillside, and half of Duchesne City's backyard. There are miles of unoccupied land east of Indian Canyon, and east of Duchesne City. It seems east is the direction your heading. WHY NOT?

> As the recent deadly accidents with moving oil by rail has shown that Oil should be moved by pipelines not by rail or trucks. Increase your fees for moving oil by trucks. As it is the oil development companies should pay 100% for any freight transportation method. The resources can be held in reserve until they can raise their own funds to pay for all aspects of the resources development.

4.3 Media

At the request of the Executive Committee, media efforts for the UBRR were primarily reactive. There were, however, several media stories that required project-wide coordination:

- In June, UDOT made a presentation to the Utah Transportation Commission. As a result of that presentation, the *Salt Lake Tribune* asked for an interview with UDOT, and the resulting story was picked up and circulated by national news services.
- In July, KUER Radio decided to do a radio version of the UBRR story. KUER interviewed UDOT at the KUER studio and also spoke to Commissioner Mike McKee.
- In August, the *Vernal Express* did a story about the UBRR with Sen. Kevin Van Tassell as the story's primary source.
- Beginning in September, newspapers in Moab began covering the question of whether Grand County should join other counties to make what would be called the Seven-County Infrastructure Coalition. During the next couple of months, the coverage of this issue was fairly intense, as the political season turned up strong and outspoken opposition to the move. The UBRR project was often mentioned as a driver for the Coalition.
- In late September, UDOT spent an hour on the air in Vernal as part of radio station KVEL's Energy Today radio program. UDOT explained the status of the UBRR, with discussion of the feasibility studies, the process of screening through 26 railway alternatives, and the current focus on one or two primary alternatives.
- In early October, the *Salt Lake Tribune* picked up on the Seven-County Infrastructure Coalition story and published a story plus an editorial expressing reservations about the Coalition and the UBRR.
- On December 8, 2014, the *Salt Lake Tribune* reported on a letter sent from Uintah and Duchesne County officials to UDOT stating that "it appears that the return on investment is insufficient to justify the expense of a railroad project," essentially announcing the end of the UBRR study.

5.0 Conclusion

The purpose of the UBRR feasibility process was to determine whether there were viable alignments that could be constructed into the Uinta Basin, and, if so, whether they were financially feasible to construct based on resource production levels in the basin. After evaluating 26 potential alignments, UDOT determined that two alignments of about 100 miles each, Alternatives 2 and 3, could meet construction and operation requirements.

Preliminary engineering and cost estimates were developed for these two alternatives so that the return on investment could be evaluated. As part of the return-on-investment evaluation, five resource-development scenarios were developed. Based on the project's construction cost, UDOT determined that only two high-production scenarios would result in a positive return on investment. The two high-production scenarios would require that oil shale and sands technology be proven, that the price of oil remain above $85 a barrel, and that no pipeline would be constructed that would compete with oil transportation by rail.

The feasibility study showed that two alignments would be feasible to construct, with Alternative 2 through along U.S. 191 being preferred by UDOT. Nonetheless, on December 1, 2014, Uintah and Duchesne Counties informed UDOT of their determination that the return on investment for the rail line was insufficient to justify the $4.5-billion construction cost. The Counties also concluded that the $300 million in upfront cost to the owner to plan and implement construction was too costly. Consequently, a notice of intent to prepare an EIS for the UBRR was never released.

6.0 References

DMJM Harris

2001 Feasibility Report for the Isolated Empire Rail Project. Prepared for the Utah Department of Community and Economic Development.

U.S. Department of Transportation, Bureau of Transportation Statistics

2007 National Transportation Statistics, Table 3-21: Average Freight Revenue Per Ton-Mile. www.bts.gov/publications/national_transportation_statistics/html/table_03_21.html. Accessed November 27, 2013.

This page is intentionally blank.