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Final Report

Rail Transportation Economic Impact Evaluation and Planning Study for the Caliente and Mina Corridors

prepared for
Nuclear Waste Repository Project Office
Nye County, Nevada

ENGINEERS PLANNERS ECONOMISTS
WilburSmith ASSOCIATES

in association with
URS Corporation

November 2007

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EXECUTIVE SUMMARY

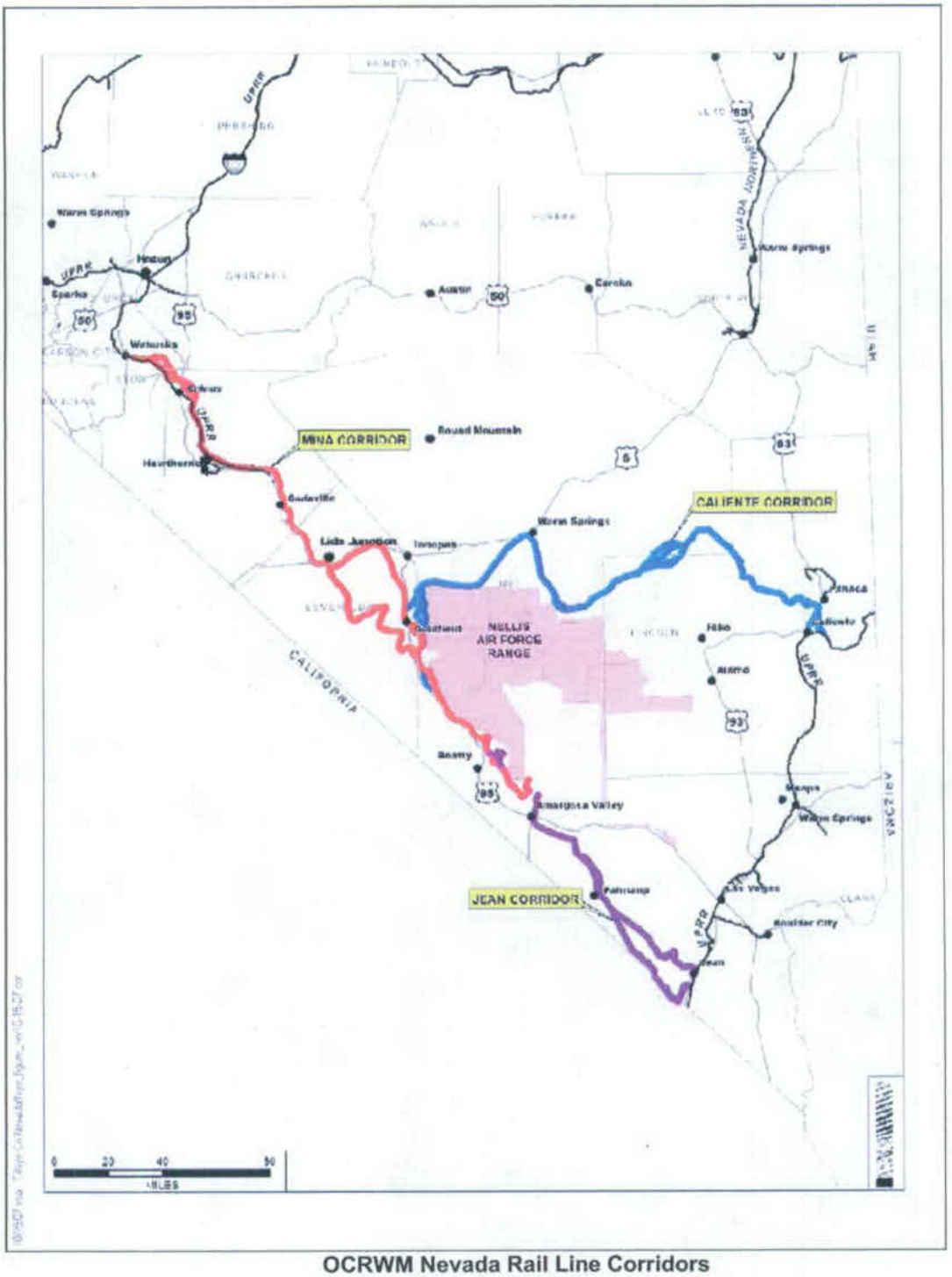
BACKGROUND AND PURPOSE OF THIS STUDY

The Department of Energy (DOE) has stated its intent to transport High-Level Waste (HLW) and Spent Nuclear Fuel (SNF) to a Geologic Repository at Yucca Mountain, Nevada via a "mostly rail" transportation strategy called Nevada Rail (Record of Decision, April 8, 2004, 69 FR 18557). Currently, two Nevada Rail corridors are under study by the DOE: the Caliente Corridor, which would run through the counties of Nye, Lincoln, and Esmeralda; and the Mina Corridor, which would run through the counties of Nye, Esmeralda, Mineral, Lyon, and Churchill. For the Caliente Corridor, the DOE would construct a new rail line from an interchange point with the Union Pacific Railroad (UPRR) at Caliente, Nevada, approximately 319 miles in length, to the repository. For the Mina Corridor, the DOE would use existing track from an interchange point with the UPRR at Hazen, Nevada, to Hawthorne, from which a new line would be constructed to serve the repository. The Mina alignment would be approximately 40 miles shorter than the Caliente alignment. Since the Mina alignment could use existing track between Hazen and Hawthorne, the amount of new construction would be reduced to a range of 240 to 254 miles. Both alignments would be designed and constructed specifically for the safe and secure transportation of SNF and HLW. In addition, whichever alignment is selected, the new rail line may enable freight shipment by industries along the line, with attendant economic benefits to the communities, counties, and the State of Nevada, as well as to private interests.

In February 2002, the DOE Office of Civilian Radioactive Waste Management (OCRWM) published an Environmental Impact Statement (EIS) under National Environmental Policy Act (NEPA) guidelines for the construction and operation of Nevada Rail along the Caliente Corridor as well as several other corridors, and for the construction and operation of the repository at Yucca Mountain. On April 8, 2004, the DOE issued a Record of Decision selecting the Caliente Corridor as the preferred corridor in which to examine possible alignments for the rail line. The DOE has recently issued a Draft Supplemental EIS (DSEIS) to update its evaluation of the Caliente Corridor as well as to examine the environmental effects of constructing and operating Nevada Rail along the Mina Corridor.

This study estimates the economic benefits that could accrue to affected Nevada counties from the use of the Nevada Rail line by local industries for freight transportation. The study builds on the findings outlined in the 2005 *Rail Transportation Economic Impact and Evaluation Planning Study*, which identified the employment and income benefits that could accrue to Nye, Lincoln, and Esmeralda Counties from the shared use of the Caliente Corridor. The current study assesses both the Caliente and Mina Corridors, estimating in greater detail the economic benefits from the commercial use of Nevada Rail and evaluating how such benefits could accrue to counties along the two routes. The study presents the results of the Mina Corridor study and compares the economic benefits of the Mina route with those estimated for the Caliente Corridor.

In addition to the terminus at the repository, the counties along the two Nevada Rail corridors are considering the additional benefits of extending Nevada Rail south from the Yucca Mountain area to a connection with the UPRR main line in southern Nevada (Southern Extension). Such an extension could follow the alignment of the originally proposed Jean Corridor, which has been dropped from further DOE analysis, or a similar alignment to achieve a connection with a main line. A map of the study area and the corridor alternatives is presented as the following figure.



OCRWM Nevada Rail Line Corridors

This assessment estimates the economic benefits of commercial traffic shipment, assuming shared use of Nevada Rail, under four scenarios: a Caliente Corridor (east access only), a Caliente Corridor with a Southern Extension (east-south access), a Mina Corridor (north access only), and a Mina Corridor with a Southern Extension (north-south access).

The economic benefit analysis was prepared on behalf of Nye County Nuclear Waste Repository Project Office (NWRPO).

ASSESSMENT METHODOLOGY

This assessment estimates economic benefit as a function of revenue and employment associated with new business made possible by the capacity and economy of shipment via Nevada Rail.

Identify Potential Shippers
Information on potential industries and individual shippers who might be served by either the Caliente or Mina Corridors was obtained from regional economic development agencies identified by the Nevada Commission on Economic Development. Additional information on potential shippers was obtained via referrals from Nye County staff, from NWRPO and by outreach to representatives of government and business interests in Nevada. This process identified approximately 30 shippers along the Mina and Caliente corridors who could benefit from shared use of Nevada Rail.

Collect and Compile Information
Representatives of businesses that might ship via the Caliente or Mina rail corridors were interviewed in person or via telephone. Potential rail shippers were asked to estimate the tonnages of their existing and future inbound and outbound shipments by truck, and the minimum and maximum tonnages they might ship via Nevada Rail, were it available. An initial round of these interviews was conducted in 2005 with shippers in Lincoln and Nye Counties who might ship via the Caliente Corridor. Follow-up phone interviews were conducted with these shippers in 2007 to update the original data and to determine whether the shippers' use of rail would increase if a Southern Extension were available.

For the Mina Corridor, a Shared Interview Questionnaire was developed in cooperation with the DOE environmental consultant to obtain data that would be of mutual benefit for the DOE Supplemental EIS for the Mina Corridor, as well as for the counties and businesses located along the corridor. To avoid redundancy, joint interviews were conducted by DOE and Nye County consultants in person or over the telephone in February 2007, with follow-up phone calls continuing through July 2007. As they were for the Caliente Corridor, potential shippers were asked to estimate their potential shipments via Nevada Rail, with and without a Southern Extension.

In addition, governmental publications, academic journals, and industry-specific publications provided information to determine domestic industry averages used for estimating transportation costs.

Estimating Commercial Freight Rail Traffic by Operating Scenario
The survey of potential shippers along the Caliente and Mina Corridors yielded information on businesses' existing truck shipments and their estimated future shipments via rail in tonnage and carloads. Information on the estimated volume of goods traveling by rail was organized into low and high estimates by shipper and by county. The "low" estimate rail scenarios reflect potential shipments via Nevada Rail by corridor shippers in the near-term or start-up phase, while the "high" estimate scenarios reflect future rail shipments by these businesses operating at maximum capacity. Low and high annual demand scenarios for each corridor were defined by using the estimates of their respective businesses' shipping volumes organized by commodity type, in tonnage and carloads. The "low" demand scenario estimates of freight rail use were considered conservative and, therefore useful as a baseline for evaluating the viability

of commercial use of Nevada Rail. The "high" estimated demand scenarios are based on the sums of the most optimistic business expectations and are therefore assumed to be unrealistically high.

The estimated commercial traffic volumes were split by direction, assuming the shared use of the Caliente Corridor (east only), the Caliente Corridor with a Southern Extension (east-south access), the Mina Corridor (north only), and the Mina Corridor with a Southern Extension (north-south access).

Finally, information from the shipper interviews was used to determine the existing annual shipments via truck (tonnage), future annual shipments diverted from truck to rail, and future new annual shipments that would be generated with the existence of Nevada Rail by county and by corridor.

Quantify Economic Benefits

The primary benefits to industries and businesses for shared use of the Nevada Rail line are expected to be:

- Reduced cost associated with shipping by rail instead of by truck, particularly for shipments traveling more than 500 miles, and
- Increased access to domestic and international markets and suppliers

The first point is illustrated by a comparison of shipping costs via truck with those for rail. Rail costs are about a fourth of those for truck on average per ton-mile. Furthermore, the cost differential grows with the distance shipped.

The second point is a corollary to the first and is reflective of shipper comments that, with lower cost rail haulage, the shippers can expand into distant markets from which they are precluded by the higher truck costs.

With more extensive access to markets, production may expand, and that expansion will generate new employment. This analysis estimated the new employment generated in the counties along the corridors as a function of the low and high traffic estimates. County-specific wage averages were applied to these estimates to calculate the new incomes of employees hired as a function of the production expansion triggered by the shared use of Nevada Rail. With the new employee income, local business activity can be expected to increase as local suppliers sell their wares to the expanding businesses, and the new employees purchase more groceries, shop for new clothes, and purchase automobiles. This study estimated these economic effects.

The study also estimated the public benefit of the potential diversion of existing truck loads to rail, if Nevada Rail were implemented and opened to commercial freight traffic. Likewise, the study estimated the potential income generated by new Nevada Rail freight shipments accruing to the connecting carrier on either corridor, the Union Pacific Railroad.

FINDINGS

The total public and private benefits under the different demand scenarios range from $21 million to $67 million for the Caliente Corridor and from $401 million to $2.3 billion for the Mina Corridor. The higher estimates for the Mina Corridor are a function of more estimated carloads and of the greater number of workers per carload in the industries served. The population of Mina Corridor shippers includes a greater mix of manufacturers and processors, whose operations are more labor intensive, than those on the Caliente Corridor.

It is important to reiterate that the "low" demand scenario estimates of freight shipments were considered conservative and, therefore, useful as a baseline for evaluating the viability of commercial use of Nevada Rail. As noted earlier, the "high" estimated demand scenarios are based on the sums of the most optimistic business expectations and are therefore assumed to be unrealistically high.

Nevertheless, low-end annual commercial carload volumes ranged from 4,200 on the Caliente Corridor to 28,000 on the Mina Corridor. These volumes are comparable to those handled today by successful short line, regional and switching railroads. Therefore, it is reasonable to assume that a short line railroad handling such freight volumes on either the Caliente or Mina Corridor would be commercially viable.

OTHER OPPORTUNITIES

There are many aspects of the implementation and operation of Nevada Rail that represent opportunities for the counties on either the Caliente Corridor or the Mina Corridor. However, the potential commercial freight operations serving local industries need to be defined among the purposes of the line, or these opportunities may be denied or overlooked. As OCRWM engages in alternative alignment selection, construction planning, and rail operations planning, the counties need to be recognized as stakeholders, and have a voice in decisions that will affect their economies. To reap the greatest reward, the counties would be well served by working together to identify their opportunities and benefits and pursuing them directly with DOE.

This analysis shows that even for a low level of commercial freight activity on the rail line, there are substantial benefits to shippers and residents living within the vicinity of Nevada Rail. Consequently, it seems reasonable that the counties involve themselves directly with DOE to ensure that a viable commercial freight rail operation, contributing to the bottom line of local shippers and increasing local payrolls, can be established.

Another potential that may be worth exploring is the establishment of a new institutional structure enabling the units of government adjacent to Nevada Rail to fully realize the benefits of the line. Models to accomplish this objective range from straightforward interlocal agreements to authorities established by state legislation. It is conceivable that such an authority could not only manage the commercial freight operation, but assume ownership of the line as well. A potential outcome of line ownership would be greater ability to control the generation of any benefits that the line could produce during both construction and operation.

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Information on Potential Shippers and Other Stakeholders

1.0 INTRODUCTION

1.1 PURPOSE OF ASSESSMENT

The Department of Energy (DOE) has stated its intent to transport High-Level Waste (HLW) and Spent Nuclear Fuel (SNF) to a Geologic Repository at Yucca Mountain, Nevada via a "mostly rail" transportation strategy called Nevada Rail.[1] Currently, two Nevada Rail Corridors are under study by the DOE: the Caliente Corridor, which would run through the counties of Nye, Lincoln, and Esmeralda; and the Mina Corridor, which would run through the counties of Nye, Esmeralda, Mineral, Lyon, and Churchill. For the Caliente Corridor, the DOE would construct a new rail line from an interchange point with the Union Pacific Railroad (UPRR) at Caliente, Nevada, approximately 319 miles in length, to the repository. For the Mina Corridor, the DOE would use an interchange point with the UPRR at Hazen, Nevada, to the repository. The Mina alignment would be approximately 40 miles shorter than the Caliente alignment. Since the Mina alignment could use existing track between Hazen and Hawthorne, Nevada, the track construction may be reduced to a range of 240 to 254 miles. Both alignments would be designed and constructed specifically for the safe and secure transportation of SNF and HLW. In addition, whichever alignment is selected, the rail line may enable freight shipment by industries along the line with attendant economic benefits to the communities, counties, and the State of Nevada, as well as to private interests.

In February 2002, the DOE Office of Civilian Radioactive Waste Management (OCRWM) published an Environmental Impact Statement (EIS) under National Environmental Policy Act (NEPA) guidelines for the construction and operation of Nevada Rail along the Caliente Corridor as well as several other corridors, and for the construction and operation of the repository at Yucca Mountain. On April 8, 2004, the DOE issued a Record of Decision selecting the Caliente Corridor as the preferred corridor in which to examine possible alignments for the rail line. The DOE has recently issued a Draft Supplemental EIS (DSEIS) to update its evaluation of the Caliente Corridor as well as to examine the environmental effects of constructing and operating Nevada Rail along the Mina Corridor.

This study estimates the economic benefits that could accrue to affected Nevada counties from the use of the Nevada Rail line by local industries for freight transportation. The study builds on the findings outlined in the 2005 *Rail Transportation Economic Impact and Evaluation Planning Study*,[2] which identified the employment and income benefits that could accrue to Nye, Lincoln, and Esmeralda Counties from the shared use of the Caliente Corridor. The current study assesses both the Caliente and Mina Corridors, estimating in greater detail the economic benefits from the commercial use of Nevada Rail and evaluating how such benefits could accrue to counties along the two routes. The study presents the results of the Mina Corridor study and compares the economic benefits of the Mina route with those estimated for the Caliente Corridor.

In addition, the counties along the Nevada Rail Corridors are considering the additional benefits of extending Nevada Rail south from the Yucca Mountain area to a connection with the UPRR main line in southern Nevada (Southern Extension). The assessment, therefore, includes the economic benefits of commercial traffic volumes, assuming shared use of Nevada Rail under

[1] Record of Decision, April 18, 2004, 69 FR 18557.
[2] *Rail Transportation Economic Impact Evaluation and Planning Study*, prepared by Wilbur Smith Associates in association with URS Corporation and KORVE Engineering, May 10, 2005.

four scenarios: a Caliente Corridor (east access only), a Caliente Corridor with a Southern Extension (east-south access), a Mina Corridor (north access only), and a Mina Corridor with a Southern Extension (north-south access).

The economic benefit analysis was prepared on behalf of Nye County Nuclear Waste Repository Project Office (NWRPO). This study is in response to Task 3 of NWRPO's overall work plan, which contains eight tasks. Separate studies will be prepared to address the results of the remaining tasks. The scope of work for Task 3 includes the Work Elements appearing in Table 1.

Table 1
Nye County Overall Work Plan Task 3 Work Elements

Subtask	Work Elements
3.1	Shared Use • Provide input to define the benefits of shared commercial use • Assess regulatory and statutory implications among various transportation authorities
3.2	Mina Corridor • Quantify and compare opportunities and risks of the Caliente and Mina Corridors
3.3	Through Rail Route • Evaluate the economic benefits of a through rail line to stakeholders and to the overall rail transportation network

1.1.1 Overall Work Plan Task 3 Work Elements

Task 3 focuses on supporting Nye County and its partners participating in the DOE's National Environmental Protection Act (NEPA) process, and comparing the opportunities and risks associated with the Caliente and Mina Corridors. This study culminates the work defined in the preceding table. Whereas the DOE may use this information to evaluate the economic impacts and benefits to the state and local entities affected by Nevada Rail, the economic effects of construction depend on the procurement, sourcing, and construction strategy being defined by DOE itself. Therefore, this study places limited analytic emphasis on the economic benefits of constructing and operating Nevada Rail. Instead, the assessment identifies local shippers who may benefit from the presence of a new freight rail line, and estimates the economic benefits the rail line may offer them and their communities. NWRPO intends to initiate a more detailed economic analysis of Nevada Rail once a preferred alignment is selected. This analysis will be Task 5 in NWRPO's overall work plan.

1.1.2 Description of System and Operations

The Caliente Corridor begins at an interchange point with the UPRR main line near Caliente and then traverses west-northwest through Lincoln County (Figure 1). It enters the eastern border of Nye County, then re-enters Lincoln County at its upper western boundary. The route follows the perimeter of the Nevada Test Site and Nevada Test and Training Range, winding generally westward among several basins and ranges. Turning sharply south at the northwest corner of the Air Force range near Tonopah, the route passes close by the town of Goldfield. The route then turns south-southeast, passing near Beatty and Amargosa Valley, before entering the

Nevada Test Site and the land withdrawal intended for the proposed repository. The Caliente Corridor was evaluated in the DOE Final EIS for the Repository (2002).

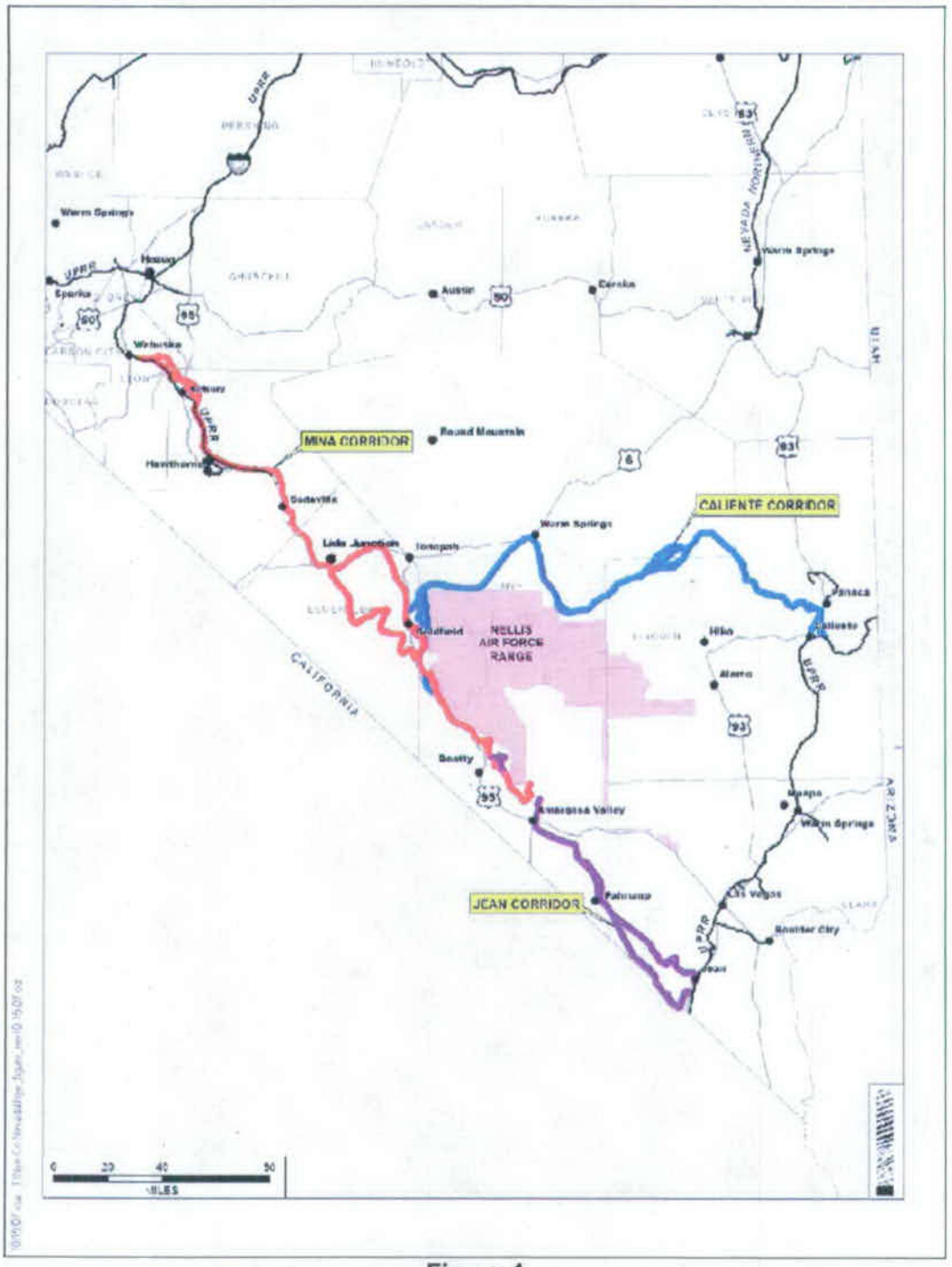

Figure 1
OCRWM Nevada Rail Line Corridors

The Mina Corridor begins at an interchange point with the UPRR at Fernley, Nevada, and uses an existing UPRR branch line to Wabuska in Lyon County. The existing alignment continues south through the Walker River Tribal Lands along a rail line currently used by the U.S. Department of Defense for shipping munitions to the Army Depot at Hawthorne in Mineral County. The corridor continues along an abandoned rail bed, passing by Luning and Mina into Esmeralda County. At U.S. Route 6, the corridor travels south along new right of way, either paralleling U.S. Route 6 and U.S. Route 95 bypassing Tonopah and joining the Caliente Corridor near Goldfield, or passing near Silver Peak and joining the Caliente Corridor at the Nye County line near State Route 267. The Mina Corridor would then follow the Caliente Corridor through Nye County to the repository.

Preliminary specifications for the Nevada Rail line call for a single-track main line, with sidings to allow inbound and outbound trains to pass. At full operation there will be three to five trains per week inbound to Yucca Mountain, and it is assumed that a similar number of empty trains will be operated outbound. DOE intends that these trains will exclusively transport HLW and SNF casks, accompanied by safety and security equipment and personnel, both to and from the repository.

A facility for the maintenance of waste transportation casks could be located at or adjacent to the repository. It is not yet clear whether this facility will also maintain rolling stock, motive power, or support the maintenance of right-of-way and track.

At Caliente, HLW and SNF shipments would be switched from the UPRR main line to Nevada Rail. It has not yet been determined whether waste transportation trains will be operated exclusively on commercial railroads and switched directly to Nevada Rail for transport to the repository.

For the Mina Corridor, the HLW and SNF shipments would presumably switch to Nevada Rail at Hazen, Nevada, for the journey south to the repository. Though not part of the DOE's ongoing Supplemental Rail Corridor and Rail Alignement EIS, a southern extension of the Caliente and Mina Corridors is assumed for this analysis. The extension could follow generally the alignment of the Jean Corridor, studied in the DOE's 2002 EIS, and connect with the UPRR at Jean.

1.2 ASSUMPTIONS

The findings of this assessment are based on the following assumptions, consistent with information published by the DOE, current descriptions of the Nevada Rail project, the National Transportation Plan, and discussions with DOE staff and stakeholders. The purpose of these assumptions is to provide parameters for the analysis of the economic impacts of Nevada Rail.

- **Mode:** The OCRWM strategy is for HLW and SNF to be transported to Yucca Mountain via "mostly rail" – entailing construction of a new railroad in Nevada for this purpose.

- **Route:** OCRWM has selected the Caliente Corridor as the preferred route for the Nevada Rail facility. Final selection is pending the outcome of the ongoing DOE Supplemental Rail Corridor and Rail Alignment EIS effort.

- **Alignment:** The Caliente Corridor and Mina Corridor identified by OCRWM are to be considered for assessing shared-use potential. The proposed extension

from the repository to the UPRR main line in southern Nevada is not included in the DOE Final EIS for the Geologic Repository (2002).

- **Implementation:** The Nevada Rail line will be completed and operational to support repository construction in 2014. The earliest the first shipment of SNF or HLW can be made is 2017.
- **Construction:** Completion of the Nevada Rail facility in advance of the repository will enable the railroad to be used for transportation of construction material and equipment.
- **Exclusivity:** Trains carrying OCRWM shipments, whether the casks are filled or empty, will operate via Nevada Rail exclusive of any other lading.
- **Schedule:** From three to five loaded trains will operate inbound to Yucca Mountain per week, and as many outbound, empty trains.
- **Speed:** Trains will be limited to an operating speed of 40 miles per hour on the Nevada Rail line.
- **Priority:** Regardless of other uses of Nevada Rail, OCRWM shipments will be the priority traffic using Nevada Rail.
- **Horizon:** OCRWM shipments to Yucca Mountain will continue for 24 years, through 2041.
- **Operation:** OCRWM has not determined the method by which operating services will be procured for Nevada Rail.
- **Purpose and Need:** The Nevada Rail facility will be constructed, operated, and maintained for the purpose of transporting HLW and SNF, and all capital and operational costs for waste transportation will be the responsibility of the federal government. While shared use is ancillary to DOE's fundamental business case for the railroad, the recently released DSEIS for Nevada Rail includes a shared use option in the definition of the preferred alternative.

The findings from this assessment are based on the following assumptions:

- The DOE expects to issue a Record of Decision for the Supplemental Rail Corridor and Rail Alignment EIS in July 2008
- The DOE constructs the rail line in advance of repository
- Operator not yet identified
- HLW and SNF shipments will be carried by dedicated trains with schedule priority
- Three to five OCRWM trains per week

- 40 MPH maximum speed
- Opportunity for shared use with commercial shippers as far as Crater Flat, just west of the repository, the location of a potential business park and access point for Amargosa Valley shippers to Nevada Rail
- Desire of counties that rail line extend south from Crater Flat to UPRR's Los Angeles–Salt Lake City main line

1.3 ASSESSMENT METHODOLOGY

1.3.1 Identify Potential Shippers

Information on potential industries and individual shippers who might be served by the shared use of Nevada Rail along the Caliente and Mina Corridors was provided by regional economic development agencies identified by the Nevada Commission on Economic Development. Additional information on potential stakeholders was supplemented by referrals from Nye County staff from NWRPO and by outreach to representatives of government and business interests in Nevada. The contacts identified approximately 30 shippers along the Mina and Caliente Corridors who could benefit from shared use (see Appendix A for information on potential shippers and other stakeholders).

1.3.2 Collect and Compile Information

Information was gathered through face-to-face and phone interviews with potential shippers in the Caliente and Mina Corridors who could conveniently ship via rail, either from dedicated spurs or from team tracks (see Section 2.7.1 for definitions). Shippers were asked to provide existing and future inbound and outbound shipments (in tonnage) by truck and to estimate tonnage for low and high scenarios if Nevada Rail were available. The initial interviews were conducted in Lincoln and Nye counties for the Caliente Corridor in 2005. Follow-up phone interviews were conducted in 2007 to update the original data and to determine whether the shippers' use of rail would increase if the Southern Extension were implemented.

For the Mina Corridor, a Shared Interview Questionnaire was developed in cooperation with the DOE Consultant to provide data that would be of mutual benefit for the DOE Supplemental Rail Corridor and Rail Alignment EIS for the Mina Corridor as well as for the counties and businesses located along the corridor (see Appendix A for the Potential Shipper Interview Questionnaire). To avoid redundant information gathering, joint interviews were conducted by DOE and Nye County consultants in person or over the telephone in February 2007 with follow-up phone calls continuing through July 2007. As in the Caliente Corridor, potential shippers were asked to differentiate between use of Nevada Rail with or without a Southern Extension.

In addition, governmental publications, academic journals, and industry-specific publications provided information to determine domestic industry averages used for estimating transportation costs.

1.3.3 Estimating Commercial Freight Rail Traffic by Operating Scenario

The survey of potential shippers along the Caliente and Mina Corridors yielded information on businesses' existing truck usage, and estimated future usage of rail in tonnage and carloads.[3] Information on the estimated volume of goods traveling by rail was organized into low and high estimates by shipper by county. The low estimate demand rail scenarios are based on the potential usage of Nevada Rail by corridor shippers in the near-term or start-up phase, while the high estimate rail scenarios reflect future rail usage based on the fulfillment of shipper business plans. Low and high annual demand scenarios for each corridor were defined by using the estimates of their respective businesses' shipping volumes organized by commodity type, in tonnage and carloads.[4] The "low" demand scenario estimates of freight rail use were considered conservative and, therefore, more realistic. It should be assumed that the "high" estimated demand scenarios are based on the sums of the most optimistic business expectations and are therefore perhaps unrealistically high.

The estimated commercial traffic volumes were then split by direction, assuming the shared use of a Caliente Corridor (east only), a Caliente Corridor with a Southern Extension (east-south access), a Mina Corridor (north only), and a Mina Corridor with a Southern Extension (north-south access).

Finally, information from the shipper interviews was used to determine the existing annual shipments via truck (tonnage), future annual shipments diverted from truck to rail, and future new annual shipments that would be generated with the existence of Nevada Rail by county and by corridor.

1.3.4 Quantify Economic Benefits

The primary benefits to industries and businesses for shared use of the Nevada Rail line are expected to be:

- Reduced cost associated with shipping by rail instead of by truck, particularly for shipments traveling more than 500 miles, and
- Increased access to domestic and international markets and suppliers

The first point is illustrated by a comparison of shipping costs via truck with those for rail. Rail costs are about a fourth of those for truck on average per ton-mile.[5] Furthermore, the cost differential grows with the distance shipped.

The second point is a corollary to the first and is reflective of shipper comments that, with lower cost rail haulage, the shippers can expand into distant markets from which they are precluded by the higher truck costs.

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[3] Based on shipper interviews, estimated shipment volumes were converted to tonnage and carload equivalents. It is assumed that 100 tons = 1 rail carload.

[4] The annual demand scenario includes the use of team tracks. It was assumed that team track usage is equivalent to 5 percent of the total annual demand in each county.

[5] The American Association of State Highway and Transportation Officials, in its 2002 *Freight Rail Bottom Line Report*, applied average costs per ton-mile from the year 2000 for shipment of all commodities via freight rail and via trucking, to demonstrate the value of rail system investment to shippers of all commodities, nationwide. The study valued the cost of truck shipment at $0.080 per ton-mile, and rail shipment at $0.024 per ton-mile.

With more extensive access to markets, production may expand, and that expansion will generate new employment. This analysis estimated the new employment generated in the counties along the corridors as a function of the low and high traffic estimates. County-specific wage averages were applied to these estimates to calculate the new incomes of employees hired as a function of the production expansion triggered by the shared use of Nevada Rail. With the new employee income, local business activity can be expected to increase as local suppliers sell their wares to the expanding businesses, and the new employees purchase more groceries, shop for new clothes, and purchase automobiles. This study estimated these economic effects.

The study also estimated the public benefit of the potential diversion of existing truck loads to rail, if Nevada Rail were implemented and opened to commercial freight traffic. Likewise, the study estimated the potential new income that would accrue to the UPRR (the connecting carrier on either corridor), from new freight shipments via Nevada Rail.

2.0 POTENTIAL SHARED USE

2.1 POTENTIAL NEW FREIGHT MARKETS FOR CALIENTE AND MINA CORRIDORS

2.1.1 Caliente Corridor

A report completed in January 2004 by the Nye County Board of Commissioners under the County's Cooperative Agreement with the DOE states among its conclusions that:

"The Caliente and Carlin rail corridors, which have been identified by the DOE as the preferred proposed repository rail corridors, have no appreciable benefit to non-nuclear businesses presently located in the region that might consider becoming rail customers."

Nye County Board of Commissioners: Preliminary Transportation Assessment Cooperative Agreement Task 1A; Prepared for the U.S. Department of Energy under Cooperative Agreement DE-FC28-03RW12223; January 2004

One of the reasons for this finding is that one of the principal criteria for the candidate routes and alternative alignments was their remoteness from human habitation and commerce. Over most its distance, the Caliente Corridor ably satisfies this criterion. Furthermore, shipment via rail is most efficient for businesses located near the rail line, particularly if their shipments are loaded and unloaded directly to and from rail cars. Intermediate transport via other modes to or from the rail line impose additional costs that render rail transport decreasingly efficient for businesses located farther from the rail line.

Given these considerations, a new rail line in the Caliente Corridor will not offer broad commercial benefit to businesses throughout Nye, Esmeralda, and Lincoln counties. It may, however, represent a more efficient means of freight transport for existing industries located in the immediate vicinity of the rail line. These industries currently ship insufficient quantities to justify a stand-alone commercial rail operation. It is possible that the efficiencies provided by rail will allow these existing industries to expand, if the Nevada Rail project allows for commercial use of the tracks.

In December 2004, the Nye County Department of Natural Resources and Federal Facilities completed an exhaustive survey of land uses and ownership over the entire Caliente rail route, in conjunction with the report cited above. This survey included businesses that could be candidates for freight shipment via rail, and provided a basis for the assessment of potential Nevada Rail freight markets. The Nye County survey includes all businesses that are sensitive to the actual alignment of the Nevada Rail route. Not all of these businesses ship freight of commodity types or in quantities that are economical for rail transportation. This assessment considers only businesses in the vicinity of the Caliente alignment and its alternatives that are likely to ship viable quantities of freight via rail. The industries considered were the ones that the study team believes have the potential to ship sufficient quantities to receive savings on transportation costs.

2.1.2 Mina Corridor

The Mina Corridor passes by communities that are more populous and have more existing commerce than those along the Caliente Corridor. In the past, commercial rail served businesses along much of the northern portion of the route. Rail currently exists between Hazen and Hawthorne, and an abandoned track bed extends south past Luning to Mina in

Mineral County. Some of the businesses in Mineral County that used commercial rail still exist or would benefit if service restarted. Mineral County is also making a concerted effort to attract businesses whose operation could benefit substantially from commercial rail service. Similarly, Lyon and Esmeralda counties each contain businesses that would benefit from the availability of a freight rail line.

Products that would be cheaper to ship by rail include bulk commodities that are associated with extraction industries and large-scale fuel and material distribution facilities, especially for construction and landscaping. These industries, which are predominant in the Mina Corridor, could use rail for bulk quantity shipments of inbound materials and outbound product that cannot be easily transported by truck. In addition, the cheaper transport cost of commercial rail would allow shipment to more distant markets and make competition with national companies possible.

2.1.3 Southern Extension of Caliente and Mina Corridors

The southern extension of the Caliente and Mina Corridors was included in this analysis to test its potential utility for moving commercial freight generated along the two corridors. For this analysis, it is presumed to start near the Geologic Repository, the terminus of the other corridors. It would run south to a connection with the UPRR's Los Angeles-Las Vegas-Salt Lake Line Railroad at Jean. This extension would represent an additional access point to the UPRR as well as another access for SNF from the National Transportation System for shipments generated on the other corridors.

2.2 KEY FINDINGS

2.2.1 Caliente Corridor

Key findings for the Caliente Corridor include:

- The alignment between Tonopah and Yucca Mountain traverses territory that is very lightly populated, with limited industry.
- The alignment between Tonopah and Caliente (the connection with the UPRR's Los Angeles-Las Vegas-Salt Lake Line) traverses territory that is essentially unpopulated, except for the 9-mile segment immediately north of Caliente along the former Pioche branch.
- The number of estimated car loadings generated by businesses in the corridor (discussed specifically in Section 2.4) does not appear to be able to support a private carrier on its own. However, depending on how trackage use agreements are worked out with DOE, there is a potential for a carrier to cover the "above the rail"[6] costs as a discrete business from the transport of HLW and SNF.

[6] These are costs for train crews, fuel, maintenance of equipment, and administration. Costs for train dispatching and track maintenance are assumed to be covered by whatever authority is empowered to handle the HLW and SNF rail shipment, as these functions would have to be handled whether or not a commercial freight operation on Nevada Rail were implemented.

- If a coal-fired power plant is developed in the Dry Lake Valley area, the portion of the line from Caliente to the power plant has the potential to be self-sufficient.

- The key for respondents to study team interviews is whether their cost of transportation will be less if they ship by rail instead of truck. Several respondents were confident that lower rail rates would trigger additional shipments.

- Freight trains will have to operate at least twice a week to provide an acceptable level of service.

- It is estimated that a minimum of three crews would be required to transport a car from Caliente to Crater Flat, just west of the Geologic Repository, a potential site identified by NWRPO for an industrial park. The requirement assumes that operations and servicing are based near the midpoint of the rail line, such as at Tonopah.

- The benefits of the railroad to Lincoln County are anticipated to arise from rail shipments from the Panaca, Caliente, and the Dry Lake Valley area; employment triggered by these new rail shipments; and employment generated by an interchange between UPRR and Nevada Rail.

- Shippers in Nye County would also benefit from direct access to commercial rail. Railroad jobs would include equipment maintenance, track maintenance, operating crews, and supervision.

- Ancillary benefits would include housing for out-of-town crews, retail to support the interchange at Caliente, and the potential for additional industrial development along the alignment.

2.2.2 Mina Corridor

Key findings for the Mina Corridor include:

- The alignment between Goldfield (Esmeralda County) and Yucca Mountain traverses territory that is very lightly populated, with limited industry.

- The alignment between Hazen (connection with the UPRR's Sacramento-Reno-Salt Lake Line) and Esmeralda County traverses territory that is populated by small towns, tribal communities, farms, and ranchlands.

- The number of estimated car loadings generated by businesses in the corridor appears to be able to support a private carrier on its own, particularly between Luning and Hazen.

- Much of the commercial rail traffic would be generated by extractive industries, fuel production and distribution centers, and business park development, particularly in Mineral County.

- The key for any of the respondents to study team interviews is whether their cost of transportation will be less if they ship by rail instead of truck. Several respondents were confident that lower rail rates would trigger additional shipments.

- Freight trains will have to operate at least twice a week to provide an acceptable level of service.

- It is estimated that a minimum of two crews would be required to transport a car from Hazen to Yucca Mountain and return. This requirement assumes that operations and servicing are based at Crater Flat.

- The benefits of the railroad to Mineral County are anticipated to arise from rail shipment by tenants of the planned business park, as well as increased markets for extractive industries. Extractive industries would also benefit from commercial rail serving Lyon, Nye, and Esmeralda counties. In addition, Churchill and Lyon counties have the potential for substantial biodiesel fuel shipments from facilities being developed in the northern portion of the corridor.

- Additional employment could be generated by the interchange between UPRR and Nevada Rail at Hazen. Railroad jobs could include equipment maintenance, track maintenance, operating crews, and supervision.

- Ancillary benefits could include housing for out-of-town crews, retail to support the interchange, and the potential for additional industrial development along the alignment.

2.2.3 Southern Extension of Caliente and Mina Corridors

As noted earlier, this analysis explored the potential implications for commercial rail-borne freight of a Southern Connection for both the Caliente and Mina Corridors to the UPRR main line south of Yucca Mountain.

- The alignment between the Crater Flat/Yucca Mountain area and a hypothetical connection with the UPRR Los Angeles-Las Vegas-Salt Lake City Line at Jean traverses territory that is very lightly populated, with limited industry. The only community near the alignment is Pahrump. For the traffic volume estimate, any rail traffic generated by industries in Pahrump was assumed to be handled through a common user facility called a team track. If a Southern Extension were built through or near Pahrump, a team track could be constructed there.

- If a Southern Extension were built in connection with a Caliente Corridor alignment, it is estimated that a minimum of two crews would be required to transport a car from Tonopah to Jean and return. This requirement assumes that operations and servicing are based at Tonopah.

- If a Southern Extension were built in connection with a Mina Corridor alignment, it is estimated that a minimum of two crews would be required to transport a car from Luning to Jean and return. This requirement assumes that operations and servicing are based at Crater Flat.

- Freight trains will have to operate at least twice a week to provide an acceptable level of service, whether operating between Tonopah and Jean or between Luning and Jean.

- As Jean is in Clark County, the benefits of the railroad to Clark County are those related to the interchange between UPRR and Nevada Rail. Railroad jobs could include equipment maintenance, track maintenance, operating crews, and supervision.

- Ancillary benefits could include housing for out-of-town crews, retail to support the interchange, and the potential for additional industrial development along the alignment.

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2.3 SUMMARY OF STAKEHOLDER INTERVIEWS

The study team contacted a number of civic and business leaders along with potential shippers to develop our understanding of the traffic potential for commercial railroad services along the Caliente Corridor and Mina Corridor and southern extensions of both. Many of the shippers noted that commercial rail service would potentially allow their businesses to expand, but only if using rail will reduce their overall transportation costs. For information on potential shippers and other stakeholders, see Appendix A.

Each of the subject counties has identified opportunities for economic development that could be enhanced by the implementation and operation of the Nevada Rail and the Geologic Repository itself. The principal economic development strategies of these counties involve establishing industrial and business parks and attracting new businesses. The importance of the rail line to their development depends on the types of industries they attract, their scale, and proximity to the rail line.

This study recognizes that there may be other potential rail shippers in the Amargosa Valley and along both the Caliente and Mina Corridors which the study team did not identify during the course of its investigation. Documenting the existence of such shippers will be a key task in any further study of Nevada Rail's commercial traffic potential.

2.4 FREIGHT TRANSPORTATION DEMAND

2.4.1 Annual Demand Scenarios for Caliente and Mina Corridors

The annual demand scenarios for the Caliente and Mina Corridors were based on information received during interviews with potential shippers regarding their estimated freight shipment volumes if Nevada Rail were in existence. The information from potential shippers was standardized (into tons and rail carloads) and used to determine the low and high freight shipment volumes of businesses served by the four corridor scenarios. These low and high scenarios correspond to the ranges of shipment quantities estimated for each potential shipper, and are summarized by commodity type in Tables 2 through 5. The total quantities of material shipped annually for each commodity type are used to quantify potential benefits to the region served by the four corridor scenarios.

The shippers contacted for the 2005 *Rail Transportation Economic Impact and Evaluation Planning Study* were re-contacted for this study. When the results in this study are compared to findings in the 2005 study, the tonnages/carloads were in some cases reduced. This was the case for the Caliente Route. However, it is important to note that the freight transportation demand estimates in this study do not take into account other potential shippers who provided additional shipment estimates after this demand analysis was completed. For example, Shamrock Mining suggested a low side volume estimate of 1,000 carloads/year and a high side volume of 2,000 carloads/year along the Caliente Corridor.

Table 2
Caliente Corridor – East Only Scenario

Commodity	Low		High	
	Tons	Carloads	Tons	Carloads
Farm Products	48,000	480	57,600	576
Coal	0	0	2,079,840	20,798
Non-Metallic Minerals	2,500	25	10,000	100
Chemicals	36,400	364	364,000	3,640
Petroleum and Coal Products*	50,369	504	138,166	1,382
Stone, Clay, Glass, Concrete	128,680	1,287	222,960	2,230
Waste and Scrap Materials*	96,000	960	96,000	960
All Other Commodities	55,788	558	117,017	1,170
Total	**417,737**	**4,177**	**3,085,583**	**30,856**

*Note: There is a variation in the type of commodities included in the demand scenario for the Caliente and Mina Corridors. The Mina Corridor scenarios include additional commodities such as biodiesel and secured materials and do not include coal. It should also be noted that the Caliente Corridor "high" scenario includes the coal-fired electric power plant planned to be located in the Dry Lake Valley.

Table 3
Caliente Corridor – With Southern Extension Scenario

Commodity	Low		High	
	Tons	Carloads	Tons	Carloads
Farm Products	48,000	480	57,600	576
Coal	0	0	2,079,840	20,798
Non-Metallic Minerals	2,500	25	10,000	100
Chemicals	36,400	364	364,000	3,640
Petroleum and Coal Products*	50,369	504	138,166	1,382
Stone, Clay, Glass, Concrete	158,680	1,587	282,960	2,830
Waste and Scrap Materials*	96,000	960	96,000	960
All Other Commodities	59,430	594	121,570	1,216
Total	**451,379**	**4,514**	**3,150,135**	**31,501**

*Note: There is a variation in the type of commodities included in the demand scenario for the Caliente and Mina Corridors. The Mina Corridor scenarios include additional commodities such as biodiesel and secured materials and do not include coal. It should also be noted that the Caliente Corridor "high" scenario includes the coal-fired electric power plant planned to be located in the Dry Lake Valley.

Table 4
Mina Corridor – North Only Scenario

Commodity	Low		High	
	Tons	Carloads	Tons	Carloads
Farm Products	48,000	480	57,600	576
Coal	0	0	0	0
Non-Metallic Minerals	132,500	1,325	582,000	5,820
Chemicals	65,000	650	88,981	890
Biodiesel, Petroleum and Coal Products*	322,836	3,228	476,678	4,767
Stone, Clay, Glass, Concrete	254,480	2,545	431,760	4,318
Waste, Scrap and Secured Materials*	1,016,500	10,165	3,794,000	37,940
All Other Commodities	814,488	8,145	4,995,117	49,951
Total	**2,653,804**	**26,538**	**10,426,135**	**104,261**

*Note: There is a variation in the type of commodities included in the demand scenario for the Caliente and Mina Corridors. The Mina Corridor scenarios include additional commodities such as biodiesel and secured materials and do not include coal. It should also be noted that the Caliente Corridor "high" scenario includes the coal-fired electric power plant planned to be located in the Dry Lake Valley.

Table 5
Mina Corridor – With Southern Extension Scenario

Commodity	Low		High	
	Tons	Carloads	Tons	Carloads
Farm Products	48,000	480	57,600	576
Coal	0	0	0	0
Non-Metallic Minerals	132,500	1,325	582,000	5,820
Chemicals	65,000	650	88,981	890
Biodiesel, Petroleum and Coal Products*	322,836	3,228	476,678	4,767
Stone, Clay, Glass, Concrete	309,680	3,097	516,960	5,170
Waste, Scrap and Secured Materials*	1,016,500	10,165	3,794,000	37,940
All Other Commodities	818,130	8,181	4,999,670	49,997
Total	**2,712,646**	**27,126**	**10,515,888**	**105,159**

*Note: There is a variation in the type of commodities included in the demand scenario for the Caliente and Mina Corridors. The Mina Corridor scenarios include additional commodities such as biodiesel and secured materials and do not include coal. It should also be noted that the Caliente Corridor "high" scenario includes the coal-fired electric power plant planned to be located in the Dry Lake Valley.

2.4.2 Traffic Scenarios by County and Direction for Caliente and Mina Corridors

The low and high freight shipment volumes to and from various counties for each corridor are summarized in Tables 6 through 9.

Table 6
Low Traffic Scenario by County and Direction – Caliente Corridor

County Low	Annual Tons			Annual Carloads		
		With S Extension			With S Extension	
	E only	E	S	E only	E	S
Nye	342,287	128,061	247,868	3,423	1,281	2,479
Lincoln	75,450	75,450	0	755	755	0
Total	**417,737**	**451,379**		**4,177**	**4,514**	

Table 7
High Traffic Scenario by County and Direction – Caliente Corridor

County High	Annual Tons			Annual Carloads		
		With S Extension			With S Extension	
	E only	E	S	E only	E	S
Nye	532,231	215,947	380,837	5,322	2,159	3,808
Lincoln	2,553,352	2,553,352	0	25,534	25,534	0
Total	**3,085,583**	**3,150,135**		**30,856**	**31,501**	

Table 8
Low Traffic Scenario by County and Direction – Mina Corridor

County Low	Annual Tons			Annual Carloads		
		With S Extension			With S Extension	
	N only	N	S	N only	N	S
Nye	265,466	105,229	219,079	2,655	1,052	2,191
Lyon	5,643	2,020	3,623	56	20	36
Churchill	317,100	271,800	45,300	3,171	2,718	453
Mineral	1,944,845	1,659,382	285,464	19,448	16,594	2,855
Esmeralda	120,750	48,125	72,625	1,208	481	726
Total	**2,653,804**	**2,712,646**		**26,538**	**27,126**	

Table 9
High Traffic Scenario by County and Direction – Mina Corridor

County High	Annual Tons			Annual Carloads		
		With S Extension			With S Extension	
	N only	N	S	N only	N	S
Nye	365,073	158,669	296,157	3,651	1,587	2,962
Lyon	140,616	72,252	68,364	1,406	723	684
Churchill	317,100	271,800	45,300	3,171	2,718	453
Mineral	9,034,118	7,461,738	1,572,380	90,341	74,617	15,724
Esmeralda	569,229	209,072	360,157	5,692	2,091	3,602
Total	**10,426,135**	**10,515,888**		**104,261**	**105,159**	

2.4.3 Aggregated Annual Demand by Caliente and Mina Corridors

Tables 10 and 11 compare demand for commercial rail service in the Caliente and Mina Corridors. In both corridors, it appears that annual demand would be sufficient to warrant shared use of Nevada Rail. The average annual traffic for North American short lines (small railroads) is 20,000 carloads.[7] It is important to note that this average includes short lines, regional railroads, and switching railroads. Thus, this average is an aggregate of the experience of different types of railroads. Secondly, "less than one-half of the non-Class I railroads carry more the 4,500 carloads per year,"[8] which means that most small railroads handle a volume that is either equal to or less than what this study estimates for the Low Volume Scenarios for almost all routes. Therefore, if there were a short line railroad operating on the Caliente Corridor, assuming a low volume scenario, it would be handling carloads similar to or perhaps slightly better than most other short line railroads.

Based on the average annual traffic for North American short lines, the Mina Corridor, under either conservative or optimistic (low and high) scenarios, generates sufficient commercial traffic to consider short line operation, independent of Nevada Rail. This level of commercial activity would occur only under the high scenario for the Caliente Corridor, and then only on the far eastern segment of the corridor near Caliente.

[7] From the presentation entitled, *The American Short Line and Regional Update*, from the American Short Line and Regional Railroad Association, August 2005 for the Federal Railroad Administration.
[8] From *The Importance of Short Line Railroads to Rural and Agricultural America*, Upper Great Plains Transportations Institute, North Dakota State University, August 2003.

Table 10
Aggregated Low and High Annual Demand – Caliente Corridor

Scenario	Annual Tons			Annual Carloads		
		With S Extension			With S Extension	
	E only	E	S	E only	E	S
Low	417,737	203,511	247,868	4,177	2,035	2,479
High	3,085,583	2,769,299	380,837	30,856	27,693	3,808

Table 11
Aggregated Low and High Annual Demand – Mina Corridor

Scenario	Annual Tons			Annual Carloads		
		With S Extension			With S Extension	
	N only	N	S	N only	N	S
Low	2,653,804	2,086,556	626,090	26,538	20,866	6,261
High	10,426,135	8,173,530	2,342,358	104,261	81,735	23,424

2.4.4 Existing Truck, Future Truck, and Future Rail Shipments by Caliente and Mina Corridors

Based on the shipper interviews, the study team standardized existing volumes of product shipped via truck to annual tonnage for all commodities provided in the shipper interviews (existing or near-term truck annual shipments that occur without Nevada Rail), future rail shipments that would be diverted from existing truck volumes, and new future rail shipments that would only occur with the existence of Nevada Rail (would not travel by truck). A summary of existing truck shipments, shipments diverted from existing truck to rail, and new shipments generated by Nevada Rail is presented in Tables 12 through 15. These tables correspond with Tables 6 through 9, which quantify shippers' estimates of future production that would be shipped by rail. Tables 12 through 15 additionally quantify shippers' estimates of future production that would be shipped by truck. These estimates reflect varying degrees of confidence among shippers regarding their future production and their distribution between modes. This uncertainty results in differences of ±3.1 percent among the estimated annual rail shipments depicted in Tables 6 through 9 and Tables 12 through 15.

Table 12
Truck vs. Rail – Low Traffic Scenario by County and Direction – Caliente Corridor

	Annual Tons					
	Caliente – East Only			Caliente – With Southern Extension		
Low	Existing Truck Shipments	Nevada Rail Shipments		Existing Truck Shipments	Nevada Rail Shipments	
		Diverted from Truck	New shipments		Diverted from Truck	New shipments
Nye	644,566	272,723	69,564	644,566	306,365	69,564
Lincoln	43,700	0	75,450	43,700	0	75,450
Total	**688,266**	**417,737**		**688,266**	**451,379**	

Table 13
Truck vs. Rail – High Traffic Scenario by County and Direction – Caliente Corridor

	Annual Tons					
	Caliente – East Only			Caliente – With Southern Extension		
High	Existing Truck Shipments	Nevada Rail Shipments		Existing Truck Shipments	Nevada Rail Shipments	
		Diverted from Truck	New shipments		Diverted from Truck	New shipments
Nye	779,909	315,334	173,616	779,909	379,887	173,616
Lincoln	80,100	0	2,553,352	80,100	0	2,553,352
Total	**860,009**	**3,042,302**		**860,009**	**3,106,855**	

Table 14
Truck vs. Rail – Low Traffic Scenario by County and Direction – Mina Corridor

	Annual Tons					
	Mina – North Only			Mina – With Southern Extension		
Low	Existing Truck Shipments	Nevada Rail Shipments		Existing Truck Shipments	Nevada Rail Shipments	
		Diverted from Truck	New shipments		Diverted from Truck	New shipments
Nye	467,249	247,523	17,943	467,249	272,723	17,943
Churchill	0	0	317,100	0	0	317,100
Lyon	7,662	5,374	269	7,662	5,374	269
Esmeralda	28,362	15,000	105,750	28,362	15,000	105,750
Mineral	964,808	252,034	1,774,112	964,808	252,034	1,774,112
Total	**1,468,080**	**2,735,105**		**1,468,080**	**2,760,305**	

Table 15
Truck vs. Rail – High Traffic Scenario by County and Direction – Mina Corridor

	Annual Tons					
	Mina – North Only			Mina – With Southern Extension		
High	Existing Truck Shipments	Nevada Rail Shipments		Existing Truck Shipments	Nevada Rail Shipments	
		Diverted from Truck	New shipments		Diverted from Truck	New shipments
Nye	542,592	246,854	74,938	542,592	272,054	74,938
Churchill	0	0	317,100	0	0	317,100
Lyon	136,728	131,112	6,977	136,728	131,112	6,977
Esmeralda	30,862	6,750	550,479	30,862	6,750	550,479
Mineral	1,218,266	384,672	8,673,046	1,218,266	384,672	8,673,046
Total	**1,928,448**	**10,391,928**		**1,928,448**	**10,417,128**	

2.5 ECONOMIC DEVELOPMENT INITIATIVES

Lincoln County's population in 2004 was 4,444, a 4 percent increase over a five-year period. The County is served by the UPRR and U.S. Route 93. The County's unemployment rate of 3.8 percent reflects the primarily service-based economy. The 2003 Comprehensive Economic Development Strategy identifies several opportunities that may diversify the economic base and directly or indirectly benefit from the presence of a common carrier freight railroad. Additional development is being proposed at industrial parks near Alamo and Caliente, both of which are in early development and discussion with potential tenants. The Meadow Valley Industrial Park in Caliente may include such industries as recycling of plastics, tires, and wood products; beverage bottling; trucking; and hay cubing, all of which could ship via rail. Among industries in their earliest stages is the development of Pinyon-Juniper biomass material as a feedstock for modular electrical generation plants. In addition, the City of Caliente is considering the potential of an intermodal transfer facility for goods being shipped to the Geologic Repository. Rail facilities in Caliente are planned to include a spur line to serve the Meadow Valley Industrial Park and a team track to serve industries distributed through the area.

Esmeralda County is sparsely populated, with 1,262 people residing in the county and one-third of the population living in Goldfield, the county seat. The County has historically relied on governmental service, mining, and agriculture as its principal economic drivers. The unemployment rate is 4.9 percent. Goldfield is located close to the Caliente Corridor, where it traverses the western boundary of Nevada Test and Training Range. Development of a business park in Goldfield could be enhanced by the proximity of the Caliente Corridor and a dedicated spur. Alternately, a siding and team track in Tonopah could also serve Goldfield. While the main resource industry in Esmeralda County is mining, rail access is not necessarily a catalyst to its development, particularly for minerals such as gold, which is typically extracted on site. Along the Mina Corridor, which traverses the county from north to south, mining operations could use rail to increase the quantity of shipments. Mining operations could include Chemetall

Foote Corporation, the county's largest private firm, located in relative proximity to the proposed rail line),

Nye County has 42,693 residents (2006), a 31 percent increase over the last 6 years. The County's primary economic engine is the construction industry, which keeps the unemployment rate below 4 percent. Nye County is planning to establish industrial parks at Tonopah and Crater Flat near Amargosa Valley. Both the planned industrial parks and existing industries would benefit from rail. Such businesses include: Cind-R-Lite (cinder block manufacturing), Foreland Refinery Corporation (petroleum products), U.S. Ecology (hazardous waste disposal), D&H Mining (rock mining), Ponderosa Dairy (dairy and other agricultural products), Ash Meadows (zeolite mining and volcanic ash tuff), and IMV Nevada (clay mining). Several of these industries have expressed interest in relocating to Crater Flat if rail were available.

Mineral County is located south of Lyon and Churchill counties. It is the terminus of the Department of Defense rail line that serves the munitions depot at Hawthorne, the county seat. Mineral County is sparsely populated, with only 6,200 residents, most of whom reside in Hawthorne. In recent times, the population has declined. At 6 percent, unemployment is higher than for the surrounding counties. A third of the county's jobs are affiliated with the Hawthorne Army Ammunitions Depot and auxiliary services. To diversify its economic base, the Mineral County Economic Development Authority has promoted the availability of inexpensive land in and around the munitions depot, as well as the modern telecommunications infrastructure related to the Army facility, to entice new manufacturing, distribution, and residential development. Peninsula Floors Inc. is the first major firm to relocate on the undeveloped parcel. Its primary distribution and granite slab fabrication facilities located in Hawthorne would benefit from commercial rail service to transport substantial volumes of materials to the distribution and fabrication facilities and to distribute finished product throughout the western region of the U.S. In addition, the county has extractive industries (Milestone Minerals and Grefco Minerals), waste storage (Nevada Waste Group), and fuel distribution facilities (Western Central Petroleum) that also could use rail to bring in supplies and to expand their market range for product distribution. Spur lines or a team track may be necessary for loading goods and supplies to and from rail.

Lyon County is at the northern end of the Mina Corridor, where the proposed rail line would join the UPRR Sacramento-Reno-Salt Lake City east-west main line at Hazen. If the Mina alignment were selected by DOE, Hazen could benefit from the rail juncture as described for Caliente (Lincoln County). Lyon County is the most populous of the counties along the Mina alignment, having more than 48,000 residents. Because of its proximity to Reno, the county has served as a bedroom community. The major east-west railroad and highway routes through northern Nevada traverse the county, stimulating employment in manufacturing, trade, agriculture, and transportation. The unemployment rate is slightly more than 5 percent. Lyon County is promoting its accessibility and rapid growth to encourage new business opportunities to serve the growing population. In addition, biodiesel fuel production (Infinifuel Wabuska) and manufacture of interior fixtures (Complete Millwork Services) are growing industries that could use the proposed rail line to expand markets outside the region. Spur lines or a team track at Wabuska would assist the loading of product onto rail.

Churchill County, which has a population of over 26,000, is located at the northern end of the Mina Corridor. The proposed rail alignment does not traverse the county but could provide branch line service to industries that are near the Lyon and Mineral county boundaries. Churchill County contains substantial farming areas and technical employment through the U.S.

Naval Air Station, Boeing Aerospace, and regional health services. Energy and Natural Resources sector are also growing, producing the lowest unemployment rate in the corridor (4.2 percent). In addition, the county is well-served by the national highway and railroad network. The UPRR east-west main line traverses the County. The proposed rail line could assist in transporting increased volumes of biodiesel fuel (Biodiesel Investment Company) produced in the county to out-of-state markets.

Walker River Paiute Tribe Indian Reservation, located in central Nevada along the Walker River between Walker Lake and Yerington, falls under the jurisdiction of the sovereign nation governed by the Walker River Paiute Tribe. The Mina Corridor would traverse south through the Walker River Tribal Lands along a rail line currently used by the U.S. Department of Defense for shipping munitions to the Army Depot at Hawthorne in Mineral County. Additional economic development opportunities from the proposed rail line for the Walker River Tribe are yet to be determined.

2.6 INDUSTRIES TO SERVE REPOSITORY OR RAIL LINE

Given the scale of the Yucca Mountain repository, it is possible that any of the industrial parks in planning by Nye, Esmeralda, Lincoln or other counties along the Caliente and Mina Corridors could attract businesses focused on service to the repository itself or the Nevada Rail line. None of the counties yet has a complete sense of the types and scale of businesses that could develop around the repository, nor have they targeted candidates for location in their planned facilities.

An example of a resource industry that could serve the repository is Advanced Pozzolan Products, a producer of additives to aid the curing of concrete. The repository itself is likely to be a large consumer of concrete products. Advanced Pozzolan Products would be a likely local source for concrete additives.

2.7 POTENTIAL CAPITAL ENHANCEMENTS – ACCESS TO RAIL LINE

On the basis of the discussions with all the shippers surveyed, this study assumes that shippers would all be served either singly or jointly by dedicated industrial spurs. It is further assumed that a minor portion of the total estimated annual freight demand for each county would constitute miscellaneous shipments that would be loaded at team tracks. Neither the locations nor the configurations of these team tracks are specified.

The following paragraphs describe the various rail facilities that would be part of a complete Nevada Rail system, configured to serve local commercial shippers. This analysis does not include cost calculations for improvements to support commercial freight service on Nevada Rail. The cost requirements would be the subject of a more detailed analysis. Funding sources would be discussed at that time.

2.7.1 Description of Track Types

Passing track: A passing track is a double-ended track that is used to allow trains headed in different directions to pass each other. Passing tracks should be located to minimize delays to trains, but are rarely long enough to permit trains to pass without one train stopping. For the Caliente and Mina Corridor service, passing tracks of 4,000 feet in length appear to be sufficient. This length will allow two commercial freight trains to pass without extra switching.

The commercial trains are expected to be significantly longer than DOE container trains. Each passing track should also have a short (less than 1,000 feet) single ended track at one end for use by maintenance-of-way (MOW) forces or to temporarily store malfunctioning equipment. Passing tracks should be located approximately every 30 miles to minimize delays between opposing trains. This study did not look at the exact locations of the passing tracks. The exact location and number of passing tracks will be based on terrain, roadway access, constructability, and a detailed operating study.

Team track: A team track is a short (1,000 feet or less) track off of a passing track that is available for use by any customer. The track can be either single or double ended. Team tracks normally have a paved area where trucks can access the freight cars, along with a loading dock for transferring machinery or pallets, and a small pit for augers to unload grain or other small, free-flowing commodities. The study assumed team tracks in the counties served. For example, a team track in Crater Flat could serve U.S. Ecology, Ponderosa Dairy, and Cind-R-Lite. As was the case with passing tracks, this study did not look at the exact locations of the team tracks. The exact location and number of team tracks will be based on terrain, roadway access, constructability, and a detailed operating study.

Industry spur: An industry spur is a track off either the main line or a passing track that is devoted to a single customer. Industry spurs are normally single ended and vary in size and length depending on the needs of the individual customer. The supporting infrastructure also varies with the type and amount of commodity being shipped at the site. Crude oil requires loading racks with flexible pipes and steam lines to allow unloading during the winter months. Landscape rock could be loaded via a front-end loader with a level area alongside the tracks for smaller shipments, to pass through loading tipples for larger amounts. Industrial spurs would be needed in the Caliente Industrial Park, near Panaca for Advanced Pozzolan Products, Warm Springs for Farland Refining, north of Beatty for D&H Mining, and at other locations for other shippers. This study did not define exact locations for industry spurs, which would be based on terrain, roadway access, constructability, and a detailed operating study.

Loading/unloading loop: A loading/unloading loop is a track off of the main line or a passing track that is used for the loading or unloading of unit trains.[9] The infrastructure on a loading/unloading loop must be of sufficient size to load/unload the train within 72 hours or less. For example, this type of facility would be required if the Dry Lake Valley power plant is constructed.

2.8 PASSENGER OPERATIONS

The 2005 *Rail Transportation Economic Impact Evaluation and Planning Study* assessed the potential for intercity and tourist rail operations sharing track with Geologic Repository shipments on the Caliente Corridor.

That analysis, using U.S. Census 2000 Journey to Work numbers, concluded that there would be very few daily riders for a Beatty-Tonopah-Caliente intercity service, if it were implemented today. The slight ridership forecast was due to the light density nature of the corridor: there are simply not enough rail divertible person trips occurring in the corridor to support a rail service.

[9] A "unit train" is a train that shuttles between a single shipper, inherent in unit train operations, (such as a mine) and receiver (such as a power plant). The elimination of intermediate terminals and switching provides the railroad will significant operating savings. However, the train must be of sufficient size (normally 60 cars or more) to realize the savings.

At the same time, capital costs for rolling stock, stations, and support facilities could cost many millions of dollars, as would operating costs, with little chance of any meaningful offsetting fare revenue.

The study also concluded that a tourist railroad operating on the line would be infeasible at the time, due to high costs of implementation and the comparatively long distance to the major population base (Las Vegas) that would be required to support it.

Given the light population densities and the long distances from major urban centers along the Mina Corridor, it is reasonable to believe that the potential for intercity rail passenger operations and tourist operations between Beatty and Fernley would face the same challenges as on the Caliente Corridor.

It would seem likely that more riders would be attracted to rail service operating between Reno and Las Vegas via a Mina Route with a Southern Extension to the UPRR southwest of Las Vegas, e.g., at Jean. However, this intercity rail concept faces three major challenges.

First, the rail route would be longer than the highway route. The highway route, using U.S. Route 95 northwest from Las Vegas and connecting highways to Reno, is about 445 miles long. A more circuitous rail routing via Jean would be at least 38 miles longer—the difference in mileage between U.S. Route 95 and a rail routing from Las Vegas to Beatty.

Second, passenger trains would be limited to operations at 40 miles per hour, as this is the design speed of Nevada Rail assumed in this study. Even assuming the same average automobile speed for cars and trains, a motorist would make the journey faster than a train rider. In all likelihood, however, a motorist will drive faster than a passenger train, widening the travel time difference between the modes.

Third, the intercity travel market between Reno and Las Vegas is small. More specifically:

- In 2006, the average number of daily originating passengers flying between Reno and Las Vegas was 810.[10]
- There are just two intercity bus round trips between Reno and Las Vegas.[11] These buses perhaps account for about 120 daily riders (an estimated 30 riders per bus).
- Year 2006 traffic counts at various points along U.S. Route 95, north of Las Vegas and south of Reno, show between 2,000 and 3,000 vehicles per day.[12]

Assuming (1) a high-side traffic volume of 3,000 vehicles daily through the intermediate points between Reno and Las Vegas, (2) that half of these vehicles are through trips, and (3) an average vehicle occupancy of 1.5 persons per vehicle, then there would be about 2,250 person trips daily made by car between the two cities.

Thus, there are an estimated 3,180 person trips each day between Reno and Las Vegas. Of these, however, only the bus trips seem the most likely candidates to divert to rail. The reason is the current bus schedules show trip duration of 18 hours. Assuming an average train speed

[10] U.S. Department of Transportation, *O&D Survey*, reconciled to Schedules T-100 and 298C T-1.
[11] The buses are operated by Greyhound Lines, Inc.
[12] Per State of Nevada Department of Transportation's *2006 Annual Traffic Report*.

of just 35 mph (accounting for station stops), a train could make the trip in about 14 hours, beating the bus by a wide margin. Still, an optimistic 120 passengers per day is insufficient to justify a multi-million dollar capital investment and operating subsidies – plus additional payments to UPRR for operating rights on its track between Las Vegas and Jean, and between Wabuska and Reno.

3.0 ECONOMIC BENEFITS – CALIENTE AND MINA CORRIDORS

In general, investment in a freight transportation system generates a series of economic benefits to the region it serves:

- **Direct effects** take place only in the industry being immediately affected. For example, the salary of an employee hired by a Nye County business as a result of work triggered by implementation of commercial freight rail service would be direct economic effect.
- **Indirect effects** concern inter-industry transactions. For example, sales of supplies by a local vendor to that expanding Nye County business would be an indirect effect.
- **Induced effects** reflect changes in household income. For example, the employees of that expanding Nye County business may eat out or shop more than they normally would have since they are now employed and have new income. These expenditures would be induced effects.

These benefits accrue in the event of shared use of the Nevada Rail facility to serve local freight customers, whether they are shipping their own freight or are shipping goods and materials to support the repository. Additional benefits specific to freight rail service arise from the reduction of highway traffic due to the diversion of freight shipments from existing truck to Nevada rail. The benefits are clearly of importance to the counties of Nye, Lincoln, Esmeralda, Mineral, Lyon, Churchill, and other such counties as Lander through which truck-borne HLW and SNF and repository construction material shipments would pass on Nevada highways.

3.1 DIRECT ECONOMIC EFFECT: NEW EMPLOYMENT

The new employment attributable to the implementation of commercial service on Nevada Rail would include the jobs associated with its operation and maintenance, the jobs created by the expansion of existing businesses served by the railroad, and jobs created by new businesses to be served by the railroad.

3.1.1 New Employment Associated with Commercial Freight Railroad

As the OCRWM has not yet defined an operating plan for the Nevada Rail, the employment benefit that would accrue to Caliente Corridor businesses (located in Nye, Lincoln, and Esmeralda counties) and Mina Corridor businesses (located in Nye, Lyon, Churchill, Mineral, and Esmeralda counties) from rail operations cannot be estimated with any certainty. These operations may generate jobs within the counties, but may also be procured in such a manner that operating crews and staff are residents elsewhere. It is possible, however, to estimate the number of jobs associated with the operation of commercial freight trains in a shared-use scenario, assuming that commercial freight is operated and managed discretely from the HLW and SNF traffic. Furthermore, as discussed in the proceeding section, Table 16 summarizes the employment and compensation estimated for the Caliente and Mina Corridors based on low and high scenarios.

3.1.1.1 Caliente Corridor East Only

An estimate of new employment associated with commercial freight rail operations on the Caliente Corridor is shown in Table 16. This estimate is based on assumptions of trainmen and support staff required to move the freight volumes developed in the previous chapter. The requirement for trainmen ranges from three to six full time equivalents (FTE).[13] There would be five support staff, including a general manager, a manager of operating practices, an accounting clerk, a locomotive electrician, and a locomotive mechanic. The salary rates assumed are the same as for the 2005 *Rail Transportation Economic Impact and Evaluation Planning Study*. The total direct economic benefit to the Nye, Esmeralda and Lincoln counties would be between $567,000 and $798,000 per year in salaries. Low and high train volumes on the route appear in Figure 2. An administrative headquarters and equipment maintenance base for the commercial freight operations could be in Tonopah.

Table 16
Estimated Annual Commercial Rail Employment and Salaries

Route	Scenario	Total Cars	Trains per Week	Cars per Train	Employees			Salaries in $000
					FTE	Support	Total	
Caliente Corridor East Only	Low	8,354	8	20	3	5	8	$567
	High	60,846	20	59	6	5	11	$798
Caliente with S. Ext.	Low	9,028	8	22	6	5	11	$798
	High	62,138	20	60	9	5	14	$1,029
Mina Corridor North Only	Low	54,702	14	75	6	5	11	$798
	High	207,838	58	69	18	5	23	$1,722
Mina with S. Ext.	Low	55,206	18	59	9	5	14	$1,029
	High	208,342	54	74	18	5	23	$1,722

The low volume calculation in Table 16 assumes one train assignment or "job." This job includes two round trips between Caliente and Tonopah per week and two round trips between Tonopah and Crater Flat/Yucca Mountain per week. These runs result in eight one-way train trips and an average of 20 cars (loads and empties) per train. The high volume calculation assumes a second job, delivering unit trains of coal to the Dry Lake Power Plant north of Caliente 6 days a week.

Employee estimates are solely those for a commercial rail operation on the Caliente Corridor, e.g., a short line railroad. Table 16 excludes FTE counts for track maintenance and inspection as well as dispatching, as these are functions that will have to be performed anyway for Nevada Rail, whether or not there is a commercial rail operation on the line. FTE counts do not include forces for fueling trains and delivering equipment maintenance supplies, as these can be contractor functions. Train counts do not include Nevada Rail SNF dedicated trains or trains operating on existing track between Hazen and Hawthorne.

[13] Train crews include an engineer and a conductor. FTE estimates are factored to account for sick leave, overtime, and vacations. High volume shippers, receiving or dispatching multiple cars per day, are assumed to have the equipment and personnel required to interchange cars with the line haul railroad.

3.1.1.2 Caliente with Southern Extension

The low and high volume scenarios here assume two longer distance jobs: Job 1 handles two round trips between Caliente and Tonopah per week, and Job 2 handles two rounds trips between Tonopah and Jean (the connection to the UPRR southwest of Las Vegas) per week. The high volume scenario also assumes the coal unit train deliveries to the Dry Lake plant. As seen in Table 16, total railroad employment would range between 11 and 14, with a corresponding direct benefit of between $798,000 and $1,029,000 per year in railroad salaries. Low and high train volumes on the route appear in Figure 3. An administrative headquarters and equipment maintenance base for the commercial freight operations could be in Tonopah.

3.1.1.3 Mina Corridor North Only

The low volume scenario assumes two jobs: Job 1 handles two round trips between Hazen and Crater Flat per week, and Job 2 handles five round trips between Hazen and Luning per week. The high volume scenario assumes several more jobs: one job handles two more round trips between Hazen and Crater Flat per week, and four other jobs each would handle five rounds trips between Hazen and Luning per week. As seen in Table 16, total railroad employment would range between 11 and 23, with a corresponding direct benefit of between $798,000 and $1,722,000 per year in railroad salaries to Nye, Lyon, Churchill, Mineral, and Esmeralda counties. Low and high train volumes on the route appear in Figure 4. An administrative headquarters and equipment maintenance base for the commercial freight operations could be in Crater Flat.

3.1.1.4 Mina Corridor with Southern Extension

The low volume scenario assumes three jobs: Job 1 would handle two round trips between Hazen and Crater Flat per week, Job 2 would handle five round trips between Hazen and Luning per week, and Job 3 would handle two round trips between Luning and Jean per week. The high volume scenario assumes four more jobs each handling five round trips between Hazen and Luning per week. As seen in Table 16, total railroad employment would range between 14 and 23, with a corresponding direct benefit of between $1,029,000 and $1,722,000 per year in railroad salaries. Low and high train volumes on the route appear in Figure 5. An administrative headquarters and equipment maintenance base for the commercial freight operations could be in Crater Flat.

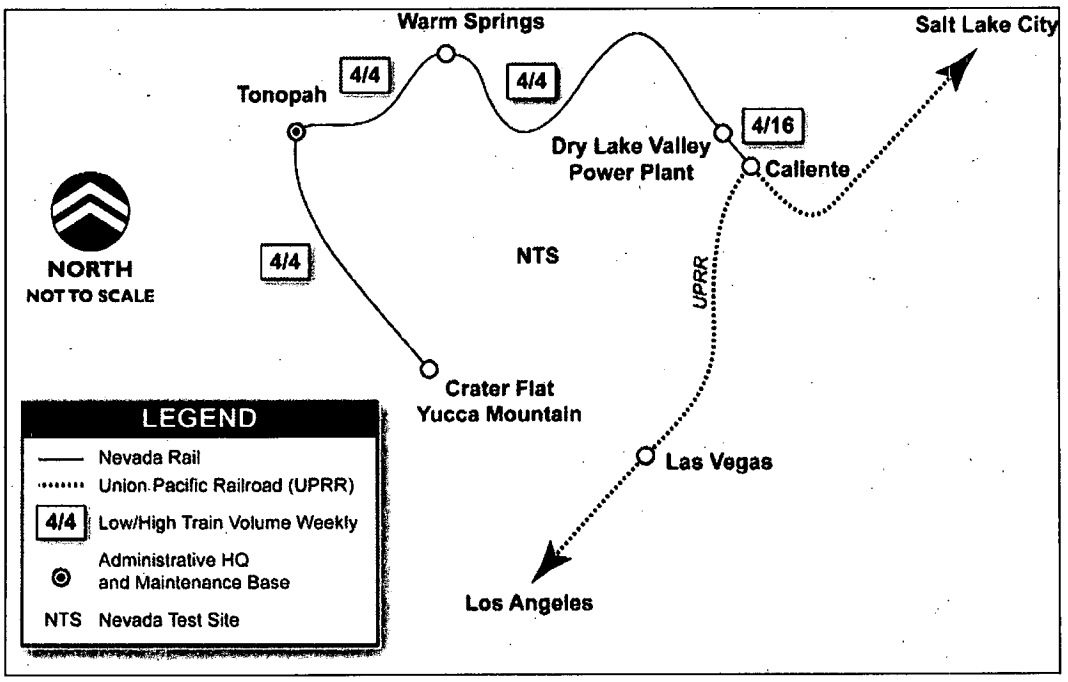

Figure 2
Estimated Weekly Freight Trains on Caliente Corridor East Only

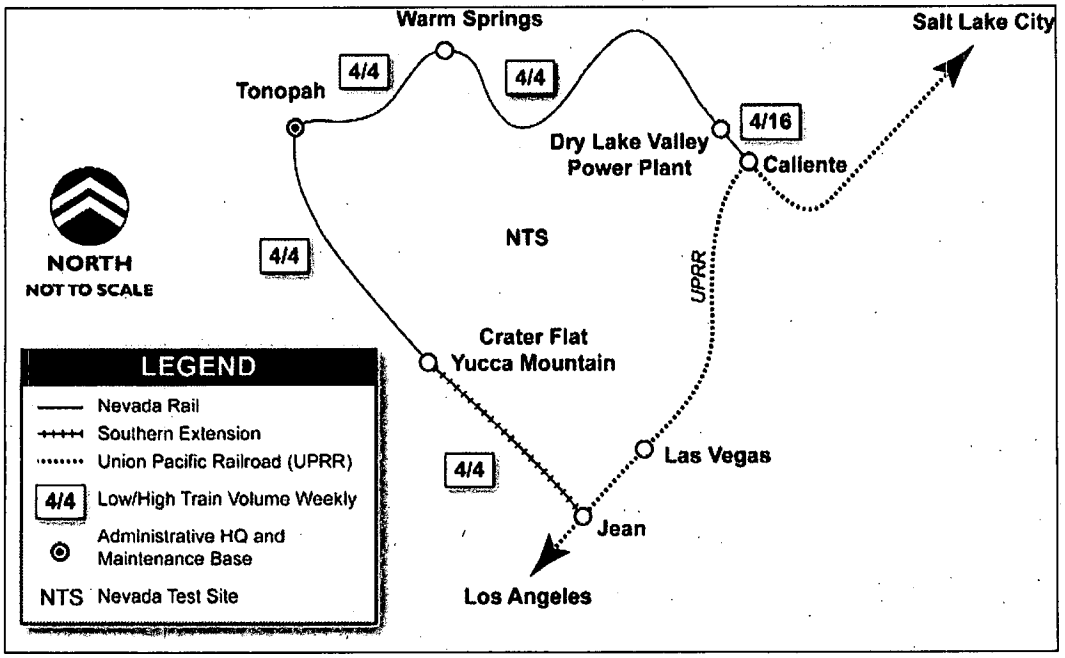

Figure 3
Estimated Weekly Freight Trains on Caliente with Southern Extension

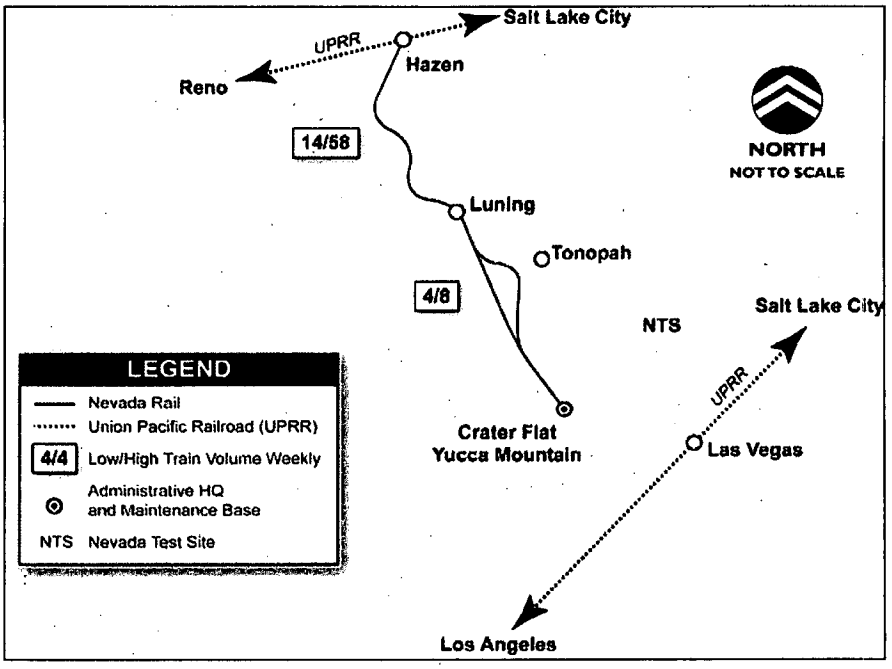

Figure 4
Estimated Weekly Freight Trains on Mina Corridor North Only

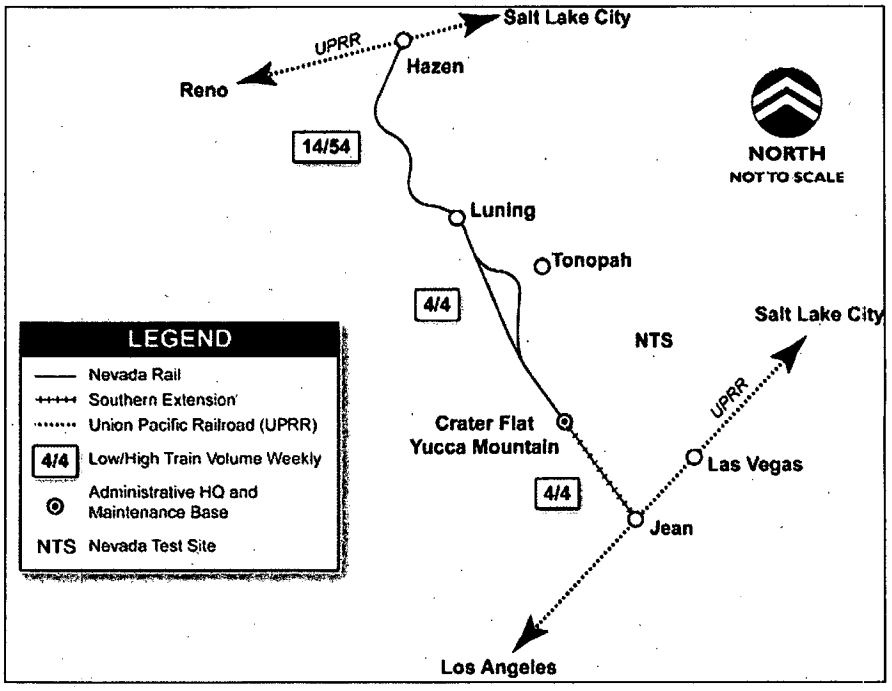

Figure 5
Estimated Weekly Freight Trains on Mina with Southern Extension

3.1.2 New Employment Associated with Corridor Businesses

Estimated new employment associated with businesses to be served by shared use of Nevada Rail includes jobs created among existing industries and potential new or revived businesses, including those that would use team tracks located at appropriate locations in each county that the rail line passes through.

3.1.2.1 Distribution of Estimated Annual Average Employment Income Among Counties

These estimated amounts to support new employment may be converted to numbers of new jobs by assessing the average annual wages paid in each of the counties that the rail passes through. The State of Nevada Department of Employment, Training, and Rehabilitation publishes the results of its Nevada Occupational Employment Statistics Wage survey on its web site, providing wage estimates for more than 800 occupations by area and industry (http://detr.state.nv.us/lmi/data/wages/TOC000.htm). The average annual wages for each commodity category in each of the counties that the Mina and Caliente alignments pass through are identified in Table 17.

Table 17
2007 Average Annual Wage by Commodity Type and County

Commodity Type	Nye	Esmeralda	Mineral	Lyon	Churchill	Lincoln
Farm Products	$28,517	N/A	N/A	N/A	$18,283	$27,622
Coal	N/A	N/A	N/A	N/A	N/A	$27,622
Non-Metallic Minerals	$85,134	$53,456	$45,594	N/A	$38,667	$42,328
Chemicals	$40,789	$15,769	$31,054	N/A	$35,859	$27,622
Biodiesel, Petroleum and Coal products	$85,134	$55,140	$45,594	$35,942	$35,859	$27,622
Stone, Clay, Glass, Concrete	$85,134	N/A	$45,594	N/A	N/A	$42,328
Waste, Scrap and Secured Materials	$28,517	N/A	$33,821	$31,720	$35,859	$21,299
All Other Commodities (including team track)	$40,789	$15,288	$31,054	$33,717	$35,859	$27,622

Source: Nevada Department of Employment Training and Rehabilitation.

3.1.2.2 Distribution of Projected Annual Revenue Among Counties

The annual new tonnage generated by the Nevada Rail per commodity was determined, as well as each commodity's average price per ton[14] on the assumed minimum shipping distance of 500 miles.[15]

[14] Commodity pricing is in 2007 dollars. See data sources listed under Commodity Pricing, 2007 in the bibliography section.

[15] The assumption that rail becomes competitive with truck when goods are shipped at distances greater than 500 miles is reflective of a point at which the efficiencies of rail transportation (lower labor and fuel costs per ton) starts to overshadow the convenience of door-to-door truck transportation. The 500-mile point is a commonplace the transportation industry. The actual point naturally will vary with the commodity shipped, the qualities of rail and truck options, and rail and truck rates. Nevertheless, a 1992 report by the General Accounting Office entitled, *Intermodal*

Each commodity's annual tonnage was multiplied by the commodity's average price. This produced the projected annual revenue for the Caliente Corridor (East Only and Southern Extension) and the Mina Corridor (North Only and Southern Extension). These results are presented in Tables 18 and 19, respectively.

Table 18
Caliente Corridor – Annual Projected Revenue

	East Only	Southern Extension	East Only	Southern Extension
County	Low	Low	High	High
	Annual Projected Revenue	Annual Projected Revenue	Annual Projected Revenue	Annual Projected Revenue
Nye	$91,082,177	$94,731,179	$160,537,196	$167,099,993
Lincoln	$7,899,178	$7,899,178	$153,783,007	$153,783,007
Total	**$98,981,355**	**$102,630,357**	**$314,320,203**	**$320,883,000**

Table 19
Mina Corridor – Annual Projected Revenue

	North Only	Southern Extension	North Only	Southern Extension
County	Low	Low	High	High
	Annual Projected Revenue	Annual Projected Revenue	Annual Projected Revenue	Annual Projected Revenue
Nye	$67,015,233	$72,914,107	$80,318,069	$89,135,162
Churchill	$63,481,835	$63,481,835	$63,481,835	$63,481,835
Lyon	$4,766,866	$4,766,866	$132,519,868	$132,519,868
Esmeralda	$28,310,935	$28,310,935	$80,035,897	$80,035,897
Mineral	$2,126,222,982	$2,126,222,982	$12,765,041,300	$12,765,041,300
Total	**$2,289,797,851**	**$2,295,696,725**	**$13,121,396,969**	**$13,130,214,062**

3.1.2.3 Aggregate New Employment

It was assumed that 11.3 percent[16] of the projected annual revenue is translated directly into wages and salaries for new employment. Therefore the annual projected revenue, per county and commodity, was multiplied by 11.3 percent to determine the average annual wages per

Freight Transportation, noted a 1991 survey of transportation managers. That survey pointed to an increasing use of rail intermodal transportation (trailer on flatcar or TOFC) versus truck for trailerloads going 500 miles or more. Another report, *Approaches for Improving Drayage in Rail-Truck Intermodal Service*, noted that the breakeven point above which transport of trailers by rail (intermodal) is less expensive than truck is thought to be in the vicinity of 500 to 700 miles.

[16] This assumption was determined based on the 2002 Economic Census Geographic Area Series for Nevada. http://www.census.gov/econ/census02/guide/02EC_NV.HTM

county for the Caliente Corridor (East Only and with Southern Extension) and the Mina Corridor (North Only and with Southern Extension), as shown in Tables 20 and 21, respectively.

Table 20
Caliente Corridor – Annual Projected Wage

	East Only	Southern Extension	East Only	Southern Extension
County	Low	Low	High	High
	Annual Projected Wages	Annual Projected Wages	Annual Projected Wages	Annual Projected Wages
Nye	$10,292,286	$10,704,623	$18,140,703	$18,882,299
Lincoln	$892,607	$892,607	$17,377,480	$17,377,480
Total	**$11,184,893**	**$11,597,230**	**$35,518,183**	**$36,259,779**

Table 21
Mina Corridor – Annual Projected Wage

	North Only	Southern Extension	North Only	Southern Extension
County	Low	Low	High	High
	Annual Projected Wages	Annual Projected Wages	Annual Projected Wages	Annual Projected Wages
Nye	$7,572,721	$8,239,294	$9,075,942	$10,072,273
Churchill	$7,173,447	$7,173,447	$7,173,447	$7,173,447
Lyon	$538,656	$538,656	$14,974,745	$14,974,745
Esmeralda	$3,199,136	$3,119,136	$9,044,056	$9,044,056
Mineral	$240,263,197	$240,263,197	$1,442,449,667	$1,442,449,667
Total	**$258,747,157**	**$259,413,730**	**$1,482,717,857**	**$1,483,714,188**

The annual projected wages identified in Tables 20 and 21 were then divided by the annual average salary, per county and commodity, to determine the number of new jobs and compensation resulting from shared use of the Nevada Rail line, as shown in Tables 22 through 25.

It is important to note that direct benefits associated with payroll represent gross benefits and do not account for any substitution of rail jobs for truck jobs. However, there is a shortage of truck drivers nationwide due to competition for labor from other industries, most notably the construction industry. Therefore, there is a high probability that any truck drivers displaced by the diversion would indeed have other employment opportunities

Caliente Corridor East Only

Total new employment for the Nye and Lincoln Counties as a direct effect of shared use of the Caliente Corridor East Only Nevada Rail line is estimated to be 275 jobs (low) and 971 jobs (high), with a corresponding annual direct economic benefit to the three counties in employee compensation[17] of $11,751,893 (low) and $36,316,183 (high), as shown in Table 22. The railroad (not specific to county) jobs and compensation refer to the numbers identified in Table 16.

Table 22
Total Employment and Compensation – Caliente Corridor East Only

	Freight Demand/ Service Scenario		Freight Demand/ Service Scenario	
	Low		High	
County	Jobs	Compensation	Jobs	Compensation
Nye	235	$10,292,286	332	$18,140,703
Lincoln	32	$892,607	628	$17,377,480
Railroad (not specific to county)	8	$567,000	11	$798,000
Total	**275**	**$11,751,893**	**971**	**$36,316,183**

Caliente Corridor with Southern Extension

Total new employment for the Nye and Lincoln Counties as a direct effect of shared use of the Caliente Corridor with Southern Extension Nevada Rail alignment is estimated to be 284 jobs (low) and 985 jobs (high), with a corresponding annual economic benefit to the three counties in employee compensation of $12,395,230 (low) and $37,288,779 (high), as shown in Table 23. The railroad (not specific to county) jobs and compensation refer to the numbers identified in Table 16.

[17] All forms of employee compensation, including employee benefits.

Table 23
Total Employment and Compensation –
Caliente Corridor with Southern Extension

	Freight Demand/ Service Scenario		Freight Demand/ Service Scenario	
	Low		High	
County	Jobs	Compensation	Jobs	Compensation
Nye	241	$10,704,623	343	$18,882,299
Lincoln	32	$892,607	628	$17,377,480
Railroad (not specific to county)	11	$798,000	14	$1,029,000
Total	**284**	**$12,395,230**	**985**	**$37,288,779**

Mina Corridor North Only

Total new employment among the Nye, Mineral, Esmeralda, Lyon, and Churchill Counties as a direct effect of shared use of the Mina Corridor North Only Nevada Rail alignment is estimated to be 8,329 jobs (low) and 47,708 jobs (high), with a corresponding annual direct economic benefit to the five counties in employee compensation of $259,545,157 (low) and $1,484,439,857 (high), as shown in Table 24. The railroad (not specific to county) jobs and compensation refer to the numbers identified in Table 16.

Table 24
Total Employment and Compensation – Mina Corridor North Only

	Freight Demand/ Service Scenario		Freight Demand/ Service Scenario	
	Low		High	
County	Jobs	Compensation	Jobs	Compensation
Nye	233	$7,572,721	260	$9,075,942
Mineral	7,680	$240,263,197	46,336	$1,442,449,667
Esmeralda	190	$3,199,136	472	$9,044,056
Lyon	15	$538,656	418	$14,974,745
Churchill	200	$7,173,447	200	$7,173,447
Railroad (not specific to county)	11	$798,000	23	$1,722,000
Total	**8,329**	**$259,545,157**	**47,708**	**$1,484,439,857**

Mina Corridor with Southern Extension

Total new employment among the Nye, Mineral, Esmeralda, Lyon, and Churchill counties as a direct effect of shared use of the Mina Corridor alignment with a Southern Extension is estimated to be 8,341 jobs (low) and 47,722 jobs (high), with a corresponding annual economic benefit to the five counties in employee compensation of $260,442,730 (low) and $1,485,436,188 (high), as shown in Table 25. The railroad (not specific to county) jobs and compensation refer to the numbers identified in Table 16.

Table 25
Total Employment and Compensation –
Mina Corridor with Southern Extension

	Freight Demand/ Service Scenario		Freight Demand/ Service Scenario	
	Low		High	
County	Jobs	Compensation	Jobs	Compensation
Nye	242	$8,239,294	273	$10,072,273
Mineral	7,680	$240,263,197	46,336	$1,442,449,667
Esmeralda	190	$3,199,136	472	$9,044,056
Lyon	15	$538,656	418	$14,974,745
Churchill	200	$7,173,447	200	$7,173,447
Railroad (not specific to county)	14	$1,029,000	23	$1,722,000
Total	**8,341**	**$260,442,730**	**47,722**	**$1,485,436,188**

3.2 INDIRECT AND INDUCED EFFECTS: BENEFITS TO COMMUNITIES

In this study, Indirect and Induced Effects are estimated at a multiple of 50 percent of the Direct Effects. Thus, the Total Direct, Indirect and Induced Effects would be 150 percent of Direct Effects, that is, of the compensation at expanding industries along the Caliente and Mina Corridors, as shown in Tables 22 through 25 above. This 1.5 multiplier was derived from a report entitled, *Wallowa County's Economic Structure: An Input-Output Analysis*. Wallowa County, in northeastern Oregon, is rural, like the counties through which Nevada Rail would pass. The 1.5 income multiplier is comparable with those cited or derived from two other reports: *Estimation of Economic Impacts For Airports in Hawthorne, Eureka, and Ely, Nevada*; and *Estimation of Economic, Employment, and Income Effects of Minden Airport on Douglas County Economy from New Employment Estimates*, both of which were prepared by the University of Nevada, Reno.

The indirect and induced economic benefits appear in Tables 26 and 27, along with direct benefits (employment) and total benefits, i.e. the sum of direct, indirect and induced benefits.

Table 26
Economic Benefits Low Volume Scenarios

	Low Volume Scenario		
	Direct Benefits	Indirect & Induced Benefits	Total Benefits
Caliente Corridor	$11,751,893	$5,875,947	$17,627,840
Caliente with So. Ext.	$12,395,230	$6,197,615	$18,592,845
Mina Corridor	$259,545,157	$129,772,579	$389,317,736
Mina with So. Ext.	$260,442,730	$130,221,365	$390,664,095

Table 27
Economic Benefits High Volume Scenarios

	High Volume Scenario		
	Direct Benefits	Indirect & Induced Benefits	Total Benefits
Caliente Corridor	$36,316,183	$18,158,092	$54,474,275
Caliente with So. Ext.	$37,288,779	$18,644,390	$55,933,169
Mina Corridor	$1,484,439,857	$742,219,929	$2,226,659,786
Mina with So. Ext.	$1,485,436,188	$742,718,094	$2,228,154,282

3.3 BENEFITS OF FREIGHT TRAFFIC DIVERSION – CALIENTE AND MINA CORRIDORS

Diverting freight traffic normally carried by trucks to trains results in benefits that reduce congestion, emissions, fuel consumption and accidents.

Estimates of existing truck tonnages divertible to rail shown on Tables 12 through 15 were divided by an assumed loading of 20 tons per truck to calculate estimates of truckloads divertible to rail on the Caliente and Mina Corridors.

These estimates were multiplied by a minimum haul of 500 miles, a rule-of-thumb figure for the distance above which rail tends to be more competitive than truck. The resulting truck-miles were then multiplied by an estimated savings per truck-mile diverted of $0.39[18] to estimate the value the truck-to-rail diversions (shown in Tables 28 and 29).

[18] The $0.39 cost per truck mile saved was derived from a truck-to-rail diversion analysis performed for the 2002 *Cascade Gateway Rail Study* for the International Mobility and Trace Corridor Project and Whatcom Council of Governments.

Table 28
Truck-to-Rail Diversion Savings – Caliente Corridor

Caliente Corridor	E Only		With S Extension	
	Low	High	Low	High
Truckloads	13,636	15,767	15,318	18,994
Truck miles	6,818,000	7,883,500	7,659,000	9,497,000
Diversion Truck to Rail Savings	$2,659,020	$3,074,565	$2,987,010	$3,703,830

*Note: The "high" scenario does not include Dry Lake Valley coal-fired power plant (Lincoln County).

Table 29
Truck-to-Rail Diversion Savings – Mina Corridor

Mina Corridor	N Only		With S Extension	
	Low	High	Low	High
Truckloads	25,997	38,469	27,257	39,729
Truck miles	12,998,500	19,234,500	13,628,500	19,864,500
Diversion Truck to Rail Savings	$5,069,415	$7,501,455	$5,315,115	$7,747,155

3.4 PRIVATE RAILROAD BENEFITS

Additional benefits would accrue to the Class I freight (a major national rail system) interchanging commercial freight generated by industries served by Nevada Rail. Given that the only Class I railroad in Nevada is the UPRR, it should be assumed that UPRR will be the beneficiary.

Industries served by Nevada Rail will generate freight that will be delivered to interchange points with the UPRR at either Caliente, Hazen or perhaps Jean. While this study does not estimate endpoints or shipping distances for commercial freights traveling to and from Nevada, we may conservatively assume that at least 80 percent of these shipments will travel another 500 miles via the UPRR, either to Southern California, Northern California, the Pacific Northwest, or the Midwest. With this assumption, we multiply 80 percent of the tonnage shipped by 500 to get a minimum revenue ton mile figure. This is then multiplied by the average revenue per ton-mile, using a national average of $0.0284, published by the Association of American Railroads (AAR).[19]

To calculate "bottom line" effects to UPRR of these Nevada Rail commercial freight shipments, a ratio of net income to total revenue for UPRR of 16 percent, (a statistic derived from data provided in UPRR's 2006 annual financial statements) was applied to the estimated revenue generated by the Nevada Rail shipments. The contribution of this revenue to UPRR's bottom line is then the difference between gross revenue and operating costs.

[19] Average revenue per ton-mile was taken from the Association of American Railroads - Policy and Economics Department, 2007 *Class I Railroad Statistics* publication.

The statistics used to calculate private freight railroad benefits are shown in Table 30.

Table 30
Coefficients Used to Calculate Economic Benefit to Private Railroad Shipping Nevada Commercial Freight

A	Freight Revenue Per Ton-Mile	$0.03
B	UPRR 2006 Total Revenue (in millions)	$15,578
C	UPRR 2006 Net Income Before Tax	$2,525
D	UPRR Income/Revenue Ratio	16%
E	Average Miles Traveled	500

The estimated economic benefit to the private railroad(s) of commercial freight shipped via Nevada Rail is developed for each of the scenarios as shown in Table 31.

Table 31
Estimated Private Railroad Economic Benefits for the Caliente and Mina Corridors

Low Scenario	Caliente Corridor		Mina Corridor	
	E Only	With Southern Extension	N Only	With Southern Extension
Tonnage	417,737	451,379	2,735,105	2,760,305
Ton-Miles Traveled	208,868,549	225,689,543	1,367,552,500	1,380,152,500
Freight Revenue	$5,931,867	$6,409,583	$38,838,491	$39,196,331
Private Railroad Benefits	$961,482	$1,038,914	$6,295,236	$6,353,238

High Scenario	Caliente Corridor		Mina Corridor	
	E Only	With Southern Extension	N Only	With Southern Extension
Tonnage	3,042,302	3,106,855	10,391,928	10,417,128
Ton-Miles Traveled	1,521,151,000	1,553,427,637	5,195,964,136	5,208,564,136
Freight Revenue	$43,200,688	$44,117,345	$147,565,381	$147,923,221
Private Railroad Benefits	$7,002,294	$7,150,873	$23,918,513	$23,976,514

3.5 SUMMARY OF ECONOMIC IMPACT ANALYSIS

As noted in Table 32, the total public and private benefits under the different demand scenarios range from $21 million to $67 million for the Caliente Corridor and from $401 million to $2.3 billion for the Mina Corridor. The higher estimates for the Mina Corridor are a function of more estimated carloads and of the greater number of workers per carload in the industries served. The population of Mina Corridor shippers includes a greater mix of manufacturers and processors, whose operations are more labor intensive, than those on the Caliente Corridor.

Table 32
Summary of Economic Benefits

Low Scenario	Caliente Corridor		Mina Corridor	
	E Only	With S Extension	N Only	With S Extension
Tonnage	417,737	451,379	2,735,105	2,760,305
Carloads	4,177	4,514	27,351	27,603
Employees	275	284	8,329	8,341
Diverted Tonnage from Existing Truck to Rail	272,723	306,365	519,931	545,131
Diverted Truckloads from Existing Truck to Rail	13,636	15,318	25,997	27,257
Benefits of Shipments Diverted from Existing Truck to Rail	$2,659,020	$2,987,010	$5,069,415	$5,315,115
Direct, Indirect, and Induced Economic Effects	$17,627,840	$18,592,845	$389,317,736	$390,664,095
Private Railroad Benefits	$961,482	$1,038,914	$6,295,236	$6,353,238
Total Public and Private Benefits	$21,248,342	$22,618,769	$400,682,387	$402,332,448

*Note: Numerical values are rounded to the nearest whole number.

High Scenario	Caliente Corridor		Mina Corridor	
	E Only	With S Extension	N Only	With S Extension
Tonnage	3,042,302	3,106,855	10,391,928	10,417,128
Carloads	30,423	31,069	103,919	104,171
Employees	971	985	47,708	47,722
Diverted Tonnage from Existing Truck to Rail	315,334	379,887	769,388	794,588
Diverted Truckloads from Existing Truck to Rail	15,767	18,994	38,469	39,729
Benefits of Shipments Diverted from Existing Truck to Rail	$3,074,565	$3,703,830	$7,501,455	$7,747,155
Direct, Indirect, and Induced Economic Effects	$54,474,275	$55,933,169	$2,226,659,786	$2,228,154,282
Private Railroad Benefits	$7,002,294	$7,150,873	$23,918,513	$23,976,514
Total Public and Private Benefits	$64,551,134	$66,787,872	$2,258,079,754	$2,259,877,951

*Note: Numerical values are rounded to the nearest whole number.

It is important to reiterate that the "low" demand scenario estimates of freight shipments were considered conservative and, therefore, useful as a baseline for evaluating the viability of commercial use of Nevada Rail. As noted earlier, the "high" estimated demand scenarios are based on the sums of the most optimistic business expectations and are therefore assumed to be unrealistically high.

Nevertheless, low-end annual commercial carload volumes ranged from 4,200 on the Caliente Corridor to 28,000 on the Mina Corridor. These volumes are comparable to those handled today by successful short line, regional and switching railroads. Therefore, it is reasonable to assume that a short line railroad handling such freight volumes on either the Caliente or Mina Corridor would be commercially viable.

The total Public and Private Benefits of the eight scenarios shown in Table 32 are summarized by corridor in Figure 6.

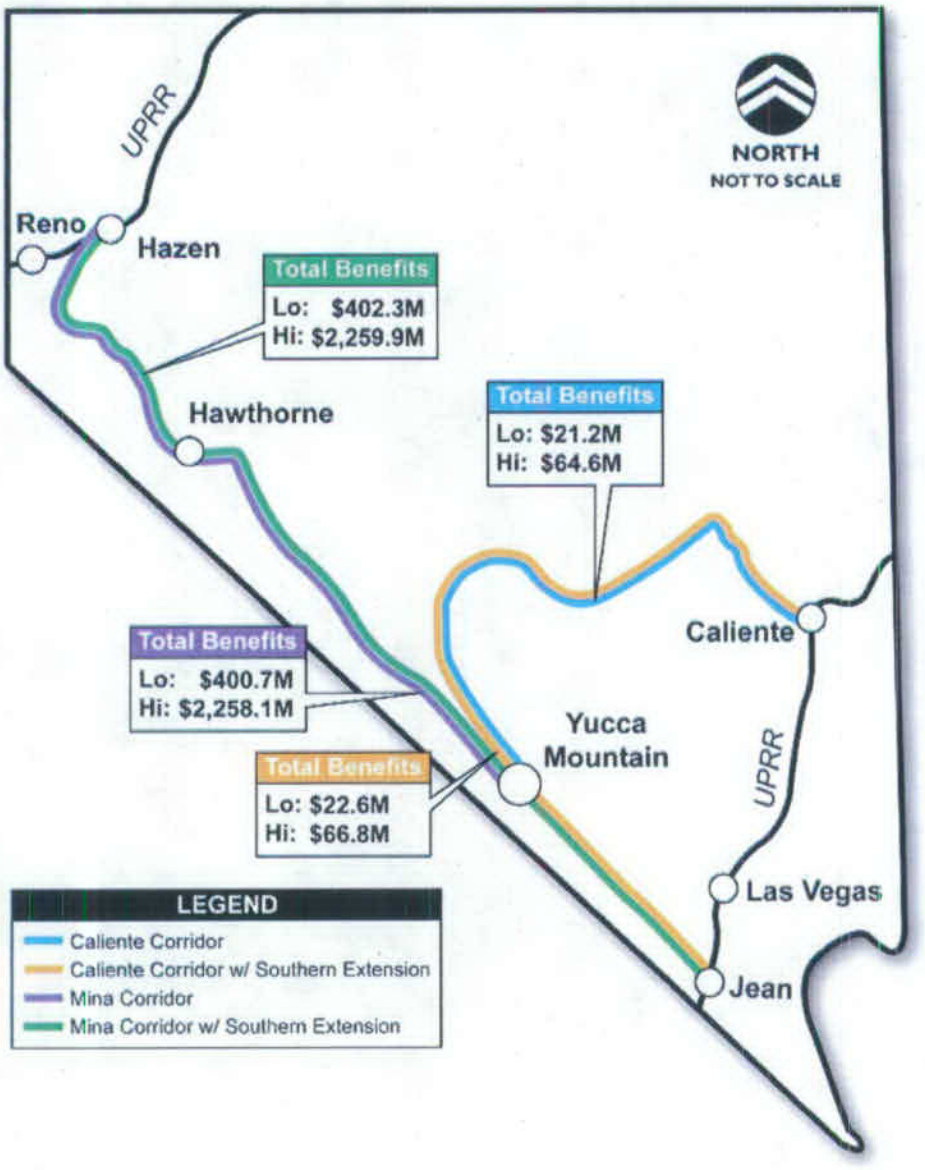

Figure 6
Summary of Public and Private Benefits by Corridor

4.0 OTHER OPPORTUNITIES

The counties affected by the Nevada Rail line may derive substantial benefits in addition to expanded transportation capacity, access to markets, and new employment. Additional benefits may be attainable via equity in the rail line itself, or from the revenue generated by both commercial freight and federal SNF and HLW shipment. Given that the Nevada Rail facility is intended to carry shipments of nuclear waste over a period of up to 50 years, state and local economies should derive all possible benefit from the construction and operation of the railroad. Among the other means by which affected state and local entities may benefit from the Nevada Rail project are:

- **Involvement in project definition, specification and procurement:** It may be possible for affected units of government to be more involved in decisions that bear on their economies. This discussion suggests areas in which the counties may pursue greater participation and derive greater economic benefit.
- **Institutional structure:** There are institutional models that may enable cooperating government entities or public-private partnerships to both support and benefit from the construction and operation of transportation facilities. This discussion considers models that have been successful in similar projects elsewhere.
- **Ownership and operation:** State and local government entities may be able to assume a role in the ownership and operation of the Nevada Rail line, and to benefit from both commercial freight and DOE shipment.

4.1 OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT NEVADA RAIL PROCUREMENT PROCESS

The OCRWM follows a prescribed process in defining and implementing large procurements. For the transportation of SNF and HLW to Yucca Mountain, these acquisitions include:

- Design and construction of the Nevada Rail line, from the interchange point with the UPRR main line to the Geologic Repository,
- Dedicated rolling stock for SNF and HLW transport,
- Facilities for MOW and equipment,
- Transportation services from temporary storage sites to the Geologic Repository, and
- Maintenance, operation, and management of the Nevada Rail line.

OCRWM has defined a time line and critical path, based on the assumption that shipment of SNF and HLW will start in 2017. Still, the transportation system implementation plan requires strategies for all these elements, and perhaps more, including definition of DOE's own ongoing role in the operation and maintenance of the rail line.

This study proposes that the counties affected by the Nevada Rail project, whether via the Caliente or the Mina alignment, should jointly assess the total OCRWM transportation program, and identify decisions in which the counties have a stake or the opportunity for economic benefit. These key DOE decisions include, but are not limited to:

- Alternative alignment selection,
- Operating plan (both dedicated HLW/SNF trains and commercial traffic),
- Safety and security plans,
- Locations of passing sidings and spurs,
- Function and configuration of interchange and yard facilities,
- Function and configuration of facilities to maintain all transportation infrastructure/equipment other than HLW/SNF casks,
- Relationship of Nevada rail procurement/operations with DOE national transportation/procurement strategy,
- Plan for operating, maintaining and managing the Nevada Rail line for HLW and SNF shipments, and
- Construction and activation planning.

The counties may be able to jointly engage directly with the DOE in these decisions, with the goal of maximizing the consequent opportunities for local business, employment, and development.

4.1.1 Purpose and Need for Nevada Rail

OCRWM has recently issued a project-specific Draft Supplemental EIS (DSEIS) for the Nevada Rail line, addressing both the Caliente and Mina Corridors. The DSEIS defines the Caliente Corridor with a Shared Use Option as the preferred alternative. In recognizing the viability of shared use, this definition may enable local and state economies to identify and pursue opportunities and benefits of increased commercial freight shipment via the Nevada Rail line. Otherwise, the rail line may be designed, built, and operated to optimally transport HLW and SNF, but perhaps not to benefit local economies. Through continued involvement in defining the Nevada Rail project, local entities may be able to incorporate their interests and influence decisions in the context of local and state economic benefit.

4.1.2 Local Business Preferences

Local business participation in planning, constructing, operating, and maintaining the Nevada Rail line may include such functions as grading the alignment for construction and providing housing for railroad construction crews. Maximizing opportunities for existing and new local businesses should be a stated goal of DOE's acquisition plans, project specifications, and proposal evaluation procedures. The government entities affected by either alignment should work with OCRWM to define support functions for both the Geologic Repository and Nevada

Rail that maximize local participation, including maintenance, administration, planning, material and service supply, safety and security, emergency response, communications, and utilities.

Greater involvement with DOE and the General Services Administration, the principal federal acquisition agency, should be pursued to define procurement processes and selection criteria that maximize local business participation.

4.2 ALTERNATIVE INSTITUTIONAL MODELS AND LINE OWNERSHIP

Institutional structures that increase cooperation, alignment, and standing among agencies affected by the Nevada Rail project may enable their participation with the DOE in defining and implementing the program. Regardless of the alignment selected, the affected units of government should consider the advantages of greater affiliation, and determine a structure that best enables action in their joint interests. Any such structure should include a model for distributing costs, effort, and benefits among the participating agencies.

The following sections describe models that have been used in other locations to enable joint implementation and operation of transportation systems. These alternative institutional structures include a state legislated authority, a Joint Powers Authority (JPA), a Memorandum of Understanding (MOU), and variations on these models. Such alternative structures would need to be adapted to the specific legal requirements of the State of Nevada.

4.2.1 Establish a New Authority via State Legislation

Creation of a statutory agency dedicated to local involvement in construction and operation of Nevada Rail would require action by the State Legislature and Governor. Governance structures can include boards either directly elected (at large or by jurisdictions within the territory of the statutory agency) or appointed. Either option would be appropriate for a special purpose agency, subject to limitations stated in the legislation or in the by-laws of the agency. The drafters would have broad discretion in fixing the terms, conditions, rights, and obligations of the statutory agency directors.

An advantage of a legislated agency is that the participants, especially at the initial stage, are able to define the powers of the new agency according to their needs and objectives. For example, unlike other institutional options, the new, legislated agency could have broad authority beyond those of the participants, individually or collectively.

Statutory agencies customarily can employ staff, enter into contracts and other agreements with other public agencies and with private entities, sue and be sued, and generally exercise any other powers of public agencies. Statutory agencies may be formed for a special purpose (such as implementing and operating a regional rail service), or as generic structures under which subordinate agencies may be formed for specific purposes in accordance with the conditions of the statute.

Statutory agencies may be able to raise funds via taxes or fees to subsidize capital or operating costs, although taxes and fees can be politically controversial and may be limited by constitutional interpretations.

Critical terms and provisions may be embedded in enabling statutory language. While all the operating terms and conditions for the new agency might not be defined, the statute could fix

critical terms, such as the representative, voting, and quorum features of the agency. Amending these provisions would require further legislative action, which would require greater effort, with a less predictable outcome, than processes for amending the charters of other types of organization.

Among the disadvantages of establishing a new agency through legislation is the uncertainty regarding whether the legislation will become law. While legislation can be drafted and a sponsor obtained, there is no assurance that the bill can be successfully navigated through the Legislature and obtain the signature of the Governor. Significant time and effort can be required to define and refine such legislation and to position it among the many measures introduced each session. Furthermore, such legislation can be amended in committee, resulting in wording that does not reflect the original intent. It is therefore uncertain whether, after successful negotiation through the legislative process, the final product will be in the form of the original draft or anything resembling it.

Once enabling legislation becomes effective, organizing a new entity may take considerable time and effort. While certain actions can be taken in anticipation of an effective date, it may be several months after enactment of the legislation before the work of the agency could begin.

Example: Alaska Railroad Corporation[20]

The Alaska Railroad Corporation (ARRC) was originally an entity of the federal government, which built and operated the railroad to connect seaports on the Gulf of Alaska coast to the interior of the territory in the early 1900s. Due to financial difficulties, in 1983 the federal government transferred the railroad to the State of Alaska. In 1985, the Alaska State Legislature purchased the Alaska Railroad for $22.3 million, and the ARRC became a State property. The ARRC is now a quasi-public corporation, governed by a seven-member Board of Directors appointed by the Governor of Alaska. ARRC revenues are not taxed and must all be used for railroad purposes. Requirements of state legislative oversight include the following:

- ARRC must file an annual financial and performance audit;
- ARRC must seek legislative approval for bond sales, expansion, reduction, or diversification of services, as well as for selling and leasing land longer than 55 years;
- ARRC must demonstrate sufficient financial responsibility to respond to spills; and;
- The Alaska State Legislature must review ARRC operation, management, and procurement procedures.

The ARRC Board of Directors consists of the commissioner of commerce, community, and economic development; the commissioner of transportation and public facilities; and five other members appointed by the Governor. One member must be an executive with a U.S. Railroad, another must be an employee-member of ARRC's labor unions, and the two other members

[20] Alaska Railroad Corporation, "Report to the State of Alaska: January 2007," Alaska Railroad Corporation, http://www.akrr.com/pdf/January%202007%20Report%20to%20State.pdf
Alaska Railroad Corporation, "Alaska Railroad Corporation Act ("Acra"): Annotated AS 42.40," Alaska Railroad Corporation, http://www.akrr.com/pdf/Corp_ARCA_2005.pdf

must live in the two judicial districts in which the railroad operates. They are responsible for the operation of the railroad and the management of its financial and legal obligations. Specific duties include:

- Managing the corporation on a self-sustaining basis;
- Applying to the Legislature, with the concurrence of the governor, for subsidies maintaining services that are not otherwise self-sustaining;
- Raising needed capital by issuing bonds of the corporation;
- Reviewing state and other land proposals for the future development or expansion of transportation services; and
- Ensuring that all procedures follow legal, accounting, and industry standards.

Example: Sonoma-Marin Area Rail Transit District

The Sonoma-Marin Area Rail Transit District (SMART) was established January 1, 2003, to oversee the development and implementation of passenger rail service in Sonoma and Marin counties in California. The agency was created by State of California legislation that consolidated the pre-existing SMART Commission, the Northwestern Pacific Railroad Authority, and the Golden Gate Bridge Highway and Transportation District Authority and their physical assets over the rail corridor into a single rail district. The SMART District is governed by twelve directors, five appointed from Sonoma County, five from Marin County and two from the Golden Gate Bridge Highway and Transportation District.

SMART's enabling legislation calls for the district to work with other authorities to develop a safe, efficient, and compatible system of passenger and freight rail service in the Marin-Sonoma corridor. It specifically authorizes the SMART district to:

- Own, operate, manage, and maintain passenger rail services within their jurisdiction;
- Contract for goods and services;
- Employ labor;
- Grant, purchase, lease, condemn for use, or otherwise use real or personal property for transit purposes;
- Impose voter-approved taxes, to invest revenues, to issue bonds, and execute equipment trust certificates;
- Create improvement and special benefit districts; and
- Annex territory and to dissolve itself.

To date, the SMART district has completed project definition and is currently in the process of completing requisite environmental documentation and supporting preliminary engineering.

Their current plan is to present a ballot measure to the voters of Marin and Sonoma counties in November of 2008 for a district tax that will provide a continuing subsidy for operating and capital expenses.

Example: Florida Tri-Rail

The Tri-Rail commuter rail system in south Florida is an example of a transit service that is governed by an agency established by state legislation. Tri-Rail is governed by the South Florida Regional Transportation Authority, formerly the Tri-County Commuter Rail Authority (TCCRRA), a special authority serving Palm Beach, Broward, and Miami-Dade counties. The Florida Legislature established the TCCRRA district in the late 1980s. In 2003, state legislation expanded the jurisdiction of the authority beyond commuter rail to that of a multi-modal regional entity.

The district's administrative board consists of nine members. These include six representatives of Palm Beach, Broward, and Miami-Dade counties (two from each county served by Tri-Rail), a representative appointed by the Governor, a representative from the Florida Department of Transportation (FDOT), and one at large member. Tri-Rail's Executive Director and staff report to the authority's board. Their duties include:

- Oversight of operating and maintenance contracts with Herzog Transit Services. Herzog Transit Services provides the crews for Tri-Rail trains, and maintains Tri-Rail rolling stock.
- Oversight of operating agreements signed with CSX Transportation and Amtrak that allow access onto FDOT-owned right-of-way for freight and intercity passenger trains in exchange for contributions toward MOW costs and capital improvement projects.
- Ticket sales, marketing, and promotion.

Other examples of state legislated entities include the Bay Area Water Transit Authority, the Bay Area Rapid Transit District (BART), the Los Angeles County Metropolitan Transit Authority (LACMTA), and the Denver Regional Transit District.

4.2.2 Establish a Joint Powers Authority

The State of California is among several states that recognize the legal standing of authorities constituted for a specific purpose via the mutual assent and joint authority of two or more existing government entities. JPA are applied to a broad range of purposes, including transportation projects, public utilities, waste management, water quality control, and fairs and expositions. While provisions for JPAs do not currently exist in the State of Nevada, enabling legislation similar to that in California could be enacted to recognize self-constituted JPAs. It is important to note that the State of California recognizes JPAs that include entities of neighboring states.

Under a JPA, decision-making and administration can be efficiently managed. The governmental nature of the implementing agreements can help ensure that conflicts are resolved expeditiously in the shared interests of the joint program. However, creation of a new

JPA can be both time- and resource-consuming. Existing agencies can have overlapping and conflicting agendas, which can make rational policy-making more difficult.

In California, there are no requirements for legislative or local electoral approval for the creation of a JPA, and the structure can be put in place as quickly as the parties can agree on the terms and conditions to be included in the agreement. A new JPA must file articles of its incorporation with the Department of State, demonstrating compliance with State corporation law. Alternately, a JPA may be established by legislation, with the same terms and powers as a self-established JPA.

A joint powers agreement generally defines the powers and limitations of the particular JPA, such as the agency's funding arrangements. As a consequence, as noted above, a review of the powers held by each of the participating public agencies needs to be conducted in advance of the establishment of a JPA as the preferred governance structure, and the parties need to carefully negotiate the details of the agency's governance. The powers of the JPA will be limited to those held by the "weakest link" participant. Accordingly, the powers of each of the respective participants in the JPA must be examined to ensure that the powers of the weakest link will be broad enough to achieve the project goals and objectives.

Each of the participants would be an eligible member of a new JPA that would jointly exercise existing powers shared in common by the participating agencies. Each of the participating public agencies can also authorize the JPA to exercise additional powers. For example, participating public agencies can authorize the agency to make and enter contracts; to employ agents and employees; to acquire, construct, manage, maintain, or operate any building, works, or improvements; to acquire, hold, or dispose of property; or to incur debts, liabilities, or obligations.

While the powers of a JPA are limited to those held in common by the participating agencies, the manner in which they may be exercised is not as limited. For instance, while the power to procure goods and services must be commonly held by all the participants in a JPA in order for the JPA to exercise the power, the manner in which such goods and services may be procured is limited only by the abilities of any one of the participants. Accordingly, if one agency has less stringent procurement policies, or permits work to be performed by agency staff, the policies of that agency may be adopted by the JPA.

The agency delegated by the authority to administer the project or service may be: (1) one or more of the parties to the agreement; (2) a commission or board constituted pursuant to the agreement; or (3) a person, firm, or corporation, including a nonprofit corporation, designated in the agreement. One party to the agreement may provide for all or a portion of the services to the rest of the participating agencies. In addition, the agreement may provide for mutual exchange of services without payment. An independent board or commission has powers as determined by the agreement. Similar to a statutory agency, it generally has the power to enter into contracts with other public entities and private parties, to sue and be sued, and to manage its affairs. The governing body is subject to appointment and with voting/quorum and other rights determined by the agreement.

If a JPA has not established a separate board or commission, the agreement would be generally in the nature of a contract among the parties, and the rights, obligations, powers, and duties of the parties would be subject to the terms of the agreement. Under this alternative, it is also possible for the parties to designate a third party, or even a private entity, as the managing

agency with the responsibility to manage the day-to-day affairs of the JPA. Generally, a managing agency JPA would contract through the managing agency rather than in the name of the JPA, and the managing agency JPA could enter into contracts on its own and could sue or be sued in its own name.

Although a managing agency JPA has no separate board or commission, it is possible and not uncommon to establish advisory, policy, and technical boards, committees, or other governance structures to create a representational decision-making process. These committees or boards could make the management decisions that would otherwise be delegated to the governing body of a separate board or commission, subject to any limitations contained in the agreement.

The terms and conditions regarding liabilities, exemptions, relief, disability, workers' compensation, and other benefits that apply to the personnel of an agency participating in a JPA also apply while they are engaged in the performance of any of their work in behalf of the JPA.

A JPA has flexible financing powers, and may issue revenue bonds in its own name for the purpose of acquisition or construction. The bonds do not constitute a debt, liability, or obligation of any of the public agencies that are members of the JPA. Moreover, a JPA can also obtain funds for a short period of time to meet operational expenses, until expected revenues are available (1) from advances of funds from the parties of the agreement, or (2) from private lending sources pursuant to the temporary borrowing powers granted to local agencies.

The parties may provide means by which the agreement may be amended, rescinded, or terminated, and for parties to join or withdraw from the JPA. In negotiating for the termination provision, the participants should take into account such issues as the maturity date of any bonds issued by the agency, payment dates of other forms of indebtedness incurred, the disposition of other claims, and the distribution of assets of the joint powers agency upon the termination of the agreement.

As noted above, the JPA can be a more flexible structure than a statutory agency. Provisions such as board membership and voting rights can be established in the agreement, subject to modification by action of the participants. Another advantage of a JPA is that the participating public agencies have the flexibility to specify in the agreement the types of common powers allocated to the agency, and the method of exercising such powers.

To the extent that modifications or amendments to the agreement are needed or desired, the process does not require legislative or voter action. Generally, since the agreement is a contract, material changes would require the unanimous consent of the parties; however, agreements frequently contain provisions that permit amendment and modification to certain terms of the agreement by less than unanimous consent.

Particularly applicable to the case of Nevada Rail is the example of the Cross Valley Rail Corridor Joint Powers Authority (CVRCJPA). The Metrolink and Caltrain commuter rail services, and the Capitol Corridor intercity service are other examples of regional rail systems governed by JPAs, formed principally for implementation and operation of passenger services, but representing various degrees of line ownership and shared operation with freight traffic.

Example: Cross Valley Rail Corridor Joint Powers Authority

The Cross Valley Rail Corridor project was created to restore and upgrade 45 miles of track between the San Joaquin valley communities of Huron and Visalia, to enable freight service and open up the potential for future cross-valley passenger service. The Cross Valley Rail Corridor Project was led by the CVRCJPA, which was formed by the cities of Lemoore, Huron, and Visalia, who in turn partnered with the San Joaquin Valley Railroad and 11 other funding agencies to raise a total of $14.2 million to complete the project.

As a private partner in the venture, Florida-based RailAmerica will operate freight traffic over the line under its subsidiary, the San Joaquin Valley Railroad. RailAmerica Inc. is the world's largest short line and regional railroad operator, with 50 railroads operating approximately 17,700 miles in the U.S., Canada, Australia, and Argentina, including track access arrangements with larger railroads. Rail America operates three other short lines in California; the Ventura County Railroad, the California Northern Railroad, and the San Diego & Imperial Valley Railroad. All of these provide access for local shippers via the short lines to connections with either the UPRR or the Burlington Northern Santa Fe Railway (BNSF) systems.

Capital improvements to the former UPRR and Southern Pacific facility were completed in 2007, to accommodate trains with cars weighing up to 286,000 pounds. The JPA has also completed a study of potential local passenger service via the line, which could also serve an intermodal station on the proposed California High-Speed Train system.

Example: Southern California Regional Rail Authority

The Southern California Regional Rail Authority (SCRRA) is a JPA that manages Metrolink, the commuter railroad serving the Los Angeles area. SCRRA was formed by an agreement signed in 1991 by the predecessor of the current LACMTA, the Orange County Transportation Authority, the Riverside County Transportation Commission, the San Bernardino Associated Governments, and the Ventura County Transportation Commission, representing the counties through which SCRRA operates. The SCRRA administrative board consists of 11 members, representing the member agencies, the counties themselves, and other local interests. An Executive Director, who reports to the SCRRA Board, heads the staff. Duties of SCRRA management includes, among other things:

- Oversight of contracts for train operations, rolling stock maintenance, and MOW.
- Oversight of operating agreements with UPRR and BNSF. In exchange for access to SCRRA controlled lines, these entities contribute to MOW expenses.
- Ticket sales, marketing, and promotion.
- Dispatching of all train traffic on lines controlled by SCRRA in the Los Angeles area.

UPRR and BNSF operate freight service on several SCRRA owned or controlled lines in the Los Angeles Basin. Also, Amtrak operates both long distance and the California Surfliner intercity services on SCRRA controlled lines.

Example: Peninsula Corridor Joint Powers Board

The Peninsula Corridor Joint Powers Board (PCJPB) was established in 1992 to operate commuter rail service (Caltrain) on the San Francisco Peninsula. The membership of the Governing Board for the PCJPB includes representatives from San Francisco, San Mateo, and Santa Clara counties. The San Mateo Regional Transit District (SamTrans) provides management staff for Caltrain according to the management agency agreement signed by PCJPB and SamTrans. Primary SamTrans duties include, among other things:

- Ownership, maintenance, and improvement of the Peninsula Rail Corridor, from San Francisco to San Jose
- Oversight of the Amtrak operating and maintenance contracts for Caltrain commuter service
- Oversight of an operating contract signed originally with UPRR for freight service on the PCJPB line,
- Ticket sales, marketing, and promotion.

Example: Capitol Corridor Joint Powers Authority

A JPA may also be created by state legislation, as in the case of the Capitol Corridor Joint Powers Authority (CCJPA). The Capitol Corridor serves 16 stations over a 170-mile intercity rail corridor connecting Placer, Sacramento, Yolo, Solano, Contra Costa, Alameda, San Francisco, and Santa Clara counties. Amtrak is currently contracted for train operations, rolling stock maintenance, and other passenger services.

Legislation was enacted in 1996 that led to establishment of the CCJPA, a partnership among six local transportation agencies:

- Placer County Transportation Planning Agency;
- Solano County Transportation Authority;
- Yolo County Transportation District;
- Sacramento Regional Transit District;
- BART; and
- Santa Clara Valley Transportation Authority (VTA).

The legislation enabled these agencies to share in the administration and management of the Capitol Corridor service, previously managed by the California Department of Transportation Division of Rail as one of its three state-sponsored intercity routes. In July 1998, an Interagency Transfer Agreement (ITA) transferred the operation of the Capitol Corridor service to the CCJPA for an initial 3-year term. In July 2001, the ITA was extended for another 3-year term, through June 2004. Legislation was enacted in September 2003 that eliminated the sunset date in the ITA, and established a permanent governance structure for the CCJPA.

Non-voting members of the CCJPA include the Metropolitan Transportation Commission and the Sacramento Area Council of Governments, the Metropolitan Planning Organizations along the route.

As the administrator for the Capitol Corridor, the CCJPA's responsibilities include:

- Overseeing day-to-day train and connecting bus scheduling and operations;
- Monitoring contractor and service performance and implementing service and efficiency improvements;
- Overseeing deployment and maintenance of rolling stock for the Capitol Corridor and San Joaquin Corridor, and
- Working with Amtrak and the UPRR on dispatching and railroad-related issues.

As a constituent of the CCJPA, BART accommodates staff and facilities for management of the Capitol Corridor service.

4.2.3 Execute a Memorandum of Understanding

A non-legislative statutory approach would be for the units of government affected by Nevada Rail to implement and manage the service using either cooperative interlocal agreements or MOUs. The implications of this arrangement are similar to a joint exercise of power in that the powers exercisable under the contract would be limited to those held by or implicit in the powers retained by the parties to the agreement. By contrast with a JPA, however, all actions and risks, including those related to operations, fundraising, and payments, must be assumed by individual parties to the MOU.

This approach would offer a number of advantages of a JPA (notably, coordination and centralized administration) without the legal, political, and administrative complexity of that structure. Most, if not all, principles embodied in a the creation of a new or modified JPA could be addressed in the simpler MOU format, such as the location and size of fees, projects to be funded, priorities and scheduling, and mechanisms for dispute resolution. As with the JPA, administration of an MOU could be undertaken by one of the signatory agencies, or other entity satisfactory to all parties.

The MOU structure does have limitations, however, in that policy changes cannot be enforced without complete, voluntary concurrence by all parties (though a JPA could, by design, also be limited in that respect) and that no identifiable entity is visible to the public and stakeholders. The MOU approach, therefore, offers a somewhat greater risk of fracturing due to unresolved disagreements. Many complex undertakings are successfully completed through an MOU structure, however, and, as in the case of using an existing JPA, most problems can be avoided or easily dealt with through effective planning and leadership.

The formation of a contract would not result in the creation of a separate entity or governing body, but the delegation of functions to one or more of the contracting parties. The contract could provide for the creation of committees, boards, or other governance mechanisms for the purpose of implementing the contract. The contract would determine the respective powers of the parties under the agreement subject to the organizational limitations of each agency.

Subject to the limitations outlined above, there are effectively few restrictions on the terms and conditions to which the parties can agree. Since there are no governmental review or approval requirements other than the internal processes of the participants, the structure can be put in place as soon as the parties can reach an agreement. Because the "lowest common denominator" or "weakest link" rule applicable to JPA agreements is inapplicable, the parties may have slightly broader authority to craft an agreement that meets their needs.

Because there is no separate entity, there is no governing body; however, there is no reason the parties cannot agree to establish committees with substantially the same functions, duties, responsibilities, and powers. Since there is no separate entity, contracts would have to be entered into with one or more of the participants, presenting the potential for some complexity in the allocation of risks and indemnification.

Example: Trinity Rail Express

The Trinity Rail Express (TRE) commuter rail service between Dallas and Fort Worth Texas is operated as a joint project by Dallas Area Rapid Transit (DART), the transit agency in Dallas County, and the Fort Worth Transportation Authority (also known as the "T"), the transit agency in Tarrant County. TRE was formed in 1994, when DART and the T signed an "interlocal agreement" establishing the service; no enabling state legislation was required. Among other things, the agreement specifies how the service will be managed and how capital costs and operating subsidies will be covered by the two governing transit agencies. Both DART and T administrative officers oversee TRE. TRE's director and staff report to management and advisory committees consisting of DART and T officers. The primary duty of the TRE director and staff is the oversight of the operating and maintenance contracts with Herzog Transit Services, which supplies the transit crews and maintenance personnel required to run TRE.

DART and the T jointly own the route, formerly part of the Rock Island Railroad. The BNSF and UPRR both have trackage rights to operate freight trains over the route. Commuter trains are operated and dispatched under contract with Herzog Transit Services, and BNSF contracts for track maintenance. Under the interlocal agreement between DART and the T, responsibilities and costs for TRE service are divided geographically. The line serves several stations outside the city limits of either Dallas or Fort Worth. The demarcation line for operating costs, material responsibility, and fare zones runs between the stations serving West Irving (DART) and Centre Port (the T).

Example: Altamont Commuter Express

The institutional form of the Altamont Commuter Express (ACE) has evolved from a Joint Exercise of Powers Agreement (JEPA) to a Cooperative Agreement for Service, in response to the needs of its constituent agencies. In 1997, the ACE Joint Powers Board (JPB) was instituted via a JEPA among the Santa Clara VTA, the Alameda County Congestion Management Agency (ACCMA), and the San Joaquin Regional Rail Commission (SJRRC). Among its provisions, the JEPA:

- Defined the powers and duties of the ACE JPB;
- Established the financial commitments of the member agencies;

- Defined a formula for allocating ACE operating and capital costs among the signatories;
- Stipulated the membership, terms and responsibilities of the ACE JPB; and
- Designated a managing agency (SJRRC) and other terms of the governance and administration of ACE and its service.

The original JEPA was scheduled to expire in 2001, in preparation for which the signatories would evaluate the performance of both the service and its governance, and negotiate a refined agreement. Under the original JEPA, each member agency's annual subsidy was determined on the basis of the proportions of total ACE daily boardings and alightings occurring in each member county. However, as the regional economy slowed during the early 2000s, this distribution resulted in commitments that VTA and ACCMA could not be certain to fulfill from year to year. Rather than redefining the JEPA, the member agencies instead negotiated a Cooperative Services Agreement (CSA) for as the preferred approach for continuing member agency funding.

After several extensions of the original JEPA while terms were resolved, a CSA became effective in mid-2003. Under the terms of the CSA, Santa Clara County contributes a flat $2.4 million and Alameda County a flat $1.66 million annually toward ACE operating expenses, indexed to 2003 dollars and escalated each year according to the Consumer Price Index. The remainder of the local contribution is paid by the SJRCC, which provides all of the staff and assets required to manage the service.

4.3 OPERATIONS

To enable and maximize the potential of shared use of Nevada Rail, the affected units of government should work directly with DOE to define a shared-use operating plan, including location and configuration of sidings and spurs; fleet sizing; type and amount of motive power; train scheduling, train control, signaling and communication; and operational integration between HLW/SNF and commercial freight.

The operational assessment should further assess:

- Interim operating strategies in the event Nevada Rail is not completed and commissioned in time to initiate shipments to the repository;
- Means by which the Nevada Rail line may be employed to help accelerate construction of the repository, the railroad, or other installations; and
- Strategies for response and recovery in the event of service interruptions, system failure, natural disasters, etc.

Discussions with OCRWM about the operating plan for Nevada Rail will be shaped to a large extent by the institutional structure and contracting authority of the local authorities involved, and on the weight of their interest in the railroad's operation.

5.0 CONCLUSION

The foregoing analysis has endeavored to identify the economic benefits of the potential shared use of Nevada Rail.

5.1 POTENTIAL SHARED USE

This analysis quantified the commercial traffic potential that could be attracted to or induced by commercial rail operation on the Caliente Corridor, the Mina Corridor, and the Southern Extension of both corridors to the UPRR main line southwest of Las Vegas. The study assumed a range of rail traffic scenarios, with a low estimate of 4,200 carloads per year on the Caliente Corridor and a high of about 105,000 carloads per year on a Mina Corridor with a Southern Extension.

The study did not find a compelling reason for initiation of intercity or commuter passenger rail service on either the Caliente Corridor or Mina Corridor and their potential extension to the south. Nor did it find potential for a tourist railroad operation in the corridors.

5.2 ECONOMIC BENEFITS

Based on the freight rail traffic analysis, the analysis indicates that there will be sizable transportation cost savings to shippers who make use of commercial freight operations on Nevada Rail. These savings will enable these industries to make investments to increase productivity, expand into new markets, and increase employment. The commercial railroad itself will be the source of new jobs. The fact that the rail line will be operated for at least 24 years underscores the fact that it should provide economic benefit to the affected counties and the state.

It is logical to anticipate that the new employment directly attributable to the commercial freight rail operation will lead to still other indirect and induced effects. Jobs at a railroad headquarters in Tonopah or Crater Flat, for example, will mean more groceries purchased at local supermarkets. New employment at industries along Nevada Rail will generate economic benefit for local service and retail businesses. Furthermore, diversions of freight now traveling by truck to rail will benefit the counties and the State of Nevada by reducing delays, congestion, and accidents on the highway system.

5.3 OTHER OPPORTUNITIES

There are many areas pertaining to the implementation and operation of Nevada Rail that provide opportunities for the counties along either the Caliente Corridor or the Mina Corridor. However, the potential commercial freight operations serving local industries need to be defined among the purposes of the line, or these opportunities may be denied or overlooked. As OCRWM engages in alternative alignment selection, construction planning, and rail operations planning, the counties need to be recognized as stakeholders, and have a voice in decisions that will affect their economies. To reap the greatest reward, the counties would serve themselves well by working together to identify where their opportunities and benefits lie and pursuing them directly with DOE.

This analysis has shown that even for a low level of commercial freight activity on the rail line, there are substantial benefits to shippers and residents living within the vicinity of Nevada Rail.

Consequently, it seems reasonable that the counties involve themselves directly with DOE to ensure that a viable commercial freight rail operation, contributing to the bottom line of local shippers and increasing local payrolls, can be established.

Another potential that may be worth exploring is the establishment of a new institutional structure enabling the units of government adjacent to Nevada Rail to fully realize the benefits of the line. Models to accomplish this vary, for example, from straightforward interlocal agreements to authorities established by state legislation. It is conceivable that such an authority could not only manage the commercial freight operation, but assume ownership of the line as well. A potential outcome of line ownership would be greater ability to control the generation of any benefits which the line could produce during construction and later operation.

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Appendix A

Information on Potential Shippers and Other Stakeholders

Potential Shipper Interview Questionnaire

QUESTION	RESPONSE
1. What is the name and contact information for your business?	
2. Briefly describe your business operation and the product(s) you are marketing.	
3. Where are your primary in-state and out-of-state markets located?	
4. What supply materials do you receive by truck? Where are the primary origin points for these trucked-in materials?	
5. On average, what quantity (truck loads) of product do you currently ship outbound by truck per week?	
6. On average, how much material (truckloads) do you currently receive by truck per week?	
7. Would you use a rail line extending either • north to Hawthorne, Wabuska, and the UPRR main line, or • east to Caliente and the UPRR main line for your current shipments (incoming or outgoing) if available? If so, ask the following questions. If not, ask why and terminate the interview.	
8. What factors, such as loading/unloading location, cost and travel time, would make rail competitive with truck for your business?	
9. What additional infrastructure, such as spurs or sidings, would you require in order to ship by rail? How far would you be willing to truck goods to or from an intermodal facility?	
10. What frequency of service would you require in order to make shipping by rail viable? (If unable to answer, ask: Would two trains a week be sufficient?)	
11. What percentage of your product would you ship inbound and/or outbound by rail compared with truck?	
12. To what extent would a rail extension to the south (to a connection with the UPRR and BNSF main lines) facilitate your business?	
13. To what other regional markets could rail provide improved access for your business?	
14. To what extent would your business benefit from a direct rail link to Mexico or Canada?	
15. Does your business plan call for expansion? *If so, ask the following questions. If not, terminate the interview.*	
16. To what degree would your shipments inbound and outbound increase if your business plan were fulfilled?	
17. To what extent would your use of rail increase if your business plan were fulfilled?	

Caliente Corridor

Nye County Potential Shippers

- **Cind-R-Lite**: Contacted Andy Coop, Mine Manager (702-249-3208). Based on the shipper interview, this producer of cinder blocks could generate shipments going to Riverside, CA, and Las Vegas, NV, each year. The shipments would depend on developing a large storage/retail site in Southern California. The use of rail is practical for 35 percent of operations, while the other 65 percent would be trucked to individual job sites.

- **Foreland Refining Corp.**: Contacted Pete Ipson (801-298-9866, ext. 225). The company, located 65 miles southwest of Ely, processes crude oil into petroleum products for use in mines and road construction and by contractors. Inbound and outbound shipments are all by truck. Mr. Ipson foresees an opportunity to import crude oil by rail to a transfer point at Warm Springs on the Caliente Corridor. He also sees an opportunity for shipping processed product outbound by rail as well. These opportunities would be realized by the lower transportation cost inherent with rail versus truck, he said. Twice a week service would be adequate for the company's needs.

- **U.S. Ecology**: Contacted Bob Marchand (775-553-2203). U.S. Ecology operates a plant in Idaho that receives annual shipments of hazardous waste by rail. The facility south of Beatty could also accommodate this amount. The waste material could come from any point in the U.S. or Canada that is more than 500 miles away. Mr. Marchand discussed the benefits in terms of increased employment in Nye County, and the ability to reduce truck traffic. Twice weekly service is acceptable to the company, at least at the conceptual level. The major concern is the ability to make the haul economically feasible, considering the 310-mile routing from the main line.

- **D&H Mining**: Contacted David and Natalie Spicer (775-553-2459). D&H Mining operates a landscape rock quarry located along the alignment north of Beatty. Depending on customers' needs, it is possible to transport 50 percent of shipments by truck and 50 percent by rail. Twice weekly service is acceptable to the company, at least at the conceptual level. The major concern is the ability to make the haul economically feasible, considering the 310-mile routing from the main line. It is also developing a bottled water product line, which would be shipped in boxcars to market, if the opportunity existed. Mr. Spicer is very optimistic about his ability to use the rail line, if shared use is allowed.

- **Ponderosa Dairy**: Contacted Ed Goodhart (775-372-1300). The dairy ships animal feed grains such as corn, beet pellets, cottonseed, and others weekly via truck from a transloading facility in Las Vegas. Rail would only be an option if it lowered the transportation costs.

- **Ash Meadows LLC**: Contacted Tim Wuest (920-361-2388). The company mines and packages high purity zeolite and volcanic ash tuff. Currently, all

products are shipped by truck, inbound and outbound. Due to confidentially reasons, no information on existing tonnage was available. However, with Nevada Rail, it is possible that rail could be practical for 50 percent of current operations. Mr. Wuest estimated that rail could increase outbound shipments

- **IMV Nevada**: Contacted Bill Wall (775-372-5341). IMV mines and processes clay (sepiolite, bentonite, and saponite). IMV currently receives diesel fuel by truck and there is potential for the fuel to be switched over to rail. He noted rail is competitive for shipments to feed lots in the Midwest and Texas. Mr. Wall said rail transportation could increase outbound shipments of clay as well.

Lincoln County Potential Shippers

- **Advanced Pozzolan Products** (formally Natural Pozzolan of Nevada): Contacted Dr. Steve Klomp (775-962-1670). Dr. Klomp is developing a large deposit of Pozzolan, a cement additive that extends the life and increases the strength of concrete. The deposit is located north of Caliente. He stated that a rail line would allow him to expand his market and operation significantly. Trucking the product to market is currently costing higher than a comparable rail haul rate. The company could ship daily if rail service were available. Dr. Klomp also believes that the product could be shipped to the Yucca Mountain repository as a constituent in the sizable volumes of cement that will be mixed there.

- **Wilken Mining and Trucking Co.**: Contacted Dennis Sonnenberg (775-962-1791). The company mines and ships processed perlite ore, delivering the product by truck to markets throughout the nation. With Nevada Rail, the business could expand into the crude perlite business.

Other Caliente Corridor Stakeholders

- Several other stakeholders in Nye, Esmeralda, and Lincoln Counties were contacted for the 2005 *Rail Transportation Economic Impact and Planning Study*. Their comments regarding the Caliente Corridor appear in that study. As it seemed likely that basic stakeholder concerns regarding the corridor would not have changed substantially over the last two years, the stakeholders were not recontacted for this study.

Mina Corridor

Nye County Potential Shippers

- The Nye County shippers located along the Mina Corridor are the same as those listed in the previous section, entitled "Caliente Corridor—Nye County Potential Shippers," with the exception of Foreland Refinery (Caliente Corridor only).

Mineral County Potential Shippers

- **Tri-State Motors**: Contacted Dave Lambert and David Bennett (417-621-2121). Headquartered in Joplin, MO, Tri-State Motors operates hundreds of trucks and trailers throughout the continental U.S. and Alaska. Materials transported include nuclear weapons, gold, currency, stamps, spent fuel, and new fuel. The company plans to open a new transloading facility at Hawthorne and expects the facility to be operational in 2008. The company is very interested in using the rail line at Hawthorne. Tri-State's traffic could increase by 2009, depending on the ban on transloading radioactive material. Also, if customers shipping freight from the East Coast were willing to containerize their shipments and send them by rail to Hawthorne, the shipments could be transloaded to trucks and shipped regionally to California and Utah. Rail would be used for shipments that are simpler and not particularly time sensitive. With rail, shipments would probably be once or twice a week, but the company could potentially increase to every day or even multiple times per day.

- **Premier Chemicals**: Contacted Rick Wrenn (610-828-6929, ext. 242). Located in Gabbs, NV, the company produces magnesium oxide, hydroxide, and sulfate used as a mineral supplement for dairy and beef cattle, in wastewater treatment, and in power plants. Premier Chemicals is using rail for the majority of the shipments. Premier Chemicals finds the possibility of accessing rail at Luning, only 30 miles from the mine, very attractive. The company owned a transfer facility at Luning until former Southern Pacific Railroad (now Union Pacific Railroad) abandoned the line in the 1980s. The shift to Fallon increased operating costs across the board. The opportunity to access Union Pacific Railroad and Burlington Northern Santa Fe Railway transfer facilities would make their business more competitive with truck for destinations to the south. If their business plan is fulfilled with access to Nevada Rail, new rail business could increase by approximately 27 percent.

- **Nevada Waste Group**: Contacted Rob Whittey (775-322-5788). Nevada Waste Group plans to haul municipal waste to the old Rawhide mine and landfill it there. Initially, the waste will come by rail to Fernley and by truck the rest of the way. The operation would not use any of the new rail line south of Hawthorne, but would use a portion of the existing Department of Defense segment from Wabuska to Hawthorne. The company may also use a portion of the proposed Schurz bypass. Rail will be used to the greatest extent possible. The company's markets include Northern California, Southern California, and brokering local waste into the city of Fallon's landfill. The company presently

plans to only landfill the waste, but there are other possibilities such as a recycling operation.

- **Peninsula Floors**: Contacted Bob Conner (925-454-5105). Headquartered in Livermore, CA, Peninsula Floors is a wholesale residential flooring distributor. The company is in the process of opening a new facility in Hawthorne,that will represent its main western hub. The operation will convert to a hub and spoke system versus direct importing to multiple warehouses. This will be the company's largest warehouse and will act as a distribution hub for the warehouses in California, Nevada, and Arizona. The company plans to open facilities that can produce slabs, structural insulated panels, carpet cushions and foam, specialty tile and cultured stone at the Hawthorne site. The company has a high level of interest in the Mina Corridor. The majority of inbound shipments could ship by rail. Mr. Conner estimates that rail usage would cut shipping costs in half.

- **Western Central Petroleum**: Contacted Scott Inman (775-945-2978). Western Central Petroleum locally distributes gasoline, heating oil, and kerosene. Fuel is shipped using the company's own fleet of trucks. The company could use the rail line for receiving. It is estimated that at least 50 percent of the fuel could be received by rail, and in the winter, perhaps 75 percent could come by rail because of weather constraints. Western Central Petroleum would require weekly rail service.

- **Milestone Minerals**: Contacted Paul Brunius (775-573-2700). The business supplies high-end crushed marble products, which are mined locally from multiple extraction sites and imported to the main crushing/processing facility. Milestone has large reserves, shipping to a wide variety of national and international markets. The company's products include, but are not limited to: architectural pre-cast (decorate concrete panels for buildings), specialty concrete materials, terrazzo materials, naturally colored industrial fillers (stucco, paint, plastics), and high-end decorative landscape materials. The logical means of transportation for these products to seaports for overseas markets would be by rail. Mr. Brunius anticipates almost 100 percent of outbound shipments could go by rail.

- **Grefco Minerals**: Contacted Rocky Torgrimson (530-335-5451, ext. 102). The company mines, mills, and dries diatomite (diatomaceous earth). The product is used in some molds, as a natural insecticide, and as filler in paints and plastics. Currently, the majority of markets are east of the Mississippi River. Grefco also serves markets, via truck, in central California. The company currently ships finished product by flat bed and intermodal piggybacks to Reno for shipments to eastern markets. Grefco has a high level of interest for using rail. Historically, the facility shipped their product from Mina to markets in the central and eastern parts of the U.S. and Canada (when rail was operated by Southern Pacific). Mr. Torgrimson believes that the company could recapture part of this market with access to rail.

- **ST Modular**: Contacted Sid Tabor (360-393-7547). The company manufactures modular units such as offices, housing, motels, and worker

camps. The operation is in the start-up stage. Once the operation is fully up and running, it will ship out fully assembled units. Mr. Tabor estimates that up to 50 percent of all outbound loads could be shipped by rail. Also, lumber is currently shipped by truck. Mr. Tabor said it would be convenient to ship lumber by rail.

Esmeralda County Potential Shippers

- **Chemetall Foote**: Contacted Kevin Keck (775-937-2222, ext. 228). Chemetall Foote mines lithium carbonate and produces other lithium products such as lithium hydroxide and lithium hydroxide anhydrous. Lithium carbonate is used in the aluminum industry and to make specialty glass such as corningware; Lithium hydroxide is used to make lithium grease and batteries; and the anhydrous version is used as a CO_2 absorbent in space shuttles and submarines. Mr. Keck believes that rail may make fuel oil, soda ash, and lime competitive from some other source; all of these commodities are currently trucked in. Mr. Keck estimates the company could ship 60 percent to 90 percent of its goods in and out by rail.

- **Nevada Western Silica Corporation**: Contacted John Yellich (303-280-1189). Although there is no activity on site, Nevada Western plans to mine a large, high grade silica deposit that is currently dormant. Markets would be paint companies and construction companies. The silica is could be used for silica cement. Primary customers would be in the Los Angeles market, with possibly secondary markets in Reno and Salt Lake. Transportation cost is the ultimate issue. With Nevada Rail, there would be a very good market opportunity that would allow them to compete with others due to lower transportation costs. Rail is definitely cheaper to Reno. Costs could be even lower if they could ship on backhaul trains.

Lyon County Potential Shippers

- **Infinifuel Wabuska**: Contacted Claude Sapp (775-247-5362). Infinifuel is in the biodiesel production business. The company is also developing alternative crops in the Nevada area for use as biodiesel stock, and is conducting research on algae for feed stock. The Wabuska plant is in the start-up phase. Once the plant is fully operationally, the company expects to ship 100 percent of biodiesel east to Salt Lake City and to the western markets by truck; however, if rail is available, the company would divert 100 percent of the truck shipments to rail.

- **Complete Millwork Services, Inc.**: Contacted John Robertson (775-246-0485). Complete Millwork Services (CMS) manufactures casino interiors, i.e., wood fixtures. The company is located in Carson City and would be willing to truck 40 to 50 miles to/from a truck-rail transfer facility. CMS ships 100 percent of its product to Las Vegas. With rail, the company would ship 60 percent of its product by rail, ideally using daily evening freight delivery service.

Churchill County Potential Shippers

- **Biodiesel Investment Company**: Contacted Jake Huber (775-345-0170). Biodiesel Investment Company produces Biodiesel fuel (B100) for wholesale to retail terminals for out-of-state markets, i.e., San Francisco Bay Area. If rail were available, the company would ship 100 percent of both inbound and outbound products by rail. Rail would also allow the company to expand its business to Southern California, Arizona and Mexico.

Other Mina Corridor Stakeholders

The following local and regional economic development agencies in Nevada provided contact information on potential rail shippers:

- Northern Nevada Development Authority: Contacted Ron Weisinger, Executive Director (775-883-4413).
- Mineral County Economic Development Authority: Contacted Shelley Hartman, Executive Director (775-945-5896).
- Churchill Economic Development Authority: Contacted Juliette Taylor, Executive Director (775-423-8587).
- Economic Development Authority for Esmeralda/Nye Counties: Contacted Paula Elefante, Executive Director (775-751-1923).
- Regional Economic Development Authority of Western Nevada, Ken Pierson, Director of Business Development (775-829-3705).
- Western Nevada Development District: Contacted Ron Radil, Executive Director (775-883-7333).