Report to Counsel

Evaluation of The Tennessee Pass Subdivision

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by

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ECONOMIC CONSULTANTS

January 2018

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January 18, 2018

Thomas W. Wilcox, Esquire
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Dear Mr. Wilcox,

At your request, L. E. Peabody & Associates, Inc. estimated the Fair Market Value ("FMV") of the Tennessee Pass Subdivision ("Tennessee Pass"), a rail line owned by the Union Pacific Railroad Company ("UP") and the Royal Gorge Route Railroad Company ("Royal Gorge"), based on a Net Liquidation Value ("NLV") approach. We also estimated the capital cost needed to rehabilitate the Tennessee Pass to reflect Federal Railroad Administration ("FRA") Class 2 operating status.[1] Finally, we developed a summary of the unique operating characteristics of the line and identified the various commodities that could traverse the line.

The Tennessee Pass consists of 229.20 mainline miles and 56.35 miles of siding between Dotsero, CO to Pueblo, CO. Attachment No. 1 to this Report is a schematic of the rail lines in the southwest quadrant of the United States including the Tennessee Pass. The second page of Attachment No. 1 includes a close up of the Tennessee Pass. The Tennessee Pass traverses the Rocky Mountains at over 10,000 feet of elevation, making it the highest railroad crossing of a mountain range in the United States. The majority of the rail line covers extremely rugged terrain. Not only does the mountain setting for this rail line provide for unique terrain, it also accounts for the extreme weather that plagues rail operations on this rail line.

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[1] The FRA categorizes track for freight in six (6) classes, segregated by maximum speed limits: Class 1 – 10 mph; Class 2 – 25 mph; Class 3 – 40 mph; Class 4 – 60 mph; Class 5 - 80 mph; and Class 6 – 110 mph. *See*, 49 CFR 213.9.

Table 1 below outlines the miles for all segments along the Tennessee Pass. Table 1 also identifies the active/inactive status of each segment as well as the railroad(s) that currently access each segment.

Table 1
Tennessee Pass Mileage and Ownership

	Segment (1)	Miles Mainline (2)	Miles Siding (3)	Operational Status (4)	Ownership (5)	Connecting Railroad (6)
1.	Dotsero, CO to Sage, CO	10.70	3.36	Active	UP	xxx
2.	Sage, CO to Malta, CO	60.50	13.84	Inactive	UP	xxx
3.	Malta, CO to Leadville, CO Spur	5.40	0.00	Inactive	UP	xxx
4.	Malta, CO to Parkdale, CO	98.80	24.17	Inactive	UP	xxx
5.	Parkdale, CO to Cañon City, CO	12.70	4.22	Active	Royal Gorge	UP, Rock & Rail
6.	Cañon City, CO to Pueblo Jct. CO	41.10	10.76	Active	UP	BNSF, Rock & Rail
7.	**Total**	**229.20**	**56.35**			

A. FAIR MARKET VALUE

Black's Law Dictionary defines Fair Market Value as:

> The price that a seller is willing to accept and a buyer is willing to pay on the open market and in an arm's-length transaction; the point at which supply and demand intersect.[2]

Absent a willing buyer, a willing seller and an open market place, there exists several methods to estimate the FMV of an asset. These include: (1) the net liquidation value of the component parts of the asset or entity; (2) the present value of cash flows of an entity or those produced by utilization of the assets; (3) an earnings multiple approach; or (4) the sales price of comparable assets or entities. To estimate the FMV of the Tennessee Pass, we performed a desk-top version of the NLV of the assets approach. The other options can be used for a going concern valuation, however, these methodologies were not appropriate for this evaluation.

Based on our desk-top analysis[3] of the Tennessee Pass, we estimate the NLV to equal $14.7 million. In addition, we estimate the capital cost to rehabilitate the Tennessee Pass to meet FRA Class 2 operating status equals $236.9 million or a cost of $1.2 million per mile. These values do not consider the capital costs associated with tunnels and bridges as these assets will need to be evaluated during a field review. An on-the-ground review of these facilities should be made to

[2] *Black's Law Dictionary, Seventh Edition*, Bryan A. Garner, Editor in Chief, The West Group, St. Paul, MN, 1999, page 1549.

[3] As this is a "desktop analysis" we have not confirmed the exact condition of the track along the Tennessee Pass, which would require a field inspection. We made assumptions about the condition of the rail line based on our experience and publicly available data, which are explained in the body of this Report.

confirm or modify our findings before an acquisition option is implemented. The attached Report provides the detail and support for our NLV and capital upgrade estimates.

Our Report also contains a description of the unique operating characteristics of the Tennessee Pass and the major western U.S. rail market commodities that may benefit from utilizing the Tennessee Pass, i.e., grain, energy and minerals, intermodal, crude oil, frac sand, steel, concrete ties and wind turbines.

We appreciate the opportunity to provide this Report to you. If you have any questions, please let me know.

Very truly yours,

Thomas D. Crowley

TDC/cn

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I. INTRODUCTION

The rail line which runs from Dotsero, CO to Pueblo, CO was classified as the Tennessee Pass Subdivision ("Tennessee Pass") by the two (2) Union Pacific Railroad Company ("UP") predecessor railroads that operated this rail line, i.e. the Denver & Rio Grande Western Railroad ("DRGW") and the Southern Pacific Transportation Company ("SP").[1]

A schematic of the Tennessee Pass and its geographic relationship to other rail lines in the southwestern United States is included as Attachment No. 1 to this Report.

During the early phases of the UP/SP merger in 1996,[2] the UP proposed abandoning the Tennessee Pass. The proposed abandonment was contested by shippers who feared the loss of alternative access to the Front Range urban area and eastern rail markets if the Central Corridor line,[3] including the Moffat Tunnel, experienced a major shutdown, or if service along the Central Corridor line significantly declined due to increased congestion. As a result, UP backed away from its initial line abandonment position and instead sought approval for discontinuance of service along the Tennessee Pass. Under this scenario, UP would stop providing service over the line and would be relieved of its common carrier obligation, but would retain the land and track infrastructure along the route.

As part of its decision approving the UP/SP merger, the Surface Transportation Board ("STB")[4] agreed to this alternative proposal and determined that it would monitor the situation to see if the action caused bottlenecks along the Central Corridor. If service along the Central

[1] DRGW and SP merged in 1988.

[2] Interstate Commerce Commission ("ICC"), Docket No. 32760, *Union Pacific Corporation, Union Pacific Railroad Company and Missouri Pacific Railroad Company -Control and Merger- Southern Pacific Rail Corporation, Southern Pacific Transportation Company, St. Louis Southwestern Railway Company, SPCSL Corp. and the Denver and Rio Grande Western Railroad Company*, approved August 1996.

[3] The Central Corridor line runs through Dotsero, CO, Bond, CO and Winter Park, CO to Denver, CO.

[4] The STB replaced the ICC effective December 31, 1995.

Corridor were to deteriorate, the STB indicated it would require reinstatement of rail service on the Tennessee Pass.

UP has not operated the entire Tennessee Pass since the UP/SP merger was approved and the Centralized Traffic Control ("CTC") signal system along the route was turned off in the early 2000s.[5] Public UP timetables for the Tennessee Pass from 2006 and 2009 contain notes in the "Main Track Authority" section that state: "[b]etween MP 171.9 [Parkdale, CO] and MP 335.0 [near Sage, CO] the main track is not in service".[6]

However, while UP has not operated the entire Tennessee Pass, UP uses a small part of the line and freight and railroad operations currently occur on other parts of the rail line by other railroad entities as a result of transactions with UP. First, the western end of the Tennessee Pass between Sage, CO and Dotsero, CO (MP 331.2 to MP 341.9) is still in active rail service. Owned and operated by UP, this 10.7 mile segment of the line runs along the Eagle River and Interstate 70 through a narrow canyon pass. While it does not appear that trains regularly operate along this section of trackage, our research suggests that this section is used for railcar storage activities during periods of soft railcar demand.

In addition to UP activity on the western end of the line, the eastern portion of the line between Parkdale, CO and Pueblo, CO is currently in active service. The Rock and Rail ("R&R") conducts aggregate freight operations over 39.57 miles of the line from Cañon City to Pueblo (MP 160.30 to MP 120.73) and certain other tracks connected to the main line. The R&R acquired these rights in 1999 from BNSF, which owned certain tracks and also had trackage rights over this

5 *See,* "*Tennessee Pass: Where Silence Has Lease*" by Kevin Morgan, published July 13, 2015. Accessed December 20, 2016, from https://issuu.com/coloradorailfan/docs/tpass_summer_2015/15.

6 Union Pacific Denver Area Timetable #3, effective November 12, 2006 and Union Pacific Denver Area Timetable #4, effective November 16, 2009.

portion of the Tennessee Pass.[7] While BNSF assigned its trackage rights to R&R, it appears that BNSF may still have trackage rights over the Cañon City to Pueblo line.[8]

In 2015, Martin Marietta Materials ("MMM") acquired a controlling interest of R&R and R&R describes itself on its website as a wholly owned subsidiary of MMM. However, R&R still operates over the tracks.[9]

In July 1998, the Royal Gorge Express, LLC acquired 11.75 miles of Tennessee Pass track from UP between MP 171.90 at Parkdale and MP 160.15 at Cañon City, for passenger excursion train operations. However, UP expressly retained "a permanent, irrevocable trackage rights [easement] so as to preserve the integrity of the Tennessee Pass route."[10] Simultaneous with the acquisition, Royal Gorge Express leased the track to R&R, subject to UP's permanent overhead trackage rights easement.[11] The operating passenger excursion railroad is now called the Royal Gorge Route Railroad.[12] UP's trackage rights easement means that if the Tennessee Pass is put

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[7] This transaction was not without controversy. Specifically, in April 1999, R&R filed a Notice of Exemption with the STB for authority to acquire from BNSF: (1) ownership of around 410 feet of track serving shippers located along the line; (2) BNSF's trackage rights over the aforementioned 39.57 miles of main line; and (3) "incidental trackage rights over BNSF's lines from the connection between BNSF's line and UP's line at Milepost 120.73 in Pueblo and approximately 2,243 feet over Track No. 254, approximately 4,200 feet over BNSF's main line track to Milepost 619.75", for the purpose of interchanging with BNSF in Pueblo. UP objected to the Notice of Exemption, complaining to the STB that BNSF did not have the legal right to assign its trackage rights to R&R without UP's consent, which UP was not providing. UP also simultaneously initiated arbitration to resolve the dispute. During the pendency of the arbitration, UP refused to honor the assignment of trackage rights from BNSF to R&R. Several months later, in September 1999, the R&R filed a letter with the STB informing it that an arbitrator had determined UP's prior consent was in fact not required for BNSF to assign its trackage rights to R&R in those particular circumstances. *See* STB Docket No. 33738, *Rock & Rail Acquisition and Operation Exemption – Lines of BNSF Railway*, decision served April 30, 1999 at page 2.

[8] Based on review of the May 24, 2016 BNSF System Map, it appears that BNSF still has trackage rights that begin in Pueblo, CO and continue west along the Tennessee Pass. The map does not label the trackage rights end point, but it appears to be in the vicinity of Cañon City. This is discussed further below in section IV.A.2.c of this Report.

[9] *See, "Martin Marietta Acquires Control of Rock & Rail"* by Rock Product News, published December 1, 2015. Accessed March 7, 2017, from http://www.rockproducts.com/news-late/14939-martin-marietta-acquires-control-of-rock-rail.html#.WL8PtPnyvuo.

[10] *See,* STB Docket No. 33608 *Rock & Rail Acquisition and Operation Exemption – Royal Gorge Express*, decision served July 15, 1998 at page 1 and STB Docket No. 33622 *Royal Gorge Express – Acquisition and Operation Exemption – UP*, decision served July 15, 1998 at page 1.

[11] *Id.*

[12] According to the R&R website, it owns a 50% interest in Royal Gorge Express, LLC. The other 50% is owned by the Cañon City Royal Gorge Railroad ("CCRG"), which operates the excursion trains.

back into service, UP would be able to travel over the 12 miles of track owned and operated by Royal Gorge Express.

While the majority of the Tennessee Pass has not seen service in two (2) decades, it appears that UP has no desire to officially abandon the line. A September 2016 report, prepared by the Colorado Department of Transportation ("CDOT"), discussed the rail lines in Colorado that have the potential to be acquired by the CDOT. The report states that:

> The Tennessee Pass line has been identified as significant to CDOT because of its potential to carry both passengers and freight and because it is the only existing trans-mountain alternative in Colorado to the Moffat Tunnel line, which often runs near capacity. The Tennessee Pass Line may be able to be used as an alternative route as trans-mountain rail demand grows due to increased development on the Western Slope or if the Moffat Tunnel were damaged or closed for any reason. Such an event would have a significant impact on Colorado, particularly on the Western Slope, since the railroads would be forced to move freight through Wyoming. The Royal Gorge Route Railroad currently offers scenic, tourist rail trips on 12 miles of the Tennessee Pass Line west of Cañon City. No freight has been shipped across the full Tennessee Pass Line since 1996, but in relatively recent (2011) conversations with the UP, there was no indication that UP would abandon this line in the near future. There have been no changes since.[13]

The CDOT report confirms that the last discussions between CDOT and UP about the Tennessee Pass line occurred in 2011. Nevertheless, the CDOT report reaffirms the long time position of CDOT that should the Tennessee Pass be abandoned, Colorado should consider purchasing the Tennessee Pass to preserve it for freight and/or passenger service in the future.

The remainder of this Report summarizes our estimate of the Fair Market Value ("FMV") and rehabilitation capital costs of the Tennessee Pass. In order to evaluate the Tennessee Pass, we inspected the rail assets via Google Earth Pro, as well as reviewed publicly available merger dockets. Based on the information collected from these and other sources, we estimated the FMV

[13] *See,* "*Report to the Transportation Legislation Review Committee on Rail Abandonments and the Potential for Rail Line Acquisitions*." Prepared by the Colorado Department of Transportation, published September 2, 2016. Accessed December 21, 2016 from https://www.codot.gov/programs/transitandrail/report-to-the-transportation-legislation-review-committee-on-rail-abandonments-and-the-potential-for-rail-line-acquisitions.

based on the Net Liquidation Value ("NLV") approach. We also estimated the capital cost associated with rehabilitating the rail line to Federal Railroad Administration ("FRA") Class 2 Status. Finally, we detailed the unique operating conditions associated with operating on the Tennessee Pass and identified potential commodities available to traverse the line.

Our findings are discussed in the remainder of this Report under the following headings:

II. Net Liquidation Value
III. Capital Costs for Class 2 Rail Line
IV. Unique Operating Conditions and Commodity Market Discussion

II. NET LIQUIDATION VALUE

To determine the FMV of the Tennessee Pass, we estimated the NLV. The NLV of rail property is defined in the Code of Federal Regulations at 49 C.F.R. §1152.34 as follows:

> The value for the highest and best use, for non-rail purposes, of the rail properties. This value shall be determined by computing the current appraised market value of such properties for other than rail purposes, less all costs of dismantling and disposition of improvements necessary to make the remaining properties available for their highest and best use.

There are two (2) components included in the determination of the NLV of the Tennessee Pass: (1) net track salvage value; and (2) land value. Table 1 below sets forth the mid first quarter of 2018 ("1Q18) value of these components of the NLV.

Table 1
NLV of The Tennessee Pass -- 1Q18

Asset Category	Net Liquidation Value
(1)	(2)
1. Track Assets	$15,221,737
2. Land	$1,330,713
3. Total	$16,552,450

See Attachment No. 2.

We estimated the NLV of the Tennessee Pass to equal $16,552,450. Each of the component parts of the estimated NLV is discussed below under the following topical headings:

A. Tennessee Pass Track Assets
B. Land Value

A. TENNESSEE PASS TRACK ASSETS

Net track salvage value represents the salvage value of the rail assets in place less the cost of recovering the assets, or the liquidation cost. To determine the quantity of the component parts of the track of the Tennessee Pass and the condition of these component parts, we reviewed similar case findings by the STB, inspected the line using Google Earth Pro and researched other publicly available sources regarding the Tennessee Pass. Using this information, we estimated the quantities and condition of the Tennessee Pass rail assets, including rail, rail anchors, tie plates, track spikes, ties, joint bars and turnouts.

Table 2 below summarizes the estimated NLV of the Tennessee Pass track components.

Table 2
Estimated Net Liquidation Value of
Tennessee Pass Track Components -- 1Q18

Track Component (1)	Liquidation Value (2)
1. Rail	$ 15,877,004
2. Other Track Material	$ 7,066,630
3. Turnouts	$ 319,156
4. Ties	$ 0
5. Gross Salvage Value	$ 23,262,790
6. Liquidation Cost	($8,041,053)
7. NLV of Track Assets	$ 15,221,737

See Attachment No. 2.

The following is a description of the major property accounts included in Table 2 above and the development of their salvage value.

1. Rail

The Tennessee Pass main line and siding tracks presumably consist of several weights and types of rail.[14] Rail weight is defined as the weight of a three-foot section of rail. For example, a three-foot section which weighs 115 pounds is referred to as 115 lb. rail. Rail typically is installed in 39-foot sections, which are jointed together, or in one-quarter mile sections, which are welded together in the field. The 39-foot sections of rail are referred to as "jointed" rail and the one-quarter mile sections of rail are referred to as "continuous welded rail" ("CWR").

[14] As this is a "desktop analysis", we have not confirmed the various types of rail along the Tennessee Pass, which would require a field inspection. We made assumptions about the various types of rail based on our experience and publicly available data, which are explained in this Report.

For this Report, a field inspection of the rail line was not performed. Instead, we relied upon STB testimony that was submitted on behalf of the railroads in the UP/SP merger, as well as other publicly available sources, to determine the types of rail that make up the Tennessee Pass. For example, an examination of a portion of the Tennessee Pass between Sage, CO and Cañon City, CO was conducted by UP/SP for the UP/SP merger filings. In these filings, the line was broken up into two (2) segments: (1) Sage, CO to Malta, CO; and (2) Malta, CO to Cañon City, CO. The STB testimony did not identify the types of rail that make up the 69.10 mile Sage-Malta segment. However, there was testimony that identified the type and length of rail for the Malta, CO to Cañon City, CO segment. According to the verified statement of Mr. E. P. Reilly:

> The main track consists of approximately 46.19 miles of 136 pound continuous welded rail ("CWR"), 132 pound CWR and jointed rail for 5.97 miles, 131 pound CWR for 12.71 miles, 112 pound jointed and CWR rail for 8.5 miles and 115 pound rail (jointed) for 35.63 miles. There are an additional 28.39 track miles of sidings.[15]

The current operations break the Malta, CO to Cañon City, CO segment at a different milepost than was utilized in the UP/SP merger, so we applied the percentages of rail type based on the 109.0 miles of main line from Malta, CO to Cañon City, CO segment described above, to each of the mainline and siding segments for the entire Tennessee Pass from Dotsero, CO to Pueblo, CO.

Table 3 below displays the rail miles of the Tennessee Pas by estimated weight and type of rail.

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[15] *See,* STB Docket No. 32760 UP/SP Merger, Volume 5, Page 331.

Table 3
Tennessee Pass Rail Miles by Estimated Type and Weight of Rail

Segment	Rail Weight and Type of Rail 136 lb. CWR	132 lb Jointed & CWR	131 lb CWR	115 lb Jointed	112 lb. Jointed & CWR
(1)	(2)	(3)	(4)	(5)	(6)
1. Dotsero, CO to Sage, CO	4.53	0.59	1.25	0.83	3.50
2. Sage, CO to Malta, CO	25.64	3.32	7.05	4.72	19.78
3. Malta, CO to Leadville, CO Spur	2.28	0.30	0.63	0.42	1.77
4. Malta, CO to Parkdale, CO	41.87	5.41	11.52	7.70	32.30
5. Parkdale, CO to Cañon City, CO	5.38	0.70	1.48	0.99	4.15
6. Cañon City, CO to Pueblo Jct. CO	17.42	2.25	4.79	3.21	13.43
7. Sidings	23.89	3.08	6.57	4.39	18.42
8. Total	121.02	15.64	33.29	22.26	93.34

To determine the NLV of a rail line, the rail is classified into rail that can be reused in other railroad applications and rail that cannot be reused. Rail that can be reused is termed "relay" or "fit" rail. Relay rail is salvaged rail that is in excellent condition and provides companies with the opportunity to "re-lay" the rail. Reroll rail does not have the ability to be re-laid, but is able to be rerolled. Rerolled rail is converted into new products without having to re-melt the steel. Reroll rail typically has a slightly higher value than scrap. Rail that cannot be reused is sold as scrap steel.

Without a physical inspection of the line, it is not possible to identify the exact quality of the rail along Tennessee Pass. Instead, using Google Earth Pro and given the number of years since the Sage, CO to Parkdale, CO portion of the Tennessee Pass has been operated (approximately 20 years), we assumed that there is no relay or reroll rail that would be able to be re-laid on the inactive Sage, CO to Parkdale, CO segment. For purposes of this Report, we categorized the remaining rail along this inactive segment as scrap.

For the remaining segments of the Tennessee Pass that have been active since 1996 (Dotsero, CO to Sage, CO and Parkdale, CO to Pueblo, CO), we relied upon the verified statement of Ralph Lee Meadows, Jr. P.E., Charles H. Banks and John D. Ireland (all employed by R. L.

Banks and Associates ("R. L. Banks")) for the KCVN/CPRR Towner Line Opening Comments on behalf of V&S Railway in order to determine the rail that would be categorized as relay, reroll or scrap.[16] In the V&S Railway Opening Comments, R. L. Banks provided two (2) sets of inventories of the Towner Line, the average of these classified 94.0 percent of the total rail as relay, 2.5 percent of the total rail as reroll and 3.6 percent of the total rail as scrap. Given that the Towner Line has been inactive since 2010 (less than 10 years), we do not believe that these rail classification percentages are appropriate surrogates for the inactive portion of the Tennessee Pass, which has been inactive for over 20 years. However, we do believe that the rail classification percentages used by R. L. Banks are appropriate for the active rail segments that make up the Tennessee Pass, absent a field review. Since various segments of the Tennessee Pass are active, it is necessary for the railroads to maintain these segments and make sure the rail is in good working condition. Thus, we applied these R. L. Banks rail classification percentages to the active lines along the Tennessee Pass.

The inactive and active percentages of relay/reroll/scrap rail discussed above were applied to the 285.55 miles that make up the Tennessee Pass resulting in an estimated 77.86 miles of relay rail, 2.05 miles of reroll rail and 205.64 miles of scrap rail. This distribution results in 17,330 relay tons, 456 reroll tons and 45,770 scrap tons for a total of 63,556 tons. Due to the age of the rail line and the time it has sat idle, we assumed that 97 percent of the rail would be recovered. This 97 percent factor was applied to the tons listed above and results in a total of 61,650 tons that would be recovered.

Table 4 below displays both the weight and type of recoverable rail estimated in the main line and siding tracks that comprise the Tennessee Pass.

[16] *See,* STB Docket No. FD 36005, *KCVN, LLC and Colorado Pacific Railroad, LLC-Feeder Line Application-Comments of V and S Railway, LLC,* Volume I, Page 23, filed on August 30, 2016.

Table 4
Estimated Tennessee Pass Recoverable Rail Weight by Type and Weight
(Tons)

Rail Weight and Type	Relay	Reroll	Scrap	Total
(1)	(2)	(3)	(4)	(5)
1. 112 lb. jointed & CWR	1,160.62	30.59	3,063.12	4,254.33
2. 115 lb. jointed	4,996.55	131.54	13,119.13	18,327.22
3. 131 lb. CWR	2,028.44	53.67	5,360.72	7,442.83
4. 132 lb. jointed & CWR	962.25	24.79	2,537.44	3,524.48
5. 136 lb. CWR	7,661.91	201.99	20,236.74	28,100.64
6. Total Rail Tons	16,809.77	442.58	44,397.15	61,649.50

Source: Attachment No. 3.

The price of relay rail is expressed in terms of dollars per net ton and varies depending on the weight and type of rail. The cost of relay rail removal varies by rail weight.

On January 2, 2018, we received quotes for each rail type considered in this analysis from Harmer Steel and Progress Rail, ranging from $140 per ton for 112 lb. CWR and jointed rail to $420 per ton for 115 lb. CWR and jointed rail. These price quotes are based on the current market for rail and are subject to change as the market changes. Reroll and scrap are sold on a dollar per gross ton basis and do not vary by weight per yard or type of rail. The current reroll and scrap values are based on January 5, 2018 American Metal Market ("AMM") scrap iron and steel prices. For the price of reroll rail, we used the "Chicago Rerolling rails" price of $325 per gross ton, which equates to $290 per net ton.[17] We also used the "Chicago No. 1 Heavy Melt" price of $265 per gross ton for scrap which equates to $237 per net ton.[18] Attachment No. 3 to this Report sets forth the classification of the weight and type of rail and estimated salvage value in the Tennessee Pass mainline and siding tracks.

[17] $325 per gross ton x (2,000 lbs. per net ton ÷ 2,240 lbs. per gross ton) = $290 per net ton.
[18] $265 per gross ton x (2,000 lbs. per net ton ÷ 2,240 lbs. per gross ton) = $237 per net ton.

Table 5
Rail Liquidation Value -- 1Q18

Rail Type	Reusable Tons	Value per Ton	Liquidation Value
(1)	(2)	(3)	(4)
1. Relay	16,809.77	$220 - $410	$5,243,766
2. Reroll	442.58	$290	$128,428
3. Scrap	44,397.15	$237	$10,504,810
4. Rail Liquidation Value	61,649.50	---	$15,877,004

See Attachment No. 3.

Table 5 above shows the estimated liquidation value for rail by type of rail for the Tennessee Pass mainline and siding tracks.

2. Crossties

For purposes of this Report, we assumed that crossties on the main line are spaced at intervals of 19.5 inches, or 3,249 ties per mile of rail,[19] which results in 927,818 total ties on the Tennessee Pass.[20] Ties are classified as reusable for railroad purposes (relay), reusable for landscape purposes (landscape), or as scrap in the development of the NLV. Given the condition of the Sage, CO to Parkdale, CO portion of the Tennessee Pass, we assumed that none of these ties would be classified as relay. The percentage of reusable ties for landscape #2 class[21] purposes is assumed to equal 15 percent and the percentage of scrap is assumed to equal 85 percent for the Sage, CO to Parkdale, CO segment.

For the remaining segments of the Tennessee Pass that have been active since 1996 (Dotsero, CO to Sage, CO and Parkdale, CO to Pueblo, CO), we assumed the percentage of ties reusable for relay is equal to two (2) percent, the percentage of ties reusable for landscape and

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19 (5,280 feet per mile x 12 inches per foot) ÷ 19.5 inches between ties = 3,249 ties per mile.
20 3,249 ties per mile x 285.55 miles = 927,818 ties.
21 Landscape #2 ties are those which were salvaged with at least two solid sides. These ties may have surface rot, or spilling at the ends up to 1 inch.

qualified for landscape #1 class[22] is assumed to equal 31 percent, the percentage of ties reusable for landscape and qualified for landscape #2 class is assumed to equal 31 percent and the percentage of scrap is assumed to equal 36 percent.

Crossties that are reusable for railroad purposes were valued at $14.50 each and ties that are useable for landscape purposes were valued at $2.50 each. Given the fact that scrap ties must be removed and disposed of, scrap ties have been assigned a negative value of $11 each to account for the proper disposal of used railroad ties. In addition, we assumed that the cost to remove each of the 927,818 ties will equal $3.00 per tie. We determined that the cost to remove and dispose of the ties that make up the Tennessee Pass is greater than the value obtained by selling the landscape ties. Therefore, we assumed that the NLV for crossties on the Tennessee Pass is zero for purposes of this desk-top analysis.

Table 6 below sets forth the estimated salvage value of Tennessee Pass ties.

Table 6
Estimated Tennessee Pass Tie Liquidation Value -- 1Q18

	Salvage Type	**Ties**	**Value per Tie**	**Liquidation Value 1/**
	(1)	(2)	(3)	(4)
1.	Relay	5,567	$14.50	$80,722
2.	Landscape #1	78,864	$2.50	$197,160
3.	Landscape #2	179,997	$2.50	$449,993
4.	Scrap	663,390	($11.00)	($7,297,290)
5.	Tie Removal	927,818	($ 3.00)	($2,783,454)
6.	Tie Liquidation Value	927,818	----	($9,352,869)

See Attachment No. 4.
1/ Column (2) x Column (3).

[22] Landscape #1 ties are those which were salvaged with at least three solid sides and no more than half an inch width in any splitting at the ends of the tie.

3. **Other Track Material**

Other track material ("OTM") consists of the material required to hold the rail in place along the tracks and includes such things as tie plates, joint bars, rail anchors, track spikes and bolts and washers. OTM is typically labeled as relay or scrap. We assumed the Sage, CO to Parkdale, CO portion of the Tennessee Pass OTM is scrap and has an estimated value of $237 per net ton, based on the AMM Chicago No. 1 Heavy Melt discussed in Section II.A.1 above.

The miles determined to be relay for rail were also assumed to be relay for OTM for the remaining segments of the Tennessee Pass that have been active since 1996 (Dotsero, CO to Sage, CO and Parkdale, CO to Pueblo, CO). The segments that are reroll or scrap for rail were assumed to be scrap for OTM, with the exception of spikes, bolts and washers which are assumed to be all scrap.

We calculated the necessary tons for each OTM category and applied the unit prices in order to develop the total estimated OTM liquidation value. Table 7 below summarizes the liquidation value for OTM on the Tennessee Pass.

Table 7
Estimated Tennessee Pass Other Track Material Liquidation Value -- 1Q18

	Item	**Unit**	**Amount**	**Value per Unit**	**Liquidation Value 1/**
	(1)	(2)	(3)	(4)	(5)
1.	Relay Tie Plates	Reusable Ties	490,791	$3.93	$1,926,355
2.	Scrap Tie Plates	Reusable Scrap Tons	16,669	$36.61	$3,944,052
3.	Relay Joint Bars	Reusable Joint Bars	9,400	$27.50	$258,500
4.	Scrap Joint Bars	Reusable Scrap Tons	1,180	$236.61	$279,200
5.	Relay Welded Rail Anchors	Reusable Anchors	272,448	$0.52	$141,673
6.	Relay Jointed Rail Anchors	Reusable Anchors	77,535	$0.52	$40,318
7.	Scrap Rail Anchors	Reusable Scrap Tons	702	$236.61	$166,100
8.	Scrap Spikes	Reusable Scrap Tons	997	$236.61	$235,900
9.	Scrap Bolt & Washers	Reusable Scrap Tons	315	$236.61	$74,532
10.	OTM Liquidation Value				$7,066,630

See Attachment No. 5.
1/ Column (3) x Column (4).

Attachment No. 5 shows our development of the estimated Tennessee Pass OTM ton classifications and value calculations.

4. **Turnouts**

Using Google Earth Pro, we reviewed the Tennessee Pass to identify the number of turnouts on the rail line. We estimated that the Tennessee Pass has a total of 133 turnouts. Of these turnouts, 74 are on the Sage, CO to Parkdale, CO segment and 59 turnouts are on the remaining segments of the Tennessee Pass.

Based on the age of the rail line between Sage, CO and Parkdale, CO and the lack of maintenance for nearly two (2) decades, we assumed that these turnouts are not reusable and therefore are classified as scrap. We estimated that each scrap turnout contains five (5) tons of scrap metal for a total of 385 tons on the Sage, CO to Parkdale, CO segment. We further assumed a recovery rate of 97 percent, which results in an estimated 373 salvageable tons of scrap metal associated with the Sage, CO to Parkdale, CO turnouts. We used the AMM scrap price of $237 per net ton for the scrap turnouts.

For the remaining 59 turnouts on the Dotsero, CO to Sage, CO and Parkdale, CO to Pueblo, CO segments, we assumed that 33 turnouts are 136 lb. rail relay turnouts, 23 are either 112 lb. or 115 lb. rail relay turnouts and three (3) are scrap turnouts.

The estimated unit cost per turnout for removal of the 136 lb. rail turnouts is $2,500 based on the January 2, 2018 unit costs provided by Harmer Steel and Progress Rail. This equates to a total cost of $82,500 for removal of the 33, 136 lb. turnouts. For the 112/115 lb. rail turnouts, we assumed a $2,650 unit cost per turnout for removal based on the January 2, 2018 unit costs provided by Harmer Steel and Progress Rail.

Table 8 below summarizes the estimated liquidation value for turnouts on the Tennessee Pass.

Table 8
Estimated Tennessee Pass Turnout Liquidation Value -- 1Q18

Salvage Type	Quantity	Value per Unit	Liquidation Value 1/
(1)	(2)	(3)	(4)
1. Relay 136 lb. No. 10 Turnouts	33	$4,000	$132,000
2. Relay 112/115 lb. No. 10 Turnouts	23	$4,300	$98,900
3. Scrap – Reusable Tons	373	$237	$81,594
4. Turnout Liquidation Value	xxx	xxx	$ 319,156

See Attachment No. 6.
1/ Column (2) x Column (3).

Attachment No. 6 shows our calculations of the estimated gross salvage value of Tennessee Pass turnouts.

5. Removal and Restoration (Recovery) Cost

The salvage values set forth above are all gross salvage values, i.e., they do not include the cost of recovery or removal of the assets from their current location.[23] We developed the relay rail and relay OTM removal costs, the scrap rail and scrap OTM removal costs, the relay turnout removal costs, the scrap turnout removal costs and the costs to restore public and private highway crossings to calculate the total estimated recovery costs for the Tennessee Pass.

In order to determine these costs, we relied upon the unit costs used by Gerald W. Fauth III ("Fauth") for the KCVN/CPRR Feeder Line Application.[24] These unit costs were used by both KCVN and V&S and these unit costs are consistent with what we have seen in other studies. We also used Google Earth Pro to estimate the number of public and private crossings that must be restored.

[23] Except for scrap ties which are discussed above and are net of recovery costs.
[24] *See,* STB Docket No. FD 36005, *KCVN, LLC and Colorado Pacific Railroad, LLC-Feeder Line Application-Line of V and S Railway, LLC,* Volume I, Page 4 of Appendix GWF-7, filed on March 18, 2016.

Table 9 below details the amounts we subtracted from our estimated gross liquidation values to account for removal and recovery costs.

Table 9
Estimated Tennessee Pass Removal & Restoration (Recovery) Costs -- 1Q18

Item	Quantity	Units	Cost per Unit	Total Cost
(1)	(2)	(3)	(4)	(5)
1. Fit Rail and OTM	77.86	Miles	$16,000	$1,245,760
2. Scrap Rail and OTM	207.69	Miles	$12,000	$2,492,280
3. Fit Turnouts	56	Turnout	$800	$44,800
4. Scrap Turnouts	77	Turnout	$500	$38,500
5. Public Highway Crossings	63	Crossing	$2,000	$126,000
6. Private Highway Crossings	62	Crossing	$300	$18,600
7. Total Recovery Costs	--	--	--	$3,965,940

See Attachment No. 7.

Attachment No. 7 to this Report details the removal and restoration costs for the Tennessee Pass.

6. Marketing and Disposition Costs

In addition to removal and restoration costs, it is also necessary to include the costs to market the assets and to administer the disposal process. Based on our experience, we assumed that relay marketing and disposition costs are equal to 15 percent of the relay gross liquidation value and scrap marketing and disposition costs are equal to five (5) percent of the reroll and scrap gross liquidation value. The total estimated marketing and disposition costs equal $1,947,291.

Attachment No. 2, Line 18 summarizes the development of the marketing and disposition costs included in this analysis.

7. Transportation Costs

Transportation costs for transporting the assets to market must also be considered. Chicago, IL is the key market in the United States for used and scrap rail assets. It is also possible to deliver scrap to Evraz Rocky Mountain Steel, which is a vendor in nearby Pueblo, CO. Evraz does not accept relay or reroll rail, so it would still be necessary to ship these assets to Chicago. Given that Chicago is much further than Pueblo and results in higher transportation costs, we assumed all of the scrap assets would be shipped to Pueblo. We reviewed current rail tariffs for the movement of relay, scrap and reroll steel products from the Tennessee Pass[25] to Chicago and Pueblo. The current tariff charge per rail car is $5,157 to transport the relay and reroll assets to Chicago and $1,896 per rail car is the current tariff charge to transport scrap assets to Pueblo. We used these rates to calculate the total estimated transportation costs of $2,127,822.

Attachment No. 8 identifies the number of railcars needed, along with the cost per railcar, required to transport relay, reroll and scrap material from the Tennessee Pass to Pueblo and Chicago.

8. Summary Before Land

The NLV of the Tennessee Pass equals the gross salvage value ($23,262,790) less removal and restoration costs ($3,965,940), marketing and disposition costs ($1,947,291) and transportation costs ($2,127,822). Subtracting these costs from the gross salvage value produces a NLV for the Tennessee Pass track assets equal to $15,221,737.

B. LAND VALUE

The mainline and siding tracks on the Tennessee Pass extend from Dotsero, CO to Pueblo, CO. The terrain in this region is predominantly mountainous, with the mainline running through four (4) Colorado counties. These counties include Eagle County, Lake County, Chaffee County and Fremont County.

The Tennessee Pass is located on both reversionary acres and non-reversionary acres. Reversionary land is land which is not owned by the railroad and thus cannot be sold. We developed the value of the Tennessee Pass non-reversionary acres, i.e., land that is owned by the

[25] Assumes Pueblo, CO is the point of origin.

railroad and can be sold, based on data in the 1995 UP/SP merger application. The 1995 UP/SP merger application identified the reversionary and non-reversionary acres that make-up the Tennessee Pass.[26]

Table 10 below summarizes the reversionary and non-reversionary acres identified in the UP/SP merger application for the segments of the Tennessee Pass.

Table 10
Tennessee Pass Acreage by Segment

Segment	Total Acres	Reversionary Acres	Non-Reversionary Acres
(1)	(2)	(3)	(4)
1. Sage, CO to Malta, CO	1,336.00	1,231.00	105.00
2. Malta, CO to Leadville, CO	70.00	30.00	40.00
3. Malta, CO to Cañon City, CO	2,487.00	2,233.95	253.05
4. Total	3,893.00	3,494.95	398.05

See Attachment No. 9.

For the other segments of the Tennessee Pass that were not included in the land valuation section of the UP/SP merger application, we estimated non-reversionary acres using a weighted average non-reversionary acre per mile, weighted on miles, using the Tennessee Pass segments included in the UP/SP merger application. We estimated 2.22 non-reversionary acres per mile, which we applied to the miles that make up the Dotsero, CO to Sage, CO segment and the Cañon City, Co to Pueblo, CO segment.

The UP/SP merger application also states that the non-reversionary acres that make up the Malta-Cañon City segment have a NLV of $378,000. This equates to $1,493.78 per acre. We indexed this per acre value to a 2017 value of $2,614 per acre using the United States Department

[26] *See,* STB Docket No. 32760 *UP/SP Merger*, Volume 5, page 293 for Sage, CO to Malta, CO and Malta, CO Leadville, CO segments and Page 343 for Malta, CO to Cañon City, CO segment.

of Agriculture's National Agricultural Statistics Service. We then applied the $2,614 per acre unit cost to each segment's non-reversionary acres.

As shown in Table 11 below, the total land value for Dotsero, CO to Pueblo, CO equals $1,330,713.

Table 11
Tennessee Pass Value of Land by Segment -- 1Q18

Segment	Non-Reversionary Acres	Estimated Value Per Acre	Total Land Value
(1)	(2)	(3)	(4)
1. Dotsero, CO to Sage, CO	20.00	$2,614	$52,282
2. Sage, CO to Malta, CO	105.00	$2,614	$274,482
3. Malta, CO to Leadville, CO	40.00	$2,614	$104,564
4. Malta, CO to Cañon City, CO	253.05	$2,614	$661,501
5. Cañon City, CO to Pueblo, CO	91.00	$2,614	$237,884
6. Total	398.05	$2,614	$1,330,713

Source: Attachment No. 9.

Twenty-nine percent of the 285.55 track miles that make up the Tennessee Pass is currently under active operation and 71 percent is currently inactive.[27] The NLV of the track assets of the Tennessee Pass is estimated to equal $15,221,737. The land value of the Tennessee Pass is estimated to equal $1,330,713. In total, the NLV of the Tennessee Pass line is estimated to equal $16,552,450.

[27] (82.84 ÷ 285.55) = 29% and (202.71 ÷ 285.55) = 71%.

III. CAPITAL COST FOR CLASS 2 RAIL LINE

To determine the capital cost of restoring the Tennessee Pass to FRA Class 2 operating status with a maximum operating speed of 25 MPH, we first estimated the current state of the rail line.[28] A large portion of the Tennessee Pass has experienced degradation as vegetation growth has gone unchecked. The degradation problem is caused by a lack of maintenance, as significant portions of the rail line have sat idle for at least 20 years. Examples of the current state of the inactive portions of the Tennessee Pass are shown in the photos[29] in Figure No. 1 below, which were taken in 2015.

Figure No. 1

[28] As this is a "desktop analysis", we have not confirmed the exact condition of the track along the Tennessee Pass, which would require a field inspection. We made assumptions about the condition of the rail line based on our experience and publicly available data, which are explained in this Report.

[29] *See*, "*Tennessee Pass: Where Silence Has Lease*" by Kevin Morgan, published July 13, 2015. Accessed December 20, 2016, from https://issuu.com/coloradorailfan/docs/tpass_summer_2015/15.

Table 12 below separates the Tennessee Pass into segments and identifies the rail miles and the operational status for each segment, i.e., either active or inactive. The estimation of the restoration capital costs requires an understanding of the operational status of the line segments.

Table 12
Tennessee Pass Mileage and Status

	Miles			Operational
Segment	**Mainline**	**Siding**	**Total**	**Status**
(1)	(2)	(3)	(4)	(5)
1. Dotsero, CO to Sage, CO	10.70	3.36	14.06	Active
2. Sage, CO to Malta, CO	60.50	13.84	74.34	Inactive
3. Malta, CO to Leadville, CO Spur	5.40	0.00	5.40	Inactive
4. Malta, CO to Parkdale, CO	98.80	24.17	122.97	Inactive
5. Parkdale, CO to Cañon City, CO	12.70	4.22	16.92	Active
6. Cañon City, CO to Pueblo Jct. CO	41.10	10.76	51.86	Active
7. Total	229.20	56.35	285.55	xxx
8. Total Active Miles	64.50	18.34	82.84	Active
9. Total Inactive Miles (Rehab Miles)	164.70	38.01	202.71	Inactive
10. Percent Active	28.1%	32.5%	29.0%	xxx
11. Percent Inactive	71.9%	67.5%	71.0%	xxx

The majority of the Tennessee Pass has not been maintained in the past two (2) decades. We estimated that nine (9) categories[30] of restoration would be necessary to restore the rail line to FRA Class 2 operating status. These include: (1) vegetation removal; (2) crosstie replacement; (3) ballast cleaning and replacement; (4) track resurfacing; (5) rail replacement; (6) track and bridge inspections; (7) crossing re-pavement; (8) communications and signaling; and (9) engineering and contingencies.

[30] A tenth category of restoration may be tunnels and an eleventh category may be bridges. While our analysis considers the below-the-wheel components of the tunnels and bridges, it does not consider the condition of the actual tunnels and bridges. The condition of the tunnels and bridges on the Tennessee Pass will have to be determined during a field inspection.

We estimated that the capital cost to restore the line to FRA Class 2 status would equal $245.4 million. Table 13 below summarizes our estimated capital cost for each of the above nine (9) categories.

Table 13
Estimated Capital Cost to Upgrade The
Tennessee Pass to Class 2 Rail Line – 1Q18

	Category (1)	Capital Cost (2)
1.	Vegetation Removal	$1,903,447
2.	Crosstie Replacement	$22,229,490
3.	Ballast Cleaning & Replacement	$3,900,141
4.	Track Resurfacing	$2,996,865
5.	Rail Replacement	$181,952,496
6.	Track and Bridge Inspections	$180,412
7.	Crossing Re-pavement	$91,400
8.	Communication & Signaling	$2,027,100
9.	Engineering & Contingencies	$30,139,389
10.	Total	$245,420,740

Source: Attachment No. 10.

The supporting details for the Table 13 values are shown in Attachment No. 10 to this Report. The development of the restoration capital costs for the Tennessee Pass is discussed in detail below.

A. VEGETATION REMOVAL

As shown in the photos in Figure No. 1 above, vegetation control is a major problem for the inactive segments along the Tennessee Pass. There appears to have been little to no on-going vegetation control in the last two (2) decades for these segments. In order to restore complete service to the Tennessee Pass, the inactive segments would need to be chemically treated to remove the vegetation from the rail right-of-way ("ROW"). In many locations, larger brush, weeds and even trees have inundated the rail line. These will require more expensive and time intensive mechanical or hand removal.

Based on recent cost estimates in rail rehabilitation grant proposals, we estimated 1Q18 vegetation removal cost at $9,390 per mile.[31] The active segments are assumed to have undergone continuous maintenance and therefore would not require any additional vegetation control or removal in order to operate at FRA Class 2 status.

The initial vegetation removal cost to achieve FRA Class 2 operating service on the entire Tennessee Pass is estimated to equal $1.90 million.[32]

B. CROSSTIE REPLACEMENT

Ties are classified as either "good condition" or "poor condition" under FRA inspection standards. We estimated that crossties on the Tennessee Pass main line are spaced at intervals of one crosstie every 19.5 inches along the rail, or 3,249 ties per mile of rail.[33] Due to the nearly two (2) decades of little to no vegetation control, we assumed that none of the ties are in "good condition" along the inactive portions of Tennessee Pass.

In order to meet FRA Class 2 standards, each 39-foot inspection section of rail needs eight (8) "good" condition ties for track with a curve of less than two (2) degrees and nine (9) "good" condition ties for track with a curve of over two (2) degrees. The Tennessee Pass is mostly mountainous and extremely curvy so we assumed nine (9) ties per 39-foot section of track will need to be replaced, for a total of 246,994 replacement ties along the inactive section of the rail line.[34]

For the active segments, we assumed that the tie condition is currently within FRA Class 2 requirements and no ties would need to be replaced for these segments.

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[31] *See*, Attachment No. 11, Column (8), Line 14.
[32] *See*, Attachment No. 10, Column (9), Line 8.
[33] (5,280 feet per mile x 12 inches per feet) ÷ 19.5 inches between ties = 3,249 ties per mile.
[34] *See*, Attachment No. 10, Column (9), Line 11.

Based on recent rail rehabilitation grant application cost estimates, we estimated the 1Q18 cost, including labor to replace ties, equals $90 per tie.[35] The total estimated cost for crosstie replacement on the Tennessee Pass equals $22.23 million.[36]

C. BALLAST REPLACEMENT

The lack of vegetation control along the inactive portions of the Tennessee Pass also resulted in the deterioration of the ballast. In some inactive areas, the ballast would need to be replaced, while in other inactive areas the ballast would need cleaning and rehabilitation.

Based on recent rail rehabilitation grant applications for similar rehabilitation projects, we estimated that 520 tons of ballast per mile[37] would need to be restored along the inactive areas, at a 1Q18 cost of $37 per ton.[38] The active segments are assumed to have undergone continuous maintenance and would not require any additional ballast replacement in order to operate at FRA Class 2 status.

The total estimated cost for ballast replacement on the Tennessee Pass is estimated to equal $3.90 million.[39]

D. TRACK REHABILITATION

In addition to the replacement of ties and ballast along the Tennessee Pass, the rail line would require significant track rehabilitation to obtain FRA Class 2 operating status along the inactive segments. Missing or damaged spikes or other track material ("OTM") would need to be replaced or repaired and joints tightened where necessary.

Due to the lack of maintenance for at least two (2) decades along the inactive portions of the Tennessee Pass, we assumed that the entire rail line in the inactive areas would need track

35 *See,* Attachment No. 12, Column (8), Line 17.
36 *See,* Attachment No. 10, Column (9), Line 13.
37 *See,* Attachment No. 13, Column (6), Line 15.
38 *See,* Attachment No. 13, Column (10), Line 15.
39 *See,* Attachment No. 10, Column (9), Line 17.

resurfacing. Based on recent rail rehabilitation grant application cost estimates, we estimated the 1Q18 cost to resurface the rail at $2.80 per track foot.[40]

The active segments are assumed to have undergone continuous maintenance and would not require any additional track rehabilitation in order to operate at FRA Class 2 status.

The total estimated cost for track rehabilitation on the Tennessee Pass is $3.02 million.[41]

E. RAIL REPLACEMENT

Similar to track rehabilitation, rail would need to be replaced on the inactive segments of the Tennessee Pass. The lack of maintenance and/or use over the last two (2) decades along the inactive portions of the Tennessee Pass where lines were subjected to severe weather changes, e.g., freezing and thawing, have caused deterioration to the point of needing replacement. Rail replacement is very costly but would be necessary to achieve at FRA Class 2 operating status.

Based on recent rail rehabilitation grant application cost estimates, we estimated the 1Q18 cost to replace the rail at $85 per track foot.[42] The active segments were assumed to have undergone continuous maintenance and would not require any rail replacements in order to operate at FRA Class 2 status.

The total estimated cost for rail replacement on the Tennessee Pass is $181.95 million.[43]

F. TRACK AND BRIDGE INSPECTIONS

To restore the Tennessee Pass to FRA Class 2 operating status, the rail line would need to undergo numerous operating and safety inspections. These would include inspections of the 285.55 miles of track, as well as the approximately 75 bridges on the Tennessee Pass. The track inspections would include either mechanical rail flaw detection or ultra-sonic rail testing, as well

[40] *See,* Attachment No. 14, Column (10), Line 13.
[41] *See,* Attachment No. 10, Column (9), Line 19.
[42] *See,* Attachment No. 15, Column (10), Line 9.
[43] *See,* Attachment No. 10, Column (9), Line 21.

as track geometry inspection, while the bridge and crossing inspections would be manual inspections.

Based on recent cost evidence accepted by the STB in its three (3) most recent maximum rate cases, we estimated the 1Q18 cost of inspections to be $890 per mile.[44] The total estimated cost for track and bridge inspections on the Tennessee Pass equals $180,412.[45]

Of the approximately 75 bridges, 58 are on the inactive line between Sage, CO and Parkdale, CO. Using Google Earth Pro, we reviewed each of the 58 inactive bridges to determine the type of bridge, as well as the length of each bridge. We were able to determine that 15 of these bridges are composed of steel and eight (8) are composed of concrete/steel. Google Earth Pro did not provide us with the necessary view to determine the bridge type of the remaining 35 inactive bridges.

Based on what we were able to see from our Google Earth Pro analysis, the longest bridge along the Sage, CO to Parkdale, CO segment is approximately 250 feet.

Attachment No. 18 provides a summary of the 58 inactive bridges discussed above. Included in Attachment No. 18 is the bridge length, bridge type, number of tracks along the bridge and the terrain the bridge traverses. In addition, Attachment No. 18 provides images from Google Earth Pro of three (3) of the bridges along the inactive line of the Tennessee Pass rail line.

We have not included costs for bridge rehabilitation or repair in this rehabilitation capital cost estimate for the 58 bridges along the inactive rail line. Upon completion of the field study of the Tennessee Pass, we will update this Report to reflect bridge rehabilitation costs.

[44] *See* Attachment No. 16, Column (8), Line 13.
[45] *See* Attachment No. 10, Column (9), Line 23.

Based on recent rail rehabilitation grant application cost estimations and STB case evidence, bridge rehabilitation is approximately $125,000 per bridge and bridge replacement can be anywhere from $500,000 to $1,000,000 depending on the specifics of the bridge being replaced.

G. CROSSING RE-PAVEMENT

After the restoration work along the inactive portions of the Tennessee Pass is completed, many of the rail and highway crossings would need to be cleared or repaved. To determine the cost to restore these crossings, we relied upon the unit costs used by Fauth in the KCVN/CPRR Feeder Line Application.[46] These unit costs were used by both KCVN and V&S and these unit costs are consistent with what we have seen in other similar studies.

We classified crossings as either public or private based on our Google Earth review. For the segments needing rehabilitation, we estimated that 40 of the crossings are public with an estimated re-paving cost of $2,000 per crossing and 38 are private with an estimated re-paving cost of $300 per crossing.[47]

The total estimated cost for crossing re-pavement on the Tennessee Pass is $91,400.[48]

H. COMMUNICATIONS & SIGNALING

Based on publicly available operating timetables and other information, the majority of the Tennessee Pass includes CTC signaling infrastructure. Without examining the infrastructure, we do not know if any additional costs would be necessary to return the signaling to operating status. For purposes of this Report, we included an additional cost of $10,000 per inactive route mile or $2.0 million[49] for upgrades or repairs to the communications and signaling system on the

[46] *See,* STB Docket No. FD 36005, *KCVN, LLC and Colorado Pacific Railroad, LLC-Feeder Line Application-Line of V and S Railway, LLC*, Volume I, page 4 of Appendix GWF-7, filed on March 18, 2016.
[47] *See,* Attachment No. 10, Column (9), Line 24 through Line 29.
[48] *See,* Attachment No. 10, Column (9), Line 30.
[49] *See,* Attachment No. 10, Column (9), Line 32.

Tennessee Pass. However, we note that our $10,000 per route mile estimate can only be verified by a field study of the Tennessee Pass.

1. Positive Train Control

Class I[50] railroads and passenger rail carriers are required to implement positive train control ("PTC") by December 31, 2018. PTC is an automated system designed to prevent train-to-train collisions and other accidents.[51] Class I rail carriers with traffic routes that carry passengers and/or hazardous toxic-by-inhalation ("TIH") or poisonous-by-inhalation ("PIH") materials, as designated under federal regulation, must implement PTC pursuant to the Rail Safety Improvement Act of 2008 ("RSIA").

We assumed, for purposes of this Report, that the railroad selected to conduct freight operations over the Tennessee Pass will be a Class II/III railroad and will not be required to implement PTC. Therefore, we have not included PTC costs[52] in this analysis. We also assumed that the PTC costs associated with the Royal Gorge Railroad passenger service between Parkdale, CO and Cañon City, CO will be borne by the Royal Gorge Railroad.

I. TUNNELS

There are a number of tunnels on the Tennessee Pass. Our analysis considers the below-the-wheel components of these tunnels. However, our analysis does not consider the upgrades that may be required because of the condition of the tunnels, since the actual condition of each tunnel

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[50] The STB defines railroad classifications based on annual operating revenue. Note that this is different than the FRA classifications of track. Class I railroads are currently defined by the STB as those that have an annual carrier operating revenue of over $250 million in 1991 dollars. Class II railroads are those with an annual carrier operating revenue of less than $250 million in 1991 dollars but greater than $20 million in 1991 dollars. Class III railroads are those with an annual operating revenue of less than $20 million in 1991 dollars.

[51] The costs to implement PTC ranges between $150,000 and $175,000 per route mile and includes all required assets from office servers to trackside equipment to locomotive equipment.

[52] Class II/III railroads that operate on Class I railroad PTC equipped tracks may be required to utilize PTC equipped locomotives. The regulation permits non-PTC equipped locomotives of connecting Class II/III railroads to run on Class I railroad lines for distances up to 20 miles. However, if the Class I requires PTC on its own locomotives used on the line segment, it will require the same of its trackage rights tenants.

and associated upgrade capital costs can only be determined by a field review. For purposes of this Report, we assumed that no capital costs would be required to upgrade tunnels.[53]

J. ENGINEERING & CONTINGENCIES

Based on recent rail rehabilitation grant application cost estimations, we assumed a 14% engineering and contingency additive for construction costs.[54] The total estimated cost for engineering and contingencies for the Tennessee Pass equals $30.1 million.[55]

[53] In the next section of this Report, we discuss the different commodity markets that could theoretically run over an upgraded Tennessee Pass. One of the commodities discussed is intermodal traffic. The tunnels on the Tennessee Pass may not be high enough to handle double stack intermodal traffic which is the predominant method for transporting intermodal traffic. If the handling of intermodal traffic is a major consideration for the Tennessee Pass, the capital costs associated with conforming the tunnels, if necessary, can be estimated through a field review.

[54] *See,* Attachment No. 17, Column (4), Line 9.

[55] *See,* Attachment No. 10, Column (9), Line 34.

IV. UNIQUE OPERATING CONDITIONS AND COMMODITY MARKET DISCUSSION

The Tennessee Pass was once a vital link in the nation's transportation system, linking distant markets via its rugged Rocky Mountain crossing. There is much speculation as to whether it could ever be economically viable to restore freight operations over the entire line. Using limited publicly available data, we provide below a preliminary assessment of the operating challenges associated with this mountainous railroad. We augment this assessment with a commodity market discussion, which evaluates potential commodities and geographic markets which could be served by an operational Tennessee Pass.

A. UNIQUE OPERATING CONDITIONS

The Tennessee Pass traverses extremely rugged terrain. It crosses the Rocky Mountains at over 10,000 feet of elevation, making it the highest railroad crossing of the mountain range. Testimony submitted in the UP/SP merger application shows that the western approach from Dotsero, CO consists of "severe grades up to three percent (3%), four (4) tunnels, tight curves and severe weather."[56] The UP/SP merger testimony noted that problems with rock slides and heavy snow up to 100 inches between October and May plague the line.[57] Much of the western slope of the line was operated with a speed limit of 50 mph, but 64 miles were subject to slower speed limits due primarily to curves and steep grades.[58] As stated previously, the line is fully signaled with centralized traffic control ("CTC") and equipped with power switches on certain sidings.[59] Various wayside detectors are linked to the signal system to stop trains when flooding, avalanche, or rock slides inhibit safe operations.[60] The eastern slope of the Tennessee Pass to Pueblo, CO is

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56 *See,* STB Docket No. 32760 UP/SP Merger, Volume 5, Page 290.
57 *Id.* at 297.
58 *Id.* at 297-298.
59 *See,* Union Pacific Denver Area Timetable #3, effective November 12, 2006 page 30-31 and Union Pacific Denver Area Timetable #4, effective November 16, 2009 page 30-31.
60 *Id.*

rated for 40 mph train operations, with three (3) timetable speed restrictions or slow orders reducing maximum speeds to as low as 20 mph.[61]

The eastern slope gradient of the Tennessee Pass line is less than 1.8%, which is less severe than the 2.0% to 3.0% gradient that rules both the eastern and western approaches to the Moffat Tunnel Subdivision.[62] The operating timetables show that the Moffat Tunnel Subdivision travels 50 miles from the start of the division at an elevation of just over 5,000 feet to the peak of the division's line at just under 9,500 feet, which necessitates the steep gradient and reflects a gain of approximately 90 feet per mile.[63]

The eastern slope of the Tennessee Pass travels approximately 162 miles, starting at an elevation near 4,600 feet and peaking at an elevation just over 10,000 feet, which reflects a gain of approximately 33 feet per mile.[64] On the western slope of the Tennessee Pass, the first 38 miles from Dotsero, CO to Minturn, CO are a 1.3% gradient. Minturn, CO is where helper operations were historically based,[65] as this is where the gradient begins to steepen and increase from 1.75% to 3.0%.[66] These helper engines would be added to the rear and sometimes the middle of trains in order to overcome the steep gradients towards the summit of the line.[67]

1. Meeting Operating Challenges

If the Tennessee Pass were reopened, it would occupy a similar role to that of the Montana Rail Link ("MRL"), which connects BNSF tracks in Sandpoint, ID to BNSF routes around Billings, MT. BNSF intermodal trains often traverse the MRL lines through southern Montana,

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61 *See,* Union Pacific Denver Area Timetable #4, effective November 16, 2009 page 30.
62 *Id.* at page 20 and 31.
63 *Id.* at page 20. (9,500 ft. – 5,000 ft.) ÷ 50 miles = 90 ft. per mile.
64 *Id.* at page 31. (10,000 ft. – 4,600 ft.) ÷ 162 miles = 33.1 ft. per mile.
65 *See,* "*Tennessee Pass: Where Silence Has Lease*" by Kevin Morgan, published July 13, 2015. Accessed December 20, 2016, from https://issuu.com/coloradorailfan/docs/tpass_summer_2015/15
66 *See,* Union Pacific Denver Area Timetable #4, effective November 16, 2009 page 31.
67 *Id.* at page 31.

only stopping for an MRL crew and fuel, if needed.[68] The Tennessee Pass would be different from an operating standpoint due to the difficult operating conditions caused by the physical characteristics of the line. Below is our desktop assessment of how the unique operating challenges of the Tennessee Pass could be met.

Operations on the majority of the Tennessee Pass are governed by physical characteristics typical of most mountain railroads. As noted above, the western slope gradient is a modest 1.3% from Dotsero, CO to Minturn, CO.[69] Trains traversing this segment in either direction would use locomotive configurations typical of operations in Colorado and throughout the western United States. UP "moves nearly two-thirds of its gross ton miles using" distributed power ("DP") technology.[70]

The same configurations would be successful for the eastern approach to the summit, where gradients are less than 1.5%. Helper locomotives would have to be added to trains traversing the steepest portion of the western slope (between Minturn, CO and the summit) in either direction in order to maintain uphill velocity and to safely move the train downhill. Based on rudimentary available public data supplemented by our Firm's experience, approximately four (4) horsepower per ton would be required.[71] Historically, helper operations were based at Minturn, CO where trains were stopped and extra power was added or removed.[72]

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68 *See,* "*The State of Intermodal*" by William C. Vantuono for RailwayAge published October 28, 2016. Accessed on December 20, 2016 from http://www.railwayage.com/index.php/intermodal/the-state-of-intermodal.

69 *See,* Union Pacific Denver Area Timetable #4, effective November 16, 2009 page 31.

70 *See,* "*About Us: Environment: Technology*". Accessed on December 20, 2016 from https://www.up.com/aboutup/environment/technology/index.htm.

71 *See,* "*Train Energy, Power and Traffic Control*" by Riley Edwards for American Railway Engineering and Maintenance-of-Way Association ("AREMA") published 2008. Accessed from: http://www.engr.uky.edu/~jrose/RailwayIntro/Modules/Module%203%20Train%20Energy,%20Power%20and%20Traffic%20Control%20REES%202010.pdf, page 25.

72 Based on a review of Google Earth Pro satellite imagery showing a yard area which could have supported helper operations and Union Pacific Denver Area Timetable #4, effective November 16, 2009 page 31.

We note that the best means to determine the operating characteristics of the line would be to model it in the Rail Traffic Controller ("RTC") computer simulation, which considers specific physical characteristics and operating needs of the railroad to quantitatively determine necessary operating inputs.

2. Regional Rail Operations

Rail operations throughout Colorado currently allow BNSF and UP to operate in sync and traverse the state. Both railroads have trackage rights on each other's lines and are able to use one another's track in order to move freight, often through directional operations, where one railroad's track is jointly used for northbound operations and the other is jointly used for southbound operations. Further discussion regarding Colorado rail operations follows.

a. Moffat Tunnel Lease

Critical to the understanding of operations on the Tennessee Pass is the nearby active Rocky Mountain rail crossing linking eastern and western Colorado. While the Moffat Tunnel Subdivision has been shown to be steeper than its southern counterpart, the Tennessee Pass, its physical characteristics and ownership obscure its future role in Colorado's rail transportation system. The Moffat Tunnel does not have the vertical clearance necessary to handle double-stack and auto-rack traffic, which are widely considered to be even-more lucrative future railroad traffic segments. The physical limitations of the Moffat route are discussed in greater detail in the intermodal section below.

The Moffat Tunnel line is operated primarily by UP, but the 6.2-mile tunnel bore is itself owned by the State of Colorado, which has leased the tunnel to UP and its predecessor railroads since 1926. Initially, this state asset was controlled by the elected Moffat Tunnel Improvement District ("MTID"). MTID and the Denver and Salt Lake Railway Company, a UP predecessor, entered into a 50-year lease agreement in 1926. This agreement was extended 49 years in 1976 and is currently set to expire in January 2025. MTID was abolished by Colorado statute in 1998 after it could not find a buyer for the tunnel assets. MTID's role as Moffat Tunnel administrator was transferred to the Department of Local Affairs ("DOLA"), which still had control over the asset in FY 2014-2015.[73] According to Colorado statute, DOLA has:

> the power to enter into contracts with persons and with private and public corporations for the right to use the tunnel for the transmission of power, for telephone and other communication lines, for railroad and railway purposes and for any other purpose to which the same may be adapted.[74]

Based on the information discussed above, it appears that DOLA will be the state agency responsible for the future of the Moffat Tunnel beyond January 2025. At that point, UP will need a new lease with the state of Colorado in order to maintain access to the tunnel.

b. <u>Closure of Burnham Shops</u>

An active Tennessee Pass could further reduce UP rail operations in Denver, which have recently begun to relocate outside the city due to various urban issues. One major component of UP activity within Denver city limits, the Burnham Shops, was closed in 2016 in preparation for sale of the 70-acre land amidst burgeoning urban renewal in the area.[75] As of January 2018, UP had not announced a sale or pending sale of the property. While the Burnham Shops and facilities area will most likely be redeveloped, it does not appear that the yards and facilities at Burnham Shops have been totally demolished at this point in time.

A December 2016 article in the Washington Park Profile states that Denver historic preservation groups are trying to obtain historic status in order to preserve six historic buildings at

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[73] *See, "Colorado Department of Local Affairs Line Item Descriptions – FY 2015-15 Budget Request*" pages 5-6. Accessed on January 25, 2017 from http://www2.cde.state.co.us/artemis/locserials/loc19internet/2014-15/LOC19201415001internet.pdf.

[74] *See*, "*Colorado Revised Statutes Title 32. Special Districts § 32-8-124.3. Contracts for use of tunnel*". Accessed January 25, 2017 from http://codes.findlaw.com/co/title-32-special-districts/co-rev-st-sect-32-8-124-3.html.

[75] *See*, "*Union Pacific to close Burnham repair yard in Denver*" by Alicia Wallace, published November 17, 2015. Accessed January 30, 2017, from http://www.denverpost.com/2015/11/17/union-pacific-to-close-burnham-repair-yard-in-denver/.

the Burnham Shops site.[76] As of August 2017, UP's plans to sell the Burnham Shops property were still unclear and the company declined to "comment on their plans to market the property" in a story by Confluence Denver.[77] An October 2017 report by CDOT, stated that the "Burnham Yard in central Denver is considered to be at high risk of abandonment or sale at the current time."[78] In addition, the CDOT report quoted a UP spokeswoman stating "the railroad plans to prepare the 70-acre locomotive repair yard, located east of Interstate 25 between West Sixth and West Eighth avenues, for sale."[79] However, the property is not currently listed for sale and there is no further update on when a sale may be planned.

The future sale of the Burnham Shops and rail yard does not impact UP's ability to efficiently move freight around Denver. According to a UP spokesperson, "the maintenance, repairs and overhauls of locomotives" previously handled at Burnham "will shift to Union Pacific sites in North Platte and South Morrill, Nebraska and North Little Rock, Arkansas."[80] UP's decision to close the shops was not entirely based on the value of the real estate, but it was certainly a factor in the comprehensive decision-making process. UP's spokeswoman stated that "[t]he well-documented decline in the coal carloadings in Colorado — a result of natural gas prices and regulatory pressure — has diminished the need for locomotive repairs and overhauls in the Denver area."[81]

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[76] *See,* "*Burnham Yard closing ends chapter of Denver History*" by Lucy Graca, published December 7, 2016. Source: http://www.denvermetromedia.com/Profile/wash-park-profile-news/burnham-yard-closing-ends-chapter-of-denver-history-by-lucy-/.

[77] *See, "Flipping Denver's Brownfields: Changing the Legacy of Urban Land"* by Eric Petersen, published August 23, 2017. Source: http://www.confluence-denver.com/features/brownfields-082317.axpx.

[78] *See,* "*Report to the Transportation Legislation Review Committee on Rail Abandonments and the Potential for Rail Line Acquisitions*", prepared by the Colorado Department of Transportation, October 2017, p. 2.

[79] *Id.* at p. 13.

[80] *See,* "*Burnham Yard closing ends chapter of Denver History*" by Lucy Graca, published December 7, 2016. Source: http://www.denvermetromedia.com/Profile/wash-park-profile-news/burnham-yard-closing-ends-chapter-of-denver-history-by-lucy-/.

[81] *Id.*

For more than a decade, UP has been planning to move freight yards out of downtown Denver to cheaper consolidated facilities nearby in response to urban growth, noise complaints and safety issues.[82] Even if there is a rail transportation demand revival over the rail networks radiating from Denver, it would prove too costly to re-establish rail facilities in the city center of Denver given that UP is already moving facilities needed for current traffic levels outside of the city. Presumably, these facilities on the city's outskirts could be expanded if required by the railroad's traffic demands.

c. **Pueblo, CO Rail Infrastructure**

It is unlikely that Denver's railcar classification and locomotive repair operations would be moved to the eastern terminus of the Tennessee Pass at Pueblo. As discussed above, the Burnham Shops locomotive repair operations are being shifted to Nebraska and Arkansas and railcar classification is being moved to sites on the outskirts of Denver. However, Pueblo would likely see expanded rail activity if the Tennessee Pass were brought back into service.

The current rail infrastructure in Pueblo, CO is a good foundation for a revitalization of the Tennessee Pass. Using Google Earth Pro, we examined the area surrounding Pueblo Yard. As shown in Attachment No. 1, Pueblo Yard is still being operated and is in good condition. Currently, both UP and BNSF are operating through Pueblo.

Rail consolidations, notably the UP acquisition of Missouri Pacific ("MoPac"), have eliminated redundant crossings of the Arkansas River in downtown Pueblo. MoPac once had a rail line that connected to Pueblo Yard and crossed the Arkansas River (see page 3 of Attachment No. 1). This MoPac track has been abandoned, along with the MoPac bridge that was formerly used to cross the Arkansas River (see page 8 of Attachment No. 1).

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[82] *See*, "*Trains to make tracks: Union Pacific Plans to move rail yards out of downtown*" by John Rebchook, published February 3, 2004. Accessed January 30, 2017, from https://www.highbeam.com/doc/1G1-112909161.html.

While the MoPac bridge is no longer used to cross the Arkansas River, it is still possible for railroads to get across the river. Page 1 of Attachment No. 1 to this report shows that BNSF, UP and R&R have access to the tracks from Cañon City to Pueblo and BNSF and UP have access to the tracks from Pueblo to NA Junction (the western terminus of the Towner Line). Cañon City to Pueblo is owned by UP, with trackage rights assigned to BNSF and R&R. As discussed above, Cañon City to Pueblo is currently being operated by R&R and it is unclear whether UP or BNSF still have active traffic on this segment of the Tennessee Pass.

Regarding the active Pueblo to NA Junction segment, publicly available BNSF track charts and UP timetables show that BNSF owns approximately 13 miles of track from Pueblo Jct. to Avondale and UP owns approximately 13 miles of track from Avondale to NA Junction. This arrangement was the result of BNSF predecessor Atchison, Topeka and Santa Fe ("ATSF") and UP predecessor MoPac consolidating the two companies' parallel routes between Pueblo and NA Junction into one rail line. Currently, UP's timetable states that trains operating between Pueblo and NA Junction are governed by BNSF operating rules and timetables. It appears that both UP and BNSF have had traffic that runs over the line from Pueblo to NA Junction in recent years.

To get from Pueblo to NA Junction both UP and BNSF must cross the Arkansas River. This crossing is possible due to a bridge that is north of the demolished MoPac bridge. Using Google Earth Pro satellite imagery, we were able to identify the bridge currently being used to ensure that it is still intact.

Attachment No. 1 to this Report, displays the abandoned MoPac bridge as well as the bridge currently used by UP and BNSF, which is close to the major wye in the center of Pueblo, to cross the Arkansas River.[83] Given that UP and BNSF are currently operating over the Arkansas River, crossing the river would not be a hurdle in reactivating rail service over the entire line from

[83] *See,* Attachment No. 1 pages 3 and 6-8.

Dotsero, CO to Towner, CO. However, this assumes that a transfer of Tennessee Pass ownership would include a transfer of the UP trackage rights that allows UP to operate east of Pueblo to NA Junction on BNSF rail lines that cross the Arkansas River.

Attachment No. 19 to this Report is a series of schematics displaying the Tennessee Pass connection to the BNSF and UP tracks in Pueblo, CO and further east to NA Junction, CO. As shown on pages 2 and 3 of Attachment No. 19, the Tennessee Pass connects with the BNSF and UP tracks in the Pueblo Yard. Both BNSF and UP have joint trackage rights to travel east from Pueblo Yard through Nyberg, CO to NA Junction, CO.

3. Potential Limitations to Restoring Operations

While the majority of the Tennessee Pass has been inactive for at least 20 years, this does not mean that the entire rail line can simply be acquired without UP's consent and restored without some hurdles. As discussed above, portions of the Tennessee Pass are still active and used by both UP and other railroads. Approximately 12 miles of the eastern portion of the Tennessee Pass is also used for tourist activities. Some of the limitations to restoring Tennessee Pass operations are discussed below.

a. Western End Limitations

If UP is unwilling to transfer ownership of the 10.7-mile portion of the line between Sage and Dotsero to KCVN, unless it is acquired as part of a larger "Feeder Line" application under 49 U.S.C. §10907 seeking the forced sale of the entire line, constructing a new parallel route adjacent to the UP ROW would prove costly.

Based on a typical railroad ROW width of 100 feet, extending 50 feet to either side of the track centerline, new track could not be built inside the 100 foot ROW without UP's permission. Assuming UP's Sage to Dotsero rail line ROW is 100 feet wide, we used Google Earth Pro to measure 100-foot ROW points along this section of track. Attachment No. 20 shows 13 locations where we believe obstacles exist in constructing a new rail line. These "choke" points would prevent construction of railroad track adjacent to the existing UP ROW. For example, page three (3) of Attachment No. 20 illustrates the UP rail line running parallel to the Eagle River on the north side of the track and mountains on the south, both of which are very close to UP's existing ROW. The Sage to Dotsero rail line also runs through towns that have roads, houses and businesses directly adjacent to the rail line. Pages four (4) through seven (7) of Attachment No. 20 provide Google Earth Pro images of some of the road crossings throughout the Sage to Dotsero segment.

The close proximity of the mountains, rivers and buildings to the UP ROW would make construction in this area extremely costly. Any potential new rail construction in this area would require excavating portions of the mountain to the south of the UP rail line and/or building bridges that traverse the river and highways to the north of the UP rail line. The buildings and houses within close proximity of UP's ROW would also have to be considered. A separate analysis would need to be performed to develop rail line construction costs for this section of the Tennessee Pass route, if this alternative was deemed appropriate.

b. <u>Eastern End Limitations</u>

The existing freight and passenger operations on the Eastern end would complicate a potential Feeder Line application since such applications are typically for the sale of lines that are not in use or over which service is inadequate. However, the fact that UP: (1) still owns the 39.57 miles of Tennessee Pass line between Cañon City and Pueblo, currently used by R&R via trackage rights; and (2) retained an exclusive permanent easement to provide overhead freight rail service over the 11.75 miles acquired by Royal Gorge Express would not, in and of itself, defeat an attempt to acquire the entire Tennessee Pass line through a Feeder Line application. There is STB precedent prohibiting an incumbent rail carrier from segmenting a line of rail into its non-profitable/inactive and profitable/active portions for purposes of a forced sale.[84]

Additionally, as noted above in footnote 10, an arbitrator determined in 1999 that UP's consent was not required for an assignment of BNSF's trackage rights between Cañon City and Pueblo to R&R. This may present an alternative means for a new operator to obtain rights to operate trains from Pueblo to Cañon City and the remainder of a rebuilt Tennessee Pass.

c. Towner/K&O Line

As discussed above, connecting to the Tennessee Pass to the east of Pueblo, CO via trackage rights is the KCVN-owned Towner rail line ("Towner Line"). The Towner Line is approximately 121 route miles long spanning from NA Junction, CO to Towner, CO. Attachment No. 19 to this Report, discussed above, displays the connection between the Tennessee Pass and Towner Line in Pueblo, CO as well as the end points of the Towner Line at NA Junction, CO and Towner, CO.

Connecting to the Towner Line to the east at Towner, CO is the Kansas & Oklahoma Railroad ("K&O"), which is a subsidiary of Watco Companies, LLC ("Watco"). K&O began operations in 2001 and consists of 904 track miles which span from Wichita, KS to Towner, CO.[85] K&O operates through 23 Kansas counties and one Colorado county. Page 1 of Attachment No. 19 to this Report, discussed above, displays the connection between the Towner Line and the K&O in Towner, CO, as well as the rest of the K&O rail lines stretching east from Towner, CO.

Much of the anticipated growth of rail traffic in the Pueblo, CO area will be freight that is both heavy (e.g., crude and grain unit trains) or very large (e.g., 150 foot wind blades, double-stack

[84] *See, Caddo Antoine and Little Missouri R. Co. v. STB*, 95 F.3d 740 (8th Cir. 1996), reversing the ICC decision that the rail line could be segmented.

[85] *See,* "*Kansas and Oklahoma Railroad*". Accessed January 14, 2018 from https://www.watcocompanies.com/services/rail/kansas-and-oklahoma-railroad-ko/.

intermodal units). We previously discussed the Moffat Tunnel limitations but it would be prudent to also consider the limitations of the other connecting rail lines in the area, namely the K&O rail line between Towner, CO and Great Bend, KS.

Nearly all Class I rail lines in Colorado are capable of carrying the standard 286,000 pound freight rail cars.[86] Based on publicly available information, it appears the Towner Line is also capable of handling 286,000 pound freight rail cars, based on the type of rail that was installed.[87] The portion of the Towner Line from NA Junction to Arlington, CO was upgraded to accommodate 286,000 pounds Gross Weight on Rails ("GWR").[88] This portion of track, approximately 40% of the 134.6 miles of Towner Line track, has 136 pound rail.[89] The remainder of the Towner Line from Arlington, CO to Towner, CO consists mainly of 112 pound and 115 pound jointed rail.[90] Assuming the other track variables on this portion of the line are at FRA Class 2 standards or above, the 112/115 pound jointed rail should be able to handle 286,000 pound GWR.

The K&O Line, however, may present a limitation to the weight of rail shipments. The K&O line connects to the Towner Line at Towner, CO. The 183 mile stretch of the K&O between Towner, CO and Great Bend, KS is not capable of carrying the heaviest traffic.[91] This section has a weight capacity of 263,000 pounds GWR.[92]

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[86] *See*, "*Colorado State Freight and Passenger Rail Plan*", Colorado Department of Transportation, March 2012 at page 6-1. *See also,* BNSF weight restriction map for 4 Axle Cars, published January 1, 2017. Accessed on January 16, 2018, at http://www.bnsf.org/ship-with-bnsf/maps-and-shipping-locations/pdf/weight-a.pdf and UP Weight Restriction map, published on February 10, 2017. Accessed on January 16, 2018 at https://www.up.com/cs/groups/public/@uprr/@customers/documents/up_pdf_nativedocs/pdf_up_gross_allow_map_large.pdf.

[87] Note: there are numerous variables that determine if a rail line is capable of handling 286,000 lb. rail cars, including but not limited to ties, ballast, grade, condition of rail, etc. For this example, we assumed these variables will be upgraded to the proper level to handle 286K lb. rail cars.

[88] Fauth's Verified Statement ("VS") filed for KCVN on March 18, 2016 in the feeder line application.

[89] Reply testimony submitted by Gerald Fauth on behalf of KCVN/CPRR. 51.83 miles of the Tower line have 136 lb. CWR and 1.29 miles have 136 lb. jointed rail.

[90] Fauth's VS filed for KCVN on March 18, 2016 in the feeder line application.

[91] *See*, "*Kansas Statewide Rail Plan*", Kansas Department of Transportation, September 2017 at page 4-7.

[92] Kansas and Oklahoma web page accessed on January 15, 2018 at https://www.watcocompanies.com/services/rail/kansas-and-oklahoma-railroad-ko/.

UP's network in Kansas is capable of carrying maximum loaded car weights of 286,000 pounds GWR or more. In addition, UP has no clearance restrictions on its network in Kansas.[93] Likewise, BNSF's network in Kansas is capable of carrying maximum loaded car weights of 286,000 pounds GWR and it has no clearance restrictions in Kansas.[94] Therefore, the Tennessee Pass will be limited by shipments that require 286,000 GWR capacity and need to originate, terminate or traverse the K&O line east of Towner, CO as it is currently configured.

Attachment No. 21 to this Report delineates all of the locations and weight of rail/rail capacities discussed above.

B. <u>WESTERN U.S. RAIL MARKET</u>

BNSF and UP dominate freight rail transportation west of the Mississippi River. As shown in Figure No. 2 below, the Tennessee Pass is geographically located between the UP's high-density line to the north and BNSF's high-density line to the south.

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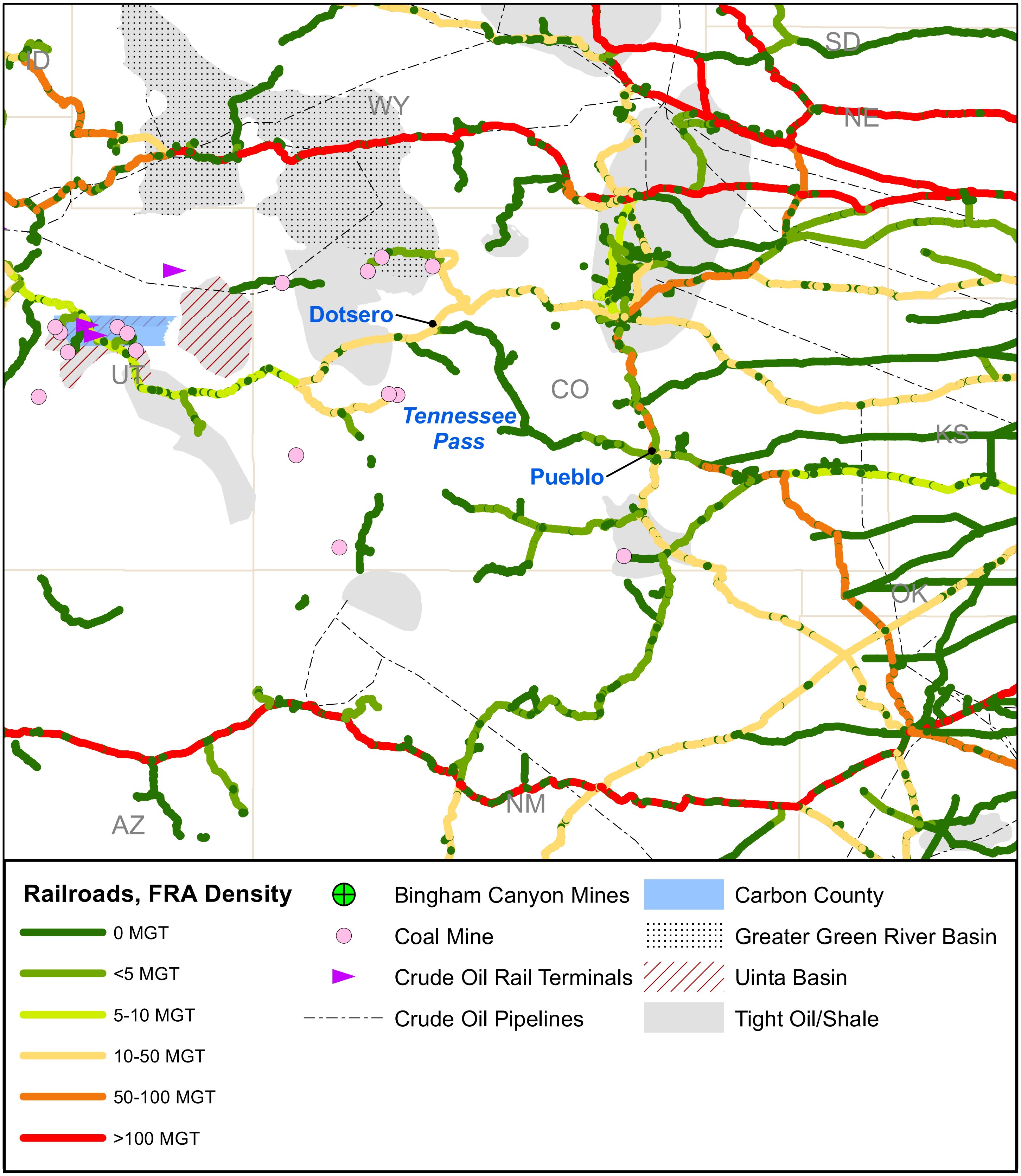
93 *See,* "*Kansas Statewide Rail Plan*", Kansas Department of Transportation, September 2017 at page 2-9.

94 *Id.* at page 2-5. *See also,* BNSF weight restriction map for 4 Axle Cars, published January 1, 2017. Accessed on January 16, 2018, at http://www.bnsf.org/ship-with-bnsf/maps-and-shipping-locations/pdf/weight-a.pdf and UP Weight Restriction map, published on February 10, 2017. Accessed on January 16, 2018 at https://www.up.com/cs/groups/public/@uprr/@customers/documents/up_pdf_nativedocs/pdf_up_gross_allow_map_large.pdf

Figure No. 2
UT and CO Energy Resources and Rail Densities



The Tennessee Pass is strategically located to offer a route that avoids some of the country's most congested rail lines with connections to both railroads. In 2016, 1.6 billion tons of freight were carried by the seven (7) U.S. Class I railroads. Over ninety percent of the freight is bulk commodities, such as agriculture and energy products, automobiles and auto parts, construction materials, chemicals, coal, equipment, food, metals, minerals and paper products. The remaining freight is intermodal traffic which generally consists of consumer goods and other miscellaneous products.[95]

Table 14 below shows the total tons and revenue for each commodity group in 2016.

Table 14
Class I Railroad Freight Carried in 2016

	Tons		Revenue	
Commodity Group	**Originated (000)**	**% of Total**	**In Millions**	**% of Total**
(1)	(2)	(3)	(4)	(5)
1. Coal	491,654	31.6%	$9,091	13.9%
2. Chemicals	176,235	11.3%	$9,998	15.3%
3. Farm Products (includes Grain)	155,977	10.0%	$6,103	9.3%
4. Non-metallic Minerals	154,132	9.9%	$2,821	4.3%
5. Misc. Mixed Shipments 1/	118,887	7.7%	$8,819	13.5%
6. Food & Kindred Products	98,823	6.4%	$5,635	8.6%
7. Refined Petroleum & Coke	52,711	3.4%	$2,656	4.1%
8. Metallic Ores	51,934	3.3%	$472	0.7%
9. Metals and Products	42,327	2.7%	$2,228	3.4%
10. Stone, Clay & Glass Products	41,521	2.7%	$1,706	2.6%
11. Waste & Scrap Materials	39,556	2.5%	$1,153	1.8%
12. Pulp, Pater & Allied Products	31,268	2.0%	$2,204	3.4%
13. Lumber & Wood Products	24,511	1.6%	$1,917	2.9%
14. Motor Vehicles & Equipment	22,279	1.4%	$5,540	8.5%
15. Crude Petroleum & Natural Gas	20,615	1.3%	$1,075	1.6%
16. Apparel & Textiles 1/	4,763	0.3%	$452	0.7%
17. Empty Trailers 1/	4,226	0.3%	$643	1.0%
18. All Other	22,082	1.4%	$2,907	4.4%
19. Total	1,553,501	100.0%	$65,420	100.0%

1/ This Group is 99% intermodal traffic.
Source: "*Class I Railroad Statistics*" Association of American Railroads.

[95] *See*, "*Class I Railroad Statistics*" by the Association of American Railroads, published May1, 2017 (https://www.aar.org/Documents/Railroad-Statistics.pdf).

Projections released in March 2016 by the U.S. Department of Transportation's Bureau of Transportation Statistics ("BTS") and Federal Highway Administration ("FHWA") show that freight tons moving on the nation's transportation network will grow 40 percent in the next three (3) decades while the value of the freight will almost double, increasing by 92 percent.[96] For rail specifically, the freight tonnage is projected to increase by 24 percent to 2,094 million tons.[97]

1. <u>Grain</u>

As discussed above, over 90 percent of the Class I railroads' 2016 freight tons consisted of bulk commodities and one of those bulk commodities is grain.[98] The United States is the world's top grain producer with an average annual grain production of 561 million tons since 2007.[99] The market, particularly the export market, is notoriously volatile and complex.

Large fluctuations in U.S. grain production are common from one year to the next due to factors such as weather, global stockpiles and the strength of the U.S. dollar.

In 2016, Class I railroads originated 1.54 million carloads of grain (5.6 percent of total carloads) carrying 149.4 million tons (9.6 percent of total tonnage) and earning gross revenue of $5.6 billion (8.6 percent of total revenue)."[100] Four (4) states (Illinois, Minnesota, Nebraska and North Dakota) accounted for approximately half of all originated rail tons of grain in 2016.[101] Likewise, the top states in terms of rail terminations of grain are typically Washington, Texas, Illinois and California, which accounted for nearly half of all rail grain terminations in 2016.[102]

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96 Bureau of Transportation Statistics "DOT Releases 30-Year Freight Projections", published March 3, 2016. Accessed December 20, 2017, from http://www.rita.dot.gov/bts/press_releases/bts013_16.

97 *Id.*

98 Corn, soybeans, oats, wheat, rice, rye, sorghum and barley are all considered grains.

99 *See,* "*Railroads and Grain*" Association of American Railroads, published June 2017. Accessed January 4, 2018 from https://www.aar.org/BackgroundPapers/Railroads%20and%20Grain.pdf.

100 *Id.*

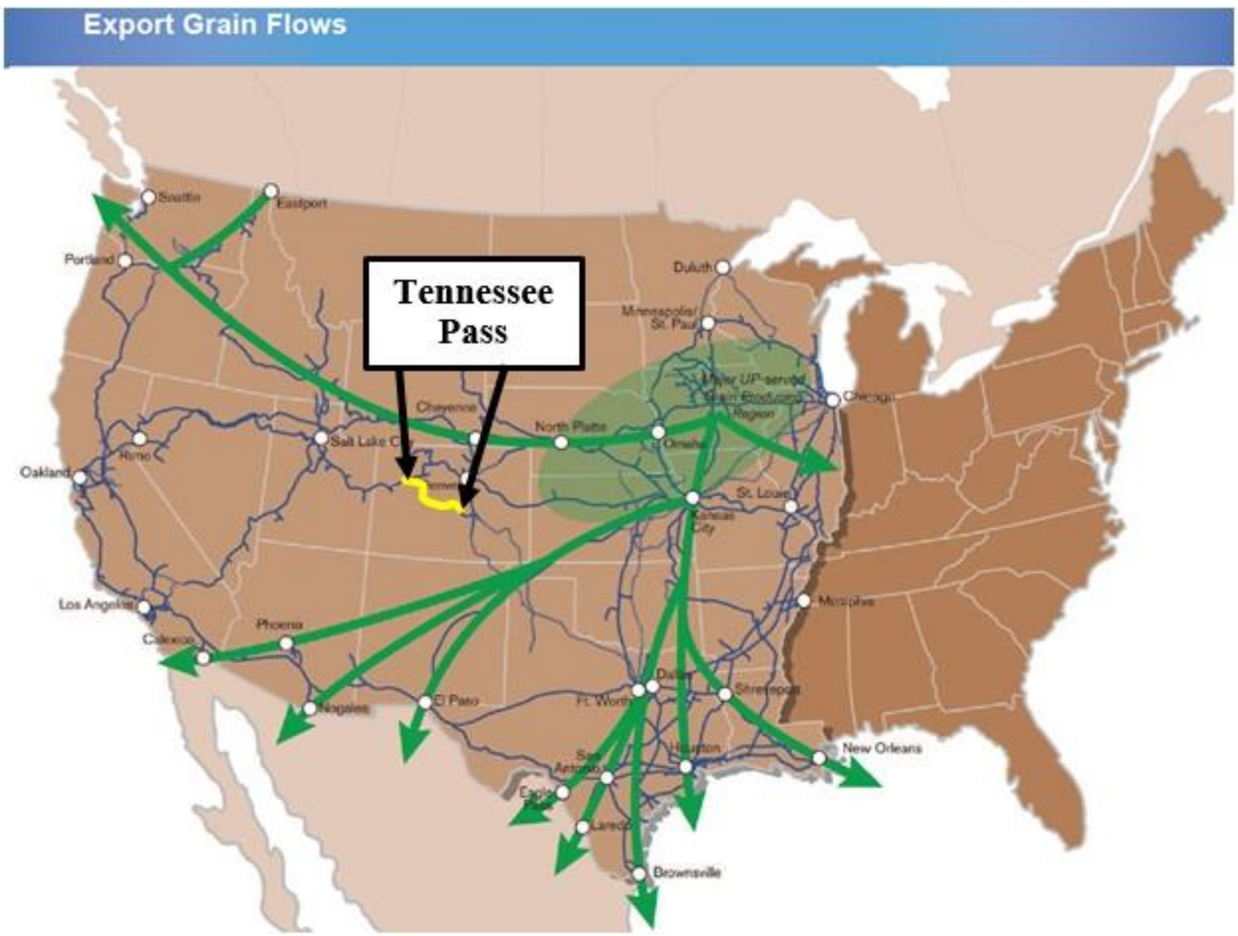
101 *Id.*

102 *Id.*

UP accesses most major grain markets, linking the Midwest and western U.S. production areas to export terminals in the Pacific Northwest, Gulf Coast ports and Mexico. UP also serves various domestic markets, including grain processors, livestock producers and ethanol facilities throughout the western United States. According to UP's 2016 Investor Factbook, freight revenues from agricultural products generated 19.5 percent of the railroad's 2016 freight revenue.[103]

The map in Figure No. 3 below shows the major grain production region served by UP, as well as the export grain flows.

Figure No. 3



Source: UP 2016 Investor Factbook.

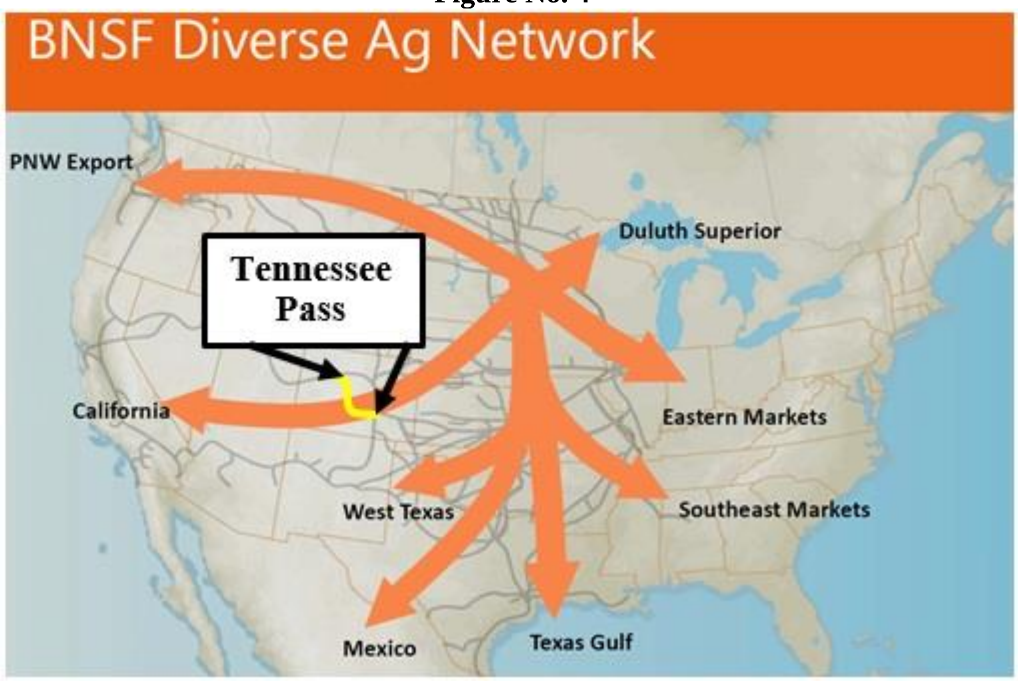
[103] Union Pacific Corporation's "*2016 Investor Fact Book*" published May 8, 2017. Source: http://www.up.com/investor/factbooks/. Agricultural Revenue of $3,625 million (page 12 "Annual Summary by Quarter – Agricultural Products") ÷ Total Freight Revenues of $18,601 (page 29 "Selected Financial Data") = 19.49%.

BNSF is also closely pursuing the country's grain markets. In BNSF's mid-third quarter 2017 ("3Q17") earnings release, BNSF states that:

> Agricultural Products volumes were down 12 percent and up 1 percent for the third quarter and the first nine months of 2017, respectively, compared with the same periods in 2016. The volume decrease in the third quarter was driven by lower grain exports, partially offset by higher domestic grain. The volume growth in the first nine months of 2017 was primarily due to higher shipments of domestic grain as well as ethanol and other grain products, partially offset by lower grain exports.[104]

BNSF grain traffic flows in a similar manner to UP traffic, with originations in the Northern Great Plains flowing primarily south and west, as shown in Figure No. 4 below.

Figure No. 4



The Tennessee Pass is ideally situated to link grain producers in the Upper Great Plains to export and food processing markets in central and southern California. For example, westbound grain shuttle trains could be directly interchanged by the BNSF at Pueblo, CO and handed off again at Dotsero, CO. Such a move would bypass the Denver, CO terminal and avoid trackage

[104] *See*, "*BNSF's Third-Quarter 2017 Financial Performance: Volumes, Revenues and Expenses*". Source: https://www.bnsf.com/about-bnsf/financial-information/performance-summary/pdf/ performance_ update_3Q_2017.pdf.

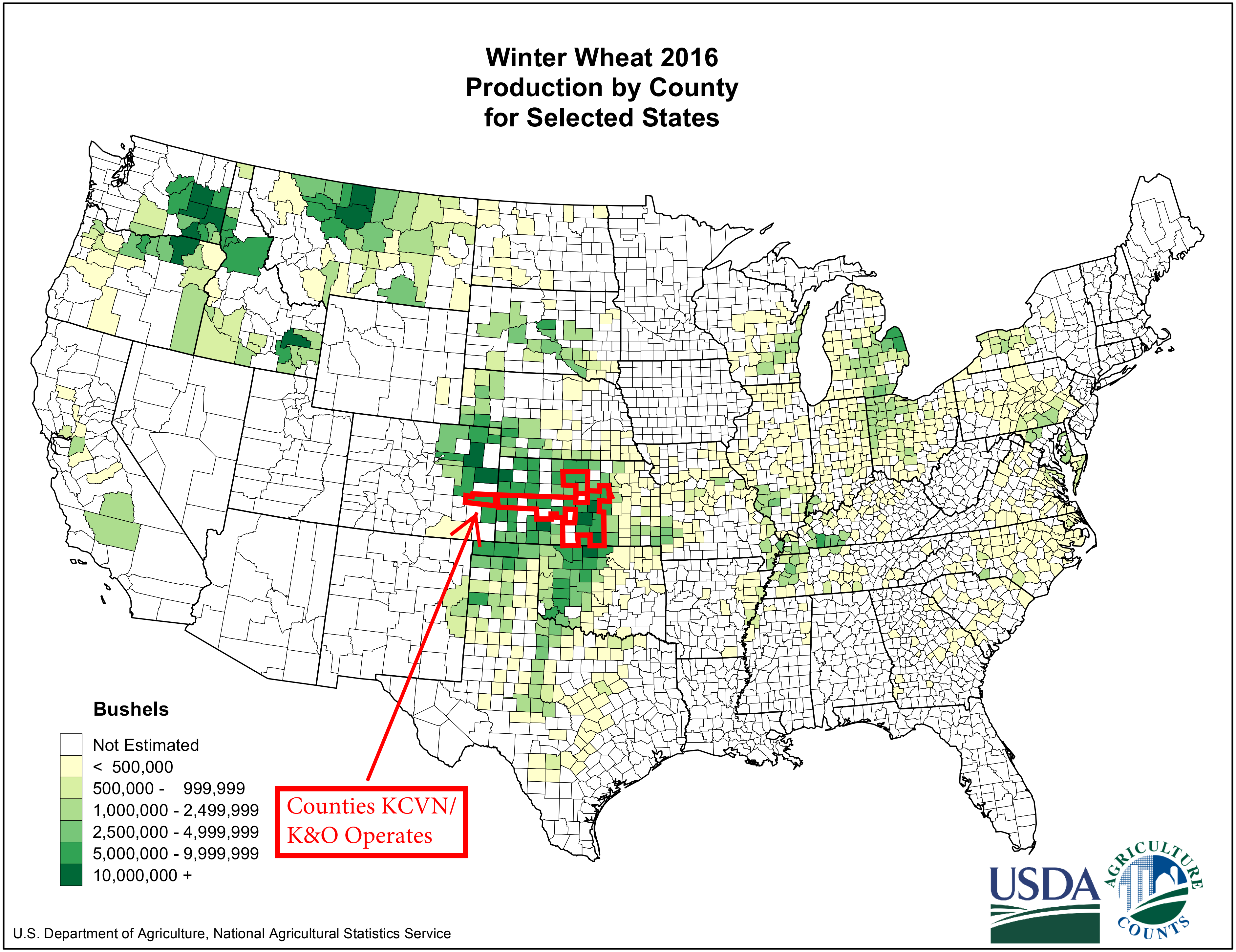
rights over the summit in UP's busy Moffat Tunnel Subdivision. The easier gradient of the east and west sides of the Tennessee Pass would not be too steep for such loaded grain unit trains, with the potential for helper engines around Minturn, CO on the western slope.

a. <u>Wheat</u>

As stated above, the Tennessee Pass is ideally situated to interact with the Towner/K&O rail line east of Pueblo, CO. The Towner/K&O rail lines operate through 23 Kansas counties and three Colorado counties, all of which are major grain territories. Kansas is the largest U.S. producer of wheat, producing 467.4 million bushels in 2016.[105] The U.S. Department of Agriculture ("USDA") map shown in Figure No. 5 below displays the 2016 winter wheat production, broken down by county. The red boxes outline the counties where the KCVN/K&O operates.

[105] USDA's *"2016 State Agriculture Overview"*. Accessed January 13, 2018, from https://www.nass.usda.gov/Quick_Stats/Ag_Overview/stateOverview.php?state=KANSAS.

Figure No. 5



Winter Wheat 2016
Production by County
for Selected States
Bushels
Not Estimated
< 500,000
500,000 - 999,999
1,000,000 - 2,499,999
2,500,000 - 4,999,999
5,000,000 - 9,999,999
10,000,000 +
Counties KCVN/
K&O Operates
U.S. Department of Agriculture, National Agricultural Statistics Service
USDA
AGRICULTURE COUNTS

K&O's portion of rail line from Towner, CO to Lyons, KS is approximately 215 miles long.[106] This stretch of K&O runs through the Kansas counties of Greeley, Wichita, Scott, Lane, Ness, Rush, Barton and Rice. Of these eight (8) counties, the USDA estimated that all but Scott and Rush County (no estimate was provided for these counties) produced between 5.0 and 9.99 million bushels of winter wheat in 2016.[107]

As previously mentioned, Kansas is the largest producer of wheat in the U.S. According to the USDA's Economic Research Service, Kansas realized wheat cash receipts of $1.4 billion for the year 2016, approximately 21.7% of Kansas's total crop cash receipts.[108] Approximately 60% ($844.6 million) of wheat produced in Kansas was exported in 2016.[109] This highlights the need for rail transportation, as the wheat must be transported to major port cities in order to be exported to other countries.

According to a November 2014 report published by the USDA, wheat is exported through three (3) areas of the U.S. with major port operations, the Pacific Northwest, Mississippi Gulf and Texas Gulf. Table 15 below displays the largest wheat export port locations in the United States.

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[106] *See,* Attachment No. 21 to this Report.
[107] *See,* Figure No. 5 above.
[108] USDA's *"Cash receipts by commodity"*. Accessed January 15, 2018, from https://data.ers.usda.gov/reports.aspx?ID=17845#P0b72aa9a83864807a0df4b22e0512a5c_2_18iT0R0x16.
[109] United States Census Bureau's *"State Exports from Kansas"*. Accessed January 15, 2018, from https://www.census.gov/foreign-trade/statistics/state/data/ks.html.

Table 15
Major U.S. Wheat Export Locations[110]

	Port Location	% of Export
	(1)	(2)
1.	Pacific Northwest	35.4%
2.	Mississippi Gulf	29.1%
3.	Texas Gulf	27.4%
4.	Interior	3.3%
5.	Great Lakes	2.7%
6.	Atlantic	2.2%
7.	Total	100.0%

Figures may not add due to rounding.

The exact location of the ports to which Kansas wheat is shipped is not publicly available information. However, we do know that these four (4) countries: Mexico (18.5%), Canada (17.6%), Japan (7.9%) and China (7.3%) received more than half (51.3%) of Kansas's $10.2 billion in total exports in 2016.[111] Since wheat is the second largest export, accounting for 8.3% of Kansas' total exports,[112] this sheds some light on the potential U.S. port locations shipping Kansas wheat.

If we assume the total export percentages for the four (4) major Kansas countries listed above apply to wheat, 18.5% of Kansas's wheat exports get shipped to Mexico ($157.3 million), 17.6% get shipped to Canada ($149.6 million), 7.9% get shipped to Japan ($67.2 million) and 7.3% get shipped to China ($62.1 million).

The Tennessee Pass and the Towner/K&O line are ideally suited to take advantage of some of these Kansas wheat export shipments. Assuming no paper barriers exist and appropriate interchange/trackage rights agreements are negotiated, the Towner/K&O line could interchange

110 *See,* Denicoff, Marina R., Marvin E. Prater and Pierre Bahizi, *"Wheat Transportation Profile"*. U.S. Department of Agriculture, Agricultural Marketing Service, November 2014. Accessed January 15, 2018, from https://www.ams.usda.gov/sites/default/files/media/Wheat%20Transportation%20Profile.pdf.
111 United States Census Bureau's *"State Exports from Kansas"*. Accessed January 15, 2018, from https://www.census.gov/foreign-trade/statistics/state/data/ks.html.
112 $850 million ÷ $10.2 billion = 8.3%.

with both UP and BNSF on the west end of its line at Pueblo Yard, CO (or NA Junction, CO) and on the east end of its line at Hutchinson, KS or Wichita, KS. The Tennessee Pass could take advantage of wheat shipments originating in Kansas and moving west.

Export wheat shipments to Mexico originating on the K&O line and heading east could interchange with BNSF at Hutchinson, KS or UP at Wichita, KS. BNSF or UP would then move this wheat south toward the Gulf of Mexico. The Mexico shipments could also head west on the Towner/K&O line and interchange with BNSF or UP in Pueblo Yard, CO and then head south.

For the wheat moving north toward Canada, originations on the Towner/K&O line could again head east or west. Wheat shipments could head east and interchange with either BNSF or UP at Hutchinson, KS and both would likely take the wheat from Hutchinson north to Canada by passing through Kansas City, MO. Canadian export wheat shipments originating on the Towner/K&O line could also head west, interchange with BNSF or UP at Pueblo Yard, CO and then head north to Canada.

For shipments to Japan and China, assuming the wheat is shipped out of the Pacific Northwest ports, the current BNSF and UP routes would likely consist of Towner/K&O shipments delivered to BNSF and UP at Pueblo Yard, CO and then north to Denver, CO and finally making its way west. These Pacific Northwest shipments also have the potential to be shipped over the Tennessee Pass. Operating over the Towner Line and the Tennessee Pass would allow for an easier and more direct line of movement to the west coast.

While Kansas wheat does present large opportunities in terms of rail transportation, the Towner/K&O is not the only rail line that could potentially carry this traffic. The K&O line running from Towner to Lyons is paralleled by a UP line to the north and a BNSF line to the south. Therefore, grain shippers have the choice to ship solely with either UP or BNSF.

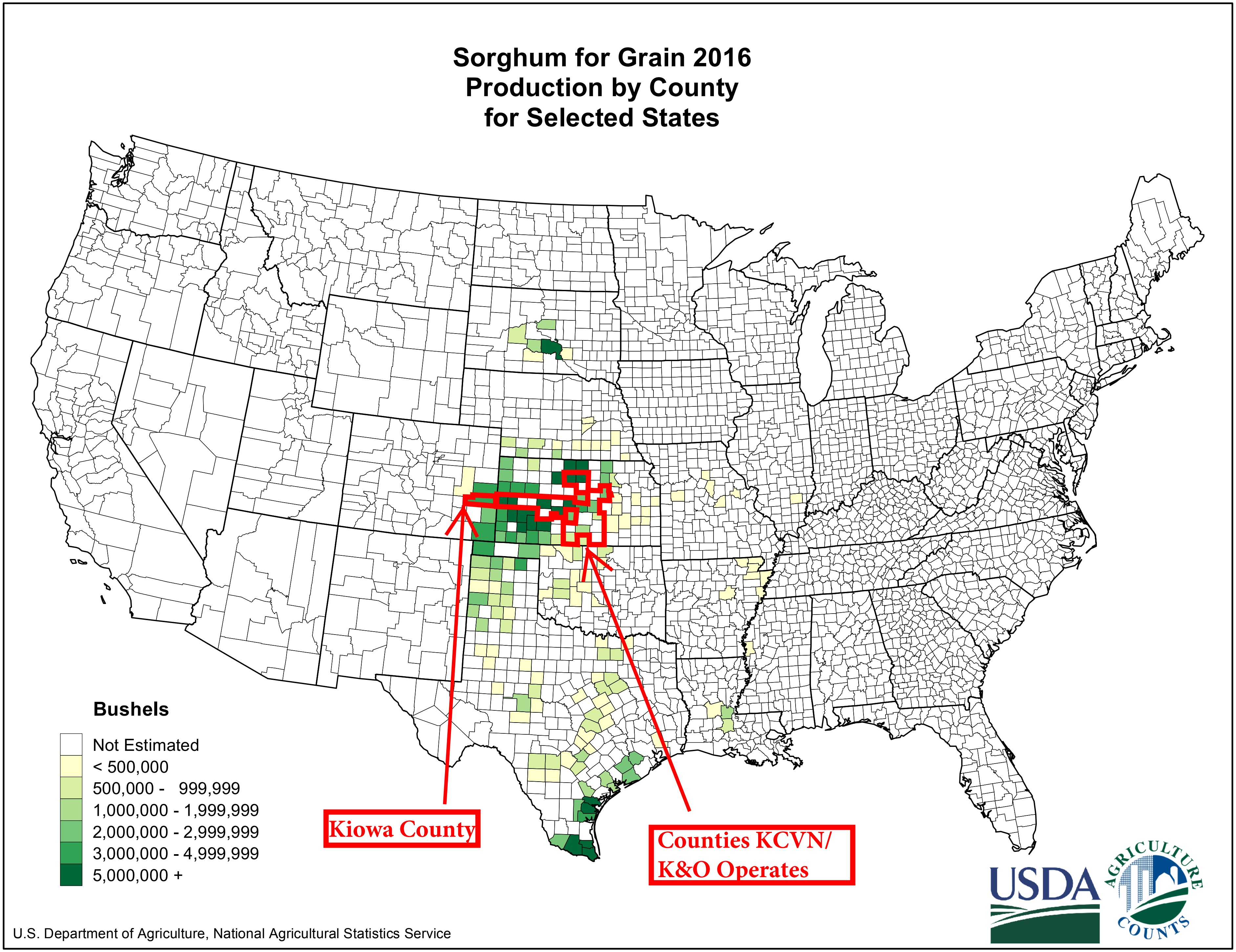
b. Sorghum

Sorghum, sometimes referred to as milo or maize, is another crop produced in Kansas along the Towner/K&O Line. Sorghum can be used for livestock feed or ethanol plants and has recently started gaining popularity in food products in the U.S. because it can be used in gluten-free food and is considered a non-genetically modified organism ("GMO"). As with wheat, Kansas is the largest producer of sorghum in the U.S., producing 268,450,000 bushels in 2016.[113]

Figure No. 6 below shows the 2016 U.S. sorghum production broken down by county with boundaries added to delineate the Colorado and Kansas counties in which KCVN/K&O operate. From the map it is clear that the Towner/K&O Line counties are major factors in the sorghum market, particularly Kiowa County, CO.

[113] USDA's *"Crop Production"*, published October 12, 2017. Source: https://www.usda.gov/nass/PUBS/TODAYRPT/crop1017.pdf.

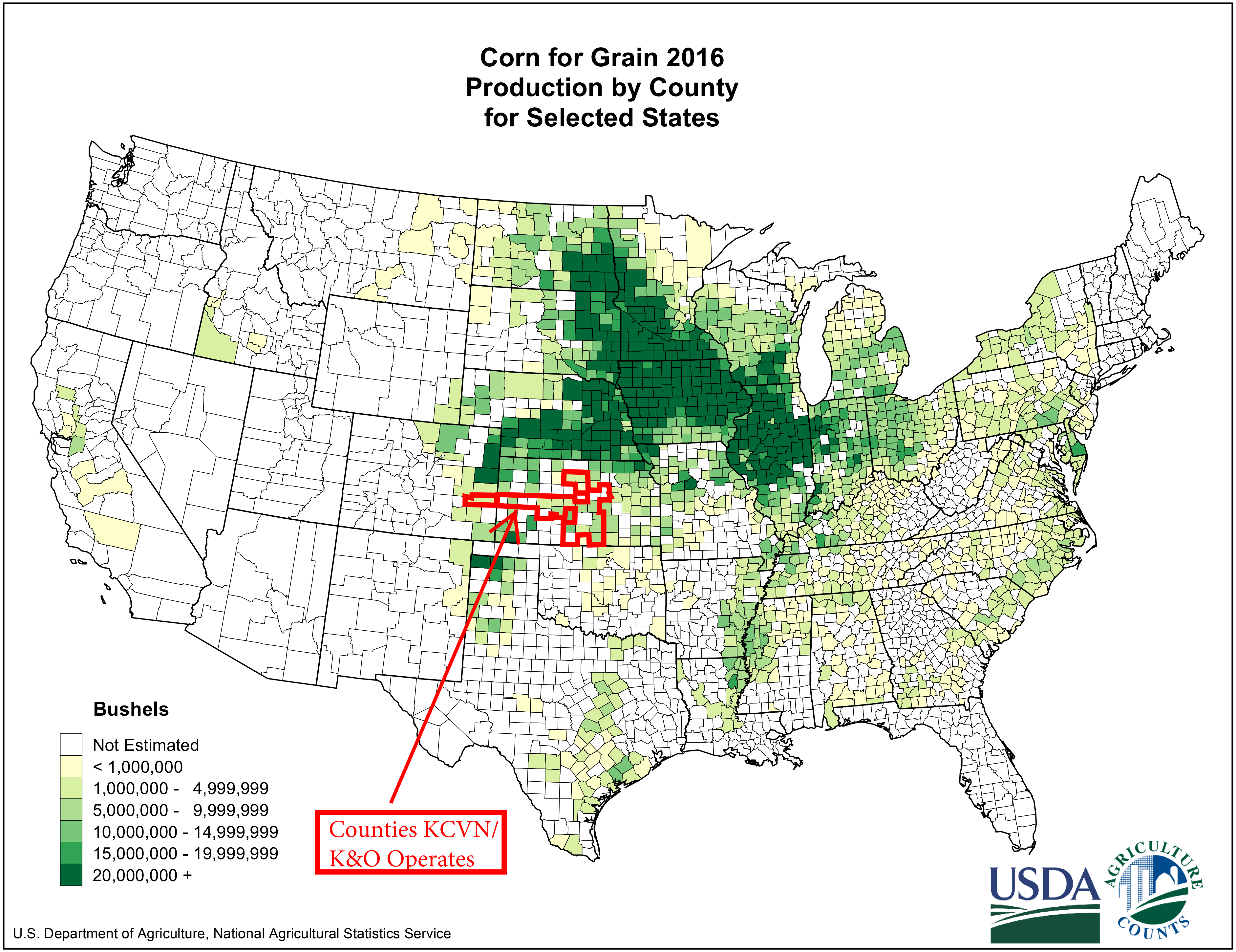
Figure No. 6


Sorghum for Grain 2016
Production by County
for Selected States
Bushels
Not Estimated
< 500,000
500,000 - 999,999
1,000,000 - 1,999,999
2,000,000 - 2,999,999
3,000,000 - 4,999,999
5,000,000 +
Kiowa County
Counties KCVN/
K&O Operates
U.S. Department of Agriculture, National Agricultural Statistics Service
USDA
AGRICULTURE COUNTS

c. **Corn**

Corn is another crop that is produced along the Towner/K&O line through Kansas. Figure No. 7 below highlights the 2016 U.S. corn production broken down by county. Boundaries have been added to the Colorado and Kansas counties in which KCVN/K&O operates to highlight the potential stake that the Towner/K&O Line has in the corn market. While not providing opportunities for large rail shipments, it is still worth noting that there are two (2) ethanol plants located along the Towner/K&O Line.

Figure No. 7


Corn for Grain 2016
Production by County
for Selected States
Bushels
Not Estimated
< 1,000,000
1,000,000 - 4,999,999
5,000,000 - 9,999,999
10,000,000 - 14,999,999
15,000,000 - 19,999,999
20,000,000 +
Counties KCVN/
K&O Operates
U.S. Department of Agriculture, National Agricultural Statistics Service
USDA
AGRICULTURE COUNTS

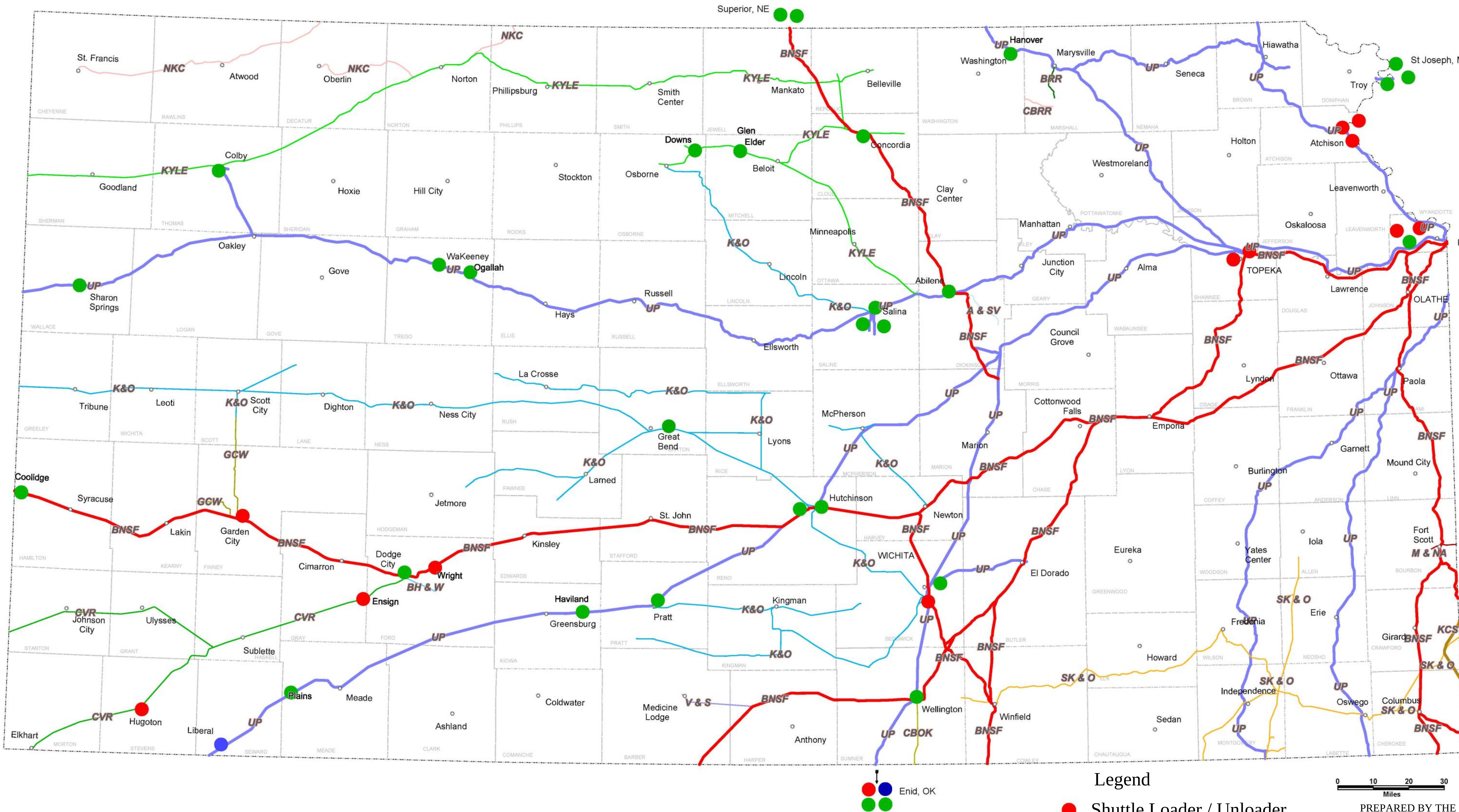
d. Shuttle Loaders/Grain Elevators

Given the large amount of Kansas grain production, shuttle loaders and grain elevators can be found throughout the state. Shuttle loaders, which are high capacity, high speed grain loading facilities, allow for greater shipping capacity and faster grain handling, as well as access to new markets. Figure No. 8 below was prepared by the Department of Transportation Bureau of Transportation Planning and identifies Kansas shuttle locations as of 2012.[114] This map distinguishes between locations that contain shuttle loaders, shuttle unloaders and both.

[114] As this map is from 2012, the Bartlett Great Bend facility, which was built in 2015, was not originally included. It has been added to the map to incorporate the new facility.

Figure No. 8

2012 Kansas Unit Loader Locations



Legend

- Shuttle Loader / Unloader
- Shuttle Loader
- Shuttle Unloader

PREPARED BY THE
DEPARTMENT OF TRANSPORTATION
BUREAU OF TRANSPORTATION PLANNING
09/14/12
Railroad_UnitLoader2012.gws

As shown in Figure No. 8 above, the only shuttle loader along the Towner/K&O line is found in Great Bend, Kansas. This shuttle loader is owned by Bartlett Grain Co. ("Bartlett") and was opened in April 2015. The Bartlett Great Bend facility "features approximately three million bushels of storage and is designed to load out 110-car unit trains."[115]

Great Bend is approximately 180 miles east of the Colorado border. The Great Bend facility along the K&O line is not the most viable option for grain producers in western Kansas given that there are no other shuttle loader facilities along the K&O line, coupled with the fact that UP and BNSF both have shuttle loader locations closer to Colorado. As shown in Figure No. 8 above, UP has four (4) shuttle loader locations west of Great Bend along the line that runs parallel to the north of K&O (Ogallah, WaKeeney, Colby and Sharon Springs). BNSF has two (2) shuttle loader locations (Dodge City and Coolidge), as well as two (2) shuttle loader/unloader locations (Wright and Garden City) along the line parallel to the south of K&O.

Based on Figure No. 8, it is apparent that farmers in western Kansas and eastern Colorado have easier access to shuttle loader facilities along the UP and BNSF lines vs. the K&O facility in Great Bend, which is captive to UP based on a current paper barrier. Building the facility in Colorado on the KCVN Towner Line would allow for the shuttle loader to have competitive options with access to UP and BNSF.

Grain elevators, which are used to store the grain, are found all throughout the state of Kansas including several along the Towner/K&O line. Bartlett operates four (4) grain facilities along the K&O line (Great Bend, Healy, Scott City and Towner), as well as two (2) facilities along the Towner line (Eads and Haswell). Figure No. 9 below is a map of the Towner/K&O line and shows the locations of the various Bartlett grain facilities along the lines.

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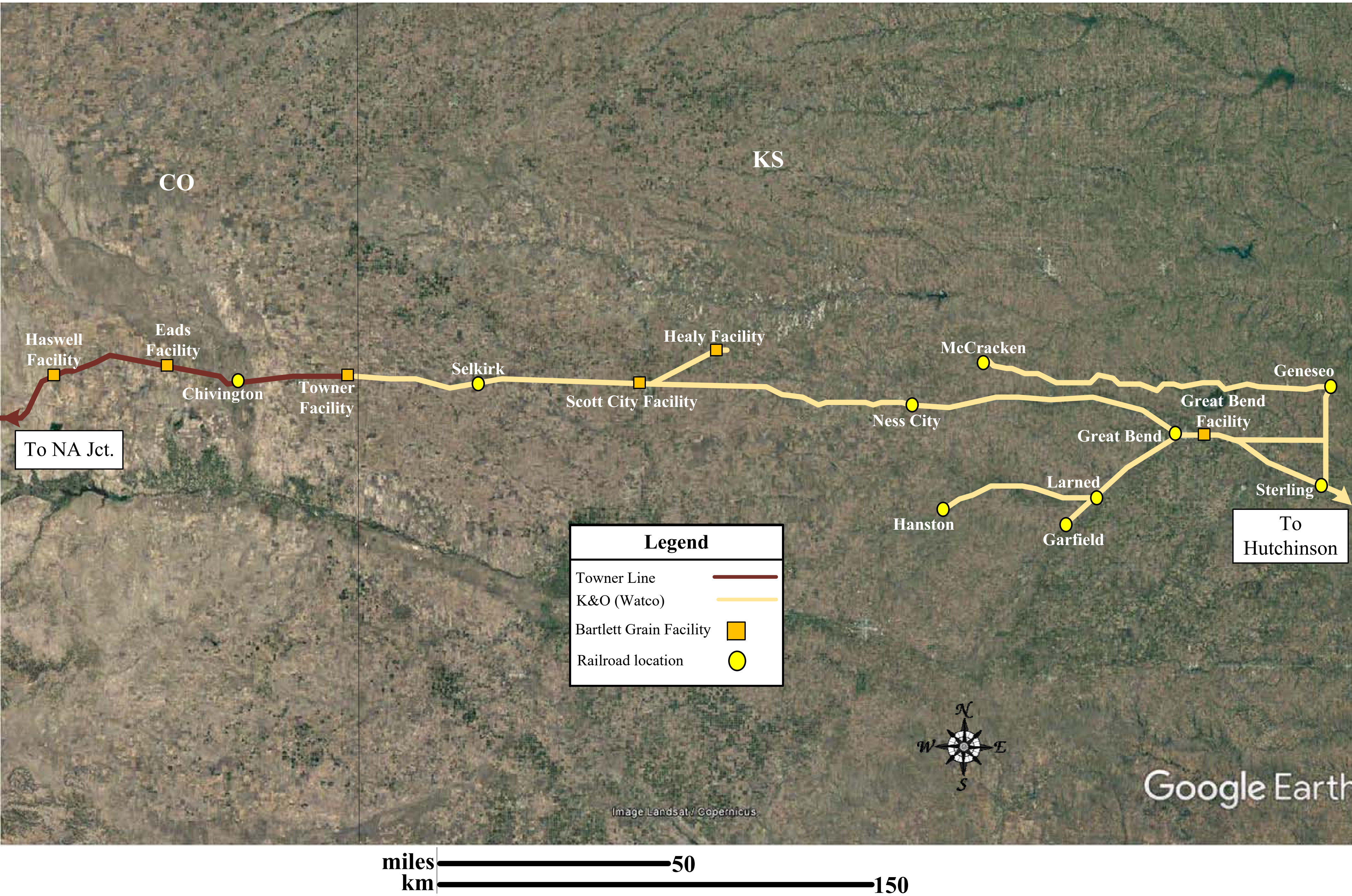
[115] *See*, Watco Companies, LLC and Watco Transportation Services, LLC *"the Dispatch"*, May 2015, Volume 16, Issue 5. Accessed January 14, 2018 from https://watcocompanies.com/wp-content/uploads/2015/05/MayWeb2015.pdf.

Figure No. 9

Bartlett & Company Grain Facilities Along Towner/K&O Line



2. Energy and Minerals

Though grain was the primary focus of our evaluation, Colorado and Utah export several other bulk commodities. The two (2) states have significant supplies of oil, natural gas, coal, uranium and base metals such as copper. In western Colorado and eastern Utah, there are twenty (20) coal mines (shown on the map in Figure No. 2 above) that produced a total of approximately twenty-three (23) million short tons in 2016.[116] Approximately sixteen (16) million tons of coal were delivered to utilities in Utah and California that would not have the potential to utilize the Tennessee Pass. However, over eight (8) million tons moved within Colorado and beyond and could potentially traverse the Tennessee Pass. These destination states along with their coal tonnages are listed in Table 16 below.

Table 16
Select Coal from CO and UT Mines and Destination States

	Destination Plant State (1)	**2016 Tons** (2)
1.	Arizona	348,691
2.	Colorado	6,429,057
3.	Florida	540,203
4.	Illinois	1,119
5.	Maryland	13,565
6.	Mississippi	384,215
7.	Nevada	425,062
8.	Ohio	545,904
9.	Pennsylvania	30,435
10.	Wisconsin	122,587
11.	Total	8,840,838

Source: 2016 EIA-923 data.

In Utah, non-fuel mineral production was valued at $2.4 billion in 2016. In Colorado, it was also $2.4 billion.[117] Combined, the two (2) states accounted for over five (5) percent of the

[116] U.S. Energy Information Administration ("EIA") Form 923 Electric Power data.

[117] *See*, "*Mineral Commodity Summaries 2017*" for the U.S Department of the Interior and published January 19, 2017. Source: https://minerals.usgs.gov/minerals/pubs/mcs/2017/mcs2017.pdf at Table 3 pages 10-11.

total U.S. production.[118] Copper is a significant value component of nonfuel minerals production in Utah, having an estimated value of $1.4 billion.[119] Rio Tinto's Kennecott Bingham Canyon Mine, adjacent to Salt Lake City, is the origin of nearly seven (7) percent of U.S. annual copper production,[120] or about 55,000,000 tons of copper ore per year.[121] Smelting and refining facilities supporting the Bingham Canyon mine are served by UP, which moves both inbound supplies and outbound copper and byproducts. The mine's location is shown on the map in Figure No. 2 above.

The potential for eastbound minerals traffic on the Tennessee Pass could be limited by the steep gradients on the west side of the line. High-tonnage trains moving eastward from the production areas in western Colorado and Utah might prove too costly to run over the Tennessee Pass from its connection with UP at Dotsero, CO because of high fuel consumption. However, westbound trains of empty cars returning from manufacturing and refining facilities could utilize the railroad to avoid Denver, CO and the steeper westbound gradient of the Moffat Line. Alternatively, if trains loaded with refined or unrefined mineral products were efficient, shorter shuttle-style unit trains, they could feasibly make the eastbound grade on their way to manufacturing facilities in the South-Central United States and Mexico.

3. <u>Intermodal</u>

Intermodal traffic represents the third largest traffic group by tonnage for the western United States. According to UP's 2016 Investor Factbook, "intermodal [traffic] utilizes just over

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[118] *Id.*

[119] *See*, "*An Analysis of a Transfer of Federal Lands to the State of Utah*" Prepared for: Public Lands Policy Coordination Office Utah Office of the Governor, Prepared by: University of Utah, Bureau of Economic and Business Research, Utah State University, Department of Applied Economics, Weber State University, Department of Economics, published November 2014, page 373. Source: http://publiclands.utah.gov/wp-content/uploads/2014/11/1.%20Land%20Transfer%20Analysis%20 Final%20Report.pdf.

[120] *See*, "*Operation*." Operation | riotintokennecott.com. Source: http://www.kennecott.com/operation.

[121] Rio Tinto's "*Kennecott Utah Copper's Bingham Canyon Mine: Teacher Guide*" published 2009. Source: http://www.kennecott.com/library/media/TeacherGuide.pdf.

half of the route miles of the Union Pacific network, routing freight between 33 UP-owned or operated intermodal terminals, as well as customer-operated, on-dock rail facilities."[122]

UP's network includes several key intermodal lanes. The east/west lanes connect the West Coast to Chicago, IL, Texas and interchange connections with Eastern U.S. railroads. The north/south intermodal lanes operate between Los Angeles and the Pacific Northwest, as well as between Chicago, IL and the upper Midwest to locations in Texas and Mexico. UP can also directly access all six (6) major Mexico gateways and serves most of the major metropolitan areas in the Western two-thirds of the United States. Virtually all routes are competitive with other railroads and are comparable to shipping distances on highways.

Intermodal traffic typically consists of lightweight "well" cars. Well cars are a type of railcar that are specially designed to carry intermodal containers. The well car consists of a depressed section, such as an indentation, that allows intermodal containers to sit closer to the rails than a traditional flatcar. This allows railroads to stack intermodal containers on top of one another and still be able to pass vertical clearance requirements. In other words, when traveling on a four (4) foot tall flatcar, an intermodal train carrying two (2) intermodal containers which are each nine (9) feet tall and stacked on top of one another would sit twenty-two (22) feet tall above the rail and would not be able to get through a tunnel with a twenty (20) foot clearance. However, with a well car, these intermodal containers would no longer be sitting four (4) feet high. Well cars would only be about one (1) foot high above the rail due to the depressed section and would be about nineteen (19) feet high in total, which would provide no problem getting through a tunnel requiring twenty (20) foot clearance.

[122] Union Pacific Corporation's "*2016 Investor Fact Book*" page 22. Source: http://www.up.com/investor/factbooks/.

Class I railroads are acutely focused on maximizing the efficiencies of high-density rail lines. UP's west-to-east intermodal traffic primarily uses its Wyoming crossing of the Rockies (via Cheyenne, WY) as well as the so-called Sunset Route along the Mexican border, which was recently the beneficiary of large capital expenditures to improve train velocity. Likewise, BNSF intermodal traffic uses the former Great Northern and Northern Pacific rail lines across Montana and Idaho, while BNSF's southern "Transcon" summits the Rockies in New Mexico.

UP has the capability to carry double-stack intermodal traffic over its Wyoming and its Desert Southwest transcontinental routes, but traffic over its Central Corridor with the Moffat Tunnel rail line and now defunct Tennessee Pass, was diverted to UP's rail corridor through Wyoming following the UP/SP merger. The Central Corridor cannot handle double-stack intermodal traffic due to the physical characteristics of the Moffat Tunnel. Double-stack intermodal trains are typically twenty (20) feet high above the rail. UP's publicly available timetables explicitly prohibit double-stack equipment, auto-rack equipment, or any other rail equipment with a vertical distance above the rail of greater than eighteen (18) feet on the Moffat Tunnel subdivision.[123]

The Tennessee Pass line was ultimately cleared for double-stack operations in the late 1980's, following decades of improvement that began with a new concrete-lined tunnel bore that replaced the original timber-reinforced tunnel in 1945.[124] The now-dormant line is UP's third Rocky Mountain crossing capable of handling double-stack freight, placing the railroad in a lucrative position compared with chief rival BNSF's two (2) east-west routes.

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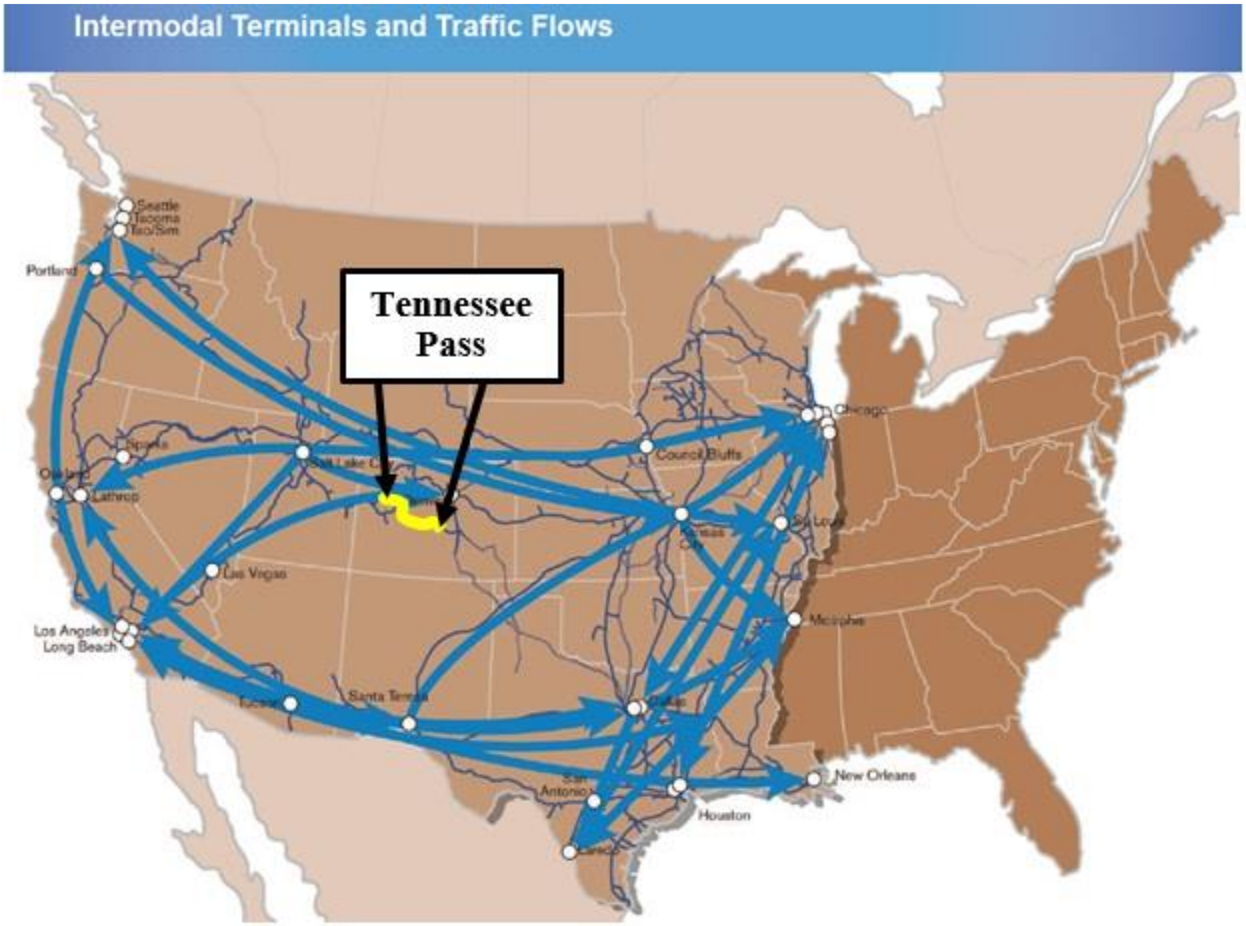
[123] Union Pacific Denver Area Timetable #3, effective November 12, 2006 and Union Pacific Denver Area Timetable #4, effective November 16, 2009.

[124] *See,* "*Rio Grande opens New Tennessee Pass Tunnel*" in the Eagle Valley Enterprise, published November 9, 1945. Accessed January 25, 2017 from https://www.coloradohistoricnewspapers.org/cgi-bin/colorado?a=d&d=EVE19451109-01.2.5# and "*Nothing Called - The last days of Tennessee Pass*" by Walter Weart for Colorado Timetable, published September-October 1997. Accessed January 25, 2017 from http://www.drgw.org/data/history/t_pass.htm.

The map in Figure No. 10 below shows the UP intermodal terminals and traffic flows.

Figure No. 10



Source: UP 2016 Investor Factbook.

The Tennessee Pass sits directly on an untapped UP intermodal lane. Figure No. 10 above shows that UP has yet to offer a direct connection between the south-central United States, eastern Mexico and the Pacific Northwest. If this market were opened, westbound intermodal trains could depart Dallas/Fort Worth, TX and travel northwest towards Pueblo, CO, where they could be run over the Tennessee Pass on their way to Salt Lake City, UT and points west. In addition to bypassing the Denver terminal and using the more gradual gradients on the eastern approach to the Tennessee Pass, this route offers an alternative to the UP Sunset Route which spans the extreme desert southwest. The Sunset Route is expected to handle 90 trains per day in the coming years.[125] In a similar vein, eastbound trains laden with import and domestic intermodal trailers and containers could be handed off by the UP at Dotsero, CO and hauled east to Pueblo, CO.

BNSF is expanding its intermodal business throughout the western United States. In the late 1980's and early 1990's a BNSF predecessor railroad sought to connect the Pacific Northwest ("PNW") with Texas via reliable, regular intermodal service. Twenty years later, these efforts have been renewed with rapid-cycle intermodal trains running five (5) days per week on lines previously dominated by the railroad's Powder River Basin ("PRB") coal traffic. The recent downturn in coal shipments has freed up capacity allowing BNSF to connect these once disparate markets for intermodal freight.[126] In addition, the railroad is offering a new joint-line service with Kansas City Southern Railway ("KCS") to connect major Mexican manufacturing hubs to Dallas, TX, Chicago, IL, Southern California and the Pacific Northwest.[127] This high-priority traffic could bypass Denver, steeper gradients on the Moffat line and inefficient train dispatching on the UP by using the Tennessee Pass.

Based on our assessment of restoring the Tennessee Pass to FRA Class 2 track standards, which limit freight train speeds to 25 mph, it may be premature to assume that high-priority, time-sensitive intermodal trains could traverse the line quickly enough to offer faster service than their counterparts using other Rocky Mountain crossings. In an emergency reroute situation, a slower transit time via Tennessee Pass would still be more valuable than delays accrued waiting for a derailment cleanup or weather delays, for example.

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[125] *See,* "*The Railroad with Better Profit Margins than Google*" by Shawn Tully for Fortune Magazine, published June 5, 2015. Source: http://fortune.com/2015/06/04/union-pacific-railroad.

[126] *See,* "*The State of Intermodal*" by William C. Vantuono for RailwayAge published October 28, 2016. Source:http://www.railwayage.com/index.php/intermodal/the-state-of-intermodal.html.

[127] *See,* "*BNSF and KCS cross-border with intermodal*" for RailwayAge published on November 16, 2016. Source: http://www.railwayage.com/index.php/intermodal/bnsf-and-kcs-cross-border-with-intermodal.html?channel=.

4. Crude Oil

Oil sands and oil shale are plentiful in the Uinta Basin[128] but have remained an untapped resource because of the difficulty in extracting the oil and natural gas. Recent advances in extraction technology could transform the basin. Utah Geological Survey estimates Utah's oil sand deposits contain 14 to 15 billion barrels of measured in-place oil, with an additional estimated resource of 23 to 28 billion barrels and that the potential economic oil shale resource in Utah is approximately 77 billion barrels.[129] The U.S. Geological Survey estimates that, if fully utilized, there is enough oil shale in the Uinta Basin to yield 1.32 trillion barrels of oil.[130] A 2010 GAO report found that oil shale deposits in the nearby Green River Formation[131] are "estimated to contain up to 3 trillion barrels of oil, half of which may be recoverable, which is about equal to the entire world's proven oil reserves."[132] The location of these basins relative to the Tennessee Pass is shown on the map in Figure No. 2 above.

Once refining challenges are overcome and macroeconomic conditions justify production, the potential flood of railroad oil traffic from the Uinta Basin could be disruptive for rail operations in the region. An increase in oil train traffic could cause ripple effects throughout the western United States, much like oil from North Dakota's Bakken Formation did in 2013.[133] The Tennessee Pass could provide an alternate route out of the Uinta Basin to the refineries in the southern and eastern United States.

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[128] Crude oil is shipped in tank cars on a unit train, with typically 100 to 120 cars per train and 700 barrels of crude oil in a tank car.

[129] *See*, "*Utah's Energy Landscape*" by Michael D. Vanden Berg for the Utah Department of Natural Resources published 2016. Source: https://ugspub.nr.utah.gov/publications/circular/c-121.

[130] *Id.*

[131] Located in Colorado and Wyoming.

[132] *See*, "*Unconventional Oil and Gas Production*" for the U.S. Government Accountability Office published May 10, 2012. Source: http://www.gao.gov/assets/600/590763.pdf.

[133] Rail traffic in the northern middle states of the U.S. was widely and severely disrupted during the winter months of 2013 into 2014, due primarily to the surging demand for tanker car shipments from the Bakken shale formation. Shale oil and gas production from the Bakken formation and the resulting increase in rail shipments occurred quickly and, when added to the shipping demands for grain, fertilizer and coal, overwhelmed the rail infrastructure in that part of the country.

Beyond its status as a lucrative sector of railroad freight business, crude oil is a hazardous commodity with potentially devastating consequences for both rail infrastructure and for communities along rail lines. Crude by rail ("CBR") faces increasing public backlash over safety concerns following the Lac-Mégantic rail disaster, a CBR train explosion which killed dozens in 2013.[134] Countless other CBR derailments, leaks and fires have eroded the public's trust in the safe movement of the commodity, including in the City of Denver.[135] Oil trains travel through Denver's city center, past sports stadiums and through developing high-rent districts. Most of the oil is from the Niobrara shale formation in Northern Colorado and Wyoming as shown in Figure No. 11 below.[136] Some city officials have policy positions which oppose the unsafe transportation of crude oil and other hazardous materials.[137] Public opinion would support a reduction of CBR traffic within Denver's core. A small portion of that traffic could be moved to the Tennessee Pass, bypassing the city center altogether. However, the Niobrara Shale originations would still likely travel through the city of Denver as they travel from areas north of Denver to Gulf Coast refineries.

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[134] *See*, "*Blast in Quebec exposes risks of shipping crude oil by rail*" by David Shaffer for the Star Tribune published July 9, 2013. Source: http://www.startribune.com/blast-in-quebec-exposes-risks-of-shipping-crude-oil-by-rail/214699171/.

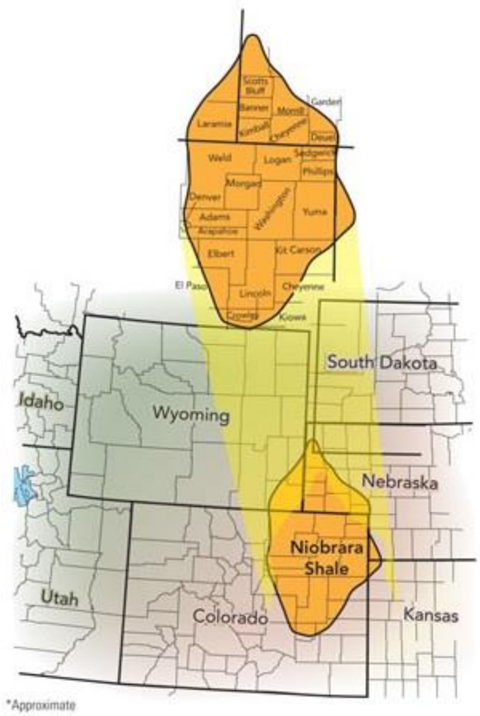
[135] *See*, "*Oil trains raise alarm for Denver residents in growing neighborhoods*" by Jon Murray for the Denver Post published December 1, 2015. Source: http://www.denverpost.com/2015/12/01/oil-trains-raise-alarm-for-denver-residents-in-growing-neighborhoods/.

[136] *Id.*

[137] *See*, "*Railroads and Hazardous Materials*" – a policy document by Deborah Ortega. Source: from https://www.denvergov.org/content/denvergov/en/denver-council-district-13/priorities/railroads-and-hazardous-materials.html.

Figure No. 11

NIOBRARA SHALE MAP



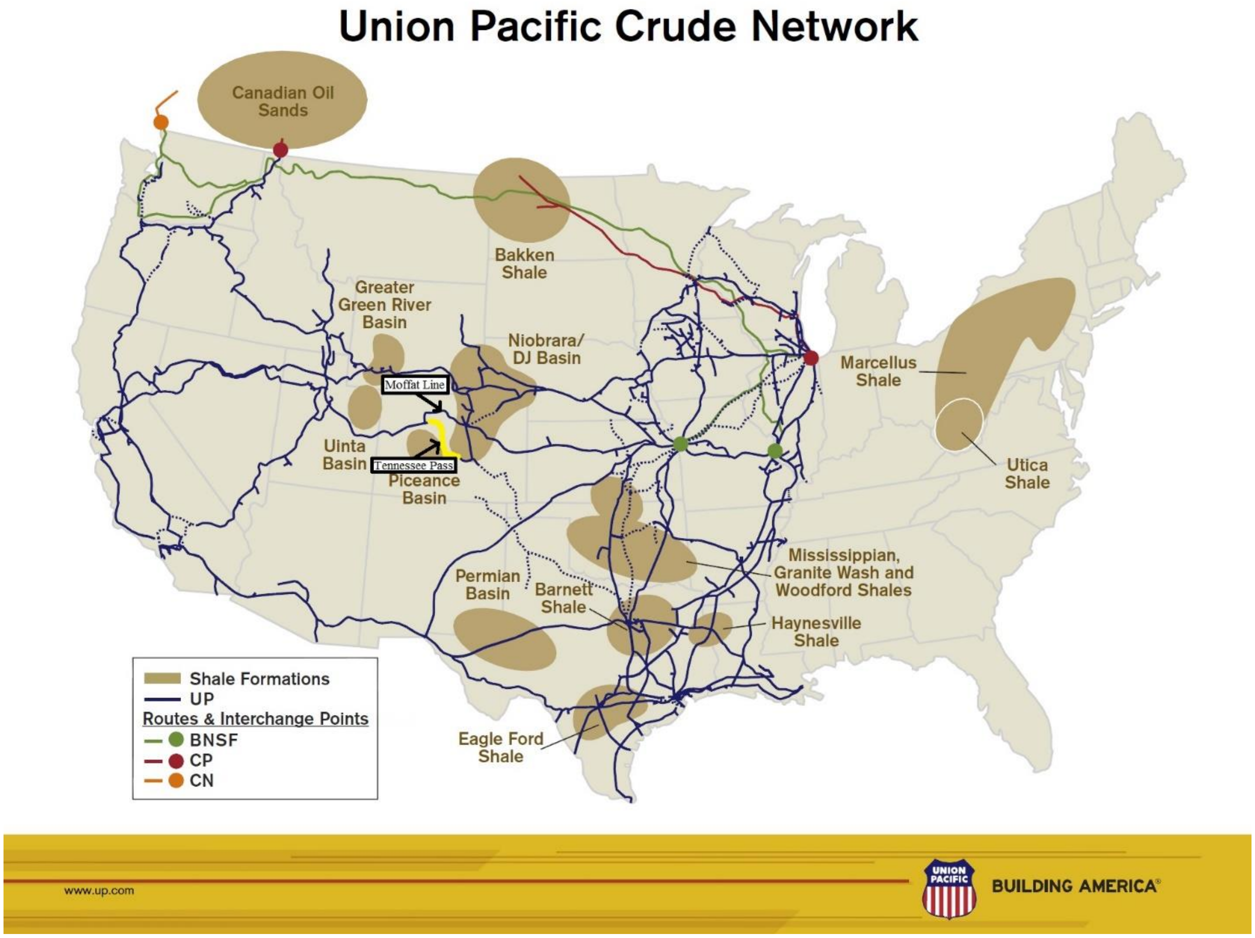
Source: http://www.ogj.com/unconventional-resources/niobrara-shale.html.

The Moffat Tunnel route currently hauls some of UP's crude oil trains that have to pass through Denver to get to their final destinations, but the majority of the CBR traffic hauled in Denver is north-south traffic, as described in the *Denver Post* article cited above.

Figure No. 12 below shows that the UP's CBR trains depend on the Denver rail hub to get to market. Local elected officials have access to CBR traffic data for emergency planning purposes, but otherwise this data is confidential for security reasons.[138] These limitations curtail our ability to determine exactly how oil trains traverse the UP system. Based on our assessment of publicly available data, a revitalized Tennessee Pass would not eliminate CBR traffic from Denver, but it could provide a safer alternative for hazardous traffic that currently uses the Moffat Tunnel route.

[138] *See*, BNSF Hazmat Safety, Source: https://bnsfrailsafety.com/hazmat-safety/.

<u>**Figure No. 12**</u>



Source: UP Crude by Rail Brochure.

The current UP route westward from Denver contains the 6.2-mile-long Moffat Tunnel, which features unique operating hazards that could be amplified in the event of a CBR train accident. There are operating rules governing use of a "ventilation gate," which must be opened to allow a train to pass through the east portal. In addition, there are "emergency exit air lock doors," 21 emergency refuges located along the inside of the tunnel and requirements for train crews to carry personal tunnel breathing apparatus.[139] All of these precautions are aimed at avoiding (or minimizing) a catastrophic event associated with the transport of hazardous materials.

[139] Union Pacific Denver Area Timetable #3, effective November 12, 2006 and Union Pacific Denver Area Timetable #4, effective November 16, 2009.

The use of the Moffat Tunnel to transport dangerous traffic such as CBR presents a significant risk for a vital piece of the nation's rail infrastructure. Upon review, it does not appear that there are any FRA rules which prohibit the operation of rail cars carrying flammable liquids such as crude oil within the Moffat Tunnel or any of the rail tunnels in the United States. The lack of regulations suggests that the tunnels on the Tennessee Pass would not prohibit carriage of CBR traffic over the line.

There are special operating characteristics to consider if the Tennessee Pass were to pick up some of the CBR traffic passing through Colorado. Crude oil was not a major rail commodity group when the Tennessee Pass last served as a fully-functioning mainline railroad. Those who witnessed the line in operation described an extremely dangerous railroad, on which multiple trains lost control and derailed while descending from the Tennessee Pass to Minturn. By April of 1996, "road foremen of engines were required to ride every train coming down Tennessee Pass" on the western slope. Eastbound coal trains using the Tennessee Pass would leave Grand Junction with three (3) AC4400CW locomotives on the head end. "At Glenwood Springs, a helper crew with two more AC4400CW's would attach to the rear for the climb to Minturn 60 miles to the east." Then, "at Minturn, a third crew sliced a second, three-unit set of AC4400CW helpers about midway in the train."[140] Unit oil trains would face similar, if not greater, challenges on the western slope of the Tennessee Pass.

Beyond the obvious risks of a westbound runaway loaded oil train, eastbound loaded trains would have to take special precautions in order to harness the horsepower required to summit

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[140] *See*, "*The Long Autumn of Tennessee Pass*" by Fred Frailey for Trains Magazine published August 16, 2012. Source: http://cs.trains.com/trn/b/fred-frailey/archive/2012/08/16/the-long-autumn-of-tennessee-pass.aspx. A road foreman of engines is a senior train & engine crewmember responsible for training and certification of train operators on a particular piece of railroad territory. "AC4400CW" is a General Electric ("GE") wide-cab diesel-electric locomotive with a 4400-horsepower prime mover and alternating current ("AC") traction motors. The article suggests that some trains required more than 35,000 horsepower to summit the eastbound grade. $4400 \times (3 + 2 + 3) = 35{,}200$.

Tennessee Pass. Federal regulations require unit crude oil trains to place a buffer car filled with sand or other inert material coupled between the trailing locomotive and the lead crude oil car.[141] This protects the head-end locomotives and train crew from the volatile contents of the train. Likewise, at the end of the train, an idler car is placed to reduce the risks resulting from a rear-end collision and to simplify switching at the destination terminal. If loaded crude oil trains were to travel in either direction on the Tennessee Pass, buffer cars would have to be added to the train to allow mid-train helpers needed for the segment between Minturn and the Tennessee Pass. The time, additional crewmen and fuel required to complete such required safety measures could significantly impact the economics of CBR traffic utilizing a revitalized Tennessee Pass line.

The impact of these requirements could be best tested using the RTC modeling software discussed above.

5. <u>Frac Sand</u>

The Energy Information Administration ("EIA") forecasts that U.S. crude oil production will reach a record high in 2018.[142] Though some of the crude will be produced by existing wells, an increase of 150 additional rigs is predicted for the first 120 days of 2018.[143] Most of the new wells will employ a hydraulic fracturing or "fracing" to drill a mile or more below the surface before gradually turning horizontal and continuing several thousand feet more. Once the well is drilled, cased and cemented, small perforations are made in the horizontal portion of the well pipe, through which a typical mixture of water, sand and additives are pumped at high pressure to create micro-fractures in the rock that are held open ("propped") by the grains of sand ("proppants"). The fluid pressure opens and enlarges fractures as well as creates new ones.

[141] *See*, "*UP Crude by Rail Equipment and Procedures*". Source: https://www.up.com/customers/chemical/crude/equipment/index.htm.

[142] *See*, "*Short-Term Energy Outlook*", U.S. Energy Information Administration, January 2018.

[143] *See*, *"The Oil and Gas Situation: A Preview of 2018"* by David Blackmon for Forbes published December 31, 2017. Accessed on January 9, 2018 at https://www.forbes.com/sites/davidblackmon/2017/12/31/the-oil-and-gas-situation-a-preview-of-2018/#3a71fbb47613.

Each shale well requires:

> approximately 5 million pounds of sand or other proppant for the hydraulic fracturing process. The quantity of proppant can vary from as low as 2.5 million pounds to up to about 7 million pounds. An estimated 95 billion pounds of fracking sand and ceramics were estimated to be pumped into the ground in the U.S. in 2014.[144]

Based on the increase in oil and gas drilling, analysts predict that over the next couple of years, crushed stone, gravel and sand will be among the most promising from a rail traffic growth perspective.[145]

US Silica, a publicly traded sand company, is forecasting total industry demand for frac sand to be in the range of 90 million to 100 million tons in 2018.[146] Currently, the surging demand for sand is mainly coming from the shale plays in Texas and New Mexico.

The United States is the world's leading producer and consumer of industrial sand and gravel. Frac sand is nearly pure quartz, very well rounded, extremely hard and of uniform size. Before shipment, frac sand is washed, sorted to ensure uniformity and dried. Ideal frac sand comes from the specific sandstone formations of St. Peter, Wonewoc and Jordan in eastern Minnesota and central and western Wisconsin. The sands in these deposits are older and have been worn down to a round shape by an ancient inland sea without sacrificing their strength.[147] This "northern white sand" is prized for hardness and roundness that performs ideally to create a porous

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[144] *See, "Frac (sand) is Back,"* by Bill Stephens for Trains Magazine published July 17, 2017. Accessed January 5, 2018, from http://trn.trains.com/news/news-wire/2017/07/21-frac-is-back.

[145] *See, "Class I Rail Frac Sand Performance and Future Carload Implications*" by James Sands for Seeking Alpha, published July 5, 2017. Accessed on January 8, 2018 at https://seekingalpha.com/article/4085788-class-rail-frac-sand-performance-future-carload-implications.

[146] *See, "U.S. Silica's Shinn: Market may hit 100 Million Tons in 2018,"* by Rock Products on November 17, 2017. Accessed January 9, 2018 at http://www.rockproducts.com/frac-sand/16992-u-s-silica-s-shinn-market-may-hit-100-million-tons-in-2018.html#.WlTYF99KuUk See also, "*Going Local for Supplies Sparks a New Frac Sand Boom,"* by Gregory Meyer in the Financial Times, December 6, 2017. Accessed January 6, 2018 at https://www.ft.com/content/dcf29ad8-da99-11e7-a039-c64b1c09b482.

[147] *See, "Transportation Impacts of Frac Sand Mining in the MAFC Region: Chippewa County Case Study, White Paper Series: 2013*, Principal Investigator Teresa Adams, National Center for Freight & Infrastructure Research & Education, University of Wisconsin-Madison, page 12.

latticework inside underground wells. Wisconsin has some of the best frac sand in the country and much of it is easily accessible as it is found near the surface.

Suppliers responded to the surging frac sand demand with upgrades to their facilities and capabilities. Sand producers recognized that unit trains are becoming a necessity. Frac sand producers recently embarked on rail-related expansions that will permit greater use of unit trains and allow them to build longer unit trains. For example, Badger Mining Corp. in April 2017, announced that it completed 1,500-foot extensions on three (3) sidings at its loading facility in Taylor, Wisconsin, on Canadian National Railroad Company ("CN"). Badger now uses 100-car trains, up from 70-car trains.[148] In August 2017, Solaris Oilfield Infrastructure announced a new seven-year contract to handle frac sand unit trains through a transload facility on the UP in Kingfisher, Oklahoma. The facility will serve multiple large volume customers in Southcentral Oklahoma with dedicated storage and unit train loop tracks. The facility is expected to be completed in August 2018.[149]

December 28, 2017 Smart Sand Inc. ("Smart Sand") announced the completion of a new unit train capable facility in Byron Township, Wisconsin. The first unit train was moved by UP on December 26, 2017. Completion of the new facility will provide Smart Sand with the ability to ship unit trains on both the UP and CP from its flagship Oakdale, Wisconsin mining operation.[150]

Because of its bulk, sand is relatively expensive to ship. According to IHS Markit "[n]orthern white sand averaged $41 per short ton at the mine gate [in 2017], but can cost $120 at

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[148] Badger Mining Press Release, accessed January 16, 2018 at http://badgerminingcorp.com/bmc-completes-rail-expansion-at-taylor-wisc-facility/.

[149] *See, "Frac Sand Transloading Locating on UP Line*" by Stuart Chirls, for Railway Age published on August 7, 2017. Accessed January 7, 2018.

[150] Smart Sands Press Release, accessed January 16, 2018 at https://globenewswire.com/news-release/2017/12/28/1275911/0/en/Smart-Sand-Inc-Announces-Commencement-of-Unit-Train-Shipments-on-the-Union-Pacific-Railroad.html.

a Texas well head after transport."[151] Increasing demand and cost-cutting among oil companies largely located outside of the Midwest has sparked a search for alternate supplies closer to the drilling.

Increasingly, sand is sourced in states surrounding the well sites because it is closer and logistically simpler to procure. These "regional" or "brown sands" vary in quality but generally have a lower crush resistance than the northern white sands, meaning they do not stand up as robustly to high well pressures. They also have characteristics which can clog the well and interfere with flow. However, Permian drillers are developing technology that allows them to use a diversity of sand types.

In 2017, sixteen (16) companies in West Texas announced plans for 23 sand mining sites. As of January 2018, three (3) mines were open and six (6) were scheduled to be open by March 2018.[152] Vista Sand, Preferred Sands, Unimin, Black Mountain, Hi-Crush Partners, US Silica and Alpine Silica all own Permian Basin mines slated to be producing by the first quarter of 2018."[153]

In another sign that the market is expanding, PanXchange ("PX"), a Denver-based company, opened the country's first ever exchange for frac sand in October 2017. The PX sand consortium includes over a dozen of the industry's leading producers and buyers. Current members, excluding service companies, represent approximately 30 percent of total U.S. sand production.[154]

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[151] *See, "Going Local for Supplies Sparks New Frac Sand Boom*," by Gregory Meyer for Financial Times published on December 6, 2017. Accessed on January 9, 2018, at https://www.ft.com/content/dcf29ad8-da99-11e7-a039-c64b1c09b482.

[152] *See, "Several Frac Sand Mines to Open in West Texas,"* by Kerry Clines for Aggregates Manager published January 3, 2018. Accessed January 9, 2018 at https://www.aggman.com/3-frac-sand-mines-open-in-west-texas-23-more-in-the-works/.

[153] *See,* "*Texas Frac Sand in Demand,"* by Hana Askran for Forbes published September 14, 2017. Accessed on January 8, 2018 at https://www.forbes.com/sites/mergermarket/2017/09/14/texas-frac-sand-in-demand/#57580f77469e.

[154] *See*, http://www.panxchange.com/news/.

In October 2016, BNSF reportedly moved the largest ever frac sand unit train when it moved nearly 19,000 tons of U.S. Silica sand from Ottawa, Illinois to Elmendorf, Texas.[155] Frac sand is typically hauled in unit trains of 100-125, 100-ton cars hauling approximately 12,500 tons per train. As shown in Table 17 below, after two (2) difficult years, railroad delivery of frac sand rebounded nicely in 2017.

Table 17
Freight Commodity Statistics for STCC Code 14413

	Carloads			Tons		
RR	**2015**	**2016**	**2017[1/]**	**2015**	**2016**	**2017[1/]**
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. UP	169,422	115,908	222,195	18,537,444	13,044,001	25,265,543
2. BNSF	131,821	139,511	224,828	14,479,587	15,806,518	25,562,220

1/ 2017 data annualized based on three quarters of available data.

The end of 2017 was particularly strong for the railroads. In December 2017, crushed stone, sand and gravel were up 15,632 carloads or 23.1 percent over December 2016.[156] The previous month carloads were up 16,402 carloads or 14.8 percent year over year.[157] The railroads predict demand for frac sand transportation will remain strong in 2018. BNSF's Carl Ice stated:

> The movement of sand has grown this year and last and we expect it to continue to be a solid commodity on our railroad. Oil and gas producers are becoming increasingly efficient and lengthening the life of existing wells, which requires more sand.[158]

155 The Halliburton Elmendorf South Texas Sand Plant can handle two 115 car unit trains simultaneously and can hold 40,000 tons in its eight silos. The facility is located within the Alamo Junction Rail Park in Elmendorf, about seven miles from the company's South Texas Operations Center in southern Bexar County. See Halliburton Press Release, October 13, 2016. Accessed January 8, 2018 at http://www.halliburton.com/public/news/pubsdata/press_release/2016/halliburton-us-silica-break-record.html.

156 AAR Press Release, accessed January 16, 2018 at https://www.aar.org/newsandevents/Press-Releases/Pages/2018-01-03-railtraffic.aspx.

157 AAR Press Release, accessed January 16, 2018 at https://www.aar.org/newsandevents/Press-Releases/Pages/2017-12-6-railtraffic.aspx.

158 *See,* "*Outlook 2018: For Class I Railroads, Moderate Growth is the Best Guess*" Compiled by Jeff Stagl, for Progressive Railroading, published December, 2017. Accessed on January 9, 2018, at http://www.progressiverailroading.com/canadian_pacific/article/Outlook-2018-For-Class-I-railroads-moderate-growth-is-the-best-guess--53413.

In recognition of the importance of the market, UP[159] has as a “Sand 2 Shale” program in place to expedite delivery to areas such as the Permian Basin and Eagle Ford shales in Texas. The program offers extensive market research, site selection and project management expertise, customized transportation options and dedicated logistics and shipment tracking for frac sand customers.[160]

Though most of the attention is currently focused on the hot Permian basin:

> The Niobrara is on a tear this year. After two years of falling oil production, the growth rate in 2017 is the highest in the history of this region. There was a small dip in September, as Anadarko shut in a large part of its production, but October set a new record again in both oil and gas output.[161]
>
> Production in the Niobrara and Anadarko regions has grown continuously since January 2017 in response to increasing rig activity and a monthly WTI price range from $45/b to $53/b during the year. With an expectation that prices will continue to be near this range, rig activity and production are expected to continue to grow.[162]

In addition to frac sand, other aggregates such as gravel, crushed stone, slag and, recycled concrete are an important part of the freight market in Colorado. Colorado’s population “grew 145 percent from 1970-2015, from 2.2 million to 5.5 million people and that is expected to increase another 54 percent (to 8.5 million) by 2050.”[163] Following all of the population growth, construction, specifically commercial construction is expected to be “particularly brisk”.[164] In November 2017, CEMEX USA launched operations at a rail-served cement distribution terminal in Commerce City, Colorado. The CEMEX Terminal is serviced by an existing BNSF line out of

[159] Also in 2017, UP announced it would consolidate its six Marketing & Sales business units from six to four: Agricultural Products, Energy, Industrial and Premium. *See* https://www.up.com/customers/announcements/customernews/allcustomernews/CN2017-74.html.

[160] *See*, https://www.up.com/customers/ind-prod/minerals/sand/index.htm.

[161] *See*, “*Visualizing US Shale and Oil Gas Production*”, Enno Peters Blog accessed January 16, 2018 at https://shaleprofile.com/index.php/2018/01/05/niobrara-co-wy-update-through-august-2017-2/#comment-1526.

[162] *See*, “*This Week in Petroleum*” October 12, 2017, U.S. Energy Information Administration.

[163] *See*, “*Colorado’s Growing Pains: From Roads to Water, Here are 5 Key Issues as the State’s Population Swells”* by Brian Eason for the Denver Post, October 15, 2017. Accessed January 8, 2018 at https://www.denverpost.com/2017/10/15/colorado-growing-population-issues/.

[164] *“2017 Economic Forecast for Metro Denver,”* Denver Metro Chamber of Commerce, January, 2017.

the Lyons Cement Plant and has a silo capacity of 5,000 tons. It houses type II Portland cement used in concrete, precast and masonry products for a variety of construction projects.[165]

Crushed stone, an aggregate used in the construction of concrete, asphalt and gravel walkways, driveways and roads, was up sharply in Colorado quarter over quarter between 2016 and 2017. [166]

Table 18
Crushed Stone Sold or Used by Producers in Colorado
(Thousand Metric Tons)

	Quarter (1)	Crushed Stone (2)
1.	1Q16	2,370
2.	1Q17	2,810
3.	% Change	+19%
4.	2Q16	3,280
5.	2Q17	4,270
6.	% Change	+30%
7.	3Q16	4,620
8.	3Q17	4,940
9.	% Change	+7%

Source: USGS Mineral Industry Surveys

Expansion of the frac sand markets is not welcomed everywhere. For example, a group of protesters has occasionally appeared on a section of tracks owned by UP in Olympia Washington, to prevent the shipment of proppants being imported from China.[167]

[165] *See*, https://www.cemexusa.com/-/cemex-usa-brings-high-quality-cement-directly-to-denver-with-new-distribution-terminal.

[166] For example, a typical wind turbine construction location requires a 20 acre gravel driveway. See https://www.up.com/aboutup/community/inside_track/wind-to-rail-09-29-2017.htm.

[167] *See*, "*Port to Protesters: No Scheduled Plans to Ship Fracking Sand by Rail"* by Rolf Boon and Amelia Dickson for The Olympian, published on November 22, 2017. Access on January 9, 2018 at http://www.theolympian.com/news/local/article185945688.html.

6. **Steel**

EVRAZ PLC is a multinational company that is headquartered in London and maintains its main operations in Russia, along with operations in Ukraine, Kazakhstan, Italy, Czech Republic, United States, Canada and South Africa. EVRAZ PLC is one of the world's largest vertically integrated steel and mining companies. One subsidiary, Evraz Rocky Mountain Steel ("Evraz"), located in Pueblo, CO, produces rail, seamless pipe, rod and coiled reinforcing bar, along with specialty and semi-finished products delivered to each customer's exact specifications.

The equivalent of more than a million cars a year are melted in Evraz's electric arc furnace to keep up with the steel production required capable of producing rods at speeds of up to 21,000 feet of rod per minute. It produces up to 1,000,000 tons of raw steel per year. Among the products produced by Evraz is an extensive selection of premium, intermediate and standard rail. The Pueblo facility has an annual capacity of 600,000 tons of rail, making it the largest producer of rail in the world. It is a qualified supplier to all North American Class I railroads and has captured more than 40% of the rail market share in North America.

Evraz also produces Oil Country Tubular Goods ("OCTG"), up to 450,000 tons of tire cord quality wire rod used in tire manufacturing and rebar for construction applications such as roads and bridges in Colorado. Evraz's largest customers are railroads, energy transmission operators and wholesale companies and traders purchasing wire rod (used for infrastructure and construction development) and rebar (used in the majority of infrastructure projects, including roads, bridges, power transmission, etc.).

Though Evraz has offered few details, it has been widely reported that it is considering its Pueblo steel mill for a $500 million expansion that would add 200 jobs.[168] Though the company

[168] *See*, "*Evraz quiet on Plans*," by Dennis Darrow for the Pueblo Chieftan, published on November 28, 2017. Accessed on January 11, 2018, at https://www.chieftain.com/business/localbusiness/evraz-quiet-on-plans/article_dc1c31e3-6397-523b-8897-6bb795ea3f3f.html.

has not commented publicly, it has also been reported that Evraz is currently seeking assurances for a low electricity rate from Xcel Energy before it will commit to the plant. In fact, without a commitment on energy rates, Evraz may move the entire operation.[169] This could have a significant impact on Xcel Energy. On November 28, 2017, David Eves, Xcel Energy's Colorado President, stated:

> EVRAZ is the Company's largest retail electric customer and a significant economic driver in the Pueblo area and southern Colorado. EVRAZ has been considering its future in Pueblo for some time, with potential outcomes ranging from making substantial new capital investments to relocating Pueblo operations to another location outside of Colorado. EVRAZ's decisions regarding its future in Pueblo have the potential to make a significant impact in southern Colorado.[170]

The situation has the attention of the Colorado Economic Development Commission ("CEDC"). In November 2017, the CEDC approved $17.3 million in state economic development incentives towards Evraz' potential expansion in an effort to encourage the company keep its manufacturing center in Colorado.[171]

There is reason to be optimistic that Xcel Energy can satisfy Evraz's request. Though no final bid has been accepted yet, Xcel Energy announced last month that the bids they have received after they issued an All-source Solicitation in November 2017 were "unprecedented."[172]

> Several details remain unknown, but the median bid for wind plus storage appears to be lower than the operating cost of all coal plants currently in

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[169] *See, "Colorado Mill Looks for Assurances on $500 Million Expansion"*, AP News Archive published December 9, 2017. Accessed on January 10, 2018 at http://www.apnewsarchive.com/2017/Chicago-based-steel-company-is-seeking-assurances-of-low-electricity-prices-before-it-commits-to-a-500-million-upgrade-at-a-Colorado-mill-that-would-add-200-jobs/id-e21bebbbe239474ab3fdc9ca1e8fa3e3.

[170] Colorado Public Utilities Commission Proceeding No. 16A-0396E, *In the Matter of the Application of Public Service Company of Colorado for Approval of its 2016 Electric Resource Plan*, Supplemental Direct Testimony of David L. Eves on behalf of Public Service Company of Colorado, November 28, 2017, page 50.

[171] *See, "Colorado Mill Looks for Assurances on $500 Million Expansion,"* AP News Archive published December 9, 2017. Accessed on January 10, 2018 at http://www.apnewsarchive.com/2017/Chicago-based-steel-company-is-seeking-assurances-of-low-electricity-prices-before-it-commits-to-a-500-million-upgrade-at-a-Colorado-mill-that-would-add-200-jobs/id-e21bebbbe239474ab3fdc9ca1e8fa3e3.

[172] Colorado Public Utilities Commission Proceeding No. 16A-0396E, Excel Energy 2016 Electric Resource plan, 2017 All-Source Solicitation 30-Day Report, December 28, 2017, page 3.

> Colorado, while the median solar plus storage bid could be lower than 74% of operating coal capacity.[173]

Attachment No. 22 to this Report details various industrial customers in and around the Pueblo, CO area. Evraz is located within a few miles of both the Towner Line and the Tennessee Pass. In addition, there are various other industrial customers (Vestas, Rocla Concrete, etc.) within a five (5) mile radius of the Towner Line and the Tennessee Pass that could be viable rail shippers along these rail lines in the future.

7. <u>Concrete Ties</u>

Rocla Concrete Tie, Inc. ("Rocla"),[174] also located in Pueblo, Colorado, manufactures a comprehensive range of pre-stressed concrete railroad ties and turnouts to customer specifications. Ties range in weight from 575 pounds for light rail applications to 900 pounds for heavy-haul applications. Major customers for its concrete ties include Amtrak, BNSF, UP, CSX, as well as other Class I railroads, light rail/transit projects, high-speed corridors and industrial/ports all around the country.

Historically, railroad crossties were made from a variety of hard and soft woods. As freight trains get heavier (e.g., 150 car coal unit trains are being tested) and the demand for more capacity and safety upgrades increases, railroads are increasingly replacing wood ties with precast concrete, especially on heavy haul routes handling 100 million gross ton miles per year. Advantages of using reinforced concrete over wood include longer service life, greater strength and lower maintenance costs. The Railway Tie Association estimates that close to a million new concrete crossties per year have been authorized by Class I railroads, mainly in the Western U.S., for 2017

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[173] *See*, "*Colorado's Renewables Revolution Gathers Steam*," by Matt Gray for Carbon Tracker, published January 5, 2018. Accessed January 17, 2018 at https://www.carbontracker.org/colorados-renewables-revolution/.

[174] Rocla Concrete Tie, Inc. is a former subsidiary of Rocla Industries Pty Limited. As of January 4, 2017, Rocla Concrete Tie, Inc. operates as a subsidiary of Vossloh AG. The company offers a comprehensive portfolio of rail infrastructure products including special trackwork, rail fastening systems, signaling and switch control solutions, rail lifecycle services and, pre-stressed concrete ties.

through 2019. Table 19 below summarizes estimated crosstie demand through 2019 for selected sectors.

Table 19
Estimated Crosstie Demand

	Sector	New Concrete Crossties Authorized for 2017	2018	2019
	(1)	(2)	(3)	(4)
1.	Eastern US Class 1 Railroads	72,000	0	0
2.	Western US Class 1 Railroads	900,000	900,000	940,000
3.	Canadian Class 1 Railroads	0	82,500	82,500
4.	Total	972,000	982,500	1,022,500

Source: Railway Tie Association Annual Survey Crossties September/October 2017.

The Rocla facility in Pueblo has production capacity for 1.1 million ties per year. In response to the demand for more capacity and safety upgrades spurred by the crude by rail market and system-wide carload increases for the Class I network, Rocla has not only invested in increasing its production capacity, but also its shipping capacity to keep up with this demand.[175]

Attachment No. 22 to this Report displays the location of the Rocla facility, south of Pueblo and situated on BNSF and UP mainlines.

8. Wind Turbines

In 2008, the U.S. Department of Energy forecasted that by 2030, 20 percent of America's electricity could be generated by wind power.[176] Reaching that level was projected to require installation of 7,000 turbines, which would require more than 50,000 shipments of turbine

[175] *See,* "*All Tied Up*" by Mischa Wanek-Libman for Railway Age published April 13, 2015. Accessed on January 12, 2018 at http://www.railwayage.com/index.php/m_and_w/all-tied-up.html.

[176] *See,* https://energy.gov/eere/wind/20-wind-energy-2030-increasing-wind-energys-contribution-us-electricity-supply.

components by rail annually by 2018.[177] By 2030, median hub height for U.S. onshore turbines is expected to be 115 meters, with rotor blade diameters of 133 feet.[178]

Currently, more than 8,000 parts are required for a fully assembled wind turbine, which can weigh up to 335 tons. It can take as many as 689 trucks, 140 railcars and eight (8) water vessels to deliver all the components necessary to build a small, 150 megawatt wind farm.[179] In addition to the blades, a wind turbine's other two (2) heaviest components are the nacelle/hub and tower sections.

In 2012, Transportation Technology Services engineered a custom rail car loading system to transport blades that were 180 feet long from Colorado to New England.[180] Notwithstanding that record-breaking trip, wind turbine blades:

> longer than 173 feet begin to present a transportation obstacle due to the large turning radius, which hinders right of way or encroachment areas within corners or curves on roads or railways. Tower sections are generally limited to 4.3 meters (14 feet) in diameter, or 4.6 meters (15 feet) where routes permit, to fit under overhead obstructions.[181]

The wind turbine industry goal is to develop longer blades and larger tower components to access better winds higher above the ground. We expect the wind turbine industry to continue to push the transportation industry to develop the technology to handle the larger components. According to the wind turbine industry:

> current transport restrictions result in sub-optimal tower design and increased cost for tower heights exceeding 80 m. A structurally optimized

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[177] *See,* "*10 FACTS ABOUT FREIGHT RAIL AND WIND ENERGY*" American Association of Railroads, Accessed on January 10, 2018 at https://www.aar.org/Pages/Delivering-Wind-Energy.aspx.

[178] *See,* "*Forecasting Wind Energy Costs & Cost Drivers: The Views of the World's Leading Experts*," published by the Wind and Water Power Technologies Office of the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy under Lawrence Berkeley National Laboratory, June 2016, pages 26-27.

[179] *See,* "*10 FACTS ABOUT FREIGHT RAIL AND WIND ENERGY*" American Association of Railroads, Accessed on January 10, 2018 at https://www.aar.org/Pages/Delivering-Wind-Energy.aspx.

[180] The custom railcar loading configuration utilized a reverse pivot arm and a bolstered arrangement that allowed the blade to negotiate curves better. See http://www.railengineer.com/windlogisticsprojec/55-meter-blade-transport/.

[181] *See,* "*Wind Vision: A New Era for Wind Power in the United States*", U.S. Department of Energy, March 12, 2015. Page 80. See Also, *"Enabling Wind Power Nationwide*" U.S. Department of Energy, May 2015.

tower would have a larger base diameter, with thinner walls and less total steel.[182]

Each increment in greater size and weight compounds the logistical issues for transport.

Despite the logistical challenges, the wind turbine industry, chasing Production Tax Credits, is pushing ahead.[183] The Production Tax Credit was established by the Energy Policy Act of 1992 to stimulate use of renewable technologies for power generation by providing a production-based credit for the first 10 years of project operations. In December 2015, Congress passed a 5-year phased-down extension of the Production Tax Credit. To qualify, projects must begin construction before January 1, 2020. In May 2016, the Internal Revenue Service ("IRS") issued guidance allowing four (4) years for project completion after the start of construction.

Initially set at 1.5¢/kWh, the credit is adjusted annually for inflation. Systems commencing construction prior to January 1, 2017 are eligible for a tax credit of 2.3¢/kWh. The value of the credit steps down in 2017, 2018 and 2019. Specifically, the Production Tax Credit will phase down in increments of 20 percentage points per year for projects starting construction in 2017 (80%), 2018 (60%) and 2019 (40%). With the extension of the Production Tax Credit, annual wind power capacity additions are projected to continue at a rapid clip for several years.

In Colorado, Xcel Energy has nearly 2,000 wind turbines that generate 14 percent of the states' electricity. That percentage is expected to increase with Xcel Energy adding 300 wind turbines that are expected to produce 600 additional megawatts of electricity.[184] In the spring of 2017, Xcel Energy hit a record achieving an hourly production peak where wind supplied more than 68 percent of its energy in Colorado.[185]

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[182] *See*, "*Wind Vision: A New Era for Wind Power in the United States*," U.S. Department of Energy, March 12, 2015, page 64.

[183] *See,* https://energy.gov/savings/renewable-electricity-production-tax-credit-ptc.

[184] Colorado Office of Economic Development and International Trade.

[185] *See*, *"Xcel Energy CEO: Wind Energy Saves Customers Billions While Maintaining the Grid's Reliability*," American Wind Energy Association Xcel Energy Press Release, May 24, 2017. Accessed on January 10, 2018 at https://www.awea.org/WINDPOWERMay242017.

Xcel Energy, which also serves millions of customers across the West and Midwest and is already the top wind energy provider in the United States, has begun a multibillion-dollar investment in additional wind power. The Minneapolis-based company is proposing to build or buy power from eleven (11) new wind farms over twelve (12) years in the seven (7) states that would generate up to 3,380 megawatts worth of renewable energy. In March 2017, Xcel Energy filed a proposal with the New Mexico Public Utilities Commission and the Public Utilities Commission of Texas, that will produce 1,230 megawatts of wind energy, mostly generated at two (2) new facilities in New Mexico and Texas.[186] The Texas and New Mexico project announcements came on top of Xcel Energy's announcement the previous week of the "largest-ever wind expansion in the Upper Midwest" — a proposal to invest $2.5 billion to add 1,550 megawatts worth of renewable energy from seven (7) new wind farms to be built in Minnesota, North Dakota, South Dakota and Iowa.[187]

The electricity at Xcel Energy's wind farms will be generated by wind turbines manufactured by Vestas Wind Systems Inc. ("Vestas") in Colorado.[188] Vestas, a world leader in wind turbine technology, operates a 13 million square-foot wind tower manufacturing facility in Pueblo, Colorado. There it fabricates, welds and assembles more steel towers than any other facility in the world. Vestas chose Pueblo, CO as it manufacturing location in part because of its centralized location to the market, including railroad access. Attachment No. 22 to this Report

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[186] Xcel Energy Press March 21, 2017 Press Release, accessed January 10, 2018 at https://www.xcelenergy.com/company/media_room/news_releases/new_xcel_energy_wind_facilities_offer_$2.8_billion_in_customer_savings_over_30_years .

[187] *See,* "*Xcel Energy to Invest Billions in New Wind Farms in Colorado, Elsewhere,*" Denver Business Journal, March 21, 2017. Accessed on January 10, 2018 at https://www.bizjournals.com/denver/news/2017/03/21/xcel-energy-to-invest-billions-in-new-wind-farms.html?s=print.

[188] Xcel Energy entered into an agreement with Vestas to purchase turbines in 2016, which qualifies company-owned developments for 100 percent of an available federal production tax credit. At the time the new wind facilities will come on line, the credit will be valued at around 2.5 cents per kilowatt-hour. Xcel Energy Press March 21, 2017, accessed January 10, 2018 at https://www.xcelenergy.com/company/media_room/news_releases/new_xcel_energy_wind_facilities_offer_$2.8_billion_in_customer_savings_over_30_years .

displays the location of the Vestas facility, south of Pueblo and situated on BNSF and UP mainlines.

Because wind turbine components are very large and heavy, railroads are uniquely suited to transport them. The dominant U.S. railroads in the wind energy business today are BNSF and the UP. Both railroads actively entered the market in early 2003 as wind farm projects across the West began growing.

In 2015, BNSF Logistics and its partner Energo Engineering ("Energo") completed testing of new equipment, or "fixtures", to accommodate increasingly large wind turbine blades by both ocean vessels and railcars. BNSF Logistics universal rail fixtures are designed to handle blades of all sizes, including those exceeding 45 meters long and were able to achieve "a 35 percent improvement of clearance envelope and superior ride quality with less stress and G-forces borne by the blades when compared to previous technologies."[189]

The BNSF fixtures include two (2) parts: one to cradle the circular end of the blade, or "root", that attaches to the wind turbine hub and the other, referred to by the company as the "taco", supports the slender blade tip. The fixtures are attached to the flat surface of a railcar and swivel to essentially contour the blades in the direction of the train without significant overhang, which is especially important when trains are moving through curvy, tight areas along their routes.[190]

UP also responded to the growing wind turbine transportation market. Union Pacific Distribution Services ("UPDS") became part of Loup Logistics Company ("Loup") in November 2017. Loup, which consists of four (4) companies: UPDS, Streamline, ShipCarsNow and INL,

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[189] *See,* "*Logistics Edge: BNSF Logistics Develops Rail Equipment, Service to Handle Increasingly Larger Wind Turbine Blades,*" for American Shipper published July 18, 2015. Accessed on January 10, 2018 at https://www.americanshipper.com/main/news/logistics-edge-60828.aspx.

[190] *Id.*

provides door-to-door shipping and logistics services for companies shipping almost any commodity, including wind turbine components.[191]

[191] UP Press Release, September 15, 2017. Accessed on January 16, 2018 at https://www.up.com/customers/announcements/customernews/allcustomernews/CN2017-74.html.

V. CONCLUSION

Based on our desk-top analysis of the Tennessee Pass, we estimated that the NLV equals $16.6 million at 1Q18 wage and price levels. As recognized by the CDOT, the Tennessee Pass is significant because it has the potential to carry both passenger and freight traffic and because it is the only existing trans-mountain alternative in Colorado to the Moffat Tunnel rail line.

There are significant impediments to restoring the Tennessee Pass to full rail service. Though portions of the Tennessee Pass are still active and used for freight transport and tourist activities, the majority of the Tennessee Pass has been inactive for at least 20 years. We estimate the capital cost to rehabilitate the Tennessee Pass to meet FRA Class 2 operating status equals $245.4 million or a cost of $1.2 million per mile.[192]

The Tennessee Pass traverses extremely rugged terrain. It crosses the Rocky Mountains at over 10,000 feet of elevation, making it the highest railroad crossing of the mountain range. However, logistical adjustments such as helper locomotives and additional horsepower could be used to overcome the rugged geometry of the line.

Despite the above, the Tennessee Pass is strategically located to offer a route that avoids some of the country's most congested rail lines. It is directly connected to an untapped rail intermodal lane. If this market were opened, westbound intermodal trains could depart Dallas/Fort Worth, TX and travel northwest toward Pueblo, CO, where they could be run over the Tennessee Pass on their way to Salt Lake City, UT and points west. In addition to bypassing the Denver terminal and using the more gradual gradients on the eastern approach to the Tennessee Pass, this route offers an alternative to the UP Sunset Route which spans the extreme desert southwest and is expected to handle 90 trains per day in the coming years. In a similar vein, eastbound trains

[192] These values do not consider the capital costs associated with tunnels and bridges as these assets will need to be evaluated during a field review. An on-the-ground review of these facilities should be made to confirm or modify our findings before an acquisition option is implemented.

laden with import and domestic intermodal trailers and containers could move over the Tennessee Pass.

The Tennessee Pass is advantageously located in close proximity to western U.S. natural resources and other industries. It is adjacent to a major grain production region served by both UP and BNSF. Currently, the grain transportation market in Western Kansas and Eastern Colorado is limited by restrictions placed on it by other shippers. There is a large grain market that is currently not utilizing rail transportation that could move over the Tennessee Pass.

Oil sands and oil shale are plentiful in the Uinta Basin but have remained an untapped resource because of the difficulty in extracting the oil and natural gas. Recent advances in extraction technology could transform the basin. The Tennessee Pass could provide an alternate route out of the Uinta Basin to the refineries in the southern and eastern United States.

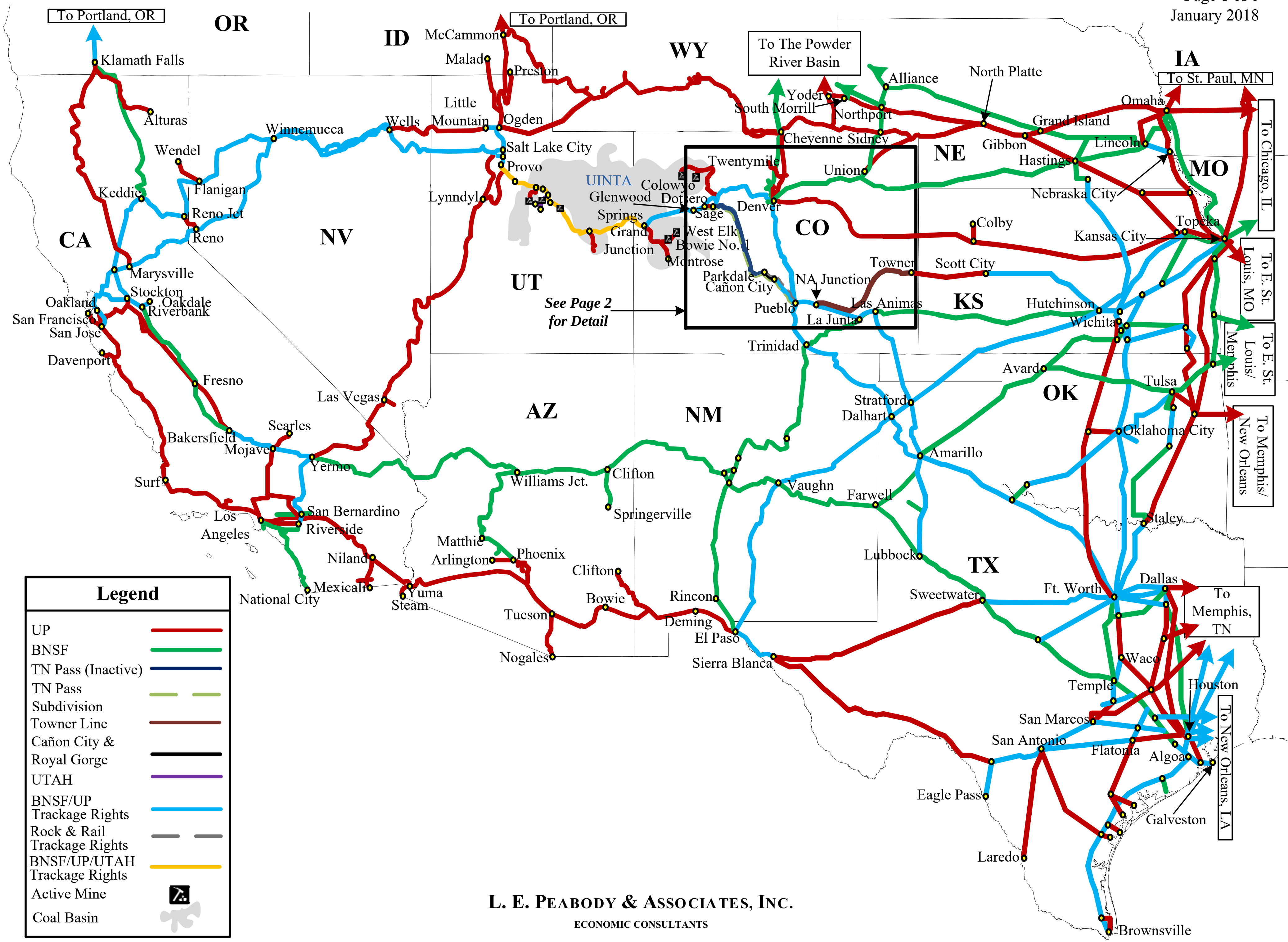
Any expansion of oil and gas exploration in the area will necessitate additional frac sand deliveries. In 2018, the forecasted demand for frac sand is approximately 100 million tons. In addition to frac sand, growth will continue for aggregates such as gravel, crushed stone, slag, recycled concrete, etc.

The current rail customer base and the centralized location relative to the market makes Pueblo, CO a good foundation for a revitalization of the Tennessee Pass with Vestas, Evraz, Rocla and other industrial customers all situated within a five (5) mile radius of Pueblo.

Based on our assessment of restoring the Tennessee Pass to FRA Class 2 track standards, which limit freight train speeds to 25 mph, it may be premature to assume that high-priority, time-sensitive intermodal trains could traverse the line quickly enough to offer faster service than their counterparts using other Rocky Mountain crossings. In an emergency reroute situation, a slower transit time via Tennessee Pass would still be more valuable than delays accrued waiting for a derailment cleanup or weather delays, for example.

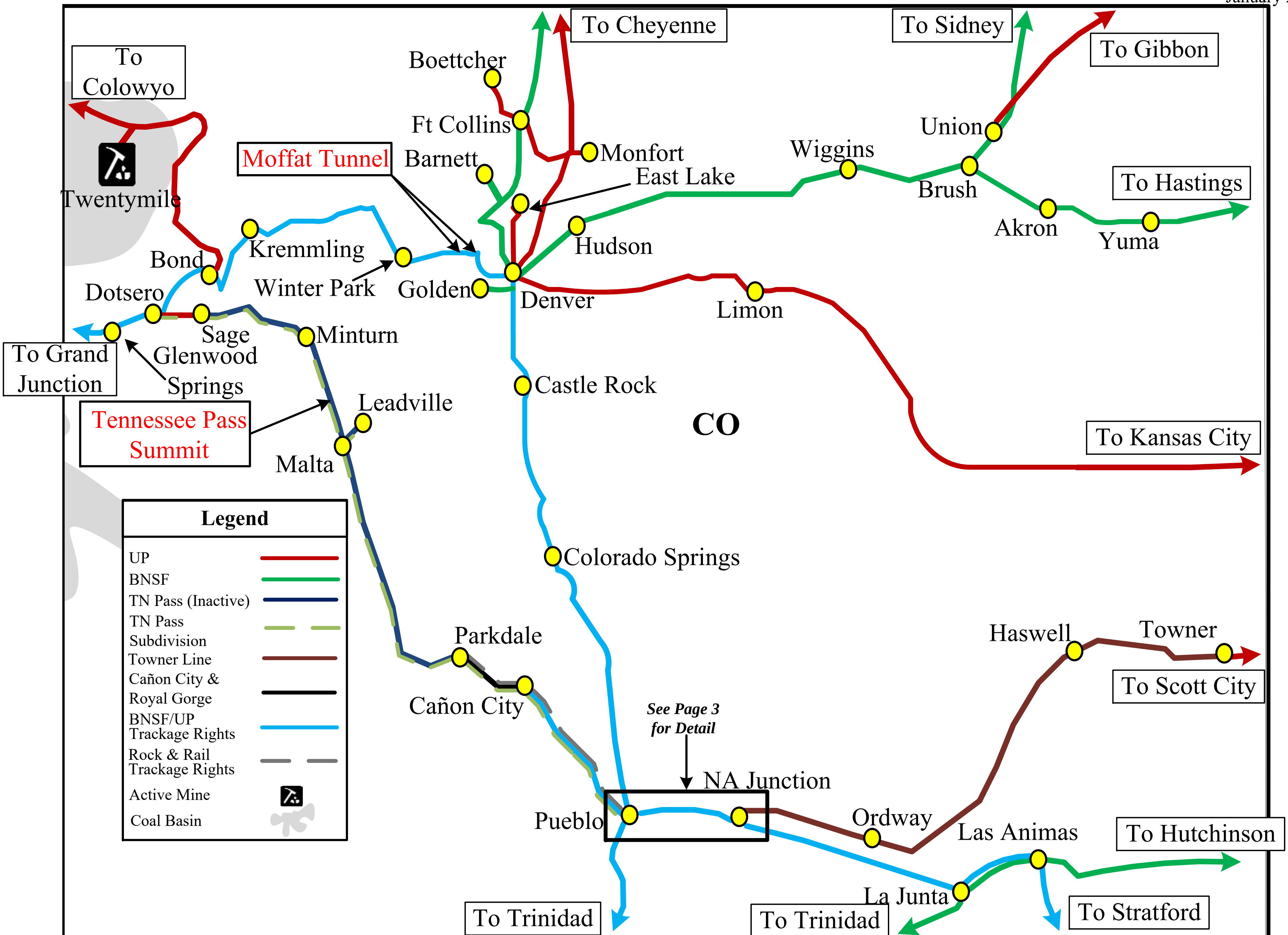
LIST OF ATTACHMENTS

Schematic of Tennessee Pass Subdivision and Surrounding Rail Lines

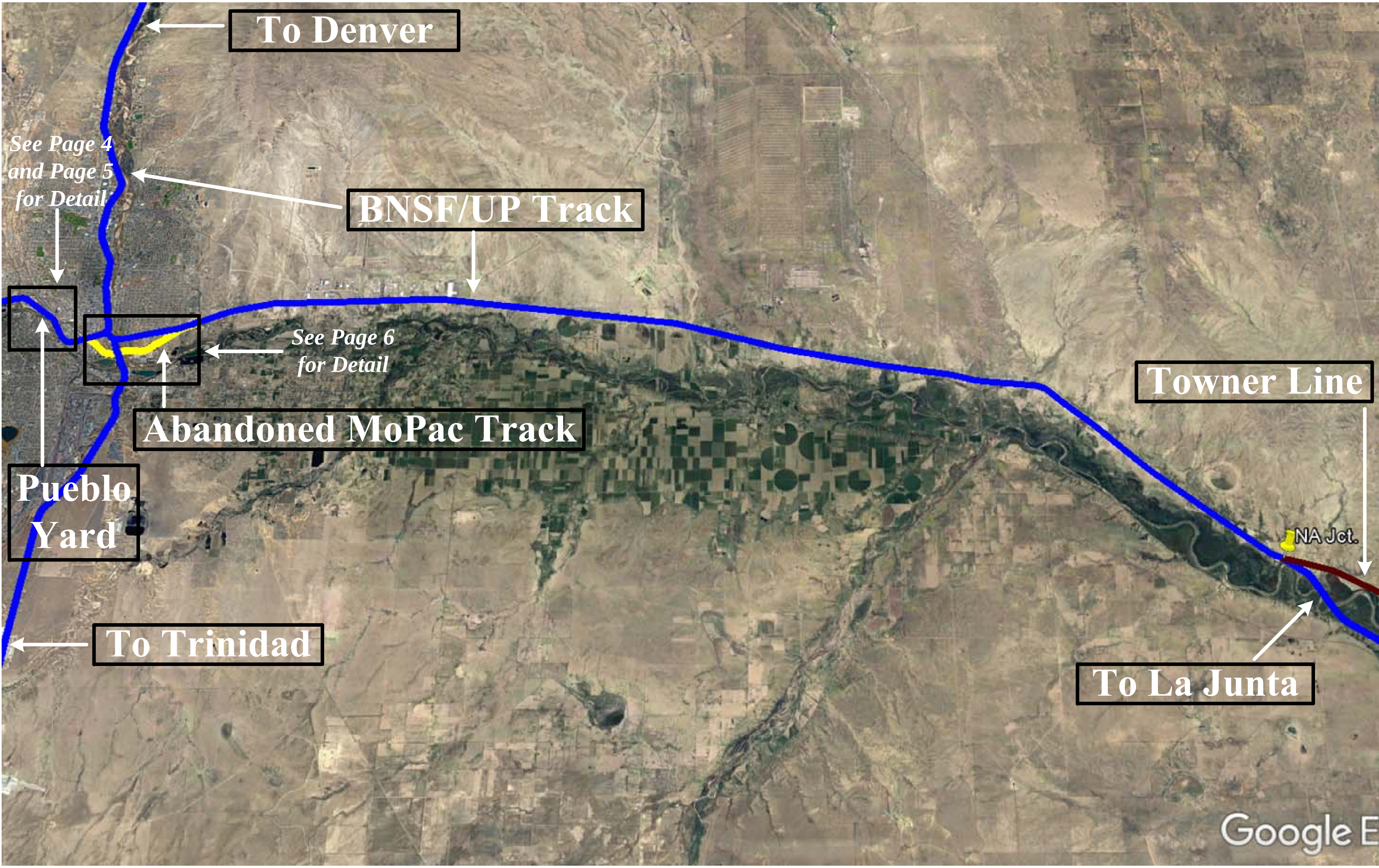


L. E. PEABODY & ASSOCIATES, INC.
ECONOMIC CONSULTANTS

Schematic of Tennessee Pass Subdivision and Surrounding Rail Lines



Google Earth Pro Imagery of Pueblo, CO to NA Junction, CO



Google Earth Pro Imagery of West Pueblo Yard

Google Earth Pro Imagery of East Pueblo Yard

Google Earth Pro Imagery of Area Surrounding Pueblo Yard

Google Earth Pro Imagery of Active Bridge Crossing Arkansas River

Google Earth Pro Imagery of Abandoned Bridge Crossing Arkansas River

Tennessee Pass Net Liquidation Value ("NLV") Summary -- 1Q18

Item (1)	Source (2)	Statistic (3)
1. Relay Rail Gross Salvage Value ("GSV")	Attachment No. 3, Column (8), L.25	$5,243,766
2. Relay Other Track Material ("OTM") GSV	Attachment No. 5, Column (3), L.68	$2,366,846
3. Relay Turnouts GSV	Attachment No. 6, Column (8), L.3	$230,900
4. Total Relay GSV	L.1 + L.2 + L.3	$7,841,512
5. Reroll and Scrap Rail GSV	Attachment No. 3, Column (8), L.32	$10,633,238
6. Scrap OTM GSV	Attachment No. 5, Column (3), L.69	$4,699,784
7. Scrap Turnouts GSV	Attachment No. 6, Column (8), L.4	$88,256
8. Total Reroll and Scrap GSV	L.5 + L.6 + L.7	$15,421,278
9. Total Rail GSV	L.1 + L.5	$15,877,004
10. Total OTM GSV	L.2 + L.6	$7,066,630
11. Total Turnouts GSV	L.3 + L.7	$319,156
12. Total Relay, Reroll and Scrap GSV	L.9 + L.10 + L.11	$23,262,790
13. Ties Net Salvage Value	Attachment No. 4, Column (3), L.28	$0
14. Total Gross Salvage Value	**L.12 + L.13**	**$23,262,790**
15. Rail/Turnout Removal and Restoration Costs	Attachment No. 7, Column (3), L.21	$3,965,940
16. Relay Marketing and Disposition Costs	L.4 x 15% 1/	$1,176,227
17. Scrap Marketing and Disposition Costs	L.8 x 5% 1/	$771,064
18. Total Marketing and Disposition Costs	L.16 + L.17	$1,947,291
19. Transportation Costs	Attachment No. 8, Column (4), L.12	$2,127,822
20. Total Liquidation Cost	**L.15 + L.18 + L.19**	**$8,041,053**
21. Total NLV of Track Assets	**L.14 - L.20**	**$15,221,737**
22. Total Value of Land	**Attachment No. 9, Column (5), L.6**	**$1,330,713**
23. Total Net Liquidation Value	**L.21 + L.22**	**$16,552,450**

1/ Marketing percentages are based on L.E. Peabody & Associates, Inc. ("LEPA") estimates.

Tennessee Pass Rail Assets Gross Salvage Value ("GSV") -- 1Q18

Item	Source	112 CWR & Jointed	115 Jointed	131 CWR	132 CWR & Jointed	136 CWR	Total 11/
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1. Total Main Track Miles	1/	17.87	74.93	26.72	12.56	97.12	229.20
2. Total Sidings Miles	2/	4.39	18.42	6.56	3.08	23.90	56.35
3. Total Rail Miles	**L.1 + L.2**	**22.26**	**93.35**	**33.28**	**15.64**	**121.02**	**285.55**
4. Relay Fit Miles	3/	6.07	25.45	9.07	4.27	33.00	77.86
5. Reroll Miles	4/	0.16	0.67	0.24	0.11	0.87	2.05
6. Scrap Miles	4/	16.02	67.23	23.97	11.26	87.16	205.64
7. Total Reroll and Scrap Miles	**L.5 + L.6**	**16.18**	**67.90**	**24.21**	**11.37**	**88.03**	**207.69**
8. Total Rail Miles	L.4 + L.7	22.25	93.35	33.28	15.64	121.03	285.55
9. Pounds per Yard	5/	112.00	115.00	131.00	132.00	136.00	-------
10. Rails Per Yard	6/	2.00	2.00	2.00	2.00	2.00	-------
11. Yards Per Mile	5,280 ft. per mile ÷ 3 ft. per yard	1,760	1,760	1,760	1,760	1,760	-------
12. Pounds per Mile	L.9 x L.10 x L.11	394,240	404,800	461,120	464,640	478,720	-------
13. Tons Per Mile	L.12 ÷ 2,000 lbs.	197.12	202.40	230.56	232.32	239.36	-------
14. Relay Fit Tons	L.4 x L.13	1,196.52	5,151.08	2,091.18	992.01	7,898.88	17,329.67
15. Percent of Total Tons	L.14 ÷ L.20	1.88%	8.10%	3.29%	1.56%	12.43%	27.27%
16. Reroll Tons	L.5 x L.13	31.54	135.61	55.33	25.56	208.24	456.28
17. Scrap Tons	L.6 x L.13	3,157.86	13,607.35	5,526.52	2,615.92	20,862.62	45,770.27
18. Total Reroll and Scrap Tons	**L.16 + L.17**	**3,189.40**	**13,742.96**	**5,581.85**	**2,641.48**	**21,070.86**	**46,226.55**
19. Percent of Total Tons	L.18 ÷ L.20	5.02%	21.62%	8.78%	4.16%	33.15%	72.73%
20. Total Tons By Rail Type	L.14 + L.18	4,385.92	18,894.04	7,673.03	3,633.49	28,969.74	63,556.22
21. Percent of Total Tons	L.15 + L.19	6.90%	29.73%	12.07%	5.72%	45.58%	100.00%
22. Reusable Percentage	7/	97.00%	97.00%	97.00%	97.00%	97.00%	97.00%
23. Relay Fit Reusable Tons	L.14 x L.22	1,160.62	4,996.55	2,028.44	962.25	7,661.91	16,809.77
24. Relay Fit Unit Price Per Ton	8/	$140.00	$420.00	$280.00	$280.00	$280.00	-------
25. Relay Fit GSV	**L.23 x L.24**	**$162,487**	**$2,098,551**	**$567,963**	**$269,430**	**$2,145,335**	**$5,243,766**
26. Reroll Reusable Tons	L.16 x L.22	30.59	131.54	53.67	24.79	201.99	442.58
27. Reroll Price Per Ton	9/	$290.18	$290.18	$290.18	$290.18	$290.18	-------
28. Reroll GSV	**L.26 x L.27**	**$8,877**	**$38,170**	**$15,574**	**$7,194**	**$58,613**	**$128,428**
29. Scrap Reusable Tons	L.9 x L.22	3,063.12	13,199.13	5,360.72	2,537.44	20,236.74	44,397.15
30. Scrap Price Per Ton	10/	$236.61	$236.61	$236.61	$236.61	$236.61	-------
31. Scrap GSV	**L.29 x L.30**	**$724,765**	**$3,123,046**	**$1,268,400**	**$600,384**	**$4,788,215**	**$10,504,810**
32. Total Reroll and Scrap GSV	**L.28 + L.31**	**$733,641**	**$3,161,216**	**$1,283,974**	**$607,577**	**$4,846,829**	**$10,633,238**
33. Total Reusable Tons	L.23 + L.26 + L.29	4,254.33	18,327.22	7,442.83	3,524.48	28,100.64	61,649.50
33. Total Rail GSV	**L.25 + L.32**	**$896,128**	**$5,259,767**	**$1,851,937**	**$877,007**	**$6,992,163**	**$15,877,004**

1/ STB Docket No. 32760, Volume 5, Page 331 identifies the type of rail and length of rail for the main line 109.0 mile Malta, CO to Canon City, CO segment. This rail type distribution has been applied to these segments in order to all segments based on a per mile distribution

2/ STB Docket No. 32760, Volume 5, Page 331 identifies the type of rail and length of rail for the main line 109.0 mile Malta, CO to Canon City, CO segment. Given that the siding rail types were not identified, the Malta, CO to Canon City, CO main line rail type distribution has been applied to the sidings in order to breakdown the sidings total miles and identify rail types.

3/ It is being assumed that 94% of the active segments (Dotsero, CO to Sage, CO and Parkdale, CO to Pueblo, CO) are relay rail due to the fact they are currently operational.

4/ Without a physical inspection of the line, it is not possible to determine the exact quality of the rail line. It is being assumed that 2% of the active segments (Dotsero, CO to Sage, CO and Parkdale, CO to Pueblo, CO) are re-roll rail and that 4% of the active segments are scrap rail. It is assumed that 100% of the inactive segments (Sage, CO to Parkdale, C(are scrap rail.

5/ Rail is identified by its weight per yard of length. Thus 112# rail weighs 112 pounds per yard, etc.

6/ Each segment of track has 2 rails.

7/ STB Docket No. FD 36005 filed March 18, 2016, KCVN/CPRR Feeder Line Application for Towner Line, Volume I. Both KCVN/CPRR and V&S Railway assumed that 97 percent of fit, reroll, and scrap rail would be recovered. This approach has been followed for the Tennessee Pass.

8/ Average of quotes from Harmer Steel received January 2, 2018.

9/ American Metal Market Daily, price quote effective January 5, 2018 for rerolling rails in Chicago, of $325 per gross ton converted to price per net ton ($325 x [2,000 lbs. per net ton ÷ 2,240 lbs. per gross ton])

10/ American Metal Market Daily, price quote effective January 5, 2018 for scrap No. 1 Heavy Melt in Chicago, of $265 per gross ton converted to price per net ton ($265 x [2,000 lbs. per net ton ÷ 2,240 lbs. per gross ton])

11/ Sum of Column (4) to Column (8).

Tennessee Pass Gross Salvage Value ("GSV") For Ties -- 1Q18

Item (1)	Source (2)	Amount (3)
1. Total Miles	Attachment No. 3, Column (8), L.3	285.55
2. Ties Per Mile	1/	3,249
3. Total Ties	L.1 x L.2	927,818
4. Relay Ties Per Mile	L.6 ÷ L.1	19
5. Relay Percentage	2/	0.6%
6. Total Relay Ties	L.3 x L.5	5,567
7. Unit Price Per Relay Tie	3/	$14.50
8. Total Relay Ties GSV	L.6 x L.7	$80,722
9. Landscape #1 Ties Per Mile	L.11 ÷ L.1	276
10. Landscape #1 Ties Percentage	2/	8.5%
11. Total Landscape #1 Ties	L.3 x L.10	78,864
12. Unit Price Per Landscape #1 Tie	3/	$2.50
13. Total Landscape #1 Ties GSV	L.11 x L.12	$197,160
14. Landscape #2 Ties Per Mile	L.16 ÷ L.1	630
15. Landscape #2 Ties Percentage	2/	19.4%
16. Total Landscape #2 Ties	L.3 x L.15	179,997
17. Unit Price Per Landscape #2 Tie	3/	$2.50
18. Total Landscape #2 GSV	L.16 x L.17	$449,993
19. Scrap Ties Per Mile	L.21 ÷ L.1	2,323
20. Scrap Percentage	2/	71.5%
21. Total Scrap Ties	L.3 x L.20	663,390
22. Unit Price Per Scrap Tie	3/	($11.00)
23. Total Scrap Ties GSV	L.21 x L.22	($7,297,290)
24. **Total Ties GSV**	**L.8 + L.13 + L.18 + L.23**	**($6,569,415)**
25. Estimated Tie Removal Cost Per Tie	4/	$3.00
26. Estimated Tie Removal Cost	L.3 x L.25	$2,783,454
27. **Total Ties NLV**	**L.24 - L.26**	**($9,352,869)**
28. **STB NLV For Ties 5/**	**L.27 or Zero**	**$0**

1/ Crossties are typically laid every 19.5 inches, which equates to approximately 3,249 crossties per mile [(5,280 ft/mile x 12 in/ft) ÷ 19.5 in].

2/ Based on track miles, 27.5%, or 78.62 miles, of the Tennessee Pass is currently being operated. Of this currently operated segment, it has been assumed that 2.0% of the ties would be classified as relay, 31.0% would be classified as landscape #1, 31.0% would be classified as landscape #2, and 36.0% would be classified as scrap. In addition to these ties, there are ties on the 72.5%, or 206.93 miles, that are non-operational. Of these ties, 0.0% have been classified as relay, 0.0% have been classified as landscape #1, 15.0% have been classified as landscape #2, and 85.0% have been classified as scrap. These distributions result in 0.6% of the Tennessee Pass ties being classified as relay, 8.5% being classified as landscape #1, 19.4% as landscape #2, and 71.5% being classified as scrap.

3/ Average of quotes from Harmer Steel and Progress Rail received January 2, 2018.

4/ Quote received from United Railroad Services Co on December 27, 2016.

5/ Based on STB proceedings, should the total ties NLV be less than zero it is assumed that the railroad would not go through the process of removing and disposing of the ties and the NLV is assumed to be zero.

Tennessee Pass Line Gross Salvage Value ("GSV")
For Other Track Materials ("OTM") -- 1Q18

Item	Source	Amount
(1)	(2)	(3)
A. Tie Plates		
1. Relay Tie Plates Miles	1/	77.86
2. Relay Tie Plates Per Mile	2/	6,498
3. Total Relay Tie Plates	L.1 x L.2	505,970
4. Reusable Percentage	3/	97%
5. Total Reusable Relay Tie Plates	L.3 x L.4	490,791
6. Unit Price Per Relay Tie Plate	4/	$3.93
7. Total Relay Tie Plates GSV	**L.5 x L.6**	**$1,926,355**
8. Scrap Tie Plates Miles	5/	207.69
9. Scrap Tie Tons Per Mile	6/	84.48
10. Total Scrap Tie Plates Tons	L.8 x L.9	17,546
11. Reusable Percentage	7/	95%
12. Total Reusable Scrap Tie Plates Tons	L.10 x L.11	16,669
13. Unit Price Per Scrap Ton	8/	$236.61
14. Total Scrap Tie Plates GSV	**L.12 x L.13**	**$3,944,052**
15. Total Tie Plates GSV	**L.7 + L.14**	**$5,870,407**
B. Joint Bars		
16. Relay Joint Bars Miles	9/	35.79
17. Relay Joint Bars Per Mile	10/	270.8
18. Total Relay Joint Bars	L.16 x L.17	9,691
19. Reusable Percentage	11/	97%
20. Total Reusable Relay Joint Bars	L.18 x L.19	9,400
21. Unit Price Per Relay Joint Bar	4/	$27.50
22. Total Relay Joint Bars GSV	**L.20 x L.21**	**$258,500**
23. Scrap Joint Bars Miles	12/	95.45
24. Scrap Joint Bars Tons Per Mile	13/	13.01
25. Total Scrap Joint Bars Tons	L.23 x L.24	1,242
26. Reusable Percentage	14/	95%
27. Total Reusable Scrap Joint Bars Tons	L.25 x L.26	1,180
28. Unit Price Per Scrap Ton	8/	$236.61
29. Total Scrap Joint Bars GSV	**L.27 x L.28**	**$279,200**
30. Total Joint Bars GSV	**L.22 + L.29**	**$537,700**
C. Relay Anchors		
31. Relay Rail Anchors Welded Miles	15/	52.41
32. Relay Rail Anchors Welded Per Mile	16/	6,498
33. Total Relay Rail Anchors Welded	L.31 x L.32	340,560
34. Reusable Percentage	17/	80%
35. Total Reusable Relay Rail Anchors Welded	L.33 x L.34	272,448
36. Unit Price Per Relay Anchor	4/	$0.52
37. Total Relay Rail Anchors Welded GSV	**L.35 x L.36**	**$141,673**
38. Relay Rail Anchors Jointed Miles	9/	35.79
39. Relay Rail Anchors Jointed Per Mile	18/	2,708
40. Total Relay Rail Anchors Jointed	L.38 x L.39	96,919
41. Reusable Percentage	17/	80%
42. Total Reusable Relay Rail Anchors Jointed	L.40 x L.41	77,535
43. Unit Price Per Relay Anchor	4/	$0.52
44. Total Relay Rail Anchors Jointed GSV	**L.42 x L.43**	**$40,318**
45. Total Relay Rail Anchors GSV	**L.37 + L.44**	**$181,991**
46. Scrap Rail Anchor Miles	5/	207.69
47. Scrap Tons of Anchors Per Mile	19/	4.22
48. Total Scrap Rail Anchors Tons	L.46 x L.47	877
49. Reusable Percentage	20/	80%
50. Total Reusable Rail Anchor Tons	L.48 x L.49	702
51. Unit Price Per Scrap Ton	8/	$236.61
52. Total Scrap Rail Anchors Welded GSV	**L.50 x L.51**	**$166,100**
53. Total Rail Anchors GSV	**L.37 + L.45**	**$348,091**

Tennessee Pass Line Gross Salvage Value ("GSV")
For Other Track Materials ("OTM") -- 1Q18

Item	Source	Amount
(1)	(2)	(3)
D. Spikes		
54. Scrap Spike Miles	21/	285.55
55. Scrap Spike Tons Per Mile	22/	4.36
56. Total Scrap Spike Tons	L.54 x L.55	1,246
57. Reusable Percentage	23/	80%
58. Total Reusable Scrap Spikes Tons	L.56 x L.57	997
59. Unit Price Per Scrap Ton	8/	$236.61
60. Total Scrap Spikes GSV	**L.58 x L.59**	**$235,900**
E. Bolts & Washers		
61. Scrap Bolts & Washers Miles	21/	285.55
62. Scrap Bolts & Washers Tons Per Mile	24/	1.38
63. Total Scrap Bolt & Washers Tons	L.61 x L.62	394
64. Reusable Percentage	25/	80%
65. Total Reusable Scrap Bolts & Washers Tons	L.63 x L.64	315
66. Unit Price Per Scrap Ton	8/	$236.61
67. Total Scrap Bolts & Washers GSV	**L.65 x L.66**	**$74,532**
F. Total		
68. Total Relay OTM GSV	L.7 + L.22 + L.45	$2,366,846
69. Total Scrap OTM GSV	L.14 + L.29 + L.52 + L.60 + L.67	$4,699,784
70. Total OTM GSV	**L.68 + L.69**	**$7,066,630**

1/ Attachment No. 3, Column (8), L.4
2/ There are two tie plates per crosstie. According to the Railway Tie Association, crossties are typically laid every 19.5 inches. (5,280 ft. per mile x 12 in. per ft.) ÷ 19.5 in. between ties equals 3,249 crossties per mile and 2 crosstie plates per crosstie equals 6,498 tie plates per mile.
3/ STB Docket No. FD 36005 filed March 18, 2016, KCVN/CPRR Feeder Line Application for Towner Line, Volume I. Both KCVN/CPRR and V&S Railway assumed that 97 percent of Relay tie plates would be recovered. This approach has been followed for the Tennessee Pass.
4/ Average of quotes from Harmer Steel and Progress Rail received January 2, 2018.
5/ Attachment No. 3, Column (8), L.7
6/ Calculated based on a weighted average tie plate weight of 26.0 lbs. per tie plate and 6,498 tie plates per mile. [6,498 tie plates per mile x 26.0 lbs. per tie plate] ÷ 2000.0 lbs. per ton equals 84.48 tons per mile.
7/ STB Docket No. FD 36005 filed March 18, 2016, KCVN/CPRR Feeder Line Application for Towner Line, Volume I. Both KCVN/CPRR and V&S Railway assumed that 95 percent of scrap tie plates would be recovered. This approach has been followed for the Tennessee Pass.
8/ American Metal Market Daily, price quote effective January 5, 2018 for scrap No. 1 Heavy Melt in Chicago, of $265 per gross ton converted to price per net ton ($265 x [2,000 lbs. per net ton ÷ 2,240 lbs. per gross ton])
9/ Attachment No. 3, Column (3), L.4 + Attachment No. 3, Column (4), L.4 + Attachment No. 3, Column (6), L.4
10/ One joint bar is necessary for side of rail per joint, joints are necessary to connect the rail section every 39 feet. [5,280 ft. per mile ÷ 39.0 ft. per rail section] x 2.0 rails per section equals 270.8.
11/ STB Docket No. FD 36005 filed March 18, 2016, KCVN/CPRR Feeder Line Application for Towner Line, Volume I. Both KCVN/CPRR and V&S Railway assumed that 97 percent of Relay joint bars would be recovered. This approach has been followed for the Tennessee Pass.
12/ Attachment No. 3, Column (3), L.7 + Attachment No. 3, Column (4), L.7 + Attachment No. 3, Column (6), L.7
13/ Calculated based on joint bar weight of 93.84 lbs. per joint bar pair for 112 and 115 lb. rail and a joint bar weight of 113.06 lbs. per joint bar pair for 132 lb. rail. For a weighted average of 13.01 lbs. per joint bar pair.
14/ STB Docket No. FD 36005 filed March 18, 2016, KCVN/CPRR Feeder Line Application for Towner Line, Volume I. Both KCVN/CPRR and V&S Railway assumed that 95 percent of scrap joint bars would be recovered. This approach has been followed for the Tennessee Pass.
15/ Attachment No. 3, Column (3), L.4 + Attachment No. 3, Column (5), L.4 + Attachment No. 3, Column (6), L.4 + Attachment No. 3, Column (7), L.4
16/ Calculated based on the assumption that CWR will need 24 anchors per 39 foot section of rail.
17/ STB Docket No. FD 36005 filed March 18, 2016, KCVN/CPRR Feeder Line Application for Towner Line, Volume I. Both KCVN/CPRR and V&S Railway assumed that 80 percent of relay rail anchors would be recovered. This approach has been followed for the Tennessee Pass.
18/ Calculated based on the assumption that CWR will need 10 anchors per 39 foot section of rail.
19/ Calculated based on anchor weight of 1.95 lbs. per anchor and an assumed 16 anchors per 39 foot section of rail.
20/ STB Docket No. FD 36005 filed March 18, 2016, KCVN/CPRR Feeder Line Application for Towner Line, Volume I. Both KCVN/CPRR and V&S Railway assumed that 80 percent of scrap rail anchors would be recovered. This approach has been followed for the Tennessee Pass.
21/ Attachment No. 3, Column (8), L.3
22/ Calculated based on a spike keg for 5/8 x 6 inch spikes with a keg weight of 200 lbs. and an assumed 43.64 spike kegs per mile of rail.
23/ STB Docket No. FD 36005 filed March 18, 2016, KCVN/CPRR Feeder Line Application for Towner Line, Volume I. Both KCVN/CPRR and V&S Railway assumed that 80 percent of scrap spike tons would be recovered. This approach has been followed for the Tennessee Pass.
24/ Calculated based on a bolt keg for 1 x 5 1/4 inch bolts with a keg weight of 200 lbs. and an assumed 13.8 bolt kegs per mile of rail.
25/ STB Docket No. FD 36005 filed March 18, 2016, KCVN/CPRR Feeder Line Application for Towner Line, Volume I. Both KCVN/CPRR and V&S Railway assumed that 80 percent of scrap bolt and washer tons would be recovered.

Tennessee Pass Turnout Gross Salvage Value ("GSV") -- 1Q18

Description	Quantity 1/	Tons Per Unit 2/	Total Tons 3/	Percent Usable 4/	Usable Tons 5/	Unit Price		Total	
(1)	(2)	(3)	(4)	(5)	(6)	(7)		(8)	
A. Relay Turnouts									
1. 136 lb. No. 10	33	xxx	xxx	xxx	xxx	$4,000	6/	$132,000	7/
2. 112/115 lb. No. 10	23	xxx	xxx	xxx	xxx	$4,300	6/	$98,900	7/
3. Total Relay 8/	56	xxx	xxx	xxx	xxx	$8,300		$230,900	
B. Scrap Turnouts									
4. Various	77	5	385	97%	373	$236.61	9/	$88,256	10/
5. Total GSV 11/	**133**							**$319,156**	

1/ L.E. Peabody & Associates, Inc.'s Google Earth Pro Analysis.

2/ STB Docket No. FD 36005 filed March 18, 2016, KCVN/CPRR Feeder Line Application for Towner Line, Volume I. Both KCVN/CPRR and V&S Railway assumed that scrap turnouts would weigh 5 tons per turnout. This approach has been followed for the Tennessee Pass.

3/ Column (2) x Column (3).

4/ STB Docket No. FD 36005 filed March 18, 2016, KCVN/CPRR Feeder Line Application for Towner Line, Volume I. Both KCVN/CPRR and V&S Railway assumed that 97 percent of scrap turnout tons would be recovered. This approach has been followed for the Tennessee Pass.

5/ Column (4) x Column (5).

6/ Quotes from Harmer Steel received January 2, 2018.

7/ Column (2) x Column (7).

8/ L.1 + L.2.

9/ American Metal Market Daily, price quote effective January 5, 2018 for scrap No. 1 Heavy Melt in Chicago, of $265 per gross ton converted to price per net ton ($265 x [2,000 lbs. per net ton ÷ 2,240 lbs. per gross ton])

10/ Column (6) x Column (7).

11/ L.3 + L.4.

Tennessee Pass Removal and Restoration Costs -- 1Q18

Item (1)	Source (2)	Amount (3)
1. Fit Rail and OTM Miles	Attachment No. 3, Column (8), L.4	77.86
2. Fit Rail and OTM Removal Cost Per Mile	1/	$16,000
3. Fit Rail and OTM Removal Costs	L.1 x L.2	$1,245,760
4. Scrap Rail and OTM Miles	Attachment No. 3, Column (8), L.7	207.69
5. Scrap Rail and OTM Removal Cost Per Mile	1/	$12,000
6. Scrap Rail and OTM Removal Costs	L.4 x L.5	$2,492,280
7. Fit Turnouts	Attachment No. 6, Column (2), L.3	56
8. Fit Turnout Removal Costs Per Turnout	1/	$800
9. Fit Turnout Removal Costs	L.7 x L.8	$44,800
10. Scrap Turnouts	Attachment No. 6, Column (2), L.4	77
11. Scrap Turnout Removal Costs Per Turnout	1/	$500
12. Scrap Turnout Removal Costs	L.10 x L.11	$38,500
13. Total Track Removal Costs	**L.3 + L.9 + L.12**	**$3,821,340**
14. Public Highway Crossings	LEPA Google Earth Estimate	63
15. Public Highway Restoration Costs Per Crossing	1/	$2,000
16. Total Public Highway Crossings Costs	L.14 x L.15	$126,000
17. Private Highway Crossings	LEPA Google Earth Estimate	62
18. Private Highway Restoration Costs Per Crossing	1/	$300
19. Total Private Highway Crossings Costs	L.17 x L.18	$18,600
20. Total Crossing Restoration	**L.16 + L.19**	**$144,600**
21. Total Removal and Restoration Costs	**L.13 + L.20**	**$3,965,940**

1/ STB Docket No. FD 36005 filed March 18, 2016, KCVN/CPRR Feeder Line Application for Towner Line, Volume I. Both KCVN/CPRR and V&S Railway used the unit cost shown in Column (3). This approach has been followed for the Tennessee Pass.

Tennessee Pass Asset Transportation Costs -- 1Q18

Item	Source	Tons	Number of Railcars 1/
(1)	(2)	(3)	(4)
1. Relay Rail	Attachment No. 3, Column (8), L.23	16,810	169
2. Reroll Rail	Attachment No. 3, Column (8), L.26	443	5
3. Scrap Rail	Attachment No. 3, Column (8), L.29	44,397	444
4. Scrap Tie Plates	Attachment No. 5, Column (3), L.12	16,669	167
5. Scrap Joint Bars	Attachment No. 5, Column (3), L.27	1,180	12
6. Scrap Anchors	Attachment No. 5, Column (3), L.50	702	8
7. Scrap Spikes	Attachment No. 5, Column (3), L.58	997	10
8. Scrap Bolt and Washers	Attachment No. 5, Column (3), L.65	315	4
9. Scrap Turnouts	Attachment No. 6, Column (6), L.4	373	4
10. Total Number of Railcars	Sum of L.1 to L.9	81,886	823
11. Cost Per Railcar	2/		$2,585
12. Transportation Costs	L.10 x L.11		$2,127,822

1/ Column (3) ÷ 100 tons per railcar.

2/ Based on Union Pacific public tariffs, the cost to ship railway material from Parkdale, CO to Chicago, IL is equal to $5,157 per car and the cost to ship scrap steel from Parkdale, CO to Pueblo, CO is equal to $1,896 per car. A weighted average unit cost was developed using the number of railcars shown above.

Tennessee Pass Estimated Value of Land -- 1Q18

Segment (1)	Track Miles 1/ (2)	Non-Reversionary Acres 2/ (3)		Estimated Value Per Acre 6/ (4)	Total Land Value 7/ (5)
1. Dotsero, CO to Sage, CO	9.1	20.00	3/	$2,614.11	$52,282
2. Sage, CO to Malta, CO	62.1	105.00	4/	$2,614.11	$274,482
3. Malta, CO to Leadville, CO	5.4	40.00	4/	$2,614.11	$104,564
4. Malta, CO to Canon City, CO	111.5	253.05	5/	$2,614.11	$661,501
5. Canon City, CO to Pueblo, CO	41.1	91.00	3/	$2,614.11	$237,884
6. Total 8/	**229.2**	**509.1**			**$1,330,713**

1/ Track miles have been calculated based on the Union Pacific Denver Area Timetable #4, effective November 16, 2009, page 30.

2/ The Tennessee Pass is comprised of reversionary acres and non-reversionary acres. Reversionary land is that which is not owned by the railroad and thus cannot be sold. In estimating the value of the Tennessee Pass land, it is necessary to only take into account the non-reversionary acres, i.e. land that is owned by the railroad and can be sold.

3/ Based on the STB Docket No. 32760, Volume 5 non-reversionary acres for the Sage, Co to Malta, CO, Malta, CO to Leadville, CO and Malta, CO to Canon City, CO, we have estimated 2.22 non-reversionary acres per mile for this segment.

4/ STB Docket No. 32760, Volume 5, Page 293 states that the Sage, CO to Malta, CO segment consists of 1,336 acres, 105 of which are considered to be non-reversionary, and Malta, CO to Leadville, CO consists of 70 acres, 40 of which are considered to be non-reversionary.

5/ STB Docket No. 32760, Volume 5, Page 343 states that the Malta, CO to Canon City, CO segment consists of 2,487 acres, 253.05 of which are considered to be non-reversionary.

6/ STB Docket No. 32760, Volume 5, Page 343 states that the Malta, CO to Canon City, CO non-reversionary segment has a NLV of $378,000. This equates to $1,493.78/acre. This value was indexed to a 2017 $/acre of $2,614.11 using the United States Department of Agriculture's National Agricultural Statistics Service and applied to all three segments comprising the Tennessee Pass.

7/ Column (3) x Column (4).

8/ Sum of L.1 to L.5.

Summary of Capital Costs to Restore Tennessee Pass Line to Federal Railroad Administration ("FRA") Class 2 Service 1/ -- 1Q18

Item (1)	Source (2)	Dotsero, CO to Sage, CO Amount 2/ (3)	Sage, CO to Malta, CO Amount (4)	Malta, CO to Leadville, CO Amount (5)	Malta, CO to Parkdale, CO Amount (6)	Parkdale, CO to Canon City, CO Amount 3/ (7)	Canon City, CO to Pueblo, CO Amount 4/ (8)	Total Rehabilitated Amount 5/ (9)
1. Milepost Start	6/	10.70	60.50	5.40	98.80	12.70	41.10	xxx
2. Milepost End	6/	0	0	0	0.00	0.00	0.00	xxx
3. Track Miles	L.1 - L.2	10.7	60.5	5.40	98.8	12.7	41.1	164.70
4. Siding and Spur Miles	7/	3.36	13.84	0.00	24.17	4.22	10.76	38.01
5. Total Miles	L.3 + L.4	14.06	74.34	5.4	122.97	16.92	51.86	202.71
6. Total Track Feet	L.5 x 5,280 ft. per mile	74,237	392,515	28,512	649,282	89,338	273,821	1,070,309
A. Vegetation Removal								
7. Vegetation Removal Cost Per Mile	8/	$0.00	$9,390.00	$9,390.00	$9,390.00	$0.00	$0.00	xxx
8. Estimated Vegetation Removal Cost	L.5 x L.7	$0	$698,053	$50,706	$1,154,688	$0	$0	$1,903,447
B. Crosstie Replacement								
9. Number of 39-ft. Sections	L.6 ÷ 39 ft.	1,904	10,064	731	16,648	2,291	7,021	27,444
10. Replacement Ties Required Per Section	9/	0	9	9	9	0	0	xxx
11. Estimated Replacement Ties	L.9 x L.10	0	90,580	6,580	149,834	0	0	246,994
12. Estimated Cost Per Tie	10/	$90.00	$90.00	$90.00	$90.00	$90.00	$90.00	xxx
13. Estimated Tie Replacement Cost	L.11 x L.12	$0	$8,152,239	$592,172	$13,485,079	$0	$0	$22,229,490
C. Ballast Replacement Cost								
14. Estimated Ballast Tons Per Mile	11/	520	520	520	520	520	520	xxx
15. Estimated Ballast Tons	L.5 x L.14	0	38,657	2,808	63,944	0	0	105,409
16. Estimated Ballast Cost Per Ton	12/	$37.00	$37.00	$37.00	$37.00	$37.00	$37.00	xxx
17. Estimated Ballast Replacement Cost	L.15 x L.16	$0	$1,430,302	$103,896	$2,365,943	$0	$0	$3,900,141
D. Track Rehabilitation								
18. Estimated Cost to Re-Surface Track Per Track Foot	13/	$2.80	$2.80	$2.80	$2.80	$2.80	$2.80	xxx
19. Estimated Cost to Re-surface Track	L.6 x L.18	$0	$1,099,043	$79,834	$1,817,988	$0	$0	$2,996,865
E. Rail Replacement								
20. Estimated Cost to Install Rail Per Track Foot	14/	$85.00	$85.00	$85.00	$85.00	$85.00	$85.00	xxx
21. Estimated Cost to Install Rail	L.6 x L.20 x 2 Rails	$0	$66,727,584	$4,847,040	$110,377,872	$0	$0	$181,952,496
F. Track and Bridge Inspections								
22. Inspection Cost Per Mile	15/	$890.00	$890.00	$890.00	$890.00	$890.00	$890.00	xxx
23. Total Estimated Track and Bridge Inspections Cost	L.5 x L.22	$0	$66,163	$4,806	$109,443	$0	$0	$180,412
G. Crossing Re-pavement								
24. Public Highway Crossings	16/	4	15	3	22	4	16	40
25. Public Highway Restoration Costs Per Crossing	17/	$0	$2,000	$2,000	$2,000	$0	$0	xxx
26. Total Public Highway Crossings Costs	L.24 x L.25	$0	$30,000	$6,000	$44,000	$0	$0	$80,000
27. Private Highway Crossings	16/	3	15	2	21	4	16	38
28. Private Highway Restoration Costs Per Crossing	18/	$0	$300	$300	$300	$0	$0	xxx
29. Total Private Highway Crossings Costs	L.27 x L.28	$0	$4,500	$600	$6,300	$0	$0	$11,400
30. Total Crossing Re-pavement Cost	L.26 + L.29	xxx	xxx	xxx	xxx	xxx	xxx	$91,400
H. Communications & Signaling								
31. Communications & Signaling Costs Per Mile	19/	$0	$10,000	$10,000	$10,000	$0	$0	xxx
32. Total Communications & Signaling Cost	L.5 x L.31	$0	$743,400	$54,000	$1,229,700	$0	$0	$2,027,100
I. Engineering & Contingencies								
33. Subtotal	20/	xxx	xxx	xxx	xxx	xxx	xxx	$215,281,351
34. Engineering & Contingencies	L.33 x 14% 21/	xxx	xxx	xxx	xxx	xxx	xxx	$30,139,389
J. Total								
35. Total Cost	**L.33 + L.34**	**xxx**	**xxx**	**xxx**	**xxx**	**xxx**	**xxx**	**$245,420,740**
36. Total Cost Per Mile	L.35 ÷ L.5	xxx	xxx	xxx	xxx	xxx	xxx	$1,210,699

1/ FRA categorizes track for freight in six classes, segregated by maximum speed limits: Class 1 – 10 mph; Class 2 – 25 mph; Class 3 – 40 mph; Class 4 – 60 mph; Class 5 - 80 mph; and Class 6 – 110 mph. See
2/ Per the Union Pacific Denver Area Timetable #4, effective November 16, 2009, page 30, this line is operational. The speed table in the timetables, nots that the maximum operating speed from MP 341.9 to MP 336.0 is 25 MPH, the maximum operating speed from MP 336 to MP 335.2 is 20 MPH, and the maximum operating speed from MP 335.2 to MP 334.6 is 25 MP, the remaining track from MP 334.6 to 331.2 is 40 MPH. As these are all greater than FRA Class 1 operating statues, we have assumed this line will need no rehabilitation to upgrade to FRA Class 2 status.
3/ Per the Union Pacific Denver Area Timetable #4, effective November 16, 2009, page 30, this line is operational. The timetable Main Track Authority notes that "Movements between MP 159.2 mad MP 171.9 are over trackage of Canon City and Royal Gorge RR. Be governed by Joint Timetable of the Canon City & Royal Gorge RR and the Rock and Rail RR." As this is a continually operated passenger rail line, it is assumed that it no rehabilitation will be need for FRA Class 2 operating status.
4/ Per the Union Pacific Denver Area Timetable #4, effective November 16, 2009, page 30, this line is operational. The speed table in the timetables, notes that the maximum operating speed is 40 MPH. As this us greater than FRA Class 2 operating status, we have assumed this line will need no rehabilitation to upgrade to FRA Class 2 status.
5/ Sum of Rehabilitated Segments in Column (4) to Column (6).
6/ Union Pacific Denver Area Timetable #4, effective November 16, 2009, page 30.
7/ Sidings miles for Malta, CO to Canon City, CO are based on STB Docket No. 32760 UP/SP Merger, Volume 5, page 308. All others are based on a L.E. Peabody & Associates, Inc. ("LEPA") Google Earth Pro analysis.
8/ Attachment No. 11, Column (8), L.14
9/ Per FRA Track and Rail and Infrastructure Integrity Compliance Manual January 2014, Class 2 track must have a minimum of 9 crossties on track over 2 degrees or turnouts and 9 on tangent track and curves of less than 2 degrees. We have used 9 to be conservative.
10/ Attachment No. 12, Column (8), L.17
11/ Attachment No. 13, Column (6), L.15
12/ Attachment No. 13, Column (10), L.15
13/ Attachment No. 14, Column (10), L.13
14/ Attachment No. 15, Column (10), L.9
15/ Attachment No. 16, Column (8), L.13
16/ LEPA Google Earth Estimate
17/ Attachment No. 7, Column (3), L.15
18/ Attachment No. 7, Column (3), L.18
19/ LEPA estimate of cost for rehabilitation signals along the inactive line.
20/ L.8 + L.13 + L.17 + L.19 + L.21 + L.23 + L.30 + L.32
21/ Attachment No. 17, Column (4), L.9

Summary of Vegetation Control Costs in Rail Rehabilitation Grant Applications and Reports -- 1Q18

	Quarter	Year	Period	Miles of Application 1/	Total Cost 1/	Cost Per Mile 2/		RS Means Index 3/	1Q18 Cost Per Mile 4/	Method Used 1/	Source	Page
	(1)	(2)	(3)	(4)	(5)	(6)		(7)	(8)	(9)	(10)	(11)
1.	1Q	2009	1Q2009	29.0	$120,500	$4,155.17		1.1825	$4,913.37	Hand Tools	Alaska Railroad Company, Nash Report (1998)	9
2.	1Q	2009	1Q2009	xxx	$112,000	$1,000.00	1/	1.1825	$1,182.47	Water, diesel	Alaska Railroad Company, Nash Report (1998)	12
3.	1Q	2009	1Q2009	42.0	$68,600	$1,633.33		1.1825	$1,931.37	Water, propane	Alaska Railroad Company, Nash Report (1998)	15
4.	1Q	2009	1Q2009	36.7	$66,710	$1,817.71		1.1825	$2,149.39	Propane	Alaska Railroad Company, Nash Report (1998)	18
5.	1Q	2009	1Q2009	30.8	$102,303	$3,321.53		1.1825	$3,927.60	Propane	Alaska Railroad Company, Nash Report (1998)	21
6.	1Q	2009	1Q2009	7343.6	$9,969,433	$1,357.58		1.1825	$1,605.29	Vegetation Control	DuPont Oct. 3rd, 2014 Technical Correction Decision	Table A-4
7.	3Q	2010	3Q2010	6911.9	$5,777,734	$835.91		1.1760	$983.05	Vegetation Control	TPI Sept. 14, 2014 Decision	Table A-6
8.	3Q	2011	3Q2011	580.6	$870,721	$1,499.59		1.1287	$1,692.53	Vegetation Control	SunBelt July 20, 2014 Decision	Table A-5
9.	1Q	2012	1Q2012	69.6	$400,000	$5,747.13		1.1124	$6,392.93	Vegetation Removal	Northeast Texas Rural Rail Transportation District U.S. DOT TIGER Grant Application (2012)	10
10.	1Q	2013	1Q2013	33.5	$408,000	$12,179.10		1.0960	$13,348.18	Vegetation Removal	Northeast Texas Rural Rail Transportation District U.S. DOT TIGER Grant Application (2013)	10
11.	1Q	2013	1Q2014	69.6	$552,200	$7,933.91		1.0631	$8,434.14	Vegetation Removal	Northeast Texas Rural Rail Transportation District U.S. DOT TIGER Grant Application (2014)	14
12.	Average Nash Report 5/								$2,670.00	Vegetation Control		
13.	Average STB Rate Cases MOW Vegetation Control Cost 6/								$1,430.00	Vegetation Control		
14.	Average NETEX Cost Estimates 7/								$9,390.00	Vegetation Removal		

1/ Information given in Report in Column (10).
2/ Unless otherwise noted, Column (5) ÷ Column (4).
3/ R.S. Means Historical Construction Cost Index from Quarter in Column (3) to 1Q18.
4/ Column (6) x Column (7).
5/ Average of L.1 through L.5, rounded to the nearest ten.
6/ Average of L.6 through L.8, rounded to the nearest ten.
7/ Average of L.9 through L.11, rounded to the nearest ten.

Summary of Crosstie Replacement Costs in Rail Rehabilitation Grant Applications and Reports -- 1Q18

	Quarter (1)	Year (2)	Period (3)	Ties Quantity 1/ (4)	Total Cost 1/ (5)	Cost Per Tie 2/ (6)	RS Means Index 3/ (7)	1Q18 Cost Per Mile 4/ (8)	Item 1/ (9)	Source (10)	Page (11)
1.	2Q	2013	2Q2013	1,754	$157,860	$90.00	1.0905	$98.14	Steel Crossties	Iowa Department of Transportation Upper Midwest Transportation Hub U.S. DOT TIGER Grant Application (2013)	2
2.	2Q	2013	2Q2013	6,750	$607,500	$90.00	1.0905	$98.14	Steel Crossties	Iowa Department of Transportation Upper Midwest Transportation Hub U.S. DOT TIGER Grant Application (2013)	3
3.	2Q	2013	2Q2013	10,477	$942,930	$90.00	1.0905	$98.14	Steel Crossties	Iowa Department of Transportation Upper Midwest Transportation Hub U.S. DOT TIGER Grant Application (2013)	3
4.	1Q	2012	1Q2012	83,426	$5,839,820	$70.00	1.1124	$77.87	Crosstie Removal & Replacement	Northeast Texas Rural Rail Transportation District MP 489.4 to MP 555 U.S. DOT TIGER Grant Application (2012)	10
5.	1Q	2014	1Q2014	94,557	$7,062,123	$74.69	1.0631	$79.40	Crosstie Removal & Replacement (Includes Spikes & Plates)	Northeast Texas Rural Rail Transportation District MP 489.4 to MP 555 U.S. DOT TIGER Grant Application (2014)	14
6.	1Q	2013	1Q2013	41,676	$2,917,340	$70.00	1.0960	$76.72	Crosstie Removal & Replacement (Includes Spikes & Plates)	Northeast Texas Rural Rail Transportation District MP 524 to MP 555 U.S. DOT TIGER Grant Application (2013)	10
7.	1Q	2013	1Q2013	2,708	$189,525	$69.99	1.0960	$76.71	Crosstie Removal & Replacement (Includes Spikes & Plates)	Northeast Texas Rural Rail Transportation District MP 524 to MP 555 U.S. DOT TIGER Grant Application (2013)	10
8.	1Q	2004	1Q2004	10,802	$972,180	$90.00	1.5017	$135.16	Crossties	Strafford Regional Planning Commission NH Northcoast Rail U.S. DOT TIGER Grant Application (2013)	1
9.	1Q	2012	1Q2012	40,560	$3,042,000	$75.00	1.1124	$83.43	Crosstie Installation	Texas Department of Transportation South Orient Rehabilitation of Sulphur Junction to Fort Stockton U.S. DOT TIGER Grant Application (2012)	14
10.	1Q	2016	1Q2016	4,980	$448,200	$90.00	1.0466	$94.19	Wood Crossties	Vermont Agency of Transportation VTR Northern Subdivision Rutland to Burlington U.S. DOT TIGER Grant Application (2016)	5
11.	2Q	2013	2Q2013	2,230	$167,250	$75.00	1.0905	$81.78	Wood Crossties	Vermont Agency of Transportation VTR Northern Subdivision Rutland to Leicester U.S. DOT TIGER Grant Application (2013)	9
12.	2Q	2013	2Q2013	1,000	$75,000	$75.00	1.0905	$81.78	Wood Crossties	Vermont Agency of Transportation VTR Northern Subdivision Rutland to Leicester U.S. DOT TIGER Grant Application (2013)	9
13.	2Q	2013	2Q2013	6,890	$516,750	$75.00	1.0905	$81.78	Wood Crossties	Vermont Agency of Transportation VTR Northern Subdivision Rutland to Leicester U.S. DOT TIGER Grant Application (2013)	9
14.	1Q	2016	1Q2016	6,330	$569,700	$90.00	1.0466	$94.19	Wood Crossties	Vermont Agency of Transportation VTR Northern Subdivision U.S. DOT TIGER Grant Application (2016)	5
15.	1Q	2015	1Q2015	399,747	$35,952,638	$89.94	1.0578	$95.14	Wood Crossties	Washington State Short Line Rail Inventory and Needs Assessment - Publicly Owned Rail (2015)	14
16.	1Q	2015	1Q2015	175,946	$15,835,130	$90.00	1.0578	$95.21	Wood Crossties	Washington State Short Line Rail Inventory and Needs Assessment - Privately Owned Rail (2015)	15
17.	Average Crosstie Cost 5/					$82.00		$90.00			
18.	Lowest Crosstie Cost 6/					$69.99		$76.71			
19.	Highest Crosstie Cost 7/					$90.00		$135.16			

1/ Information given in Report in Column (10).
2/ Column (5) ÷ Column (4).
3/ R.S. Means Historical Construction Cost Index from Quarter in Column (3) to 1Q18.
4/ Column (6) x Column (7).
5/ Average of L.1 through L.16, rounded to the nearest dollar.
6/ Minimum of L.1 through L.16.
7/ Maximum of L.1 through L.16.

Summary of Ballast Rehabilitation Costs in Rail Rehabilitation Grant Applications and Reports -- 1Q18

	Quarter (1)	Year (2)	Period (3)	Miles 1/ (4)	Tons Quantity 1/ (5)	Tons Per Mile 2/ (6)	Total Cost 1/ (7)	Cost Per Ton 3/ (8)	RS Means Index 4/ (9)	1Q18 Cost Per Ton 5/ (10)	Item 1/ (11)	Source (12)	Page (13)
1.	2Q	2013	2Q2013	xxx	3,050	xxx	$42,700	$14.00	1.0905	$15.27	Ballast - AREMA NO. 4	Iowa Department of Transportation Upper Midwest Transportation Hub U.S. DOT TIGER Grant Application (2013)	2
2.	2Q	2013	2Q2013	xxx	8,172	xxx	$114,401	$14.00	1.0905	$15.27	Ballast - AREMA NO. 4	Iowa Department of Transportation Upper Midwest Transportation Hub U.S. DOT TIGER Grant Application (2013)	3
3.	2Q	2013	2Q2013	xxx	18,550	xxx	$259,700	$14.00	1.0905	$15.27	Ballast - AREMA NO. 4	Iowa Department of Transportation Upper Midwest Transportation Hub U.S. DOT TIGER Grant Application (2013)	3
4.	1Q	2012	1Q2012	69.6	31,320	450	$1,566,000	$50.00	1.1124	$55.62	Ballast & Delivery	Northeast Texas Rural Rail Transportation District MP 489.4 to MP 555 U.S. DOT TIGER Grant Application (2012)	10
5.	1Q	2014	1Q2014	69.6	36,717	528	$1,273,054	$34.67	1.0631	$36.86	Ballast & Material Delivery	Northeast Texas Rural Rail Transportation District MP 489.4 to MP 555 U.S. DOT TIGER Grant Application (2014)	14
6.	1Q	2013	1Q2013	33.5	19,600	585	$1,078,000	$55.00	1.0960	$60.28	Ballast & Delivery	Northeast Texas Rural Rail Transportation District MP 524 to MP 555 U.S. DOT TIGER Grant Application (2013)	10
7.	1Q	2012	1Q2012	16	8,100	506	$405,000	$50.00	1.1124	$55.62	Ballast	Texas Department of Transportation South Orient Rehabilitation of Sulphur Junction to Fort Stockton U.S. DOT TIGER Grant Application (2012)	14
8.	1Q	2016	1Q2016	4.98	2,660	534	$106,400	$40.00	1.0466	$41.86	Furnish and Place Ballast Surface Course	Vermont Agency of Transportation VTR Northern Subdivision Rutland to Burlington U.S. DOT TIGER Grant Application (2016)	5
9.	1Q	2016	1Q2016	6.33	3,300	521	$132,000	$40.00	1.0466	$41.86	Furnish and Place Ballast Surface Course	Vermont Agency of Transportation VTR Northern Subdivision Rutland to Burlington U.S. DOT TIGER Grant Application (2016)	5
10.	2Q	2013	2Q2013	2.23	1,160	520	$46,400	$40.00	1.0905	$43.62	Furnish and Place Ballast Surface Course	Vermont Agency of Transportation VTR Northern Subdivision Rutland to Leicester U.S. DOT TIGER Grant Application (2013)	9
11.	2Q	2013	2Q2013	1	520	520	$20,800	$40.00	1.0905	$43.62	Furnish and Place Ballast Surface Course	Vermont Agency of Transportation VTR Northern Subdivision Rutland to Leicester U.S. DOT TIGER Grant Application (2013)	9
12.	2Q	2013	2Q2013	6.89	3,582	520	$143,280	$40.00	1.0905	$43.62	Furnish and Place Ballast Surface Course	Vermont Agency of Transportation VTR Northern Subdivision Rutland to Leicester U.S. DOT TIGER Grant Application (2013)	9
13.	1Q	2015	1Q2015	xxx	544,315	xxx	$13,607,880	$25.00	1.0578	$26.45	Ballast Distribution	Washington State Short Line Rail Inventory and Needs Assessment - Publicly Owned Rail (2015)	14
14.	1Q	2015	1Q2015	xxx	239,740	xxx	$5,933,512	$24.75	1.0578	$26.18	Ballast Distribution	Washington State Short Line Rail Inventory and Needs Assessment - Privately Owned Rail (2015)	15
15.	Average 6/					520		$34.00		$37.00			
16.	Lowest Ballast Cost 7/							$14.00		$15.27			
17.	Highest Ballast Cost 8/							$55.00		$60.28			

1/ Information given in Report in Column (12).
2/ Column (5) ÷ Column (4).
3/ Column (7) ÷ Column (5).
4/ R.S. Means Historical Construction Cost Index from Quarter in Column (3) to 1Q18.
5/ Column (8) x Column (9).
6/ Average of L.1 through L.14, rounded to the nearest whole number (Column (6)) or dollar Column (8) and Column (10)).
7/ Minimum of L.1 through L.14.
8/ Maximum of L.1 through L.14.

Summary of Rail Rehabilitation Costs in Rail Rehabilitation Grant Applications and Reports -- 1Q18

	Quarter (1)	Year (2)	Period (3)	Miles 1/ (4)	Track Feet Quantity (5)	Quantity Per Mile (6)	Total Cost 1/ (7)	Cost Per Track Foot 4/ (8)	RS Means Index 5/ (9)	1Q18 Cost Per Track Foot 6/ (10)	Item 1/ (11)	Source (12)	Page (13)
1.	1Q	2012	1Q2012	69.6	367,488 2/	5,280 1/	$416,000	$1.13	1.1124	$1.26	Track Surfacing & Ballast Regulating	Northeast Texas Rural Rail Transportation District MP 489.4 to MP 555 U.S. DOT TIGER Grant Application (2012)	10
2.	1Q	2014	1Q2014	69.6	367,488 2/	5,280 1/	$459,360	$1.25	1.0631	$1.33	Track Surfacing	Northeast Texas Rural Rail Transportation District MP 489.4 to MP 555 U.S. DOT TIGER Grant Application (2014)	14
3.	1Q	2013	1Q2013	33.5	176,880 2/	5,280 1/	$199,800	$1.13	1.0960	$1.24	Track Surfacing & Ballast Regulating	Northeast Texas Rural Rail Transportation District MP 524 to MP 555 U.S. DOT TIGER Grant Application (2013)	10
4.	1Q	2004	1Q2004	42	221,760 2/	5,280 1/	$221,820	$1.00	1.5017	$1.50	Resurface & Regulate 42-mile Rail Line	Strafford Regional Planning Commission NH Northcoast Rail U.S. DOT TIGER Grant Application (2013)	1
5.	1Q	2012	1Q2012	16	84,480 2/	5,280 1/	$75,120	$0.89	1.1124	$0.99	Surfacing & Regulating	Texas Department of Transportation South Orient Rehabilitation of Sulphur Junction to Fort Stockton U.S. DOT TIGER Grant Application (2012)	14
6.	1Q	2016	1Q2016	4.98	26,295 1/	5,280 3/	$105,180	$4.00	1.0466	$4.19	Raise, Alight and Surface Track	Vermont Agency of Transportation VTR Northern Subdivision Rutland to Burlington U.S. DOT TIGER Grant Application (2016)	5
7.	1Q	2016	1Q2016	6.33	33,430 1/	5,281 3/	$133,720	$4.00	1.0466	$4.19	Raise, Alight and Surface Track	Vermont Agency of Transportation VTR Northern Subdivision Rutland to Burlington U.S. DOT TIGER Grant Application (2016)	5
8.	2Q	2013	2Q2013	2.23	11,774 1/	5,280 3/	$47,096	$4.00	1.0905	$4.36	Raise, Alight and Surface Track	Vermont Agency of Transportation VTR Northern Subdivision Rutland to Leicester U.S. DOT TIGER Grant Application (2013)	9
9.	2Q	2013	2Q2013	1	5,280 1/	5,280 3/	$21,120	$4.00	1.0905	$4.36	Raise, Alight and Surface Track	Vermont Agency of Transportation VTR Northern Subdivision Rutland to Leicester U.S. DOT TIGER Grant Application (2013)	9
10.	2Q	2013	2Q2013	6.89	36,379 1/	5,280 3/	$145,516	$4.00	1.0905	$4.36	Raise, Alight and Surface Track	Vermont Agency of Transportation VTR Northern Subdivision Rutland to Leicester U.S. DOT TIGER Grant Application (2013)	9
11.	1Q	2015	1Q2015	515.45	2,721,576 1/	5,280 3/	$7,443,170	$2.73	1.0578	$2.89	Surface Line and Dress	Washington State Short Line Rail Inventory and Needs Assessment - Publicly Owned Rail (2015)	14
12.	1Q	2015	1Q2015	227.03	1,198,702 1/	5,280 3/	$3,278,301	$2.73	1.0578	$2.89	Surface Line and Dress	Washington State Short Line Rail Inventory and Needs Assessment - Privately Owned Rail (2015)	15
13.	Average Rail Rehabilitation 7/							$2.57		$2.80			
14.	Lowest Rail Rehabilitation 8/							$0.89		$0.99			
15.	Highest Rail Rehabilitation 9/							$4.00		$4.36			

1/ Information given in Report in Column (12).
2/ Column (4) x Column (6).
3/ Column (5) ÷ Column (4).
4/ Column (7) ÷ Column (5).
5/ R.S. Means Historical Construction Cost Index from Quarter in Column (3) to 1Q18.
6/ Column (8) x Column (9).
7/ Average of L.1 through L.12, rounded to the nearest tenth.
8/ Minimum of L.1 through L.12.
9/ Maximum of L.1 through L.12.

Summary of Rail Replacement Costs in Rail Rehabilitation Grant Applications and Reports -- 1Q18

	Quarter (1)	Year (2)	Period (3)	Miles 1/ (4)	Track Feet Quantity 1/ (5)	Quantity Per Mile 2/ (6)	Total Cost 1/ (7)	Cost Per Track Foot 3/ (8)	RS Means Index 4/ (9)	1Q18 Cost Per Track Foot 5/ (10)	Item 1/ (11)	Source (12)	Page (13)
1.	1Q	2007	1Q2007	10.23	48,523	4,743	$3,154,008	$65.00	1.3079	$85.01	Rail Replacement	Maine Department of Transportation Mountain Division Rail Study (2007)	96
2.	1Q	2007	1Q2007	48.97	230,896	4,715	$15,008,266	$65.00	1.3079	$85.01	Rail Replacement	Maine Department of Transportation Mountain Division Rail Study (2007)	91
3.	1Q	2016	1Q2016	4.98	52,590	10,560	$3,944,250	$75.00	1.0466	$78.49	Install 115 LB CWR to replace 105 lb. 39' Jointed Rail	Vermont Agency of Transportation VTR Northern Subdivision Rutland to Burlington U.S. DOT TIGER Grant Application (2016)	5
4.	1Q	2016	1Q2016	6.33	66,850	10,561	$5,013,750	$75.00	1.0466	$78.49	Install 115 LB CWR to replace 105 lb. 39' Jointed Rail	Vermont Agency of Transportation VTR Northern Subdivision Rutland to Burlington U.S. DOT TIGER Grant Application (2016)	5
5.	2Q	2013	2Q2013	2.23	23,549	10,560	$1,766,175	$75.00	1.0905	$81.78	Install 115 LB CWR to replace 105 lb. 39' Jointed Rail	Vermont Agency of Transportation VTR Northern Subdivision Rutland to Leicester U.S. DOT TIGER Grant Application (2013)	9
6.	2Q	2013	2Q2013	6.89	72,758	10,560	$5,456,850	$75.00	1.0905	$81.78	Install 115 LB CWR to replace 105 lb. 39' Jointed Rail	Vermont Agency of Transportation VTR Northern Subdivision Rutland to Leicester U.S. DOT TIGER Grant Application (2013)	9
7.	1Q	2015	1Q2015	515.45	2,721,576	5,280	1/ $244,941,840	$90.00	1.0578	$95.21	Rail Replacement	Washington State Short Line Rail Inventory and Needs Assessment - Publicly Owned Rail (2015)	14
8.	1Q	2015	1Q2015	227.03	1,198,702	5,280	1/ $107,883,211	$90.00	1.0578	$95.21	Rail Replacement	Washington State Short Line Rail Inventory and Needs Assessment - Privately Owned Rail (2015)	15
9.	Average Rail Replacement 6/							$76.00		$85.00			
10.	Lowest Rail Rehabilitation 7/							$65.00		$78.49			
11.	Highest Rail Rehabilitation 8/							$90.00		$95.21			

1/ Information given in Report in Column (12).
2/ Unless otherwise noted, Column (5) ÷ Column (4).
3/ Column (7) ÷ Column (5).
4/ R.S. Means Historical Construction Cost Index from Quarter in Column (3) to 1Q18.
5/ Column (8) x Column (9).
6/ Average of L.1 through L.8, rounded to the nearest dollar.
7/ Minimum of L.1 through L.8.
8/ Maximum of L.1 through L.8.

Summary of Inspection Costs in Recent STB Rate Cases -- 1Q18

	Quarter	Year	Period	Miles of Application 1/	Total Cost 1/	Cost Per Mile 2/	RS Means Index 3/	1Q18 Cost Per Mile 4/	Method Used 1/	Source	Table
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1.	1Q	2009	1Q2009	7,343.55	$5,080,447	$691.82	1.1825	$818.06	Geometry Testing	DuPont Oct. 3rd, 2014 Technical Correction Decision	Table A-4
2.	1Q	2009	1Q2009	7,343.55	$2,402,989	$327.22	1.1825	$386.93	Rail Flaw Detection Testing	DuPont Oct. 3rd, 2014 Technical Correction Decision	Table A-4
3.	1Q	2009	1Q2009	7,343.55	$935,379	$127.37	1.1825	$150.62	Major Bridge Inspection	DuPont Oct. 3rd, 2014 Technical Correction Decision	Table A-4
4.	1Q	2009	1Q2009	7,343.55	$8,418,815	$1,146.42	1.1825	$1,355.61	Sub-Total	xxx	xxx
5.	3Q	2010	3Q2010	6,911.87	$748,265	$108.26	1.1760	$127.31	Geometry Testing	TPI Sept. 14, 2014 Decision	Table A-6
6.	3Q	2010	3Q2010	6,911.87	$3,095,310	$447.83	1.1760	$526.65	Ultrasonic Rail Testing	TPI Sept. 14, 2014 Decision	Table A-6
7.	3Q	2010	3Q2010	6,911.87	$72,923	$10.55	1.1760	$12.41	Major Bridge Inspection	TPI Sept. 14, 2014 Decision	Table A-6
8.	3Q	2010	3Q2010	6,911.87	$3,916,498	$566.63	1.1760	$666.37	Sub-Total	TPI Sept. 14, 2014 Decision	xxx
9.	3Q	2011	3Q2011	580.64	$110,696	$190.64	1.1287	$215.17	Track Geometry Testing	SunBelt July 20, 2014 Decision	Table A-5
10.	3Q	2011	3Q2011	580.64	$141,599	$243.87	1.1287	$275.24	Ultrasonic Rail Testing	SunBelt July 20, 2014 Decision	Table A-5
11.	3Q	2011	3Q2011	580.64	$82,277	$141.70	1.1287	$159.93	Bridge Inspection	SunBelt July 20, 2014 Decision	Table A-5
12.	3Q	2011	3Q2011	580.64	$334,572	$576.21	1.1287	$650.35	Sub-Total	SunBelt July 20, 2014 Decision	xxx
13.	Average Cost for 3 Recent Decisions 5/					$760.00		$890.00			
14.	Lowest Decision Cost 6/					$566.63		$650.35			
15.	Highest Decision Cost 7/					$1,146.42		$1,355.61			

1/ Information given in Report in Column (10).
2/ Column (5) ÷ Column (4).
3/ R.S. Means Historical Construction Cost Index from Quarter in Column (3) to 1Q18.
4/ Column (7) x Column (8).
5/ Average of L.4, L.8, and L.12, rounded to the nearest ten.
6/ Minimum of L.4, L.8, and L.12.
7/ Maximum of L.4, L.8, and L.12.

Summary of Engineering and Contingencies Percentages in Rail Rehabilitation Grant Applications and Reports

	Report (1)	Engineering (2)		Contingencies (3)		Total (4)	
1.	Northeast Texas Rural Rail Transportation District MP 489.4 to MP 555 U.S. DOT TIGER Grant Application (2012)	xxx		xxx		17.0%	1/
2.	Northeast Texas Rural Rail Transportation District MP 524 to MP 555 U.S. DOT TIGER Grant Application (2013)	xxx		xxx		17.0%	2/
3.	Northeast Texas Rural Rail Transportation District MP 489.4 to MP 555 U.S. DOT TIGER Grant Application (2014)	xxx		xxx		9.0%	3/
4.	Vermont Agency of Transportation VTR Northern Subdivision Rutland to Leicester U.S. DOT TIGER Grant Application (2013)	6%	4/	5%	5/	11.0%	6/
5.	Vermont Agency of Transportation VTR Northern Subdivision Rutland to Burlington U.S. DOT TIGER Grant Application (2016)	7%	7/	5%	8/	12.0%	6/
6.	Texas Department of Transportation South Orient Rehabilitation of Sulphur Junction to Fort Stockton U.S. DOT TIGER Grant Application (2012)	7%	9/	8%	10/	15.0%	6/
7.	Washington State Short Line Rail Inventory and Needs Assessment - Publicly Owned Rail (2015)	xxx		xxx		15.0%	11/
8.	Washington State Short Line Rail Inventory and Needs Assessment - Privately Owned Rail (2015)	xxx		xxx		15.0%	12/
9.	Average Engineering and Contingency Percentage 13/					14.0%	
10.	Lowest Engineering and Contingency Percentage 14/					9.0%	
11.	Highest Engineering and Contingency Percentage 15/					17.0%	

1/ Engineering & Contingencies Total Amount of $1,451,545 ÷ Project Total of $9,990,045, see Report page 10.
2/ Engineering & Contingencies Total Amount of $821,509 ÷ Project Total of $5,653,918, see Report page 10.
3/ (Engineering & Contingencies Total Amount of $505,041 + Project Management And Administration Total Amount of $404,033) ÷ Project Total of $11,009,895, see Report page 14.
4/ Listed percentage for "Construction Engineering" on Report page 9.
5/ Listed percentage for "Contingency" on Report page 9.
6/ Column (2) + Column (3).
7/ Listed percentage for "Construction Engineering" on Report page 5.
8/ Listed percentage for "Contingency" on Report page 5.
9/ Listed percentage for "Engineering & Contingencies" on Report page 14.
10/ Listed percentage for "Mobilization" on Report page 14.
11/ Listed percentage for "Misc. Items, Sales Tax, Mobilization" on Report page 14.
12/ Listed percentage for "Misc. Items, Sales Tax, Mobilization" on Report page 15.
13/ Average of L.1 through L.8, rounded to the nearest percent.
14/ Minimum of L.1 through L.8.
15/ Maximum of L.1 through L.8.

Inactive Bridges Along Tennessee Pass

	Length (feet) 1/	Bridge Type 1/	Number of Tracks 1/	Runs Over 1/	
	(1)	(2)	(3)	(4)	
A. Sage, CO to Malta, CO					
1.	156	Steel	1	Waterway	
2.	245	Steel	1	Waterway	
3.	148	Steel	1	Road	
4.	74	2/	1	Road	
5.	74	2/	1	Mountain Water Runoff	
6.	53	2/	1	Mountain Water Runoff	
7.	202	2/	1	Waterway	
8.	200	Steel	1	Waterway	
9.	192	Concrete/Steel	2	Road	
10.	190	Concrete/Steel	1	Road	
11.	240	Steel	1	Waterway	
12.	193	Steel	1	Waterway	
13.	136	Steel	1	Waterway	3/
14.	58	2/	1	Mountain Water Runoff	
15.	124	2/	1	Waterway	
16.	87	2/	1	Waterway	
17.	96	2/	1	Waterway	
18.	80	2/	1	Waterway	
19.	75	2/	1	Waterway	
20.	65	2/	1	Waterway	
B. Malta, CO to Parkdale, CO					
1.	60	2/	1	Waterway	
2.	120	2/	1	Waterway	
3.	58	Concrete/Steel	1	Waterway	4/
4.	65	Steel	1	Waterway	
5.	130	Steel	1	Waterway	
6.	45	2/	1	Mountain Water Runoff	
7.	48	2/	1	Mountain Water Runoff	
8.	120	Steel	1	Waterway	
9.	185	Steel	1	Waterway	
10.	50	2/	1	Dried Waterway	
11.	225	2/	1	Waterway	
12.	105	Steel	1	Waterway	
13.	250	2/	1	Waterway	
14.	175	2/	1	Waterway	
15.	190	2/	1	Road and Waterway	
16.	190	2/	1	Waterway	
17.	50	2/	1	Mountain Water Runoff	
18.	40	2/	1	Mountain Water Runoff	
19.	72	2/	1	Mountain Water Runoff	
20.	45	Concrete/Steel	1	Mountain Water Runoff	
21.	44	2/	1	Road	
22.	63	2/	1	Mountain Water Runoff	

Inactive Bridges Along Tennessee Pass

	Length (feet) 1/	Bridge Type 1/	Number of Tracks 1/	Runs Over 1/	
	(1)	(2)	(3)	(4)	
23.	70	2/	1	Mountain Water Runoff	
24.	72	2/	1	Mountain Water Runoff	
25.	80	Concrete/Steel	1	Mountain Water Runoff	
26.	105	Steel	1	Mountain Water Runoff	
27.	64	2/	1	Mountain Water Runoff	
28.	35	Steel	1	Mountain Water Runoff	5/
29.	40	2/	1	Mountain Water Runoff	
30.	88	2/	1	Mountain Water Runoff	
31.	85	2/	1	Mountain Water Runoff	
32.	67	2/	1	Mountain Water Runoff	
33.	40	Concrete/Steel	1	Mountain Water Runoff	
34.	55	2/	1	Mountain Water Runoff	
35.	93	Steel	1	Mountain Water Runoff	
36.	67	2/	1	Mountain Water Runoff	
37.	50	Concrete/Steel	1	Mountain Water Runoff	
38.	82	Concrete/Steel	1	Mountain Water Runoff	

Total Inactive Bridges	58
Inactive Bridges 2 tracks or more	1
Inactive Bridges - Smallest (feet)	35
Inactive Bridges - Longest (feet)	250
Inactive Steel Bridges	15
Inactive Concrete/Steel Bridges	8
Inactive Unknown	35

1/ L.E. Peabody & Associates, Inc. ("LEPA") Google Earth estimate.
2/ Using the views provided in Google Earth Pro, LEPA was not able determine the bridge type.
3/ See Attachment No. 18, Page 3 for Google Earth Pro view of bridge.
4/ See Attachment No. 18, Page 4 for Google Earth Pro view of bridge.
5/ See Attachment No. 18, Page 5 for Google Earth Pro view of bridge.

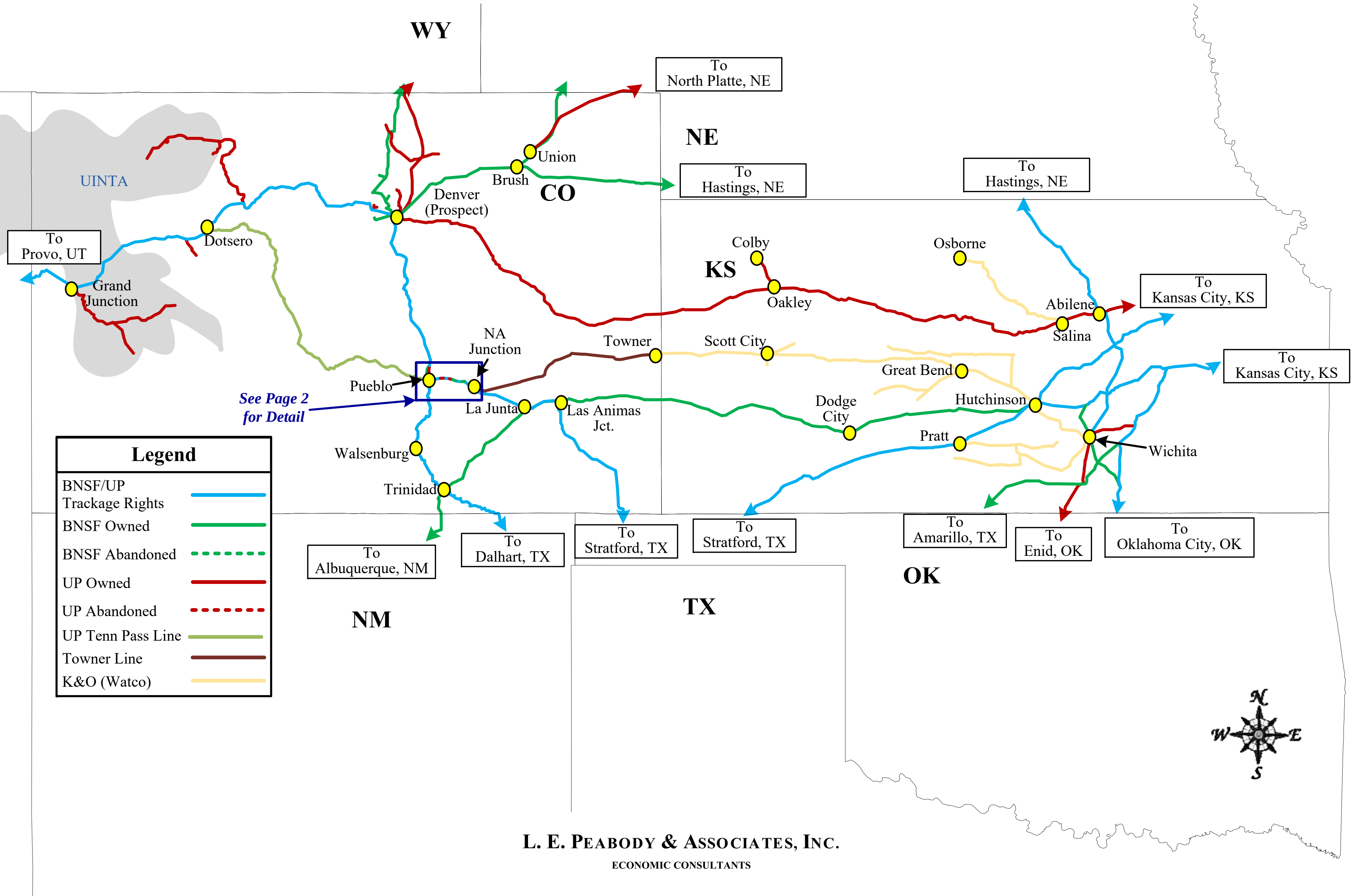
Sage, CO to Malta, CO Steel Bridge

Malta, CO to Parkdale, CO Concrete/Steel Bridge

Malta, CO to Parkdale, CO Steel Bridge

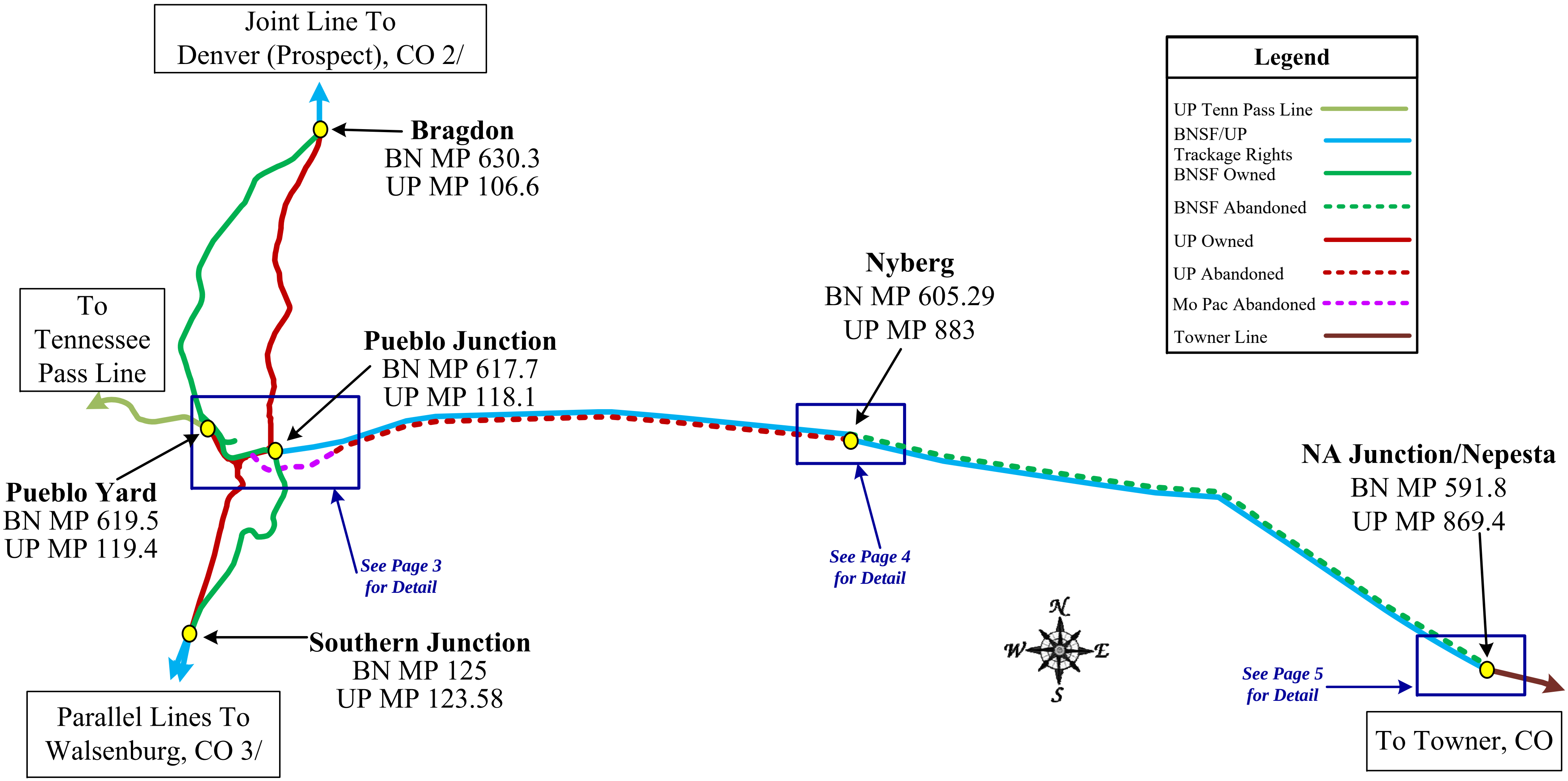
Schematic of Tennessee Pass Subdivision and Towner Line

(Colorado and Kansas)



Schematic of Tennessee Pass Subdivision and Towner Line

(Area Between Tennessee Pass Subdivision and Towner Line 1/)



Below quotes from publically accessed UP Denver Timetables effective 11/16/2009:

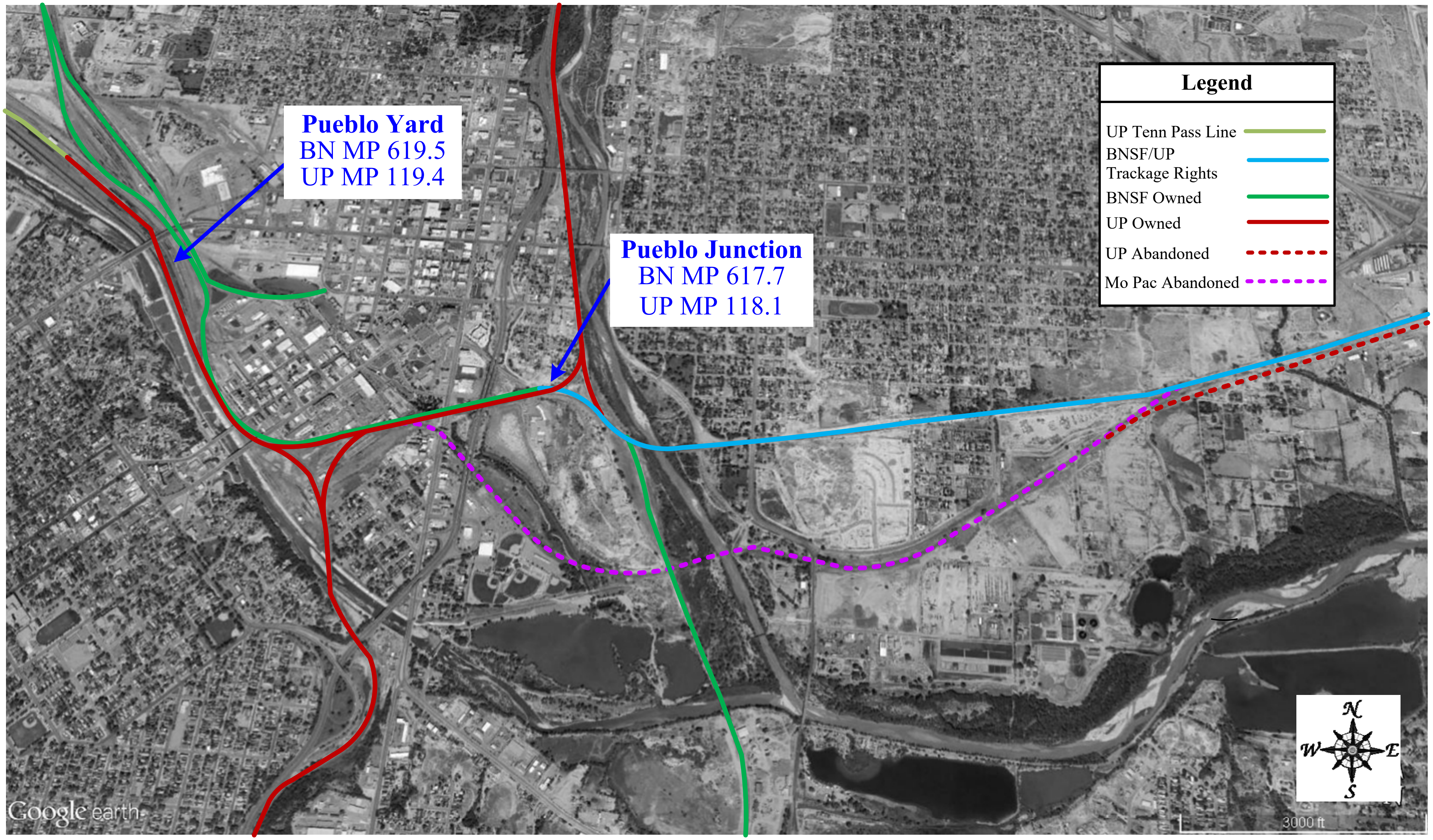
1/ Page 30 "Between Na Jct. and Pueblo Jct. be governed by BNSF Timetable Pueblo Subdivision and BNSF Op. Rules." Note, while both BNSF and UP can operate between Pueblo Junction, CO and NA Junction, CO, BNSF owns the line from Pueblo Junction, CO to Nyberg and UP owns the line from Nyberg, CO to NA Junction, CO.

2/ Page 34 "Between Prospect and Pueblo Jct. be governed by BNSF Timetables, Pikes Peak [Subdivison] and BNSF Operating Rules."

3/ Page 36 "Between Southern Jct. and Walsenburg be governed by current BNSF Timetables and BNSF Operating Rules."

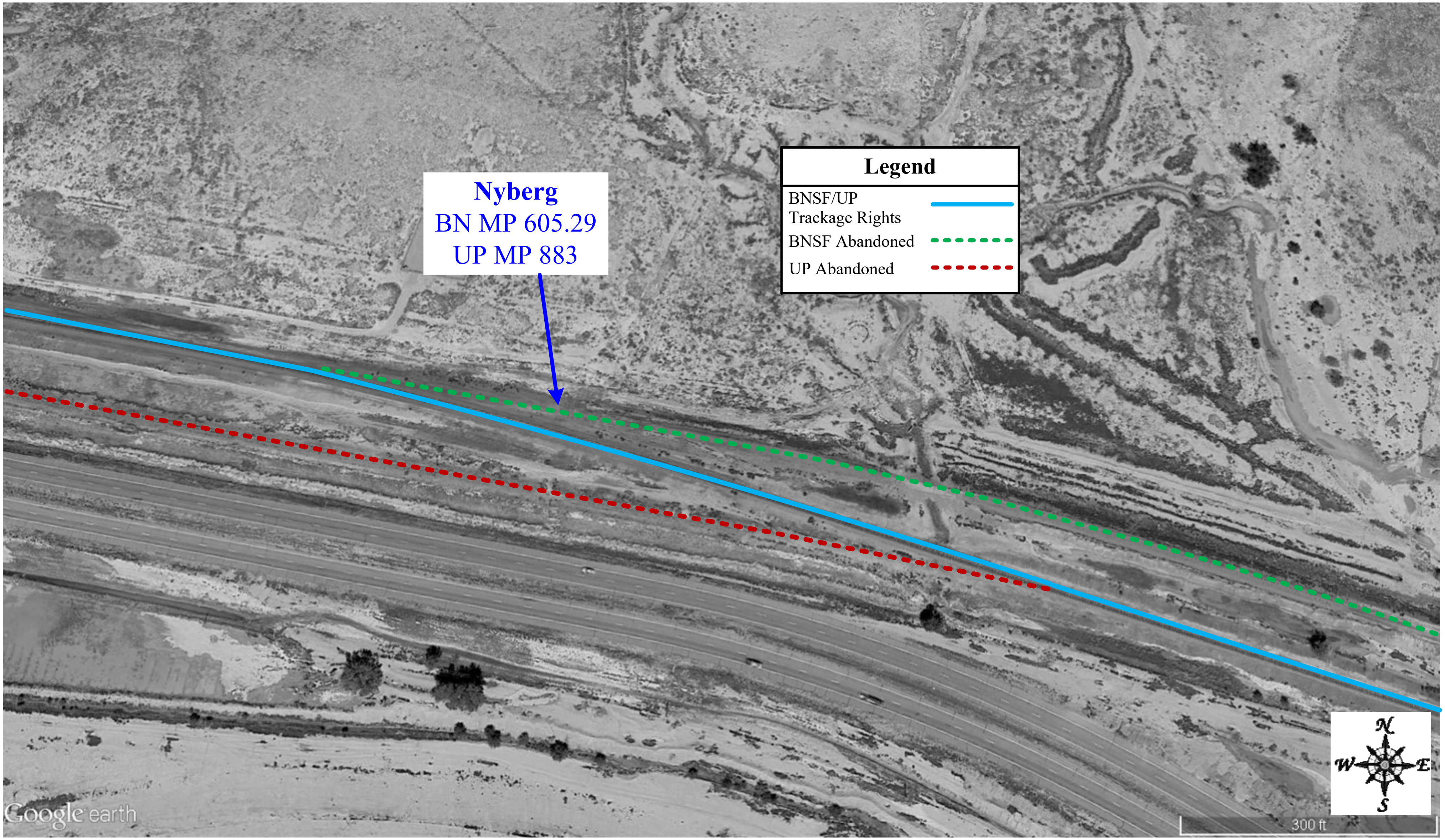
Schematic of Tennessee Pass Subdivision and Towner Line

(Close Up of Pueblo Junction)



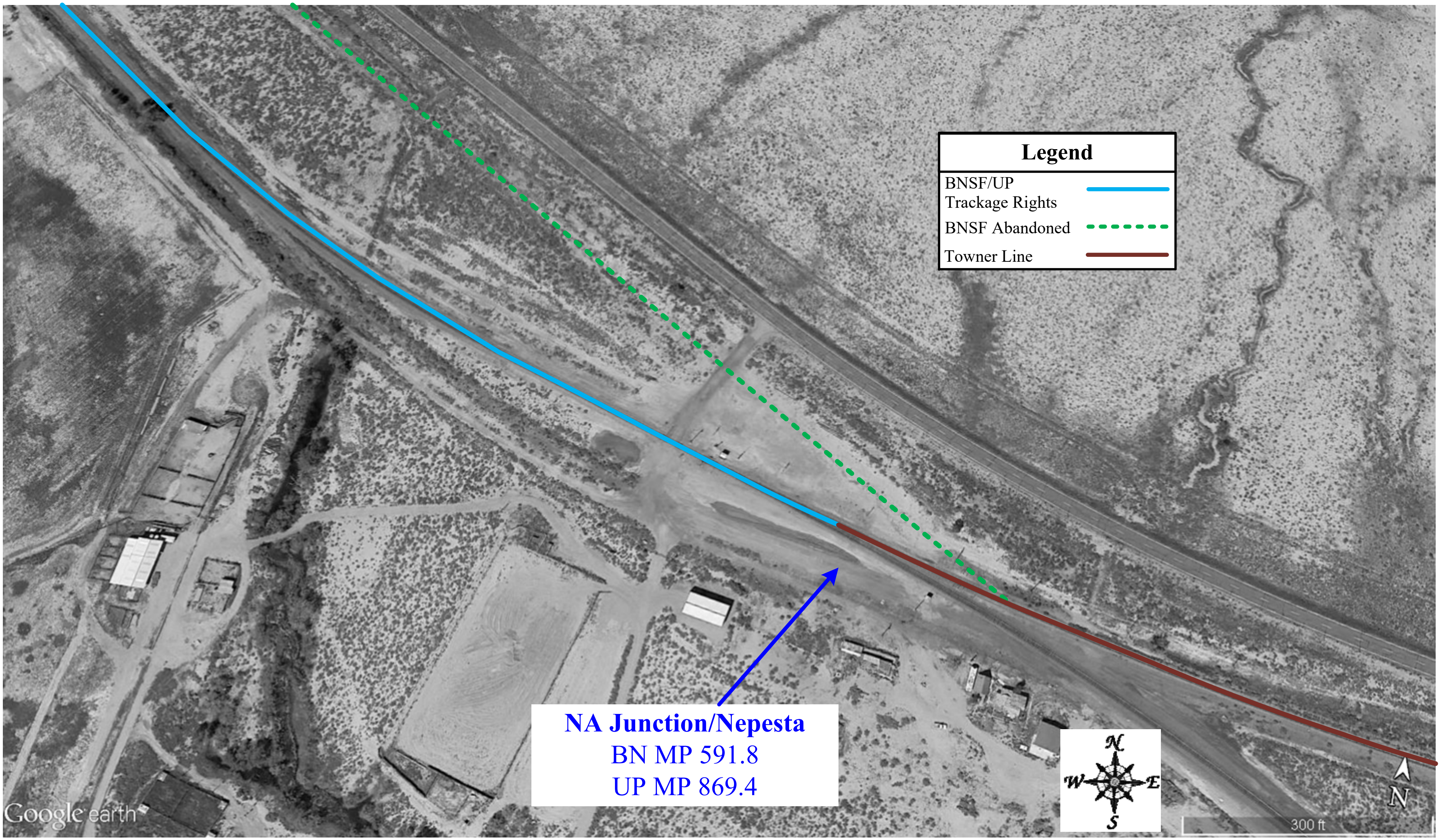
Schematic of Tennessee Pass Subdivision and Towner Line

(Close Up of Nyberg)

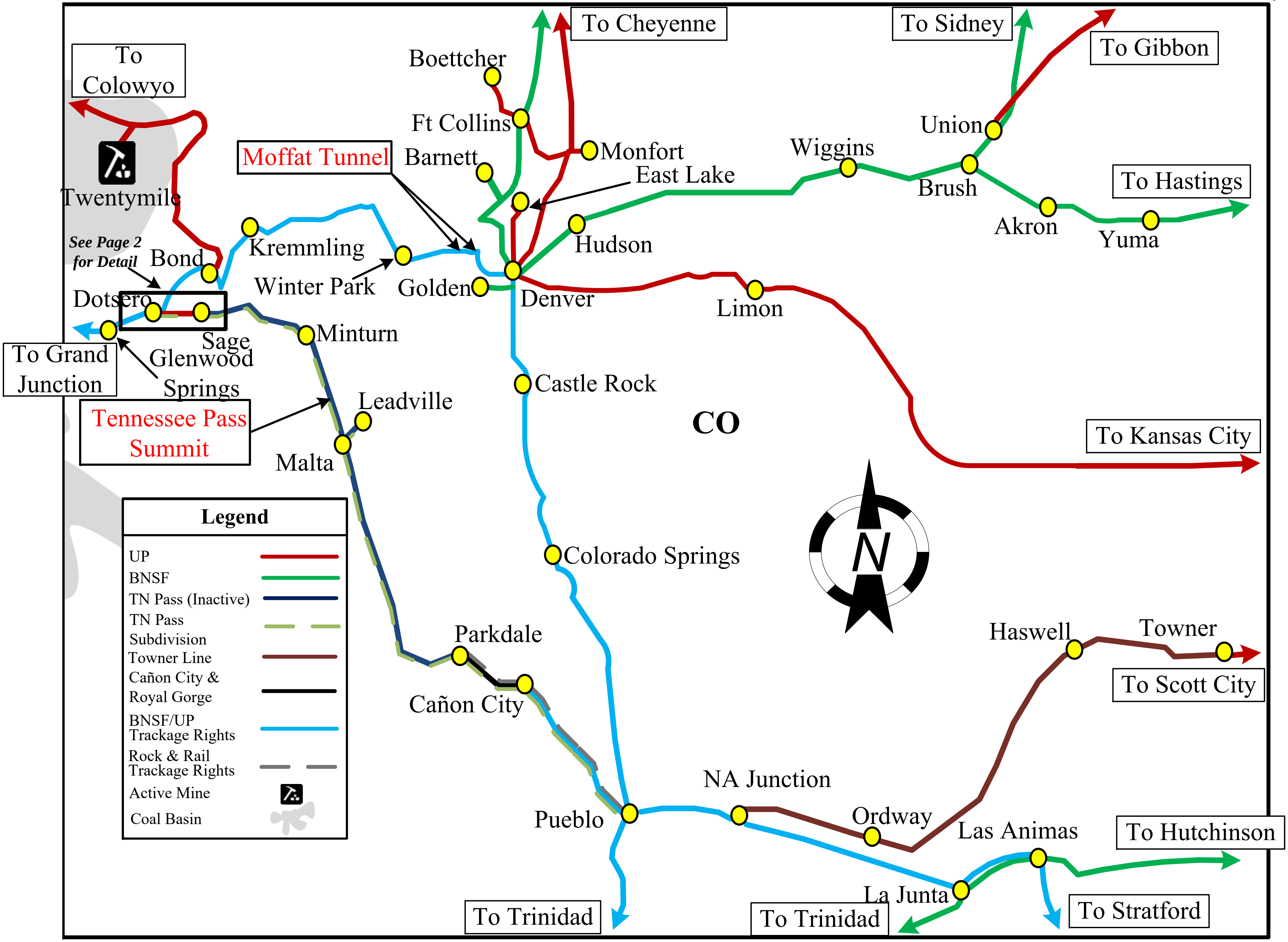


Schematic of Tennessee Pass Subdivision and Towner Line

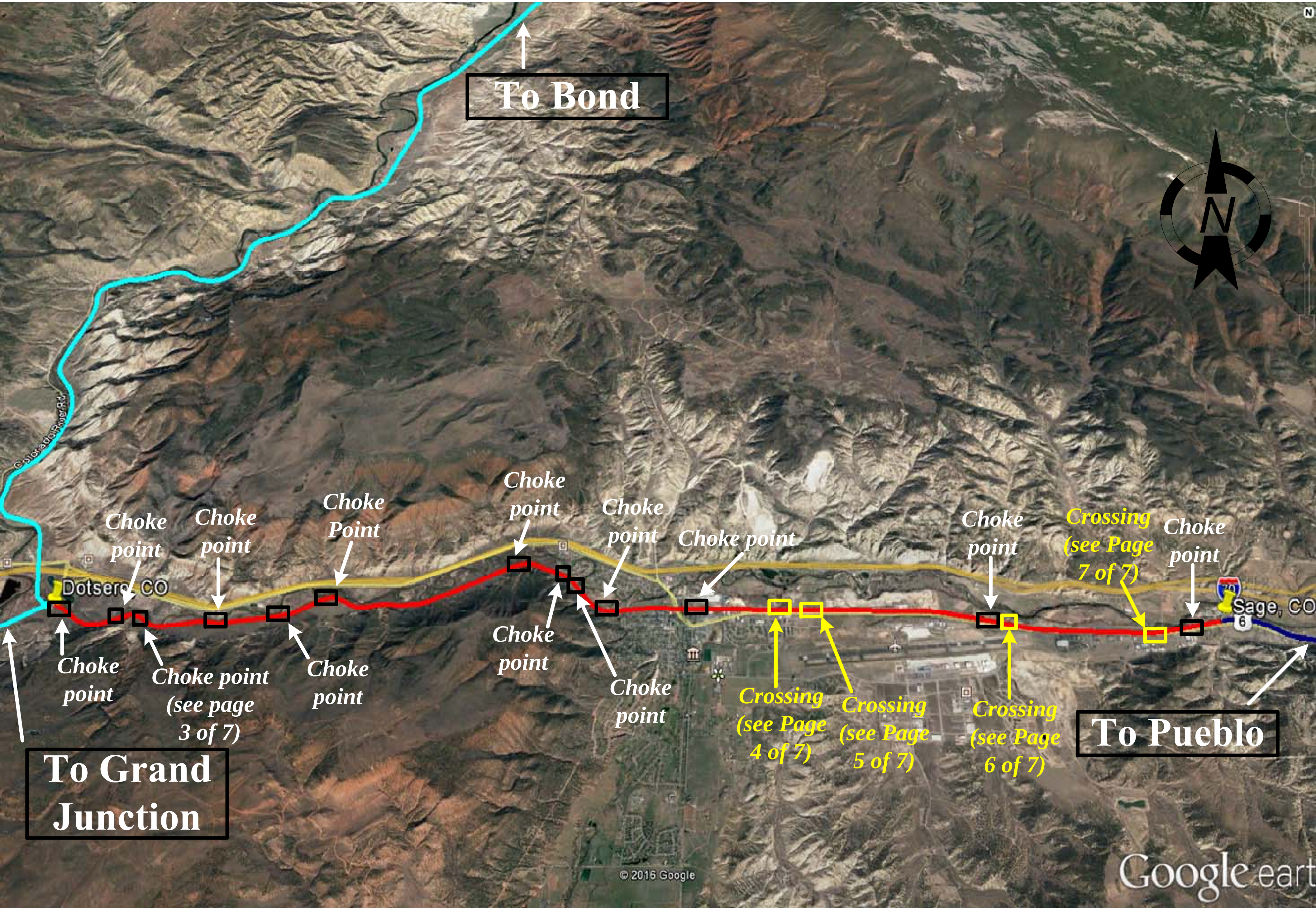
(Close Up of NA Junction/Nepesta)



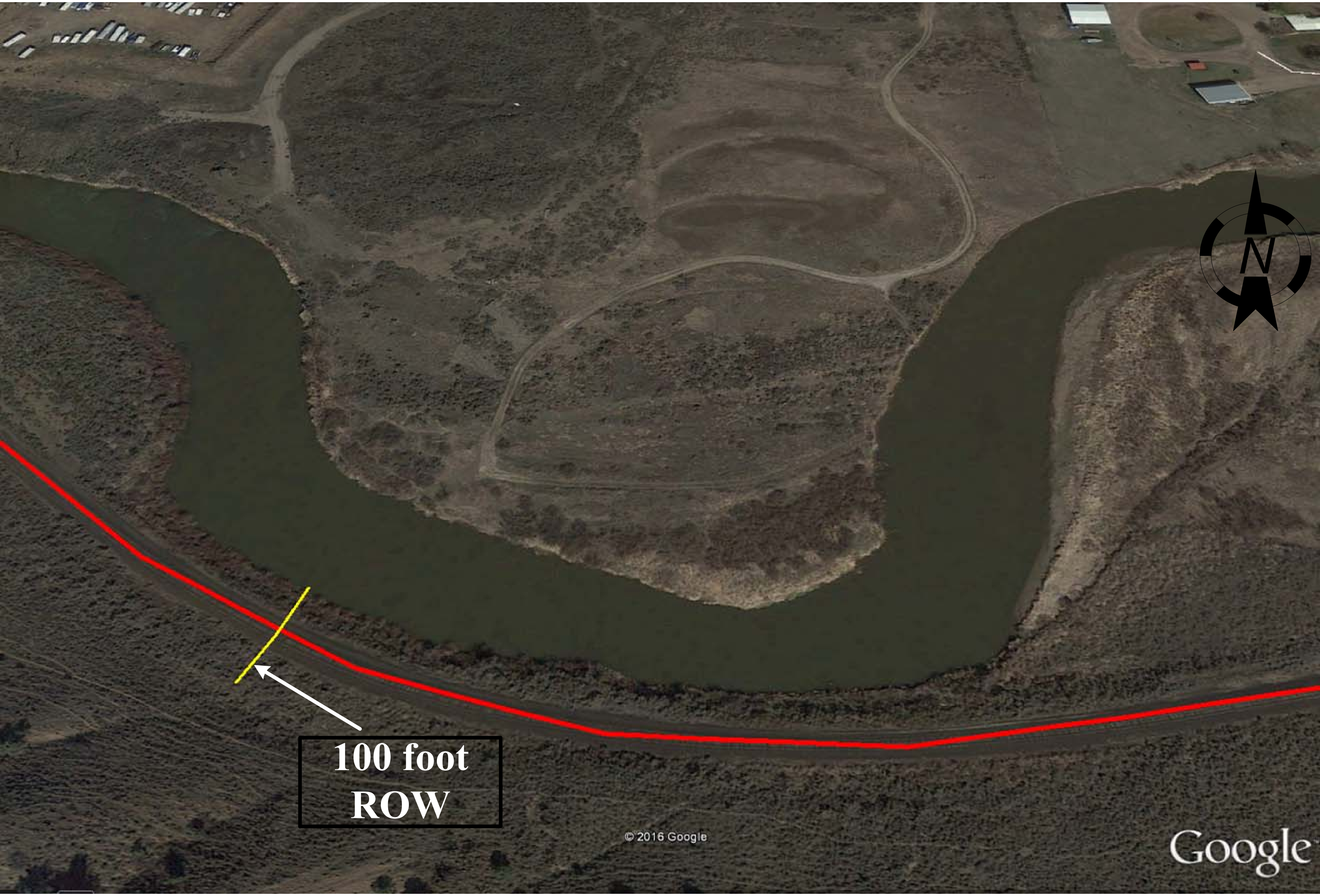
Summary of Physical Limitations to New Rail Line Construction Between Sage, CO and Dotsero, CO



Google Earth Pro Imagery of Dotsero, CO to Sage, CO



Google Earth Pro Imagery of Dotsero, CO to Sage, CO



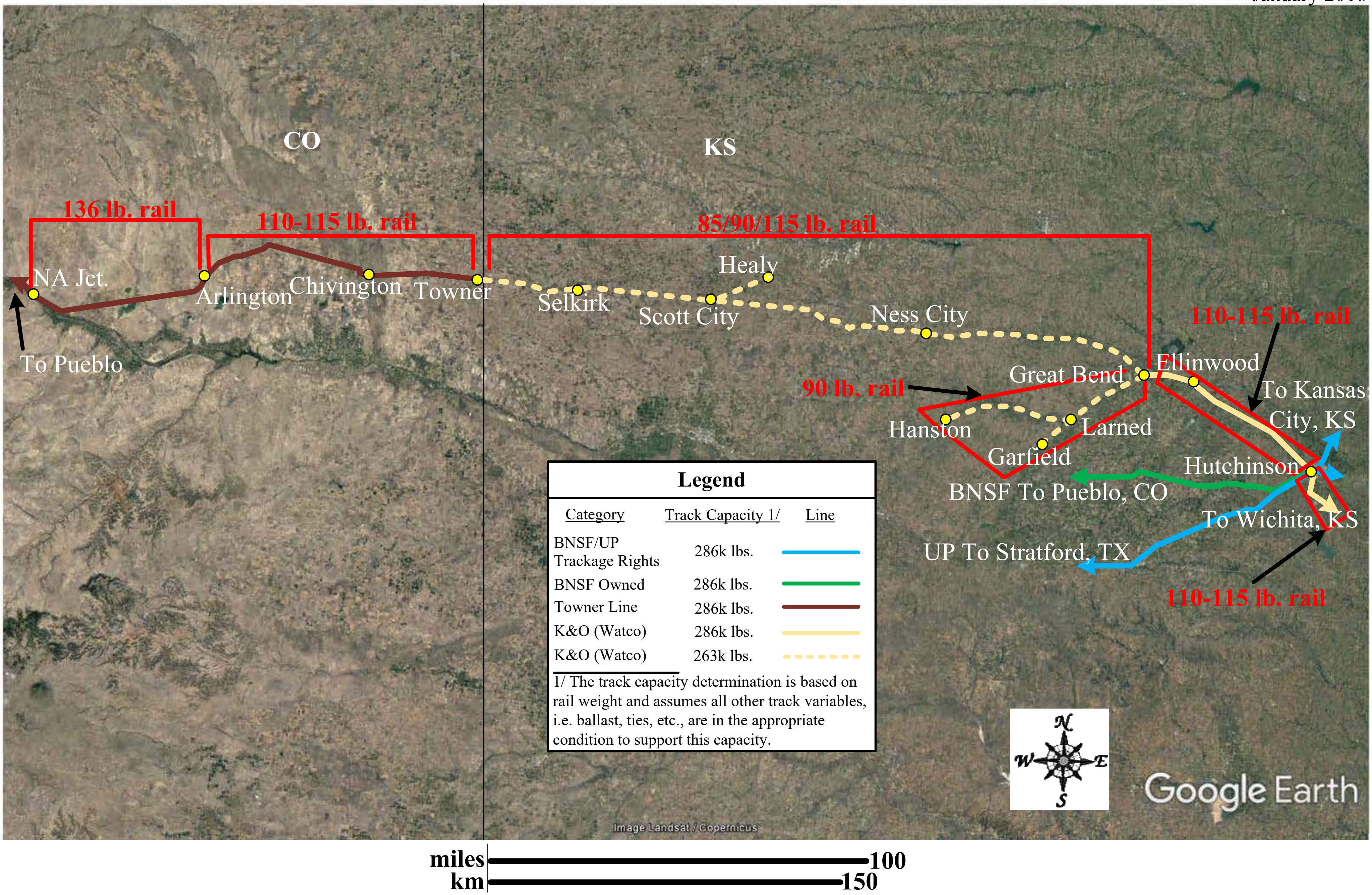
Google Earth Pro Imagery of Dotsero, CO to Sage, CO

Google Earth Pro Imagery of Dotsero, CO to Sage, CO

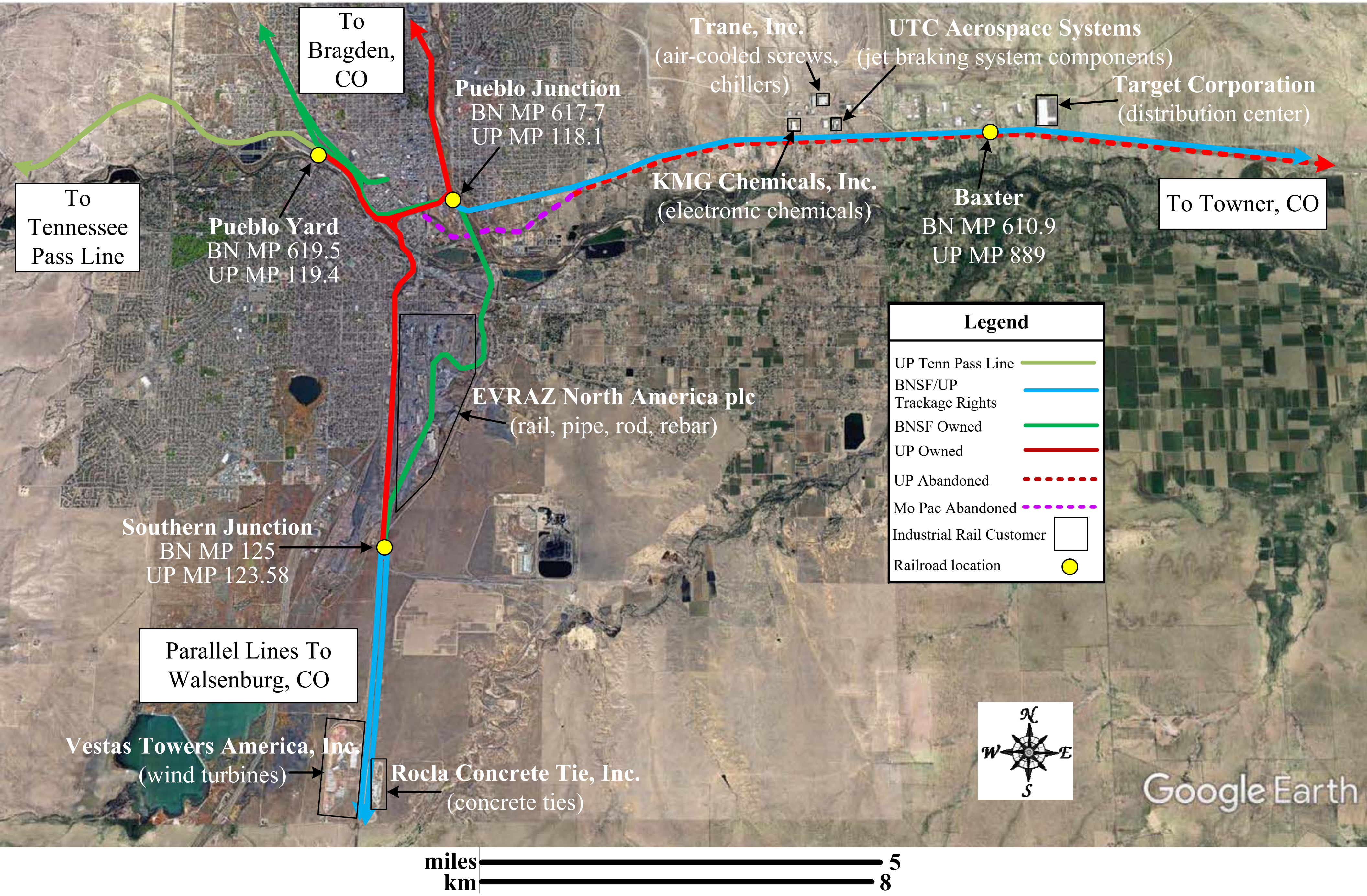
Google Earth Pro Imagery of Dotsero, CO to Sage, CO

Google Earth Pro Imagery of Dotsero, CO to Sage, CO

Rail Weight/Track Capacity Along Towner/K&O Line



Potential Pueblo, CO Industrial Rail Customers



L. E. PEABODY & ASSOCIATES, INC.
ECONOMIC CONSULTANTS