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BEFORE THE
SURFACE TRANSPORTATION BOARD

INTERMOUNTAIN POWER AGENCY Complainant, v. UNION PACIFIC RAILROAD COMPANY, Defendant.	Docket No. 42127

**REPLY EVIDENCE AND ARGUMENT OF DEFENDANT
UNION PACIFIC RAILROAD COMPANY**

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ABBREVIATIONS

AAR	Association of American Railroads.
ABS	Automatic Block Signal System. A series of consecutive blocks of main track governed by block signals, cab signals, or both; actuated by the presence of a train or engine in a block, or by certain conditions affecting the use of a block such as a broken rail.
AEI	Automatic Equipment Identifier.
AEO	2011 Annual Energy Outlook Update Forecast.
AII-LF	All-Inclusive Less Fuel Index, published by AAR.
ATC	Average Total Cost.
ATF	Across-the-Fence.
BN	Burlington Northern Railroad Company.
BNSF	The Burlington Northern and Santa Fe Railway Company and Predecessors.
CMS	Crew Management System.
CAPM	Capital Asset Pricing Model.
CMM	Coal Marketing Module.
CMP	Corrugated Metal Pipe.
COC	Cost of Capital.
COD	Cost of Debt.
COE	Cost of Equity.
CTC	Centralized Traffic Control. A block signal system under which train and engine movements are authorized by block signals, whose indications supersede the superiority of trains for both opposing and following moves on the same track. A semi-automated means of ensuring the rapid and safe movement of trains.
CWR	Continuous Welded Rail.
DCF	Discounted Cash Flow.
DP	Distributed Power Configuration. Placement of locomotives at two or more locations in a train with acceleration and braking of all locomotives controlled from the head locomotive unit.
DPU	Distributed Power Unit. A locomotive unit equipped to be part of a distributed power configuration.
DRD	Disaster Recovery Dispatcher.
DTL	Direct to Locomotive.
EB	Eastbound.
EIA	Energy Information Administration.
ENS	Emergency Notification Signs.
EOTD	End-of-Train Telemetry Device.
FED	Failed-Equipment Detector.
FRA	Federal Railroad Administration.

GTM	Gross Ton-Mile.
GVWR	Gross Vehicle Weight Rating.
GWR	Gross Weight on Rail.
HDF	On-Highway Diesel Fuel Index.
HP/TT	Horse power per trailing ton.
ICC	Interstate Commerce Commission.
ICCTA	Interstate Commerce Commission Termination Act.
IGS	Intermountain Generating Station.
IPA	Intermountain Power Agency.
IPP	Intermountain Power Project.
IRR	Intermountain Railroad.
ISS	Interline Settlement System.
Jct	Junction.
KCS	Kansas City Southern Railway.
LADWP	Los Angeles Department of Water and Power.
MGT	Million Gross Tons.
MITA	Master Intermodal Transportation Agreement.
MMM	Maximum Markup Methodology.
MOW	Maintenance of Way.
MSDCF	Multi-Stage Discounted Cash Flow.
NB	Northbound.
NCSC	Union Pacific's National Customer Service Center in St. Louis, Missouri.
NEMS	National Energy Modeling System.
PPI	Producer Price Index.
PRB	Powder River Basin (includes Wyoming and Montana mines).
PTC	Positive Train Control.
RCAF-A	Rail Cost Adjustment Factor, adjusted for productivity.
RCAF-U	Rail Cost Adjustment Factor, unadjusted for productivity.
RCP	Reinforced Concrete Pipe.
ROW	Right of Way.
RSIA	Rail Safety Improvement Act of 2008.
R/VC	Revenue-to-Variable Cost.
RTC	Rail Traffic Controller Model.
SAC	Stand-Alone Cost.
SARR	Stand-Alone Railroad.
SB	Southbound.
STEO	Short-Term Energy Outlook.
SYO	Supervisor-Yard Operations.

T&E	Train & Engine.
TCS	Transportation Control System. UP's computer system that supports the transportation product provided by the railroad.
TL	Train line up in CMS and TCS.
TTD	Terminal Train Dispatcher.
TWC	Track Warrant Control. Authority to operate over track controlled by written orders (track warrants) and verbal communications with the dispatcher.
UP	The current Union Pacific rail system, including the former CNW and SP.
UPC	Union Pacific Railroad Corporation.
UPRR	The Union Pacific rail system before the acquisition of CNW and SP.
URC	Utah Railway Co.
URCS	Uniform Railroad Costing System.
USDA	United States Department of Agriculture.
WB	Westbound.

CASE NAMES

Amtrak	*National Railroad Passenger Corp. & Consolidated Rail Corp. – Application Under Section 402(a) of the Rail Passenger Service Act for an Order Fixing Just Compensation*, 10 I.C.C.2d 863 (1995)
AEP Texas North	*AEP Texas N. Co. v. BNSF Ry.*, STB Docket No. 41191 (Sub-No. 1) (STB served Sept. 10, 2007)
AEP Texas North Reconsid-eration	*AEP Texas N. Co. v. BNSF Ry.*, STB Docket No. 41191 (Sub-No. 1) (STB served May 15, 2009)
AEPCO	*Ariz. Elec. Power Coop., Inc. v. BNSF Ry. & Union Pac. R.R.*, STB Docket No. 42113 (STB served June 27, 2011)
APS I	*Ariz. Pub. Serv. Co. v. Atchison, Topeka & Santa Fe Ry.*, 2 S.T.B. 367 (1997)
APS II	*Ariz. Pub. Serv. Co. v. Atchison, Topeka & Santa Fe Ry.*, 3 S.T.B. 70 (1998)
Burlington Northern	*Burlington Northern R.R. v. STB*, 75 F.3d 685 (D.C. Cir. 1996)
Coal Rate Guidelines	*Coal Rate Guidelines, Nationwide*, 1 I.C.C.2d 520 (1985)
Coal Trading	*Coal Trading Corp. v. Baltimore & Ohio R.R.*, 6 I.C.C.2d 361 (1990)
CP&L	*Carolina Power & Light Co. v. Norfolk Southern Ry.*, 7 S.T.B. 235 (2003)
Duke/CSXT	*Duke Energy Corp. v. CSX Transp. Inc.*, 7 S.T.B. 402 (2004)
Duke/NS	*Duke Energy Corp. v. Norfolk Southern Ry.*, 7 S.T.B. 89 (2003)
FMC	*FMC Wyo. Corp. v. Union Pacific R.R.*, 4 S.T.B. 699 (2000)
Georgia Power	*Ga. Power Co., Southern Co. Servs., Inc., Oglethorpe Power Corp., Mun. Auth. of Ga., & City of Dalton v. Southern Ry. Co. & Norfolk Southern Corp.*, ICC Docket No. 40581 (ICC served Nov. 8, 1993)
Major Issues	*Major Issues in Rail Rate Cases*, STB Ex Parte No. 657 (Sub-No. 1) (STB served Oct. 30, 2006)

McCarty	*McCarty Farms, Inc. v. Burlington N. Inc.*, 2 S.T.B. 460 (1997)
Nevada Power I	*Bituminous Coal – Hiawatha, UT, to Moapa, NV*, 6 I.C.C.2d 1 (1989)
Nevada Power II	*Bituminous Coal – Hiawatha, UT, to Moapa, NV*, 10 I.C.C.2d 259 (1994)
OPPD	*Omaha Public Power Dist. v. Burlington Northern R.R.*, 3 I.C.C.2d 853 (1987)
Otter Tail	*Otter Tail Power Co. v. BNSF Ry.*, STB Docket No. 42071 (STB served Jan. 27, 2006)
PPL	*PPL Montana, LLC v. Burlington N. & Santa Fe Ry.*, STB Docket No. 42054 (STB served Aug. 19, 2002)
PSCo/ Xcel I	*Public Serv. Co. of Colo. D/B/A Xcel Energy v. Burlington Northern R.R.*, 7 S.T.B. 589 (2004)
PSCo/ Xcel II	*Public Serv. Co. of Colo. D/B/A Xcel Energy v. Burlington Northern R.R.*, STB Docket No. 42057 (STB served Jan. 19, 2005)
Railroad Cost of Capital	*Railroad Cost of Capital – 2010*, STB Ex Parte No. 558 (Sub-No. 14) (STB served Sept. 30, 2011)
San Antonio	*San Antonio, TX, Acting By and Through Its City Public Serv. Board v. Burlington Northern R.R.*, 1 I.C.C.2d 561 (1986)
TMPA	*Tex. Mun. Power Agency v. Burlington N. & Santa Fe Ry.*, 6 S.T.B. 573 (2003)
WCTL	*Western Coal Traffic League v. Union Pac. R.R.*, STB Finance Docket No. 33726 (STB served May 12, 2000)
WFA I	*Western Fuels Ass'n, Inc. & Basin Elec. Power Coop. v. BNSF Ry.*, STB Docket No. 42088 (STB served Sept., 10, 2007)
WFA II	*Western Fuels Ass'n, Inc. & Basin Elec. Power Coop. v. BNSF Ry.*, STB Docket No. 42088 (STB served Feb., 18, 2009)
WPL	*Wis. Power & Light Co. v. Union Pac. R.R.*, 5 S.T.B. 955 (2001)

WPL Reconsid-eration	*Wis. Power & Light Co. v. Union Pac. R.R.,* STB Docket No. 42051 (STB served May. 14, 2002)
WTU	*West Tex. Utils. Co. v. Burlington Northern R.R.,* STB Docket No. 41191 (STB served May 3, 1996)

I: Counsel’s Argument and Summary of Evidence

I. COUNSEL'S ARGUMENT AND SUMMARY OF EVIDENCE

The Board must dismiss the complaint filed by Intermountain Power Agency ("IPA") because a Stand-Alone Cost ("SAC") analysis of the challenged rates shows that IPA is not entitled to any relief, and there is no merit to IPA's claim that UP failed to provide IPA with common carrier rates in a timely manner.

A. INTRODUCTION

In this proceeding, IPA challenges the reasonableness of UP's common carrier rates for transporting unit-train movements of coal to IPA's Intermountain Generating Station ("IGS") at Lynndyl, Utah, from one Utah mine (the Skyline Mine), one Utah coal loadout (the Savage Coal Terminal), and one point of interchange with Utah Railway Company ("URC") in Provo, Utah. Specifically, IPA challenges the rates that UP established in Item 6200-A of UP Tariff 4222, which became effective January 1, 2011.

In an effort to show that the challenged rates are unreasonable, IPA engaged in a SAC analysis using a hypothetical stand-alone railroad ("SARR"), called the Intermountain Railroad ("IRR"). IPA selected a traffic group to be served by the SARR, designed the SARR's physical plant and operating plan for serving that traffic group, and then estimated the SARR's revenues and costs over the ten-year period from 2011 through 2020. However, IPA used flawed methods or assumptions in almost every step of its analysis. At each step, IPA skewed its analysis in a way that improperly inflated SARR revenues and disregarded significant costs. The result of these numerous errors was that IPA substantially overstated SARR revenues and substantially understated SARR costs.

The evidence UP presents in this filing shows that, when IPA's errors are corrected and the SAC analysis is carried out based on proper SAC methods and assumptions, the challenged rates do not exceed a reasonable maximum, and thus, IPA is not entitled to any rate relief.

UP briefly describes some of the major flaws in IPA's SAC evidence in Section I.B. Section I.C explains why the Board should not prescribe maximum rates for potential UP single-line movements of coal from Skyline Mine or the Savage Coal Terminal to IGS, even if it were to accept IPA's flawed SAC evidence. In Section I.D, UP explains why there is no merit to IPA's claim that UP failed to provide IPA with common carrier rates in a timely manner.

B. IPA HAS FAILED TO SHOW THAT UP'S COMMON CARRIER RATES ARE UNREASONABLE

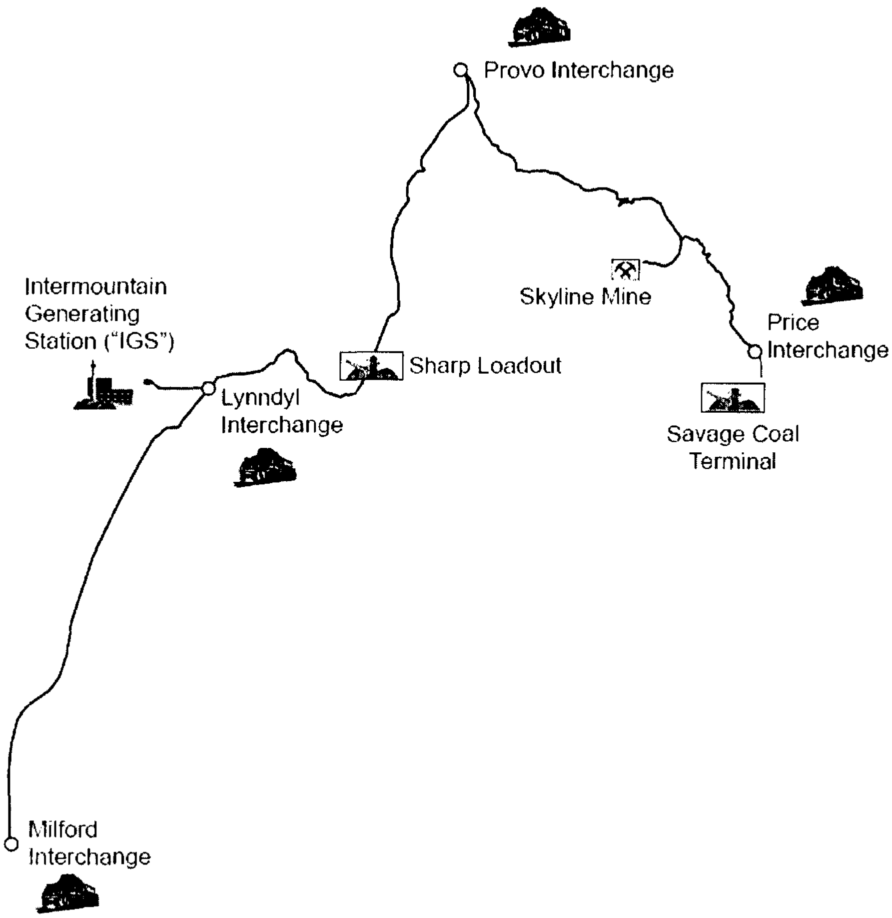
IPA's conclusion that SARR revenues would exceed SARR costs over the ten-year SAC analysis period rests upon errors that pervade its SAC analysis. A proper analysis shows that SARR costs exceed SARR revenues by a substantial amount: the annual stand-alone costs are double the level of stand-alone revenues over the ten-year period.

IPA constructed a SARR consisting of two parts, as shown in the diagram on the next page. The first part of the SARR replicates UP's route from Price, Utah, northwest through Provo, Utah, then southwest to IGS at Lynndyl. This part includes all the core facilities needed to serve the issue traffic. The second part of the SARR extends southwest from Lynndyl to Milford, Utah. This second part does not carry any issue traffic.

IPA selected three general categories of traffic for its SARR: issue and non-issue coal traffic moving to IGS, non-IPA coal traffic, and non-coal traffic. IPA also assumed that IRR would obtain revenue from BNSF Railway Company ("BNSF") for use of trackage rights mirroring rights that BNSF obtained over certain UP lines in the UP/SP merger.

IPA designed its SARR to minimize costs and maximize revenues. However, its analysis did not fully account for the consequences of its choices with regard to the revenues to which the SARR would be entitled, the level of service it could offer, or the costs it would impose on the residual UP.

Intermountain Stand-Alone Railroad ("IRR")



For example, IPA designed its SARR so that all of the non-coal traffic moving on IRR would be overhead traffic that moves in intact trainloads. Under this design, IRR would not bear any of the time, facility, or personnel costs associated with switching, fueling, or inspecting these non-coal trains. Yet, IPA allocated the SARR revenues for this traffic as though IRR would do more work, incurring the same types of costs that UP incurs to handle traffic in carload or multi-car service.

In addition, IPA designed its SARR so that almost all of IRR's intermodal traffic would move over IRR for only 89 miles between Milford and Lynndyl. Under IPA's design, IRR would interchange this traffic with the residual UP at both Milford and Lynndyl. However, IPA failed to account correctly for the impact of its design on the service levels IRR could provide for high-priority intermodal traffic. IPA's choices regarding the design of IRR mean that IRR could not offer the necessary level of service for this traffic. IPA also failed to analyze the cross-subsidies that it created by selecting for its SARR traffic group this large body of intermodal traffic that shares no facilities in common with the issue traffic.

With regard to the other non-coal traffic IPA selected for its SARR, UP trains that carry the traffic in the real world periodically stop along the lines replicated by the SARR to set out or pick up cars at local industries. However, IPA chose to exclude those cars from its traffic group, presumably so IRR could minimize its costs by moving its non-coal traffic in intact trainloads. IPA apparently assumed that the residual UP would bear the additional costs associated with switching these cars on or off the trains that IRR interchanges with UP and holding them at the interchange point, but IPA failed to include these additional costs in its analysis.

In addition to the errors IPA made in designing its SARR to capture an excessive share of revenues and avoid costs or subsidize the SARR's coal operations, IPA made significant errors and omissions in implementing the design of its SARR. It also ignored Board precedent when applying the Board's discounted cash flow ("DCF") model and when calculating maximum reasonable rates using the Board's Maximum Markup Methodology ("MMM"). UP explains each of IPA's errors in detail in Part III.

1. <u>Stand-Alone Revenues</u>

IPA overstated stand-alone revenues by overstating the traffic volumes that would move on IRR and the revenues IRR would earn from the traffic. For example, IPA made mathematical and data entry errors that led it to overstate 2011 volumes of non-IPA coal traffic from Utah and Colorado by nearly one million tons, which in turn affected IPA's traffic volume projections for

2012 through 2020. *See* Section III.A.2.b. IPA also created volume forecasts for non-coal traffic that are inconsistent with the mix of commodities that would move on IRR. This caused IPA's volume projections to be overstated by almost two million tons in the final year of the analysis period. *See* Section III.A.2.c. UP corrects these and similar errors.

IPA also overstated SARR volumes by including UP's high-priority intermodal "Z trains" in the IRR traffic group. *See* Section III.A.2.c.iii. The Z trains move between Southern California and points to the east of IRR. IPA assumed that IRR would serve as a bridge carrier, replacing UP for the 89-mile portion of UP's route from Milford to Lynndyl. However, IPA chose to construct this segment to a lower standard, and as a result, IRR cannot replicate the level of service UP provides today. IPA tried to hide this failing by presenting data showing the average, unopposed running times of all SARR trains between Milford and Lynndyl. However, when Z trains are evaluated as a separate category of service and their operation is modeled to account for all the traffic moving on the line, it is evident that IRR service for these trains would be dramatically inferior to the service UP provides today. Because IPA did not show (and could not show, given the design choices it made for its SARR) that IRR would provide "service that is equal to (or better than) the existing service" for the Z trains,[1] or that "the affected shippers, connecting carriers, and receivers would not object" to the inferior service,[2] UP removes the Z trains from the SARR traffic group.[3]

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[1] *Tex. Mun. Power Agency v. Burlington N. & Santa Fe Ry.*, 6 S.T.B. 573, 589 (2003); *see also Duke Energy Corp. v. CSX Transp., Inc.*, 7 S.T.B. 402, 414 (2004) ("[The operating] plan must be capable of providing, at a minimum, the level of service to which the shippers in the traffic group are accustomed.").

[2] *Duke/CSXT*, 7 S.T.B. at 427 (citing *McCarty Farms, Inc. v. Burlington N. Inc.*, 2 S.T.B. 460, 476 (1997); *FMC Wyo. Corp. v. Union Pac. R.R.*, 4 S.T.B. 699, 736 (2000)).

[3] *TMPA*, 6 S.T.B. at 589 ("[T]he traffic group selected by the complainant is open to challenge."); *Coal Rate Guidelines – Nationwide*, 1 I.C.C.2d 520, 544 (1985) ("[T]he potential (continued…)

IPA's revenue evidence also reflects fundamental errors. As one example, IPA created a "hybrid" fuel price forecast to calculate fuel surcharge revenues by combining prices from a short-term forecast with projected rates of change from a long-term forecast. *See* Section III.A.3.d.i.(b). UP shows that IPA's blending of forecasts is improper because the forecasts were developed using different methodologies and at times when fuel prices were at different levels. UP avoids both problems by using UP's actual fuel price for 2011 and a recent forecast that allows it to projects fuel prices for 2012 through 2020 using a consistent methodology.

IPA also skewed its revenue evidence by making by several technical errors and one conceptual error in its Average Total Cost ("ATC") calculations. *See* Section III.A.3.c. IPA's most significant technical error was its omission of IRR's variable costs from the denominator of an equation used to calculate the ratio of IRR's variable and fixed costs to the total variable and fixed costs for each movement. UP corrects this and other errors in IPA's ATC calculations.

IPA's ATC calculations are also flawed because they reflect a "mismatch" between the assumptions IPA used to calculate variable costs for the on-SARR portion of certain movements and its apparent handling of those movements under the SARR operating plan. Specifically, IPA calculated the on-SARR variable costs of non-coal traffic as though the traffic would move in carload and multi-car service, but IPA's operating plan assumes the traffic will move over the SARR as if it were in unit trains. The Board recognized this issue in its June 27, 2011 decision in the *AEPCO* case as it related to the calculation of variable costs for purposes of MMM.[4] In order to avoid a mismatch in ATC calculations, and as a matter of logical consistency, the same

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traffic draw and attendant costs and revenues that the hypothetical stand-alone provider could expect are open to scrutiny in individual cases. The proponent of a particular stand-alone model must identify, and be prepared to defend, the assumptions and selections it has made.").

[4] *Ariz. Elec. Power Coop., Inc. v. BNSF Ry. & Union Pac. R.R.*, STB Docket No. 42113 (STB served June 27, 2011).

variable cost calculations should be used for both MMM and ATC. UP's ATC calculations reflect the on-SARR operation of IRR trains as unit trains.

When SARR revenues are calculated correctly, they are much lower than IPA claims; indeed, they do not exceed corrected SARR costs. UP summarizes the differences in the IRR revenues IPA developed and the IRR revenues calculated by UP in Table III.A.15 below.

2. Stand-Alone Costs

IPA understated SARR costs by understating many SARR operating expenses and road property investment costs. In some cases, IPA ignored or misinterpreted information that UP provided in discovery. In others, IPA disregarded the challenge of operating a railroad over the mountainous territory between Price and Provo. IPA also failed to account for costs its IRR operating plan would impose on UP.

IPA's operating plan is flawed in many respects that affect its calculation of SARR costs. For example, IPA failed to identify more than 100 trains IRR would need annually to return empty cars to support loaded movements that IPA selected for its traffic group. *See* Section III.C.1.c.ii.(a). IPA's failure to include these trains in its analysis means that IPA's operating expenses do not include the associated costs for locomotives, fuel, crew, and cars for these trains, even as IPA allocated revenues to IRR based on handling the full loaded and empty movement through the application of ATC. IPA's failure to identify and include the trains returning empty cars also means their impact on IRR's other operations was not reflected in IPA's RTC model. UP corrects these errors.

In developing the IRR operating plan, IPA made choices that would impose extra costs on the residual UP. For example, IPA ignored data showing that some UP trains from which it selected traffic for its SARR terminate at Helper, Utah, rather than farther south at Price. *See* Section III.C.3.a. IPA improperly re-routed these trains by positing that the SARR would hand the traffic back to UP at Price, a point more than ten miles beyond where they actually terminate.[5] Rather than eliminate the traffic from the SARR traffic group, UP corrected IPA's error by establishing an interchange at Helper. UP corrects several other similar errors in IPA's operating plan.

In other instances, however, IPA's operating plan imposed additional costs that UP could not readily avoid. In particular, IPA decided not to have IRR handle cars that UP today sets out and picks up at industries located along lines replicated by the SARR, so that IRR could operate its non-coal trains intact. This decision leaves the residual UP with new costs associated with switching these cars at the interchange between UP and IRR. IPA improperly failed to account for these additional costs. *See* Section III.D.10.[6] IPA also failed to account for the costs it would impose on UP by requiring creation of a new UP crew change point at Lynndyl, as well as a variety of other costs that UP would incur only because IPA chose to insert IRR as a bridge carrier in the middle of UP through moves. This includes the costs from additional locomotive dwell time due to new UP crew change operations at Lynndyl and Provo. *See id.* UP's evidence accounts for these costs.

IPA significantly understated IRR's operating costs in many other ways. For example, IPA misinterpreted an RCAF index figure as reflecting an inflation rate and improperly applied this figure to locomotive lease cost information to obtain an incorrect discount rate. IPA also

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[5] *See TMPA*, 6 S.T.B. at 594 ("To reroute non-issue traffic, the complainant's SAC evidence must either take full responsibility for the entire movement . . . or fully account for the ramifications of requiring the residual carrier to alter its handling of the traffic.").

[6] *See Duke/CSXT*, 7 S.T.B. at 443 ("[W]hile the proponent of a SARR can determine (within reason) how the SARR would operate, it cannot assume that a connecting carrier . . . would alter its existing operations for the benefit of the SARR."); *Duke Energy Corp. v. Norfolk Southern Ry.*, 7 S.T.B. 89, 112 (2003) ("At a minimum, the complainant must fully account for all of the ramifications of requiring the residual carrier to alter its handling of [its] traffic . . . .").

misapplied locomotive utilization data that UP produced in discovery to calculate a locomotive spare margin that is absurdly low. *See* Section III.D.1.a. IPA significantly understated IRR's locomotive fuel costs by applying an inappropriate fuel price index and by cherry-picking UP's fuel consumption data to develop an average consumption rate based on a mix of trains and locomotive types that is unrepresentative of IRR operations. *See* Section III.D.1.d.

As a further example, IPA disregarded the significant challenges IRR will face to maintain its lines in the mountains of Utah. IPA developed its IRR maintenance-of-way ("MOW") plan based on IRR's route miles, track miles, and traffic volumes, giving little or no consideration to the actual challenges IRR will face to maintain its lines in light of the extreme curvature, steep grades, and difficult geotechnical and weather conditions that it will encounter, particularly between Price and Provo. *See* Section III.D.4. UP's MOW evidence accounts for the actual conditions in which IRR will operate.

Finally, IPA understated IRR road property costs in many respects. Among its many errors, IPA used artificially low earthwork costs from an unrelated UP capacity expansion project in Wyoming. IPA also understated transportation costs in developing its unit costs for ballast, rail, and other material required to construct the SARR. *See* Section III.F.3. As another example, IPA incorrectly assumed that a single typical bridge design with a relatively short span length could accommodate the myriad of bridges along the IRR route. *See* Section III.F.5. And IPA placed IRR's locomotive facility at a location that was covered by standing water when UP's construction experts visited the site, but IPA made no provision for addressing the soil and drainage conditions at that site. *See* Section III.F.7.c. UP's road property evidence accounts for all of the costs that would be incurred to construct the SARR.

When SARR costs are calculated correctly, they are substantially higher than the costs IPA developed. UP summarizes the differences in the IRR operating expenses IPA developed and IRR operating expenses calculated by UP in Table III.D.1. The differences in road property investment costs developed by IPA and UP are summarized in Table III.F.1.

3. Application of the DCF Model and Maximum Markup Methodology

IPA incorrectly claimed that its application of the DCF methodology was consistent with Board precedent. In fact, its DCF analysis departs from Board precedent in several ways.

For example, IPA claimed that it based equity costs for IRR over its construction period on the Board's annual cost of capital determinations. In fact, IPA substituted the cost of equity derived from the Board's Capital Asset Pricing Model ("CAPM"). This is different from the Board-determined railroad industry cost of equity, which for the years 2008 through 2010 is based on a 50/50 mix of the CAPM-based cost of equity and the cost of equity determined using the Board's Multi-Stage Discount Cash Flow model.[7] *See* Section III.G.1. UP uses the Board-determined railroad cost of equity in its DCF analysis.

As another example, IPA ignored the Board's June 27, 2011 decision in the *AEPCO* case regarding variable cost calculations used in MMM. In *AEPCO*, the Board ordered the parties to revise their variable cost calculations for carload and multi-car shipments to account for the low-cost characteristics the complainant had posited for those movements over the portion of the through movement replicated by the SARR.[8] As discussed above, IPA, like the complainant in *AEPCO*, designed its SARR so that carload and multi-car shipments would move in intact

[7] *Use of a Multi-Stage Discounted Cash Flow Model in Determining the Railroad Industry's Cost of Capital*, STB Ex Parte No. 664 (Sub-No. 1) (STB served Jan. 28, 2009).

[8] *AEPCO*, slip op. at 2.

trainloads over the portion of the through movement replicated by the SARR. UP's MMM calculations reflect the Board's order in *AEPCO*. *See* Section III.H.2.

As a final example of IPA's departures from precedent, its DCF analysis omitted any test for cross-subsidies. UP's reply evidence shows that SARR costs exceed SARR revenues, and thus there is no need to apply a separate cross-subsidy test. However, UP provides workpapers to illustrate how the Board would apply its threshold internal cross-subsidy test to the IRR's line from Price to Lynndyl. *See* Section III.H.1.k. Also, in accordance with the Board's discussion in *Otter Tail*,[9] UP provides workpapers to illustrate how the Board would apply its cross-subsidy principles to the IRR as presented by IPA to ensure that any rate reduction produced by applying MMM to a SARR that includes the Milford-Lynndyl segment does not reduce rates to levels that are insufficient to cover the costs of the Price-Lynndyl portion of the SARR. *See* Section III.H.2.[10]

If the Board were to conclude (contrary to UP's evidence) that SARR revenues exceed costs, it should not award any relief to IPA before examining the Price-Lynndyl segment for cross-subsidies. As discussed above, IRR does not need the Milford-Lynndyl segment to serve the issue traffic. The prospect that the Milford-Lynndyl segment will generate an impermissible cross-subsidy is heightened by the fact that almost all of the intermodal traffic that IPA selected moves over the IRR system using only that segment – it does not share any facilities with the issue traffic.

[9] *Otter Tail Power Co. v. BNSF Ry.*, STB Docket No. 42071, slip op. at 9-11 (STB served Jan. 27, 2006).

[10] *Id.* at 11 ("[O]ur *PPL* cross-subsidy analysis serves as both a threshold inquiry and a limit on potential rate relief.").

UP's evidence shows that, based on IPA's revenue and cost evidence, eliminating the cross-subsidization of the issue traffic by traffic on the Milford-Lynndyl segment would leave prescribed maximum revenue-to-variable cost ratios more than 31 points higher than the ratios calculated by IPA by the last year of SAC analysis period. Thus, even if the Board accepted all of IPA's revenue and cost evidence, it could not prescribe the maximum rates calculated by IPA.

C. THE BOARD SHOULD NOT PRESCRIBE MAXIMUM RATES FOR POTENTIAL UP SINGLE-LINE TRANSPORTATION OF COAL FROM SKYLINE MINE OR THE SAVAGE COAL TERMINAL TO IGS

Even if the Board were to find that the challenged rates are unreasonable, it should not prescribe maximum rates for UP's single-line transportation of coal from Skyline Mine or the Savage Coal Terminal from 2012 through 2020. IPA's own evidence establishes that {

}

1. IPA's Evidence Establishes That IPA {

}

IPA's evidence in this proceeding shows that {

} *See* Section III.A.2, Table III.A.1. IPA's evidence also shows that {

}[12] In short, IPA's own evidence shows {

}

2. The Board Lacks The Authority To Prescribe Maximum Rates For Future Movements When {
}

The Board has the authority to prescribe maximum rates for future movements only if it concludes "that a rate charged or collected by a rail carrier . . . does or will violate this part." 49 U.S.C. § 10704(a)(1). Because IPA's evidence demonstrates {

} the Board lacks authority to prescribe maximum rates for such movements.

[11] IPA Opening Nar. at III-A-5.

[12] Significantly, IPA sought an extension of the procedural schedule in this case on June 24, 2011 on the grounds that it "recently concluded negotiations on, and expect[ed] to sign very shortly, a new coal supply arrangement and is engaged in the final stages of negotiations for an additional new coal supply arrangement." Motion for Extension of Schedule at 2 (filed June 24, 2011). IPA explained that the extension would "permit the parties to base their evidence on the most accurate information available regarding future traffic patterns and volumes." *Id.*

The limitation on the Board's authority to prescribe rates for certain future movements reflects a statutory scheme that emphasizes the importance of market-based rates, shipper-carrier negotiations, and the ratemaking discretion of railroads. One of Congress's express goals when it enacted the Staggers Act was to "minimize the need for federal regulatory control over . . . rail transportation."[13] One way this goal was accomplished was by giving railroads, not the regulator, discretion to set rates in the first instance. When Congress enacted the Interstate Commerce Commission Termination Act of 1995 ("ICCTA"), it reiterated "the Staggers Act policy that regulatory intervention should be relegated to a role as a 'safety net' in those relatively rare situations where market forces and shipper-carrier negotiations do not produce a satisfactory business relationship."[14]

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[13] Staggers Act, Pub. L. No. 96-448, §101(a), 94 Stat. 1895, 1897 (1980).

[14] H.R. Rep. No. 104-311 at 83, *reprinted in* 1995 U.S.C.C.A.N. at 795.

In *Burlington Northern Railroad v. STB*,[15] the court addressed a similar issue. In that case, a shipper sought to bring a rate reasonableness case over a year prior to the termination of a coal transportation contract for the express purpose of having a prescribed rate in place when the contract expired. It obtained an order from the Interstate Commerce Commission ("ICC") that required Burlington Northern ("BN") to publish a common carrier rate for its traffic even though there was no imminent prospect of transportation under that rate because the existing contract would remain in effect for several months.

BN challenged the ICC's order requiring publication of a common carrier tariff, arguing that the governing statute did not permit shippers to use the ICC's processes to obtain prescribed rates for transportation long in advance of when the common carrier transportation would occur. The court agreed. It concluded that the ICC did not have the "statutory authority to impose upon a rail carrier a current obligation to file a tariff specifying a rate for traffic . . . that would not be ready to move under the rate until months or years down the road."[16]

IPA is not attempting to obtain a prescribed rate for coal moving from Skyline Mine or the Savage Coal Terminal while that traffic is moving under a UP contract. However, the same fundamental principle that dictated the outcome in *Burlington Northern* applies here: UP should not be bound by a prescription that restricts its future ratemaking ability {

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[15] 75 F.3d 685 (D.C. Cir. 1996).

[16] *Id.* at 692. The *Burlington Northern* decision was based on the statute as it existed prior to the ICCTA, but the court commented that the authority to require railroads to maintain rates for non-imminent, future transportation solely for purposes of mounting a rate reasonableness challenge was even weaker under ICCTA: "any future action by the Board along the lines of the Commission's action here would be on even weaker statutory ground than was the action taken here." *Id.* at 693 n.7.

3. Regardless Of The Board's Authority, The Board Should Exercise Its Discretion Not To Prescribe Maximum Rates For Potential UP Single-Line Transportation Of Coal From Skyline Mine Or The Savage Coal Terminal To IGS From 2012 Through 2020.

Even if the Board concludes that it has the authority to prescribe maximum rates for UP's potential single-line movements of coal from Skyline Mine or the Savage Coal Terminal to IGS, it should exercise its discretion not to prescribe such rates. "[I]n contrast to reparations – to which a complainant that has paid an unreasonably high rate for past movements has a statutory right to be awarded – the complainant has no similar right to a rate prescription for future movements."[17] "Rather, the Board has discretion as to whether or not to prescribe rates for future movements," and it "look[s] at the broader context to determine whether or not a rate prescription appears to be warranted and appropriate."[18]

In this case, prescription of future rates for potential single-line UP movements from Skyline Mine or the Savage Coal Terminal would be unwarranted and an inappropriate exercise of the Board's discretion. As discussed above, the evidence makes it clear that {

} in contravention of federal policy "to minimize the need for Federal regulatory control over the rail transportation system."[19]

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[17] *AEP Tex. N. Co. v. BNSF Ry.*, STB Docket No. 41191 (Sub-No. 1), slip op. at 15 (STB served May 15, 2009).

[18] *Id.*

[19] 49 U.S.C. § 10101(2); *see also AEP Texas North*, slip op. at 19 (explaining that "the prescription of rates is a quasi-legislative act that has the force of law").

IPA may argue that the Board should prescribe future rates now {

} As the ICC explained in *Coal Rate Guidelines*, regulatory intervention should be limited "to avoid inhibiting or discouraging contract solutions."[20]

Moreover, there are good reasons not to allow complainants to use rate proceedings to obtain relief for speculative circumstances. Just like IPA's current coal sourcing plans, the stand-alone cost analysis in this proceeding reflects forecasts of future conditions. {

} Efforts to use recent, accurate data are especially important in rate cases because a rate prescription imposes a constraint on railroad pricing that "cannot be undone retroactively by future Board action."[21] By contrast, if rates UP actually charges IPA in the future prove to be unreasonable, IPA always "could be made whole by an award of reparations under 49 U.S.C. § 11704(b)."[22]

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[20] *Coal Rate Guidelines*, 1 I.C.C.2d at 524; *see also* 49 U.S.C. § 10101(1) (policy "to allow, to the maximum extent possible, competition and the demand for services to establish reasonable rates for transportation by rail").

[21] *AEP Texas North*, slip op. at 19 (citing *Ariz. Grocery Co. v. Atchison, Topeka & Santa Fe Ry.*, 284 U.S. 370, 389 (1932)).

[22] *Id.*

IPA {

} In these circumstances, neither the law nor equity supports the prescription of such rates.

D. UP COMPLIED WITH ITS OBLIGATION TO ESTABLISH COMMON CARRIER RATES AND SERVICE TERMS

IPA complains about UP's response to IPA's requests for common carrier rates.[23] In fact, UP responded to IPA's requests in good faith and established the requested rates in accordance with its obligations under the Board's regulations and 49 U.S.C. § 11101. Indeed, UP responded to IPA's initial request by establishing rates several weeks earlier than required by law.

1. Background

IPA's traffic has long moved under contract with UP and its predecessors. As the expiration date of the most recent contracts approached, UP worked in good faith to negotiate a new contract with IPA. At some point, IPA apparently concluded that its interests would be best served by requesting common carrier rates. On October 29, 2010, more than two months before the existing contracts expired, IPA requested that UP provide common carrier rates that would apply to IPA's transportation beginning on January 1, 2011.[24] Just four business days later, on November 4, 2010, UP replied that it would provide rates no later than December 1, unless the parties had agreed to a new contract before then.[25] IPA responded on November 8, asserting that Board regulations required UP to establish the requested rates by November 12, and claiming that any delay would "hamper IPA's ability to plan for post-2010 coal deliveries."[26] UP replied

[23] IPA Opening Nar. at I-25 to I-30; *id.* at V-1 & Verified Statement of John Aguilar ("Aguilar V.S.").

[24] UP Reply Exh. V-1.

[25] *Id.*, Exh. V-2.

[26] *Id.*, Exh. V-3.

on November 10, explaining that IPA was misinterpreting the Board's rules, that even if UP rushed to establish rates on the schedule demanded by IPA, the rates could change before January 1, 2011, and that UP needed the time "to satisfy ourselves that the rates we establish are lawful."[27] UP also renewed its commitment to provide rates by December 1.[28]

As promised, UP provided IPA the rates it had requested on December 1.[29] Then, on Friday, December 10, IPA requested common carrier rates for shipments from a new origin, Skyline Mine.[30] UP provided those rates just two business days later, on Tuesday, December 14.[31]

IPA does not claim that it suffered any harm because UP provided common carrier rates on December 1, rather than the date IPA had requested.[32] This is understandable. One of the three rates that IPA challenges is the one for movements to Skyline Mine, a rate IPA did not even request until December 10. Moreover, IPA cannot claim that waiting the two weeks between November 12 and December 1 made a crucial difference in planning for post-2010 coal

[27] *Id.*, Exh. V-4. IPA states that it believed that UP's response was inconsistent with the Board's regulations, and that its counsel contacted the STB's Rail Customer & Public Assistance Program. Aguilar V.S. at 5. IPA reports that it "failed to receive any relief through that process." *Id.* That result is not surprising, because IPA's understanding of the Board's regulations is incorrect, as discussed below.

[28] UP Reply Exh. V-4.

[29] *Id.*, Exh. V-5.

[30] *Id.*, Exh. V-6.

[31] *Id.*, Exh. V-7.

[32] In discovery, UP asked IPA to identify any harm that IPA suffered because it received UP's rates on December 1. *Id.*, Exh. V-8. IPA objected that the question was "irrelevant" and "premature." *Id.*, Exh. V-9. UP also asked IPA to produce documents relating to any harm that it suffered. *Id.*, Exh. V-10. IPA responded with the same objections. *Id.*, Exh. V-11. However, IPA's counsel later told UP's counsel that "no responsive documents exist." *Id.*, Exh. V-12.

deliveries – IPA was still finalizing its coal-supply plans in June 2011, which required it to seek a four-week extension of this proceeding.[33]

Nonetheless, IPA argues that UP violated the Board's regulations by responding to IPA's October 29 request for common carrier rates on December 1, rather than November 12. Even though IPA's traffic was moving under contracts that did not expire until January 1, 2011, IPA maintains that UP had an obligation to respond by the earlier date. IPA is incorrect.

2. Argument

IPA's argument is not well founded. UP provided common carrier rates a full month before its contracts with IPA were set to expire. IPA argues, however, that UP was required to respond within ten days because, as of the date of IPA's request "there were no 'existing rates' for the transportation that was the subject of IPA's request (*i.e.*, common carrier transportation service from the subject origins/interchange to IGS beginning on January 1, 2001)."[34] IPA reaches its flawed conclusion by twisting the meaning of Board regulations and ignoring the decision of the D.C. Circuit Court of Appeals in *Burlington Northern Railroad Co. v. STB*.[35] That decision makes clear that the Board lacks the statutory authority to impose on a rail carrier a current obligation to establish common carrier rates for traffic that would not move under those rates until some future point.[36] The Board's rules regarding the disclosure and publication of common carrier rates were proposed and adopted *after* the D.C. Circuit's decision,[37] and there is

[33] *See* Motion for Extension of Schedule (filed June 24, 2011).

[34] IPA Opening Nar. at I-29.

[35] 75 F.3d 685 (D.C. Cir. 1996).

[36] *See id.* at 692-96.

[37] *See Disclosure, Publication, and Notice of Changes of Rates and Other Service Terms for Rail Common Carriage*, 1 S.T.B. 153 (1996).

no basis for interpreting them in a way that would conflict with that court's conclusion in *Burlington Northern.*

Under 49 U.S.C. § 11101(b), a rail carrier is to provide rates "promptly after the receipt of the request." Acting under delegated rulemaking authority,[38] the Board requires a rail carrier to establish a new common carrier rate on request "promptly," "as soon as reasonably possible, but no later than 10 business days from receipt of the request," but only "in the absence of an existing rate for particular transportation."[39] The IPA traffic at issue was moving under a contract that did not expire until January 1, 2011. Thus, under the terms of the regulation, UP was not obligated to establish a new common carrier rate for that traffic until January 1, 2011.

IPA offers no valid reason for ignoring the plain meaning of Section 1300.3.

a. "An Existing Rate" Includes "An Existing Contract Rate."

IPA's primary argument is that Section 1300.3's reference to "an existing rate" applies only to common carrier rates, because Section 1300.1(c) states that the "'provisions of this part do not apply to any transportation or service provided by a rail carrier under a contract.'"[40] That is a misreading of the regulatory language.

Section 1300.1(c) does not say that every use of the term "rate" in Part 1300 should be taken to mean "common carrier rate." Section 1300.1(c) simply makes explicit that the Board's regulations in Part 1300 do not impose obligations on transportation subject to a contract. In other words, Section 1300.1(c) makes explicit that Section 1300.2, which establishes "Disclosure requirements for existing *rates*," does not require disclosure of existing contract rates; that

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[38] *See* 49 U.S.C. § 11101(f).

[39] 49 C.F.R § 1300.3.

[40] IPA Opening Nar. at I-28 (quoting 49 C.F.R. § 1300.1(c)).

Section 1300.3, which establishes procedures for a rail carrier's "Response to request for establishment of a new *rate*," does not apply to requests for new contract rates; and that Section 1300.4, which establishes a "Notice requirement" when a rail carrier seeks to increase "any *rates*," does not create a regulatory notice requirement for increases to contract rates. However, the reference to "an existing rate" in Section 1300.3 does not impose any regulatory obligation on existing rates, so there is no basis for reading this language as applying only to "an existing common carrier rate."

In fact, IPA's argument that "an existing rate" under Section 1300.3 refers only to "an existing common carrier rate" leads to an outcome that is contrary to the purpose of Section 1300.1(c). The point of that provision is to make clear that transportation under a contract is not subject to regulatory obligations that apply to common carrier transportation. Under IPA's view, UP would not have been obligated to establish the requested rates if its existing rates were common carrier rates, but it was required to establish new rates in this case because its existing rates were contract rates. Interpreting Section 1300.1(c) to increase a carrier's regulatory burdens when its existing rates are contract rates is at odds with the basic principle underlying Section 1300.1(c).

Furthermore, IPA's interpretation of Section 1300.3 produces results that conflict with established precedent. Under IPA's interpretation, a rail carrier would be required to establish common carrier rates for traffic currently moving under contract, because there would be no "existing common carrier rate." However, Board precedent establishes that a rail carrier is *not* required to establish common carrier rates for transportation governed by a rail transportation contract.[41]

Accordingly, UP's position that Section 1300.3's reference to "an existing rate" extends to existing contract rates is plainly correct.

b. <u>A Carrier With "An Existing Rate" In A Contract Has No Current Obligation To Establish A Rate That Cannot Be Used Until Some Point In The Future.</u>

IPA's fall-back argument is that, even if Section 1300.3's reference to "an existing rate" applies to contract rates, UP was obligated in November to establish common carrier rates that would apply to IPA's traffic beginning on January 1, 2011 because, as of the date of IPA's request, UP had no existing rates for transportation of IPA's coal on or after January 1, 2011.[42] IPA's argument is frivolous. IPA's position conflicts directly with the Court's holding in *Burlington Northern*, and it would produce results at odds with common sense.

In *Burlington Northern*, the ICC had ordered a railroad to establish common carrier rates that would apply only after the expiration of an existing contract governing the traffic at issue. The Court held that the ICC lacked the statutory authority to impose on a rail carrier a current obligation to establish common carrier rates for traffic that would not be ready to move under those rates until some future point.[43] As the Court explained, Congress struck a balance between shipper and carrier interests by giving carriers control over when they establish new common

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[41] *See, e.g.*, *Ariz. Elec. Power Coop. v. Union Pac. R.R.*, STB Docket No. 42113 (Sub-No. 1), slip op. at 3 (STB served Apr. 23, 2009) ("If the court rules that AEPCO and UP have entered into a valid contract that governs AEPCO's traffic from the Colorado and SPRB mines to Apache Station, we would not order UP to establish a common carrier rate.").

[42] IPA Opening Nar. at I-25.

[43] *See Burlington Northern*, 75 F.3d at 692-96. The case was decided under the law as it existed before the ICCTA, but the Court observed that "th[e] change in the law suggests that any future action by the Board along the lines of the Commission's action here would be on even weaker statutory grounds than was the action taken here." *Id.* at 693 n.7.

carrier rates,[44] and Board interference with carriers' control over timing would improperly "shift[] the balance in the parties' negotiations over a new contract by altering the default situation – what would prevail were no agreement reached."[45]

Burlington Northern forecloses IPA's argument that the Board can create a current obligation for rail carriers to establish rates for movements that cannot occur until existing rates expire. If the Board's regulations purported to create such an obligation, they would be unlawful for the reasons identified in *Burlington Northern.* [46]

Moreover, IPA's position, if adopted by the Board, would lead to absurd results. In essence, IPA is claiming that, even if UP and IPA had a contract that ran through 2025, IPA could currently require UP to establish common carrier rates within ten days for traffic moving on or after January 1, 2026 because UP has no existing rate governing that future traffic. This is not the law.

IPA argues that its position must be correct, or else a shipper could request new common carrier rates only when its existing contract had expired, the carrier would have ten days to respond, and thus a shipper could be left without a rate for a ten-day period.[47]

IPA's argument is a red-herring. UP has never argued that Section 1300.3 precludes a shipper from requesting a new rate until its existing rate expires. Under Section 1300.3, as long as a shipper requests the new common carrier rate at least ten days before its existing rate expires (and provides information sufficient for the carrier to establish the new rate), the carrier must

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[44] *See id.* at 694-95.

[45] *See id.* at 691.

[46] In fact, as discussed above, the Board proposed and adopted its current rules shortly after the Court's decision in *Burlington Northern*, and a straightforward, common-sense reading of the rules shows that they are consistent with that decision.

[47] IPA Opening Nar. at I-29.

have a new common carrier rate in place within ten days. While UP attempted to provide earlier information on new rates where possible, as a courtesy to IPA, Section 1300.3 does not require a carrier to establish new rates until existing rates expire. As the Court explained in *Burlington Northern*, that is why Congress provided that new common carrier rates can go into effect immediately.[48]

IPA's claim that the Board's regulations required UP to establish a new common carrier rate a month and a half before that rate could possibly be used is further undermined by the rules that govern changes to common carrier rates. Under 49 U.S.C. § 11101(c) and Section 1300.4 of the Board's regulations, a rail carrier may increase its common carrier rates on 20-days' notice. Accordingly, if UP had been required to establish rates on November 12, it could have established the rates, but provided notice of increased rates on December 11, and applied the increased rates to IPA's traffic beginning on January 1, 2011. Requiring UP to establish rates on November 12 would have increased UP's administrative costs, but IPA would have had no assurance that its traffic would actually move under those rates. This result makes no sense. IPA's argument that a shipper can somehow require a railroad to establish rates more than a month before they could be used is inconsistent with the broader statutory and regulatory structure.

3. The Board Should Reject IPA's Claim That UP Committed An Unreasonable Practice.

The Board should reject IPA's claim that UP violated Board regulations or otherwise acted unreasonably in responding to IPA's requests for common carrier rates. UP responded to

[48] *See Burlington Northern*, 75 F.3d at 695.

IPA's requests promptly and in good faith, explaining the reasons for its actions. UP's responses complied fully with the Board's regulations and UP's obligations under 49 U.S.C. § 11101.

E. CONCLUSION

For the foregoing reasons, the Board should dismiss IPA's claim that UP's rates in Item 6200-A of UP Tariff 4222 exceed maximum reasonable levels and IPA's claim that UP failed to establish those common carrier rates on a timely basis.

Respectfully submitted,

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II: Market Dominance

II. MARKET DOMINANCE

A. QUANTITATIVE EVIDENCE

UP agrees with the traffic and operating characteristics for the movements to which the challenged rates apply that are listed IPA's Table II-A-1.

UP also agrees with IPA's calculations of variable costs for the movements to which the challenged rates apply, as set forth in IPA's Table II-A-2, recognizing that IPA's variable costs are based on a preliminary 2010 UP URCS dataset generated by IPA and that revisions to those calculations will almost certainly be necessary to reflect the official 2010 UP URCS dataset that will be released by the Board.

B. QUALITATIVE EVIDENCE

For purposes of its reply evidence, UP does not dispute that it has market dominance over the transportation to which the challenged rates apply. As IPA recognized, UP had admitted in discovery that it could not prevail on this issue.[1] Why IPA devoted nine pages of its opening evidence to the issue of qualitative market dominance is a mystery.

[1] IPA Opening Nar. at II-7 to II-8.

III.A: Stand-Alone Traffic Group

III. STAND-ALONE COST

A. TRAFFIC GROUP

IPA challenges the reasonableness of UP's common carrier rates for transporting unit-train movements of coal to IPA's Intermountain Generating Station ("IGS") at Lynndyl, Utah. The challenged rates apply to UP service to IGS from one Utah mine (Skyline Mine), one Utah coal loadout (the Savage Coal Terminal), and one point of interchange with the Utah Railway Company ("URC") in Provo, Utah.

IPA constructed a hypothetical stand-alone railroad ("SARR"), called the Intermountain Railroad ("IRR"), that consists of two parts. The first part of the SARR replicates UP's route from Price, Utah, northwest through Provo, then southwest to IGS at Lynndyl. This part includes all the core facilities needed to serve the issue traffic. The second part of the SARR extends southwest from Lynndyl to Milford, Utah. This part does not carry any issue traffic. A diagram of the IRR's system is provided in UP Reply Exhibit III.A-1.

UP accepts many of IPA's methods for determining the SARR's volumes and revenues, but it also identifies and corrects several significant errors committed by IPA. For example, IPA made mathematical and data entry errors that created an overstatement of non-issue coal traffic volumes. Also, when performing revenue-allocation calculations for the IRR cross-over traffic, IPA failed to modify its calculations to conform with the implications of the Board's June 27, 2011 decision in *AEPCO*,[1] and it overstated IRR's share of revenue by omitting from the denominator the variable costs associated with the SARR's portion of the total route.

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[1] *Ariz. Elec. Power Coop., Inc. v. BNSF Ry. & Union Pac. R.R.*, STB Docket No. 42113 (STB served June 27, 2011).

UP also modifies IPA's methods in certain instances to reflect more accurately the actual characteristics of the traffic that IPA selected for its SARR. For example, IPA used UP's actual first quarter 2011 results, along with UP's projections for the remainder of the year, to calculate 2011 volumes of non-coal traffic, while UP uses actual data for the first three quarters of 2011. Also, IPA and UP use the same sources of forecasts to project growth in IRR's non-coal traffic volumes for each year from 2012 to 2020, but IPA created blended forecasts that do not reflect the actual mix of traffic actually moving on the SARR, while UP relies on commodity-specific forecasts that correspond more precisely to the traffic selected by IPA.

UP also removes one category of traffic from IPA's SARR because IPA impermissibly provided a lower level of service for that traffic without showing that the affected shippers and connecting carriers would not object. IPA added more than one hour to the transit time of UP's highest-priority intermodal "Z trains" as a result of its decision to have IRR take the traffic from UP at Milford, move it over the 89-mile Lynndyl-Milford segment, then hand it back to UP at Lynndyl. This represents a greater than 50% increase over actual transit times on UP. Because IPA failed to demonstrate that UP could make up for the lost time, or that the affected shippers, which include UPS and other extremely service-sensitive customers, would accept the lower level of service that IRR would provide for their traffic, UP excludes that traffic from the SARR traffic group, consistent with Board precedent.

UP discusses in detail its corrections to IPA's volume calculations in Section III.A.2 and its corrections to IPA's revenue calculations in Section III.A.3. UP's evidence is supported by Robert Fisher, a Director in FTI's Network Industries Strategies group. Mr. Fisher analyzed the flaws in IPA's volume and revenue assumptions, and he generated corrected traffic volume and revenue data for use in UP's reply evidence. Mr. Fisher's qualifications and verification appear in Part IV.

1. Stand-Alone Railroad Traffic

IPA divided the IRR traffic group into four main categories, which it described as follows: IGS coal traffic, non-IPA coal traffic, IRR non-coal traffic, and BNSF trackage rights trains.[2] IPA's terminology is unnecessarily confusing. UP divides coal traffic into "IPA coal traffic" and "non-IPA coal traffic" when discussing SARR volumes and revenues.

2. Volumes (Historical and Projected)

a. IPA Coal Traffic

"IPA coal traffic" consists of issue and non-issue coal traffic moving to IGS. The issue traffic includes: (i) coal that IRR originates from Skyline Mine and delivers to IGS in single-line service, and (ii) coal that URC originates from the Savage Coal Terminal, which IRR receives from the URC in interchange at Provo and delivers to IGS. The non-issue coal traffic originates on IRR at the Sharp Loadout and is delivered to IGS in single-line service.

IPA used its own internal forecasts to determine IPA coal traffic tonnages for 2011 through 2020.[3]

UP accepts IPA's projected volumes for the issue traffic.

The resulting volume projections for the issue traffic are as follows:

[2] IPA incorrectly asserts that "IRR does not reroute any traffic." IPA Opening Nar. at III-A-8. As discussed in Section III.C.3, UP identified two instances in which IPA deviated from real-world movements. However, UP revised the IRR operating plan to conform to the real-world movements of the traffic, so there is no impact on IRR volumes or revenues.

[3] IPA Opening Nar. at III-A-8 and IPA Opening workpapers "Coal Forecast 7-27-11.xlsx" and "IPA Coal Traffic Forecast.xlsx."

Table III.A.1
IPA Coal Traffic
(thousands of tons)

Year	Origin			Total
	Provo (Savage/URC)	Skyline	Sharp	
2011	{ }	{ }	{ }	{ }
2012	{ }	{ }	{ }	{ }
2013	{ }	{ }	{ }	{ }
2014	{ }	{ }	{ }	{ }
2015	{ }	{ }	{ }	{ }
2016	{ }	{ }	{ }	{ }
2017	{ }	{ }	{ }	{ }
2018	{ }	{ }	{ }	{ }
2019	{ }	{ }	{ }	{ }
2020	{ }	{ }	{ }	{ }

Source: UP Reply workpaper "Coal Traffic Forecast Reply.xlsx."

b. Non-IPA Coal Traffic

"Non-IPA coal traffic" includes all coal traffic that moves on IRR other than the IPA coal traffic. Specifically, non-IPA coal traffic includes:

(i) coal traffic that IRR originates at Skyline Mine, the Savage Coal Terminal, or the Sharp Loadout and interchanges to UP at Price, Provo, or Milford;

(ii) overhead coal traffic that IRR receives in interchange from UP at Price and interchanges back to UP at Milford or Provo;

(iii) overhead coal traffic that IRR receives in interchange from UP or URC at Provo and interchanges to UP at Milford; and

(iv) overhead coal traffic that IRR receives in interchange from UP at Lynndyl and interchanges back to UP at Milford.

i. 2011 Non-IPA Coal Volumes

IPA calculated IRR's 2011 coal volumes for non-IPA coal traffic by first using UP's detailed 2010 records to identify the coal that moved over the lines of the IRR system, and then using UP's "Prophecy" forecast to project the growth of those volumes from 2010 to 2011.

UP accepts IPA's approach but corrects errors that IPA made in implementing its approach with regard to coal originating in Utah and Colorado.

(a) Utah Coal Originations

To develop 2011 volumes of non-IPA coal traffic from Utah coal originations moving over IRR, IPA first developed the projected rate of change in volumes between UP's 2010 Utah coal originations (based on UP's actual data) and UP's 2011 anticipated Utah coal originations (based on UP's Prophecy data). IPA then applied that projected rate of change to the 2010 non-IPA, Utah-origin coal volumes it identified as moving over the lines of the IRR system.[4]

IPA erred, however, by failing to exclude from its calculations the 2010 actual and 2011 projected IPA coal traffic. IPA's identification of UP's 2010 actual and UP's 2011 anticipated Utah coal originations includes IPA coal traffic, and IPA provided its own projections for Utah coal traffic moving to IGS in 2011. Accordingly, to develop the projected rate of change for non-IPA, Utah-origin coal volumes, IPA should have excluded the IPA coal traffic from its calculations, and not applied the overall average.

Specifically, IPA calculated that overall UP Utah coal originations will { } from 2010 to 2011. However, IPA's own forecast projects that IPA's Utah-origin coal volumes will { } over the same time period.[5] Because IPA coal traffic accounts for { } of UP's Utah coal origins, Utah originations of non-IPA coal must necessarily { }, to produce the overall { }.

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[4] IPA Opening Nar. at III-A-11.

[5] { }.

As shown in the chart below, application of IPA's methodology to Utah coal originations, after excluding IPA coal traffic, produces a projected { } for non-IPA coal from Utah originations, rather than the { } calculated by IPA.

Table III.A.2
Utah Coal Tonnage
(thousands of tons)

	2010	2011	Growth Rate
Total Utah Coal	{ }	{ }	{ }
IPA UT-Origin Coal	{ }	{ }	{ }
Non-IPA Utah Coal	{ }	{ }	{ }

Source: UP Reply Workpaper "Coal Traffic Forecast Reply.xlsx."

Accordingly, UP calculates 2011 non-IPA, Utah coal originations by applying the { } to the 2010 volumes identified by IPA.

(b) <u>PRB/Colorado Coal Originations</u>

To develop 2011 volumes of non-IPA coal traffic from Colorado coal originations, IPA used the same general approach it used for Utah coal originations. IPA had data regarding UP's 2011 anticipated Colorado coal originations from Prophecy. However, IPA did not have data that specifically identified UP's 2010 actual Colorado coal originations, so IPA used publicly-reported data that identified UP's 2010 actual *combined* Colorado *and* Utah coal originations, and then subtracted UP's 2010 actual Utah coal originations (which were identified in UP records produced in discovery).[6]

In performing these calculations, however, IPA incorrectly recorded UP's reported 4Q 2010 Colorado and Utah coal volume as 670,000 tons, rather than 6,700,000 tons.[7] Because IPA

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[6] IPA Opening Nar. at III-A-13 to III-A-14.

[7] UP Reply workpaper "Coal Traffic Forecast Reply.xlsx." *See also* UP Reply workpaper "4q2010_slides.pdf," Slide 9 and IPA Opening workpaper "IPA Coal Traffic Forecast.xlsx," Tab "2010 Act & 2011 Proph by Region," cell G13.

compared 2010 data that incorporated this understated figure with UP's 2011 Prophecy data, it overstated the projected increase from 2010 to 2011 for Colorado origins, and then it applied that overstated increase when calculating the 2011 Colorado-origin coal volumes moving over the IRR system.

After correcting this error, UP calculates 2011 Colorado-origin coal volumes moving over the IRR system by applying a { } to the 2010 volumes identified by IPA, rather than the { } used by IPA.

ii. <u>2012-2020 Non-IPA Coal Volumes</u>

For non-IPA coal traffic, IPA calculated IRR coal traffic volumes for each year from 2012 to 2020 using data from the Energy Information Administration's ("EIA") 2011 Annual Energy Outlook ("AEO") forecast. IPA applied the annual rates of change that EIA developed for coal moving from specified supply regions to specified demand regions to IRR's prior year coal movements based on each movement's supply and demand regions.[8]

UP accepts IPA's approach but corrects a calculation error in IPA's treatment of coal traffic moving to Missouri. For this traffic, IPA applied the rates of change for EIA's "West North Central 1" demand region, which includes Minnesota, North Dakota, and South Dakota.[9] However, IPA should have applied the rates of change for EIA's "West North Central 2" demand region, which includes Iowa, Nebraska, Kansas, and Missouri.[10] UP calculates 2012-2020 IRR coal volumes using the correct EIA growth rates for traffic destined to Missouri.

[8] IPA Opening Nar. at III-A-14 to III-A-15.

[9] IPA Opening workpaper "IPA Coal Traffic Forecast.xlsx."

[10] Documentation of EIA's Coal Marketing Module, *available at* www.eia.gov/forecasts/aeo/assumptions/pdf/coal.pdf (Figure 11).

Table III.A.3 summarizes UP's revised non-IPA coal tonnages:

Table III.A.3
IRR Non-IPA Coal Tonnages
(thousands of tons)

Year	IPA	Reply	Difference
2011	{ }	{ }	{ }
2012	{ }	{ }	{ }
2013	{ }	{ }	{ }
2014	{ }	{ }	{ }
2015	{ }	{ }	{ }
2016	{ }	{ }	{ }
2017	{ }	{ }	{ }
2018	{ }	{ }	{ }
2019	{ }	{ }	{ }
2020	{ }	{ }	{ }

Source: UP Reply workpaper "Coal Traffic Forecast Reply.xlsx."

c. IRR Non-Coal Traffic

UP updates IPA's calculations of IRR non-coal traffic volumes to project more accurately IRR's 2011 volume levels, which IPA used as the base for projecting volume levels for 2012 to 2020. UP also applies more commodity-specific forecasts when projecting volume levels for 2012 to 2020. Finally, UP removes traffic moving on UP's "Z trains" from the SARR traffic group, because IPA's operating plan provided for an inferior level of service for this traffic.

i. 2011 IRR Non-Coal Volumes

IPA did not accurately describe or properly perform its calculations of 2011 IRR non-coal volumes. IPA said it developed 2011 IRR non-coal volumes by (i) selecting traffic that moved over the IRR system in 2010; (ii) using UP's actual data for 2010 and UP's Prophecy forecast for 2011 to calculate the projected rate of change in traffic volume for each of UP's business group from 2010 to 2011; and (iii) applying the projected rate of change for the appropriate business group to the 2010 traffic volumes.[11]

In fact, IPA did not rely solely on UP's Prophecy forecast to calculate the projected rate of change in traffic volumes from 2010 to 2011. Instead, IPA combined UP's actual data for 1Q 2011 with UP's Prophecy forecast for 2Q through 4Q 2011 to calculate UP's projected 2011 volumes.[12]

In addition, IPA did not accurately apply the projected rate of change for each business group to IRR's non-coal traffic that fell into that business group. IPA erroneously classified certain food products and chemical products into UP's Industrial Products group, rather than UPs' Agricultural Products or Chemicals groups.

UP accepts IPA's general approach to calculating 2011 IRR non-coal volumes, but it makes three modifications to IPA's calculations to more accurately account for actual 2011 traffic levels.

First, UP substitutes actual 2Q and 3Q 2011 results for Prophecy forecasts. This substitution simply updates IPA's approach to reflect the availability of more current 2011 data, as UP uses the same source and methodology that IPA used to incorporate UP's actual results from 1Q 2011. Since IPA developed its opening evidence using UP actual data for 1Q 2011, additional 2011 data have become available. UP incorporates these more current data in its reply evidence.

Second, UP adjusts the projections contained in its Prophecy forecast for 4Q 2011 to reflect its actual experience in the first three quarters of 2011. This adjustment also reflects an

[11] IPA Opening Nar. at III-A-15 to III-A-16.

[12] IPA Opening workpaper "2010 UP Prophecy Data.xlsx."

effort to develop a more accurate projection of 2011 traffic levels based on actual experience in the first three quarters of the year. UP finalized its Prophecy forecast for 2011 in December 2010. There are now three quarters of actual 2011 results that can be used to evaluate that forecast. For some business groups, UP's traffic growth in the first three quarters exceeded projections. For others, traffic growth lagged behind projections.

Accordingly, UP adjusts the projections contained in its Prophecy forecast for 4Q 2011 upward or downward by the percentage difference between projected and actual traffic growth in each business group over the first three quarters of 2011.[13] UP then combines the actual data for 1Q through 3Q 2011 with the adjusted projections for 4Q 2011 to calculate projected traffic volumes for full year 2011, and it then uses those volumes to calculate the projected rate of change from 2010 to 2011 for the traffic that IPA selected for IRR.

Third, UP applies projected rates of change, by business group, to the traffic that IPA selected for the IRR. As noted above, IPA claimed that it applied the projected rates by business group. However, IPA actually applied the projected rate of change for traffic in UP's Industrial Products group to a substantial volume of traffic that falls into the Agricultural Products or Chemicals groups.[14] UP corrects the errors by applying the appropriate rates of change to the traffic that IPA selected for IRR.

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[13] For example, UP's Prophecy forecast projected that traffic in UP's Chemicals business group would grow by 4.5% in the first three quarters of 2011, and by 1.5% in the fourth quarter of 2011. In fact, UP's chemicals traffic grew 8.8% in the first three quarters of 2011. UP therefore increased the fourth quarter forecast to project traffic growth of 5.8%.

[14] This appears to reflect inadvertent coding errors by IPA, because IPA's workpapers elsewhere correctly identify how the standard transportation commodity codes ("STCC codes") for the traffic that IPA selected for the IRR correspond with UP business groups. IPA Opening workpaper "Non-coal IRR Traffic Forecast.xlsx," Tab "Traffic Summary" compared to Tab "Traffic Type Lookup."

Table III.A.4 summarizes the differences between IPA's and UP's projected growth rates for IRR non-coal volumes from 2010 to 2011.

Table III.A.4
Non-Coal Traffic Growth Rates 2010-2011

	IPA	Reply	Difference
Agricultural Products	{ }	{ }	{ }
Automotive	{ }	{ }	{ }
Chemicals	{ }	{ }	{ }
Industrial Products	{ }	{ }	{ }
Intermodal	{ }	{ }	{ }

Source: UP Reply Workpaper "2010 UP Prophecy Data Reply.xlsx."

ii. 2012-2020 IRR Non-Coal Volumes

IPA calculated the rates of change in IRR traffic volumes for each year from 2012 to 2020 for traffic in UP business groups by using publicly available forecasts from EIA and the U.S. Department of Agriculture ("USDA"), or by aggregating various commodity-specific components of publicly available forecasts, to create a forecast for a "basket of goods" that supposedly corresponds to the traffic in each business group. In most cases, this "basket of goods" approach is inaccurate because IPA's "baskets" do not reflect the mix of SARR traffic, and it is unnecessary because the industries represented in the EIA forecasts that IPA used match up very closely with the two-digit STCC definitions of the IRR traffic, obviating the need for a "basket" approach.

UP uses the same publicly available forecasts as IPA, but it applies the commodity-specific components of the forecasts that correspond to the IRR traffic. For IRR traffic without a commodity-specific forecast, UP creates baskets that correspond more closely to this IRR traffic than the baskets developed by IPA.

(a) Automotive Traffic

IPA classified as "automotive traffic" all of the traffic that it selected for IRR that falls within STCC 37. IPA calculated the rate of change in IRR automotive traffic volumes for each year from 2012 to 2020 using the annual forecasted change in new automobile and light truck sales from EIA's AEO 2011 Transportation Equipment forecast.[15]

Because automobiles represent the majority of STCC 37 traffic on the SARR and to reduce the number of disputes between the parties, UP accepts IPA's use of the forecasted change in new automobile and light truck sales.

(b) Agricultural Products Traffic

IPA calculated the rate of change in IRR agricultural traffic volumes for each year from 2012 to 2020 by creating a basket of selected US agricultural goods and using the forecasted change in production for those goods as estimated in the *United States Department of Agriculture Agricultural Projections to 2020* (OCE-201101).[16] However, IPA's agricultural basket is significantly affected by forecasted changes in volumes for several commodities that do not move on IRR. Specifically, 26% of the basket that IPA constructed from the USDA's projection consists of milk, livestock, and sugar, but none of these commodities moves on IRR. Accordingly, UP calculates the rate of change in the IRR agricultural traffic volumes using the USDA's forecast for each commodity that IPA included in the IRR traffic group.[17] In the very few cases in which USDA did not have a commodity-specific forecast for an agricultural

[15] IPA Opening Nar. at III-A-17.

[16] *Id.*

[17] UP Reply workpaper "EIA and USDA Forecasts Reply.xlsx."

commodity that moves on IRR (*e.g.*, hay), UP applies the USDA's rate of change for eight major crops, all of which move on IRR.[18]

(c) Intermodal and Other Non-Coal Traffic

IPA calculated the rates of change in IRR intermodal and other non-coal traffic volumes for each year from 2012 to 2020 using the forecasted values of output from EIA's AEO 2011 Industrial Output Forecast, and by aggregating the forecasts associated with selected industrial production sectors that supposedly correspond to IRR intermodal traffic, IRR industrial products traffic, and IRR chemicals traffic.[19] However IPA made no attempt to match the EIA's sectors with the actual traffic on the SARR, even though EIA's industrial sectors are based on NAICS (North American Industry Classification System) codes, which correspond very closely to the STCC industry codes that UP provided in the traffic data that IPA used to select traffic for its SARR.

UP begins with the same EIA Industrial Output Forecast as IPA, but it uses commodity-specific forecasts when they are available. UP develops baskets that better correspond with actual IRR intermodal, industrial products, and chemicals traffic when commodity-specific forecasts cannot be used.

Intermodal Traffic. IPA applied the same basket forecast to all intermodal traffic, even when UP traffic data include a commodity-specific two-digit STCC code for the traffic (rather than a non-commodity-specific code for intermodal traffic – *i.e.*, STCCs 42 and 46).

[18] *Id.*

[19] IPA Opening Nar. at III-A-18.

UP applies a more precise approach. When UP traffic data contain a commodity-specific STCC code identifying the intermodal traffic, UP applies the corresponding EIA industrial production forecast to produce a more specific volume projection for that traffic.[20]

When the UP traffic data do not identify a specific commodity, UP adopts IPA's basket approach, but it makes two refinements to IPA's basket.

First, UP excludes EIA's "Construction" industry forecast. "Construction" represents the largest portion of IPA's basket for intermodal traffic. However, EIA's "Construction" industry is defined as NAICS code 23, which represents the level of production *activities* involved in building houses, office buildings, and other structures, not the production of construction *materials* that would move over a railroad, let alone volumes that are actually transported.[21] EIA's forecasts for the production of materials used in construction are reflected in its forecasts for the industries that produce those materials.[22]

Second, UP corrects a weighting error that occurs in IPA's calculations. IPA included in its basket calculation EIA's projected value of production of "Stone, Clay, and Glass Products," as well as EIA's projections for "Glass and Glass Products" and "Cement Manufacturing." But the latter two categories are actually two sub-categories included within "Stone, Clay, and Glass

[20] UP Reply workpaper "EIA and USDA Forecasts Reply.xlsx."

[21] The EIA's modeling documentation defines the Construction sector (NAICS 23) as "establishments primarily engaged in the construction of buildings or engineering projects (e.g., highways and utility systems). Establishments primarily engaged in the preparation of sites for new construction and establishments primarily engaged in subdividing land for sale as building sites also are included in this sector." UP Reply workpaper "EIA NEMS App D.pdf."

[22] Manufacturers of construction materials, such as steel, lumber and cement, fall within NAICS 32 and NAICS 33; wholesalers of construction materials fall within NAICS 42. UP Reply workpaper "NAICS Codes.xlsx."

Products," so IPA's methodology double-counts these values.[23] UP's calculations eliminate IPA's double-count.[24]

Industrial Products Traffic. IPA applied the same forecast to all industrial products traffic, even though UP traffic data included a commodity-specific two-digit STCC code.

UP applies a more precise approach here as well. UP applies the EIA industrial production forecast corresponding to the two-digit STCC code of the particular traffic moving on IRR to produce a more specific volume projection for that traffic. In the few situations in which two-digit STCC codes for traffic moving on the IRR do not correspond with EIA's forecasts for specific industries, UP adopts IPA's basket approach, but it again refines IPA's basket.

First, UP excludes EIA's "Construction" industry forecast for the same reasons described above – that is, because this industry forecast does not actually address the production of construction *materials* that would be shipped by rail.

Second, UP corrects another weighting error that occurs in IPA's calculations. IPA included in its calculations EIA's projected value of production of "Primary Metals," as well as EIA's projections for "Iron and Steel Mills and Products," "Alumina and Aluminum Products," and "Other Primary Metal Products." But the latter three categories are actually sub-categories included within "Primary Metals," so IPA's methodology double-counts these values.[25] UP's calculations eliminate IPA's double-count.[26]

Chemicals Traffic. IPA again used a basket approach for chemicals traffic, even though the EIA's chemicals sub-sectors closely match two-digit STCCs.

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[23] UP Reply workpaper "EIA and USDA Forecasts Reply.xlsx."

[24] *Id.*

[25] *Id.*

[26] *Id.*

Again, UP applies a more precise approach. UP applies the EIA industrial production forecast corresponding to the two-digit STCC of the particular traffic moving on IRR to produce a more specific volume projection for that traffic. For example, for STCC 28 traffic, UP applies the forecast for the EIA's Chemical Manufacturing sector (NAICS 325), which matches up closely with STCC 28. Because all of the chemicals traffic matches up to specific EIA sector forecasts, UP's approach fully replaces IPA's chemicals basket.[27]

iii. "Z-Trains"

In selecting traffic for its SARR, IPA included a substantial volume of intermodal traffic for which IRR would serve as a bridge carrier, replacing UP for the portion of the route between Milford and Lynndyl. However, IPA's operating plan failed to replicate the level of service that UP provides for one important type of intermodal traffic: UP's high-priority "Z trains." Accordingly, UP removed that traffic from the SARR traffic group.

UP's classifies its intermodal trains into three categories based on the level of service required. UP provides "standard intermodal" service in trains with symbols beginning with an "I" (or "I trains"), "premium intermodal" service in trains with symbols beginning with a "K" (or "K trains"), and "guaranteed intermodal" service in trains with symbols beginning with a "Z" (or "Z trains"). Intermodal traffic moving in Z trains is the most service-sensitive traffic on UP's network. As the traffic data produced in discovery show, this traffic moves for customers such as UPS, for whom rail service is a viable alternative only if railroads can approach the transit time and reliability of truck service. UP's Z trains have the highest priority on UP's network after passenger trains, which must be given priority over all other trains by law. All other UP

[27] *Id.* UP notes that IPA's chemicals basket includes several weighting errors of the type described above with respect to intermodal and industrial products traffic.

trains have a lower priority than Z trains. UP produced information identifying the different service priorities in discovery.[28]

IPA's operating plan is incapable of replicating the level of service UP currently provides for Z trains that move over its network between Milford and Lynndyl, though IPA tried hard to hide that fact. IPA selected for the SARR traffic group a substantial volume of intermodal traffic that moves in Z trains from Los Angeles to Denver over the Milford-Lynndyl segment. IPA's operating plan requires UP to interchange the trains at Milford to IRR, which would hand the trains back to UP at Lynndyl. IPA claims that "IRR's 2020 peak-period train transit times for train movements over the various IRR line segments are faster than the real-world UP cycle times for the comparable trains during the 2010 base year."[29] However, that statement is not true. When IRR's transit times are examined by category of service, rather than as an average that blends coal, manifest, and different types of intermodal trains, it is clear that IRR's service for Z trains over the Milford-Lynndyl segment is dramatically inferior to the service provided by UP: trains take approximately 50% more time to move over the segment. The reasons for the slower service, which include track designed for lower speed limits and time lost because of the addition of a new interchange between IRR and UP at Lynndyl, are discussed below in Section III.C.2.b.

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[28] UP Reply workpaper "CAD train category characteristics.pdf" (UP-IPA-000037666).

[29] IPA Opening Nar. at III-C-34. In its exhibits, IPA provides data in terms of "Average Transit Times In Hours," thereby disguising the distinction among different train types. IPA Opening Exh. III-C-3.

Indeed, as discussed below in Section III.C.2.b, IPA's transit time exhibit is even more deceptive than it initially appears, because it reflects an averaging of *unopposed* transit times – that is, the results reflect an averaging of transit times for individual trains that are modeled as though they could operate without regard to other trains, including trains moving in the opposite direction over IRR's single-track network.

Under the circumstances, Board precedent compels the exclusion of Z train traffic from the IRR traffic group. "The reasonableness of . . . the traffic group selected by the complainant is open to challenge. Thus, for example, the SARR must meet the transportation needs of the traffic in the group by providing service that is equal to (or better than) the existing service for that traffic."[30] In this case, IRR plainly would not be providing service equal to or better than the service provided by UP. Moreover, IPA made no effort to show that the affected shippers would accept the inferior level of service that IRR would provide, even though Board precedent clearly places the burden on IPA: "A core SAC principle is that the SARR must meet the transportation needs of the traffic it would serve. Thus, the proponent of a SARR may not assume a changed level of service . . . unless it also presents evidence showing that the affected shippers, connecting carriers, and receivers would not object."[31]

"When the [operating] plan presented in a SAC case by the complainant is infeasible, it is generally incumbent on the defendant railroad to present a realistic alternative so that the SAC analysis may be completed."[32] In this case, UP was unable to modify the SARR operating plan in a way that would allow IRR to replicate the transit times that UP provides for Z trains. *See*

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[30] *Tex. Mun. Power Agency v. Burlington N. & Santa Fe Ry.*, 6 S.T.B. 573, 589 (2003) (internal footnote omitted); *see also Duke Energy Corp. v. CSX Transp., Inc.*, 7 S.T.B. 402, 414 (2004) ("[The operating] plan must be capable of providing, at a minimum, the level of service to which the shippers in the traffic group are accustomed."); *Bituminous Coal – Hiawatha, UT to Moapa, NV*, 10 I.C.C.2d 259, 273 (1994) (rejecting operating plan that "fail[ed] fully to account for the time-sensitive requirements . . . of the shippers on the line, as well as the considerable additional switching and handling expense that would be entitled in interlining traffic in general freight (manifest) trains of the lengths envisioned [in the operating plan]").

[31] *Duke/CSXT*, 7 S.T.B. at 427 (citing *McCarty Farms, Inc. v. Burlington N. Inc.*, 2 S.T.B. 460, 476 (1997); *FMC Wyo. Corp. v. Union Pac. R.R.*, 4 S.T.B. 699, 736 (2000)).

[32] *Duke/CSXT*, 7 S.T.B. at 430.

infra at Section III.C.2.b. Under the circumstances, the appropriate solution is to exclude the traffic from the SARR traffic group, which is what UP has done in its reply evidence.[33]

Table III.A.5 summarizes UP's reply non-coal tonnages:

Table III.A.5
IRR Non-Coal Tonnages
(thousands of tons)

Year	IPA	Reply	Difference
2011	13,603	12,472	-1,131
2012	14,390	12,769	-1,621
2013	15,259	13,352	-1,907
2014	15,417	13,410	-2,007
2015	15,637	13,584	-2,053
2016	15,821	13,750	-2,071
2017	15,995	13,935	-2,060
2018	16,193	14,137	-2,056
2019	16,403	14,341	-2,062
2020	16,653	14,562	-2,091

Source: UP Reply workpaper "Non-Coal IRR Traffic Forecast Reply.xlsx."

d. BNSF Trackage Rights Trains

"BNSF trackage rights trains" refers to traffic that IPA included in its SARR because it hypothesized that IRR will step into UP's shoes with respect to a trackage rights arrangement between UP and BNSF Railway that, among other things, allows BNSF to move traffic over UP's lines that IRR replicates between Price and Provo.

IPA used UP trackage rights invoices issued to BNSF in 2010 to develop the volume of BNSF trackage rights traffic in 2010, and then used the EIA's overall Industrial Sector forecast to project BNSF trackage rights tonnages for the years from 2011 to 2020.[34]

[33] *TMPA*, 6 S.T.B. at 589 ("[T]he traffic group selected by the complainant is open to challenge."); *Coal Rate Guidelines – Nationwide*, 1 I.C.C.2d 520, 544 (1985) ("[T]he potential traffic draw and attendant costs and revenues that the hypothetical stand-alone provider could expect are open to scrutiny in individual cases. The proponent of a particular stand-alone model must identify, and be prepared to defend, the assumptions and selections it has made.").

UP accepts IPA's general approach to incorporating this traffic, but modifies it slightly by eliminating the Construction sector from the Industrial Sector forecast because, as described above with respect to intermodal and industrial products traffic, EIA's construction forecast does not actually address the production of construction materials that would be shipped by rail.

Table III.A.6 summarizes UP's reply trackage rights gross tons:

Table III.A.6
IRR Trackage Rights Tonnages
(thousands of gross tons)[35]

Year	IPA	Reply	Difference
2011	{ }	{ }	{ }
2012	{ }	{ }	{ }
2013	{ }	{ }	{ }
2014	{ }	{ }	{ }
2015	{ }	{ }	{ }
2016	{ }	{ }	{ }
2017	{ }	{ }	{ }
2018	{ }	{ }	{ }
2019	{ }	{ }	{ }
2020	{ }	{ }	{ }

Source: UP Reply workpaper "Trackage Rights Forecast Reply.xlsx."

e. <u>Peak Year Traffic</u>

Table III.A.7 compares total SARR volumes developed by IPA for IRR with total volumes developed by UP for IRR for each year of the discounted cash flow ("DCF") period. (IPA's and UP's figures both exclude trackage rights tonnages.)

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[34] IPA Opening Nar. at III-A-18 to III-A-19.

[35] While other tables in Section III.A provide tonnage information in terms of net tons, trackage rights tonnage is reported in gross tons because compensation under the UP/BNSF trackage rights arrangement is based on gross ton miles.

Table III.A.7
IRR Total Annual Tonnages
(thousands of tons)

Year	IPA	Reply	Difference
2011	25,121	23,231	-1,890
2012	24,881	22,395	-2,486
2013	26,151	23,360	-2,791
2014	26,309	23,449	-2,860
2015	26,821	23,919	-2,902
2016	27,155	24,220	-2,935
2017	27,472	24,558	-2,914
2018	27,119	24,284	-2,835
2019	27,294	24,470	-2,824
2020	27,606	24,756	-2,850

Source: UP Reply workpaper "Traffic and Revenue Summary Reply.xlsx."

Table III.A.8 shows IPA's and UP's respective calculations of traffic volumes for 2020, the peak year, by commodity group.[36]

Table III.A.8
IPA Peak Year Traffic
(thousands of tons)

Business Group	IPA	Reply	Difference
Agricultural Products	1,300	3,398	2,099
Automotive	200	166	-34
Chemicals	2,429	2,895	466
Industrial Products	5,654	2,732	-2,922
Intermodal	7,071	5,372	-1,699
Coal	10,952	10,194	-758
Total	27,606	24,756	-2,849

Source: UP Reply workpapers "Non-Coal IRR Traffic Forecast Reply.xlsx" and "Traffic and Revenue Summary Reply.xlsx."

3. Revenues (Historical and Projected)

UP accepts many of IPA's methods for determining IRR revenues, but it also identifies several errors in IPA's evidence and corrects them as described below. UP then applies the

[36] The "Reply" column includes corrections to IPA's business group assignments. In particular, IPA's workpapers show that IPA incorrectly assigned certain UP Agricultural Products traffic to the Intermodal business group.

corrected SARR revenues to the corrected SARR traffic volumes to derive SARR revenue estimates for the ten-year period from 2011 through 2020.

The differences between IPA's revenue estimates and those developed by UP are largely explained by differences in traffic volume calculations and clear errors in IPA's implementation of its methods. However, IPA also created a systematic bias in projecting fuel surcharge levels for UP traffic. These issues and others are discussed in more detail below.

a. Single-Line

IPA included very little single-line traffic in the IRR traffic group: only the portion of the issue traffic moving from Skyline Mine to IGS and non-issue coal moving from the Sharp Loadout to IGS.[37] Single-line traffic accounts for only 9% of IRR's total 2011 traffic volume.[38]

b. Divisions – Existing Interchanges

IPA also included very little traffic in the IRR traffic group that IRR would interchange with other carriers at the present location of interchange. All of this traffic is coal traffic that UP presently interchanges with URC in Provo, and the vast majority is issue traffic moving from the Savage Coal Terminal to IGS. Traffic in this category accounts for only 12% of IRR's total 2011 traffic volume.[39]

c. Divisions – Cross-Over Traffic

The overwhelming majority of traffic that IPA included in the IRR traffic group is cross-over traffic – that is, traffic that IRR interchanges with the residual UP at a new, hypothetical interchange because IRR handles a shorter portion of the movement than the real-world UP. In

[37] IPA Opening Nar. at III-A-21.

[38] UP Reply workpaper "Traffic and Revenue Summary Reply.xlsx."

[39] *Id.*

2011, cross-over traffic accounts for 55% of IRR's coal traffic and 100% of IRR's non-coal traffic.[40]

Like IPA, UP applies the Board's modified Average Total Cost ("ATC") method to cross-over traffic, after making the corrections to IPA's rate and revenue calculations that are described below in Section III.A.3.d.

Unlike IPA, however, UP's ATC calculations of the variable costs for transportation of SARR traffic over the portions of the through movement replicated by the SARR reflect the movement of all of the traffic selected by IPA in trainload service. As IPA recognizes, "IRR's traffic group consists of coal, intermodal and general freight traffic that moves entirely in unit train or trainload service."[41] "All coal trains move as unit trains, and all non-coal trains move intact in overhead service between on-SARR and off-SARR junctions with the residual UP."[42] Nonetheless, IPA calculated on-SARR variable costs for IRR's intermodal and general freight traffic using UP's URCS costs, as though the traffic moved in carload and multi-car service.[43]

In its June 27, 2011 decision in *AEPCO*, the Board recognized that a "mismatch" occurs when a SARR is presumed to move traffic in trainload service, but the variable costs calculated for that traffic are costed using the defendant's costs as though the traffic is moved in carload and multi-car service.[44] The Board addressed this issue specifically as it related to variable cost calculations for purposes of application of its Maximum Markup Methodology ("MMM"), but if MMM is to be calculated using the defendant's variable costs, the same cost assumptions should

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[40] *Id.*

[41] IPA Opening Nar. at III-C-2.

[42] *Id.* at I-18.

[43] *Id.* at III-A-23; IPA Opening workpaper "2010 ATC Moves For Phase III Costing v6.0_080511.xlsx."

[44] *AEPCO*, slip op. at 2.

also be used in performing ATC calculations, where the parties are instructed to use "the variable and fixed costs for the carrier" to determine the amount of revenue that should be allocated to the SARR.[45] UP therefore performed its ATC-based revenue allocation in a way that recognizes IRR's handling of intermodal and general freight traffic as unit-train traffic.[46]

IPA also made several technical errors in its ATC calculations that UP corrects on reply.

First, IPA overstated the SARR's share of revenues from cross-over movements through a miscalculation. Specifically, when IPA attempted to calculate the ratio of IRR's variable and fixed costs to the total variable and fixed costs for each movement, IPA inadvertently excluded IRR's variable costs from the denominator. By understating the total costs of the through movement, IPA overstated the share of revenues that are assigned to the SARR portion. IPA correctly described the calculations it attempted to make.[47] However, IPA's workpapers show that IPA erred in performing those calculations.[48] UP performs these calculations correctly in its reply.[49]

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[45] *Major Issues in Rail Rate Cases*, STB Ex Parte No. 657 (Sub-No. 1), slip op. at 26 (STB served Oct. 30, 2006).

[46] UP Reply workpaper "2010 ATC Moves For Phase III Costing Reply.xlsx."

UP has also provided calculations supporting the application of the Board's modified ATC method in its workpapers – *i.e.*, calculations that reflect the allocation of revenues without the adjustments discussed in *AEPCO*. In addition, because a dispute over the Board's application of the ATC methodology is pending in another case, UP has also provided calculations supporting the application of the original ATC method to this case in its workpapers. UP Reply workpapers "Expanded_Waybill_Data_ATC_Percentages_080411 Reply.xlsx" and "Coal Revenue Forecast Reply.xlsx."

[47] IPA Opening Nar. at III-A-25 (discussing step iii.c.(3)).

[48] IPA Opening workpaper "Expanded_Waybill_Data_ATC_Percentages_080411.xlsx." IPA mistakenly used the value labeled "UP VC" in the denominator of its calculations, but "UP VC" accounted for only the residual UP's variable costs for each movement, and not the total variable costs.

[49] UP Reply workpaper "2010 ATC Moves For Phase III Costing Reply.xlsx."

Second, IPA also miscalculated the SARR's share of revenues from cross-over movements through a mistake in developing the URCS variable costs for intermodal traffic. Specifically, IPA incorrectly used container weights rather than car weights as the URCS costing input when calculating the variable costs for intermodal traffic. Intermodal shipments are waybilled by container or trailer, so the UP traffic records produced in discovery reflect the individual container/trailer weights. However, URCS costs are calculated at the freight car level – costs are allocated to a carload assuming a system-average number of loaded containers; the URCS costing result is not associated with an individual container/trailer. Thus, if the weight per container/trailer is not converted to account for the weight per carload, the cost per ton that is output by the URCS model will dramatically overstate the cost per container. IPA failed to perform the appropriate conversion.[50] UP performs the appropriate conversion in its reply.[51]

Third, IPA overstated the SARR's share of revenue from cross-over movements by overstating the number of miles that cross-over traffic would travel over the SARR in two situations. The first involves traffic that IRR moves on the Price-Provo segment between interchanges with UP. IPA located IRR's Provo Yard and the interchange with UP not at the Ironton cross-over, where the IRR through movements leave the Provo Subdivision to continue onto the Sharp Subdivision, but approximately four miles down the Provo Subdivision towards Price.[52] However, IPA identified that the Provo interchange with UP would occur at IRR's Provo Yard, and IPA assumed such traffic would enter and exit the SARR at the yard in the RTC

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[50] IPA Opening workpaper "2010 ATC Moves For Phase III Costing v6.0_080511.xlsx."

[51] UP converted container/trailer weights to car weights by multiplying intermodal shipment weights by UP's system-average number of TOFC/COFC units loaded per car, as shown in Schedule 755, Row 134 of UP's Annual Report R-1. UP Reply workpaper "2010 ATC Moves For Phase III Costing Reply.xlsx."

[52] IPA Opening Exh. III-B-1 at 3.

model, thus including no SARR time for operations between the Provo Yard and the Ironton crossover.[53] In its reply, UP corrects the IRR miles and costs associated with this traffic to reflect the location IPA chose for the IRR Provo Yard and the interchange with UP.[54]

The second situation involves coal traffic moving from the Savage Coal Terminal to a connection with IRR's main line near Price over the Castle Valley Industrial Lead, commonly known as the CV Spur. IPA agrees that IRR will own a portion of the CV Spur that is only 1.7 miles long.[55] However, IPA included 3.5 miles, rather than 1.7 miles, when allocating revenues to the SARR, because it included the distance the traffic moves over non-IRR-owned industry track at the Savage Coal Terminal.[56] The mileage figures for movements in the UP waybill data do not report the miles that UP operates over private track. As a result, the mileages for the through movement used in the ATC allocations reflect carrier-owned miles only. Accordingly, allowing IPA to receive "credit" for industry tracks at the origin would bias the ATC calculations in favor of IPA, when no corresponding adjustment is made to incorporate similar industry track mileages on the off-SARR portion, including at the shipment's destination. UP eliminates the bias by correcting the IRR miles for traffic moving over the CV Spur in its reply.[57]

Fourth, IPA's fixed-cost calculations for the on-SARR segments vary widely for moves with the same SARR on and off points. One of the sources of variations appears to be that IPA altered the SARR on and off points after calculating the on-SARR fixed costs; however, the sources of other variations could not be determined from IPA's workpapers. In its reply, UP

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[53] IPA Opening workpaper "IPA Open Final v7.TRAIN."

[54] UP Reply workpaper "2010 ATC Moves For Phase III Costing Reply.xlsx."

[55] IPA Opening Nar. at III-B-2 & III-B-4, Table III-B-1.

[56] UP Reply workpaper "2010 ATC Moves For Phase III Costing Reply.xlsx."

[57] *Id.*

calculates the correct fixed costs for each SARR segment. In performing these calculations UP eliminates line segments that IPA included in the SARR's fixed costs even though they extend beyond the SARR (*e.g.*, Wellington to CV Spur, and Provo to Gatex). UP also adjusts the fixed costs to account properly for the location of the IRR's Provo Yard, as discussed above. UP applies the corrected fixed cost per ton to each movement based on the SARR on and off points that IPA used to calculate revenues for each coal and non-coal move.[58]

d. Projected Revenues

IPA used different methodologies to calculate IRR revenues from 2011 through 2020 for the different categories of traffic included in the IRR traffic group. UP identifies errors in IPA's methodologies and the corrections that must be made for each category of traffic in the sections below.

i. IPA Coal Traffic

IPA assumed that the rates for IPA issue coal traffic and IPA non-issue coal traffic would not increase above the levels in Item 6200-A of UP's Common Carrier Tariff 4222 in the period from 2011 through 2020.[59] IPA also assumed that the fuel surcharge in the Item 695-series of UP's Tariff 6007-series would be applied to those rates.[60]

UP's corrections to IPA's calculation of revenues from IPA coal traffic are described below.

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[58] For non-coal, UP used IPA's "Normalized" On-SARR and Off-SARR points in IPA's primary traffic and revenue workpaper "Non-Coal IRR Traffic Forecast.xlsx."

[59] IPA Opening Nar. at III-A-27.

[60] *Id.*

(a) IPA Coal Traffic – Base Revenues

IPA assumed that base rates for IPA coal traffic would not increase above their current levels from 2011 through 2020 because UP's tariff governing transportation of IPA coal traffic contains no rate escalation provision. IPA's assumption that UP rates for IPA coal traffic will not increase over the next ten years is patently unrealistic, particularly in light of IPA's assumptions about rate increases for non-IPA coal traffic.

However, UP accepts IPA's assumption to reduce the number of disputes between the parties and because it will have no impact on UP's future ability to set rates for IPA coal traffic: If the Board finds the challenged rates to be reasonable, UP's future rates will not be subject to regulation; if the Board finds the challenged rates to be unreasonable, UP's future rates will be based on UP variable costs and a prescribed revenue-to-variable cost ratio in each year.

(b) IPA Coal Traffic – Fuel Surcharge Revenues

UP accepts IPA's assumption that UP's mileage-based surcharge that currently applies to IPA coal traffic will apply to IPA coal traffic from 2011 through 2020. However, UP does not accept IPA's calculation of fuel surcharge revenues for IPA coal traffic. UP believes that fuel surcharge revenues should be calculated based on the forecasted railroad fuel cost produced by Global Insight.

IPA blended EIA's short-term and long-term fuel price forecasts to create a "hybrid" projection of fuel prices for the period from 2013 through 2020. This approach contains a distortion that affects all of IPA's fuel surcharge calculations, and it overstates fuel surcharge revenue for IPA coal traffic, and for all traffic in the IRR traffic group.

IPA used EIA's July 2011 Short Term Energy Outlook ("STEO") to determine actual and forecasted Highway Diesel Fuel ("HDF") prices for 2011 through 2012.[61] IPA used EIA's Annual Energy Outlook 2011 ("2011 AEO") to determine forecasted HDF prices for 2013 through 2020.[62] However, IPA combined the two forecasts in a way that disregards the actual fuel prices forecasted in the 2011 AEO and thus overstates EIA's projections of fuel prices for 2013 through 2020.

EIA's short-term and long-term fuel price forecasts are based on different models and rely on different assumptions.[63] EIA uses the STEO to project fuel prices two years into the future and updates the forecast on a monthly basis. EIA's uses the AEO to project fuel prices twenty-five or more years into the future and updates the forecast on an annual basis.

For the years after 2012, EAI's only fuel price forecast is the 2011 AEO: the most recent available version of the STEO forecast, which was published in September 2011, projects fuel prices through 2012 only. However, rather than simply use the projected fuel prices in the 2011 AEO for 2013, IPA took a more complicated approach: IPA derived a fuel price by calculating the percentage change between the 2011 AEO's fuel prices in 2012 and 2013, and applying that percentage change to the July STEO's fuel price for 2012. IPA continued to apply the same

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[61] IPA states that it used the June STEO. IPA Opening Nar. at III-A-27. However, IPA's workpapers show that IPA actually used the July STEO. IPA Opening workpaper "Hybrid HDF Forecast from STEO and AEO.xls."

[62] IPA Opening Nar. at III-A-27; IPA Opening workpaper "Hybrid HDF Forecast from STEO and AEO.xls."

[63] The AEO uses the National Energy Modeling System, an energy-economy modeling system focused on the long term (here, through 2035). *See* Office of Energy Analysis, U.S. Energy Information Administration, U.S. Department of Energy, Integrating Module of the National Energy Modeling System: Model Documentation 2011 (May 2011), *available at* ftp://ftp.eia.doe.gov/modeldoc/m057(2011).pdf. The STEO uses the Short-Term Integrated Forecasting model, which is based upon hundreds of interrelated regression equations. *See* http://www.eia.doe.gov/emeu/steo/pub/document/overview.pdf.

approach through 2020 – that is, IPA used 2011 AEO forecast to determine a year-over-year percentage change, but it applies the percentage change to a fuel price originally based on the July STEO's projected price for 2012. This approach dramatically overstates EIA's projected fuel prices for 2013 through 2020, because the July STEO projected a 2012 fuel price that is much higher than the 2012 fuel price projected by the 2011 AEO.

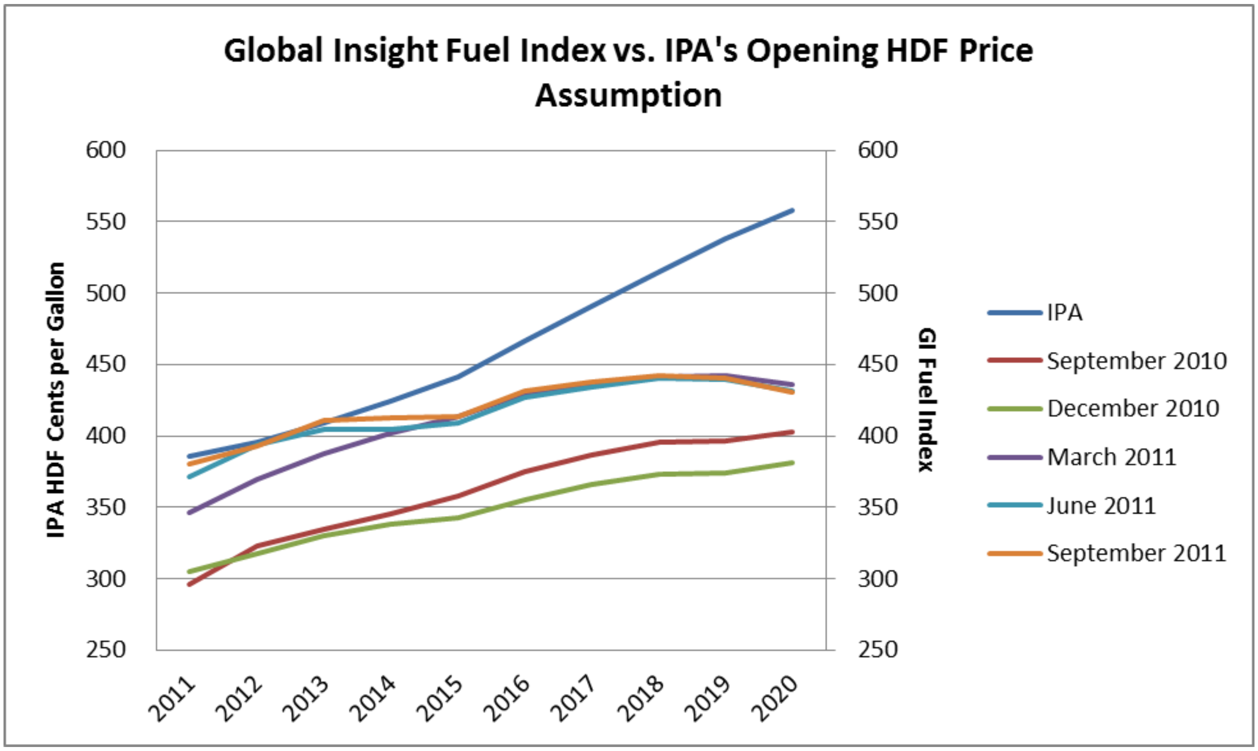
IPA's approach to combining the STEO and AEO forecasts misused the data. EIA recognizes that the appropriate fuel price forecasts after 2012 are generated by the AEO model, not by applying AEO-based growth rates to STEO-based prices that were determined in a different period.

UP understands why IPA would attempt to avoid the fuel price forecast in EIA's 2011 AEO: EIA completed the fuel price forecast in its 2011 AEO in early February 2011, before a significant spike in the price of fuel occurred in April. Fuel prices remain significantly higher than were projected in the 2011 AEO, which is why the July STEO projected a 2012 fuel price that is much higher than the 2012 fuel price projected in the 2011 AEO. That is why it benefits IPA to blend the July STEO's projected price for 2012 with the 2011 AEO's projected growth rates.

Under the circumstances in this case – that is, the existence of a significant spike in fuel prices that occurred after EIA had prepared its most recent long-term fuel price forecast, and that will likely have a continuing impact in the early years covered by that forecast – UP agrees that it would not be appropriate to use the 2011 AEO to project long-term fuel prices. However, it would also be inappropriate to blend the EIA's short-term and long-term forecasts in the way IPA has proposed.

EIA's 2011 AEO contains a relatively low forecast of 2012 fuel prices, but it combines the relatively low starting point with relatively high growth rates. This is because EIA's nearer-term projections are driven more by current prices, while its longer-term projections are driven more by longer-term trends. In other words, whatever the starting point, the out years of the forecast will remain relatively stable. As a result, if the forecast is made at a time when fuel prices are relatively low, the projected growth rate will be relatively high.

The interaction between short-term prices and long-term growth rates can be seen most clearly in fuel price forecasts that are updated more frequently than EIA's long-term forecast. The chart below illustrates the interaction using Global Insight's forecast of railroad fuel costs, which is prepared on a quarterly basis, and which addresses short-term and long-term changes using a single forecast. As the chart shows, forecasts prepared when fuel costs were relatively low contain a relatively high growth rate, forecasts prepared when fuel costs were relatively high contain a relatively low growth rate, and thus both sets of forecasts converge over the long-term.



Source: UP Reply workpaper "RCAF Fuel Forecast.xlsx."

Accordingly, UP believes that the appropriate approach in this case is to use a fuel price forecast that reflects both short-term market conditions and long-term trends. That role can be filled by the Global Insight forecast. IPA itself provides support for use of the Global Insight forecast: IPA justified its "hybrid" approach by arguing that its "forecasted change in HDF prices closely correlates with the forecasted railroad fuel costs produced by Global Insight, which IPA is utilizing to forecast operating costs."[64] Rather than creating a "hybrid" of EIA forecasts that were never meant to be combined, it makes sense to rely on the single Global Insight forecast, which, as IPA observes, both parties use for other portions of their SAC analyses. UP therefore uses Global Insight's forecast to project fuel costs for purposes of

[64] IPA Opening Nar. at III-A-27 to III-A-28.

calculating fuel surcharge revenues.[65] UP begins with the actual average HDF price used to determine UP fuel surcharge levels in 2011, and then it projects the HDF price for 2012-2020 using the Fuel index in Global Insight's most recent RCAF forecast, dated September 2011.[66]

The difference between IPA's approach and UP's approach is shown in Table III.A.9.

Table III.A.9
HDF Price Forecast
(cents per gallon – nominal)

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
IPA	386.1	395.4	408.9	424.5	441.4	466.2	490.5	514.5	538.3	557.8
Reply	372.8	385.4	402.4	404.6	405.5	423.2	428.8	433.7	431.1	422.0

Source: UP Reply workpaper "RCAF Fuel Forecast.xlsx."

Table III.A.10 summarizes UP's revised IPA coal traffic revenue projections:

Table III.A.10
IPA Coal Revenues
(millions)

Year	IPA	Reply	Difference
2011	{ }	{ }	{ }
2012	{ }	{ }	{ }
2013	{ }	{ }	{ }
2014	{ }	{ }	{ }
2015	{ }	{ }	{ }
2016	{ }	{ }	{ }
2017	{ }	{ }	{ }
2018	{ }	{ }	{ }
2019	{ }	{ }	{ }
2020	{ }	{ }	{ }

Source: UP Reply workpaper "Coal Revenue Forecast Reply.xlsx."

[65] To be clear, UP accepts IPA's use of UP's fuel surcharge formula; UP is using the Global Insight forecast to project the HDF prices that will be used in calculating fuel surcharges.

[66] UP can calculate the average HDF fuel price used to determine UP fuel surcharge levels for all of 2011 because UP does not apply a change in the average HDF fuel price to its fuel surcharge calculations until the second month following the month on which the average prices was based. In other words, UP's fuel surcharge levels for December 2011 will be based on the average HDF price in October 2011. *See* http://www.uprr.com/customers/surcharge/index_revenue.shtml.

ii. Non-IPA Coal Traffic

IPA determined revenues for non-IPA coal traffic using UP traffic data produced in discovery and the contract terms under which the traffic moves. IPA calculated base revenues – that is, revenues excluding fuel surcharges – and then adjusted the base revenues pursuant to the terms of each contract until its expiration.[67] For time periods after contracts expired, IPA took the estimated rate in the last year of the contract and projected it forward through the end of the DCF period based on EIA's Coal Transportation Rate Escalator.[68]

IPA developed fuel surcharge revenues for non-IPA coal traffic based upon the corresponding fuel surcharge formulas prescribed/set forth by the contracts.[69] For time periods after contracts expired, IPA applied UP's standard mileage-based fuel surcharge for coal trains and IPA's "hybrid" of EIA's HDF forecasts.[70]

UP's corrections to IPA's calculations of revenues from non-IPA coal traffic are described below.

(a) Non-IPA Coal Traffic – Base Revenues

UP accepts IPA's approach to calculating base revenues to non-IPA coal traffic, but it makes two types of adjustments to IPA's calculations.

First, for contracts with rate adjustment mechanisms that used the All Inclusive Index Less Fuel (error adjusted) ("AII-LF") or the RCAF-U, IPA adjusted rates using either actual AII-LF or RCAF-U values or forecasts of those values included in the March 2011 Global Insight

[67] IPA Opening Nar. at III-A-28.

[68] *Id.*

[69] *Id.* at III-A-29.

[70] *Id.* Although IPA's narrative says that IPA applied UP's standard carload rate-based fuel surcharge, IPA's workpapers show that IPA actually used UP's standard mileage-based fuel surcharge for coal trains. IPA Opening workpaper "Coal Revenue Forecast.xlsx."

Rail Cost Adjustment Factor Forecast.[71] UP uses Global Insight's more recent September 2011 forecast, which IPA also used for non-coal traffic.

Second, UP corrects IPA's computational errors in escalating rates in the final year of certain contracts, even though IPA's errors consistently favored UP.

(b) Non-IPA Coal Traffic – Fuel Surcharge Revenues

IPA overstated fuel surcharge revenues for non-IPA coal traffic by using its "hybrid" of EIA's HDF forecasts, as discussed above in Section III.A.3.d.i.(b). UP projects HDF prices based on a Global Insight forecast, as discussed in Section III.A.3.d.i.(b).

Table III.A.11 summarizes UP's revised revenue projections for non-IPA coal in the traffic group:

Table III.A.11
Non-IPA Coal Revenues
(millions)

Year	IPA	Reply	Difference
2011	{ }	{ }	{ }
2012	{ }	{ }	{ }
2013	{ }	{ }	{ }
2014	{ }	{ }	{ }
2015	{ }	{ }	{ }
2016	{ }	{ }	{ }
2017	{ }	{ }	{ }
2018	{ }	{ }	{ }
2019	{ }	{ }	{ }
2020	{ }	{ }	{ }

Source: UP Reply workpaper "Coal Revenue Forecast Reply.xlsx."

iii. Intermodal Traffic

IPA did not accurately describe its calculation of revenues from intermodal traffic. IPA said that it used the rate adjustment mechanisms from intermodal contracts that UP produced in

[71] IPA Opening Nar. at III-A-29.

discovery to escalate base rates for intermodal traffic on a year-over-year basis during the terms of existing contracts.[72] However, IPA's workpapers show that IPA actually used only 13 of the 28 intermodal contracts that UP produced in discovery.[73] Moreover, IPA used the contractual escalation terms only when adjusting the base rates of traffic governed by those contracts. For all other intermodal traffic, IPA ignored the information produced by UP and adjusted the base rates using AII-LF.[74]

IPA calculated fuel surcharge revenues for intermodal movements in much the same way that IPA calculated base revenues for intermodal movements. IPA applied the fuel surcharge terms from thirteen of the contracts produced in discovery to traffic moving under those contracts, but otherwise it applied the fuel surcharge terms of UP's Master Intermodal Transportation Agreement ("MITA") and IPA's hybrid of EIA's HDF forecasts.[75]

UP's corrections to IPA's calculations revenues from intermodal traffic are described below.

(a) Intermodal Traffic – Base Revenues

UP does not accept IPA's methodology of calculating base revenues for intermodal traffic from 2011 through 2020. First, as noted above, IPA used the contractual rate escalation

[72] IPA Opening Nar. at III-A-29 to III-A-30.

[73] IPA Opening workpaper IPA_UP NonCoal Summarized Contracts.xlsx."

[74] IPA Opening Nar. at III-A-30. IPA seems to imply that UP was somehow at fault for not producing contracts covering all intermodal traffic in discovery. However, the parties agreed that IPA would request, and UP would produce, contracts covering the 30 largest movements of non-coal traffic over the UP lines replicated by the SARR, as reflected in a list of contracts that UP had provided to IPA. UP Reply workpaper "Letter from C. Mills to M. Rosenthal, Feb. 15, 2011.pdf." In fact, UP ultimately produced more than the 30 contracts that IPA requested. Upon further review of its traffic files, UP determined that a few contracts that were not on the original list it had provided to IPA would have been among the top 30, so UP produced those contracts, in addition to the 30 contracts it had previously agreed to produce to IPA.

[75] IPA Opening Nar. at III-A-30.

provisions from only 13 of the 28 intermodal contracts produced in discovery. Second, when addressing other intermodal traffic, IPA ignored the intermodal-specific rate escalation information that UP provided and instead relied solely on AII-LF.

UP calculates base revenues for intermodal traffic using all 28 intermodal contracts produced in discovery.[76] Those contracts cover 87% of the intermodal carloads in the SARR traffic group.[77] For the traffic governed by those contracts, UP adjusts the base revenues using the contractual escalation terms. For the traffic not governed by those contracts, UP adjusts the base revenues using an average change per revenue unit for intermodal traffic governed by those contracts, weighted to reflect 2010 volumes. After a contract expires, UP adjusts the base revenues for the traffic governed by the expired contract using AII-LF, and it updates the weighted average to reflect use of AII-LF in place of the expired contract's terms.

IPA made no attempt to justify its use of AII-LF when more specific information is available about the contractual rate adjustments mechanisms that apply to the intermodal traffic moving over the UP lines replicated by the SARR. UP believes a rate adjustment mechanism based on 87% of the intermodal traffic that IPA selected for its SARR is a better proxy for the remaining 13% of traffic than AII-LF. In addition, UP's method of giving continuing weight to unexpired contracts, while accepting use of AII-LF for expired contracts in the absence of better evidence of future rates, is consistent with the Board's approach to rate projections in *Wisconsin Power & Light Co. v. Union Pacific Railroad.*[78]

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[76] UP Opening workpaper "IPA UP NonCoal Summarized Contracts Reply.xlsx." IPA appeared to have difficulty identifying the price authorities associated with a handful of contracts; however, these could be matched up by using the contract index produced in discovery or from the file names themselves.

[77] *Id.*

[78] 5 S.T.B. 955, 976 (2001).

(b) Intermodal Traffic – Fuel Surcharge Revenues

IPA's calculation of fuel surcharge revenues for intermodal traffic from 2011 through 2020 contains the same flaws as IPA's calculation of base revenues: IPA used only 13 of the 28 contracts produced in discovery, and it entirely ignored those contracts when addressing traffic not specifically governed by those contracts.[79]

UP calculates fuel surcharges for intermodal traffic using all of the intermodal contracts that it produced in discovery and the same weighted-averaging approach it applies to adjust base rates.[80] After a contract expires, UP adjusts fuel surcharge revenues for the traffic governed by the expired contract using the fuel surcharge terms of UP's MITA, and it updates the weighted average to reflect use of the MITA fuel surcharge in place of the expired contract's terms.

UP also corrects the fuel surcharge mechanism that IPA applied to the traffic of one intermodal customer, { }. { } agreement with UP, which UP produced in discovery and which is designated { }, includes a specific fuel surcharge provision that is based on { }.[81] IPA, however, inadvertently relied on fuel surcharge language in a document that was electronically generated to reflect minor changes to { } and contained an erroneous cross-reference to the fuel surcharge provision of an expired agreement, designated { }.[82]

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[79] IPA Opening workpaper "IPA_UP NonCoal Summarized Contracts.xlsx."

[80] UP Reply workpaper "IPA_UP NonCoal Summarized Contracts Reply.xlsx."

[81] UP Reply workpaper { }

[82] UP Reply workpaper "2135043V85_621610344.pdf." IPA could have recognized the error because the document upon which IPA relied describes the fuel surcharge that would be applicable { }, and, as noted in the text, UP and { } did not enter into their current agreement until { }.

Finally, UP corrects the overstatement of fuel surcharge revenues that occurred because IPA constructed a hybrid of EIA's HDF forecasts, as described in Section III.A.3.d.i.(b).[83]

Table III.A.12 summarizes UP's revised revenue projections for intermodal traffic in the traffic group:

Table III.A.12
Intermodal Revenues
(millions)

Year	IPA	Reply	Difference
2011	$15.5	$9.1	-$6.4
2012	16.4	10.4	-6.0
2013	17.0	11.4	-5.5
2014	18.4	11.9	-6.5
2015	19.3	12.2	-7.1
2016	20.2	12.8	-7.4
2017	21.1	13.3	-7.8
2018	22.1	13.8	-8.2
2019	23.1	14.3	-8.8
2020	24.0	14.8	-9.2

Source: UP Reply workpaper "Non-Coal IRR Traffic Forecast Reply xlsx."[84]

iv. Automotive, Agricultural, and Other Non-Coal Traffic

IPA did not accurately describe its calculation of revenues from automotive, agricultural, and other non-coal traffic. IPA said that it used the rate adjustment mechanisms from contracts for this traffic that UP produced in discovery to escalate base rates for this traffic on a year-over-year basis during the terms of existing contracts.[85] However, IPA's workpapers show that IPA actually used only four of the eight contracts that UP produced in discovery.[86] Moreover, IPA

[83] UP Reply workpaper "IPA_UP NonCoal Summarized Contracts Reply.xlsx."

[84] Inexplicably, IPA failed to account for its projected changes in the volumes of non-coal traffic when calculating IRR's projected revenues from 2011 through 2020. UP does not commit the same error.

[85] IPA Opening Nar. at III-A-31.

[86] IPA Opening workpaper "IPA_UP NonCoal Summarized Contracts.xlsx."

used the contractual escalation terms only for the subset of traffic that was governed by those contracts. For all other traffic, IPA ignored the information produced by UP and adjusted the base rates using AII-LF.[87]

IPA calculated fuel surcharge revenues for automotive, agricultural, and other non-coal traffic by analyzing the contracts and waybill data produced in discovery to determine whether the surcharges were rate-based or mileage-based, and then applying UP's "Standard Carload - HDF Indexed" rate-based or mileage-based fuel surcharges, as appropriate, and IPA's hybrid of EIA's HDF forecasts.[88]

UP's corrections to IPA's calculations of revenues from of revenues from automotive, agricultural, and other non-coal traffic are described below.

(a) Automotive, Agricultural, and Other Non-Coal Traffic – Base Revenues

UP does not accept IPA's methodology of calculating base revenues for automotive, agricultural, and other non-coal traffic from 2011 through 2020. As noted above, IPA used the contractual rate escalation provisions from only four of the eight contracts produced in discovery.

UP calculates base revenues for automotive, agricultural, and other non-coal traffic using the eight contracts produced in discovery in the same manner that it calculated base revenues for intermodal traffic.[89] That is, for the traffic governed by the eight contracts, UP adjusts the base revenues using the contractual escalation terms. For the traffic not governed by those contracts,

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[87] IPA Opening Nar. at III-A-31.

[88] *Id.* IPA says it calculated fuel surcharge revenues for traffic moving under contracts using the terms of the fuel surcharge mechanisms in contracts until the contracts expired. *Id.* {

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[89] UP Reply workpaper "IPA_UP NonCoal Summarized Contracts Reply.xlsx."

UP adjusts the base revenues using an average change per revenue unit for intermodal traffic governed by those contracts, weighted to reflect 2010 volumes. After a contract expires, UP adjusts the base revenues for the traffic governed by the expired contract using AII-LF, and it updates the weighted average to reflect use of AII-LF in place of the expired contract's terms.

(b) Automotive, Agricultural, and Other Non-Coal Traffic – Fuel Surcharge Revenues

UP accepts IRR's approach to developing fuel surcharge revenues for automotive, agricultural, and other non-coal traffic by dividing the traffic into separate categories for mileage-based and rate-based fuel surcharges and applying UP's standard fuel surcharges.

However, UP corrects the overstatement of fuel surcharge revenues that occurred because IPA constructed a hybrid of EIA's HDF forecasts, as described in Section III.A.3.d.i.(b).[90]

Table III.A.13 summarizes UP's revised revenue projections for automotive, agricultural, and other non-coal traffic in the traffic group:

[90] UP Reply workpaper "IPA_UP NonCoal Summarized Contracts Reply.xlsx."

Table III.A.13
Automotive, Agricultural, and
Other Non-Coal Revenues
(millions)

Year	IPA	Reply	Difference
2011	$31.2	$24.2	-$6.9
2012	32.5	25.7	-6.9
2013	33.6	27.6	-6.0
2014	34.6	28.5	-6.2
2015	36.0	29.6	-6.3
2016	37.3	31.0	-6.3
2017	38.6	32.2	-6.4
2018	39.9	33.5	-6.3
2019	41.3	34.8	-6.5
2020	42.6	35.9	-6.7

Source: UP Reply workpaper "Non-Coal IRR Traffic Forecast Reply xlsx."[91]

v. BNSF Trackage Rights Traffic

IPA determined revenues from BNSF trackage rights traffic by developing the fee per gross ton-mile ("GTM") that BNSF paid to UP for that traffic in 2010, and then projecting the fee level from 2011 through 2020 by claiming to adjust the fee pursuant to the terms of the trackage rights agreement between UP and BNSF.[92]

UP does not accept IPA's methodology, as it does not adjust the fee pursuant to the terms of the agreement. As IPA states, the trackage rights agreement provides that the fee is adjusted upwards or downwards each year based on the difference in the two preceding years in UP's system-average URCS costs for specified categories of maintenance and operating expenses. These include operating categories, such as maintenance of way and dispatching, and do not include such items as fuel. Thus, IPA should have (1) projected the change in system-average

[91] As noted above, IPA failed to account for its projected changes in the volumes of non-coal traffic when calculating IRR's projected revenues from 2011 through 2020.

[92] IPA Opening Nar. at III-A-32 to III-A-33.

URCS costs *for the specified categories of expenses*, (2) calculated the difference in those costs in the two years preceding the adjustment, and then (3) adjusted the existing fee upwards or downwards by the difference. Instead, IPA multiplied the existing fee each year by the forecast change in RCAF-U (as a proxy for changes in UP's URCS costs). Multiplying the entire fee by projected changes in URCS is very different from calculating the projected change in URCS costs for certain categories of expenses and then adding that difference to the fee.

IPA also committed an error in using RCAF-U as a proxy for changes in UP's URCS costs. The Board has recognized that RCAF-A is a better proxy for year-over-year changes in a carrier's URCS costs than RCAF-U because it, like URCS, incorporates the effects of productivity on railroad costs.[93]

UP calculates revenues for BNSF trackage rights traffic using the methodology established by the trackage rights agreement, and using RCAF-A to reflect anticipated changes in UP's URCS costs for the categories of expenses covered by the fee.[94]

Table III.A.14 summarizes UP's revised revenue projections for BNSF trackage rights traffic:

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[93] *See Western Fuels Ass'n, Inc. & Basin Elec. Power Coop. v. BNSF Ry.*, STB Docket No. 42088, slip op. at 30 (STB served Feb., 18, 2009) (explaining that "to properly forecast the defendant's variable costs" the Board "must use the RCAF-A index").

[94] UP Reply workpaper "Trackage Rights Forecast Reply.xlsx."

Table III.A.14
BNSF Trackage Rights Traffic
(millions)

Year	IPA	Reply	Difference
2011	{ }	{ }	{ }
2012	{ }	{ }	{ }
2013	{ }	{ }	{ }
2014	{ }	{ }	{ }
2015	{ }	{ }	{ }
2016	{ }	{ }	{ }
2017	{ }	{ }	{ }
2018	{ }	{ }	{ }
2019	{ }	{ }	{ }
2020	{ }	{ }	{ }

Source: UP Reply workpaper "Trackage Rights Forecast Reply xlsx."

vi. <u>Traffic Summary</u>

Table III.A.15 presents a summary of the differences in IRR total revenues assumed by IPA and IRR total revenues calculated by UP after making the corrections described above.

Table III.A.15
Comparison of IPA's IRR Revenues
and UP's IRR Revenues
(millions)

Year	IPA	Reply	Difference
2011	$131.9	$101.5	-$30.4
2012	131.6	102.0	-29.7
2013	140.8	110.7	-30.1
2014	145.7	113.4	-32.3
2015	151.1	117.2	-34.0
2016	157.3	121.6	-35.7
2017	164.7	126.7	-37.9
2018	164.8	126.8	-38.0
2019	169.3	129.5	-39.8
2020	175.0	132.8	-42.2

Source: UP Reply workpaper "Traffic and Revenue Summary Reply xlsx."

III.B: Stand-Alone Railroad System

III. B. STAND-ALONE RAILROAD SYSTEM

In analyzing the IRR system, UP relied on experts who are highly familiar with the routes at issue.

Thomas Murphy was a long-time employee of UP and the Chicago and North Western Railway Company. From 1999 to 2009, Mr. Murphy held the position of Assistant Vice President for UP's Western Region. His responsibilities in that position included the territory between Price and Provo and between Provo, Lynndyl, and Milford, which includes all the UP lines IPA has replicated for IRR. Prior to holding that position, Mr. Murphy served for approximately 18 months as the General Manager of UP's Harriman Dispatch Center.

David Wheeler, President of Rail Network Analytics, held a number of positions with UP before starting his own business. Among other positions, Mr. Wheeler served as UP's General Director, Capacity Planning and Analysis. He also led teams within UP's Finance, Network and Capital Planning, and Network Design and Integration Departments. Mr. Wheeler has extensive experience with use of the Rail Traffic Controller ("RTC") model. Mr. Murphy worked with Mr. Wheeler to identify the operating requirements for IRR so that Mr. Wheeler could perform an accurate simulation of peak-period operations for IRR using the RTC model.

In advising Mr. Wheeler about the proper track, yard, and interchange configurations, Mr. Murphy drew on his years of experience with the UP lines and facilities located on these routes. In addition, in September 2011 Mr. Murphy took a hi-rail trip over the entire IRR route, visiting key locations on the route.[1] He also drove along parts of the IRR route (on the Provo and Sharp Subdivisions) in March 2011. On these recent trips Mr. Murphy conducted interviews with current UP operating personnel. Based on information he gathered on these trips, as well as

[1] UP Reply workpaper "Murphy Trip Summary2011.pdf."

his long experience with the relevant routes and locations, Mr. Murphy advised Mr. Wheeler about the track configurations, yard facilities, and other facilities that would be needed for IRR operations.

1. Route and Mileage

The SARR posited by IPA consists of 278.67 route miles. It is located entirely within the State of Utah, extending from Price on the east to Milford on the west.[2] UP accepts IPA's figure for constructed route miles. A schematic showing the IRR network appears in UP Reply Exhibit III.A-1.

a. Mainline

UP accepts IPA's proposed mainline and the connection to the mainline of the spur to IPA's Intermountain Generation Station ("IGS") southwest of Lynndyl.[3] The spur, known as the IPP Industrial Lead, extends 8.9 miles from Lynndyl to IGS.[4]

b. Branch Lines

UP accepts IPA's proposed sole branch line for IRR, the Pleasant Valley Branch, which extends 19.63 miles from Colton to the Skyline Mine at Skyline.[5] UP also accepts IPA's proposal for IRR ownership of the Castle Valley Industrial Lead, commonly known as the CV Spur, and 0.19 miles of the IPP Industrial Lead.[6]

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[2] IPA Opening Nar. at III-B-1.

[3] *Id.* at III-B-1 to III-B-2.

[4] *Id.* at III-B-1.

[5] *Id.*

[6] *Id.*

c. Interchange Points

IPA proposes four interchanges between IRR and UP, located at Price, Provo, Lynndyl, and Milford. In addition, IPA proposes an interchange with URC at Provo.[7] IPA neglected to include an interchange with UP at Helper, the termination point for some UP traffic that IPA selected for the IRR traffic group. UP switches these trains (MROHP) for local industry in the vicinity of Helper. UP adds the interchange at Helper. UP track configuration at each interchange point is shown in UP Reply Exhibits III.B-1 and III.B-2.

IPA claims that there is no need to switch any of the traffic it selected for IRR at the interchanges or any intermediate points (except for the issue traffic and in connection with 1,500-mile car inspections of eastbound coal trains).[8] However, as described in Section III.C below, the UP trains carrying the traffic that IPA selected for IRR also carry some cars that UP currently picks up or sets out at local industry locations at various points on the IRR routes. IPA apparently assumes that the residual UP will handle switching of this traffic at the interchange points and move the cars between the interchange points and the industry locations. UP provides for construction of additional track at Price, Provo, Lynndyl, and Milford to hold the local cars. Interchange of local cars at Helper would occur on the IRR siding at that location.

As explained in Section III.D below, IPA's decision not to have IRR set out or pick up local cars that move on the trains IPA identified will also impose additional operating costs on the residual UP. IPA's decision results in extra switching at the Lynndyl, Milford, Price, and Provo interchanges because local cars will need to be removed from an IRR train at these interchanges and added to a UP train that will move them to local drop-off points along the

[7] *Id.*

[8] *Id.* at III-B-3.

SARR route. Likewise, a UP train will need to pick up these cars from points along the SARR route and bring them to an interchange so they can be added to an IRR train.

d. Route Mileage

UP agrees with IPA's route mileages for IRR. Table III.B.1 below shows route mileage for IRR line segments.

Table III.B.1
IRR Line Segments and Route Mileage

Segment	UP Subdivision	Miles
Main Lines		
Price to Helper	Green River	10.58
Helper to Provo	Provo	73.05
Provo to Lynndyl	Sharp	84.52
Lynndyl to Milford	Lynndyl	89.00
Total Mainline miles		**257.15**
Branch Line		
Pleasant Valley	Pleasant Valley	19.63
Total Branch Line miles		**19.63**
Other		
IRR portion of CV Spur		1.70
IRR portion of IPP Industrial Lead		0.19
Total Other miles		**1.89**
Total route miles		**278.67**

Source: IPA Opening Nar. at III-B-4 (Table III-B-1).

e. Track Miles and Weight of Track

UP generally agrees with IPA's track miles for IRR and accepts IPA's proposed weight of tracks. As described in more detail below and in Section III.C, Mr. Murphy's most significant track changes are the result of lengthening the sidings between Price and Provo; addition of 2.5 miles of mainline track on the Sharp Subdivision to the east of the IPA car shop; and addition of a 10,820-foot track at Price Yard. Mr. Murphy also makes further additions to set-out and lead tracks at the Provo, Lynndyl, and Milford interchanges and provides for set-out track on both sides of each Failed-Equipment Detector ("FED"). UP Exhibit III.B-1 contains UP's detailed schematic track and yard diagrams for the entire IRR system. Table III.B.2 below lists the IRR constructed track miles.

Table III.B.2
IRR Constructed Track Miles

	IPA	**Reply**	**Difference**
Mainline track—Single first main track[1/]	278.67	278.67	0.00
—Other main track[2/]	30.54	35.82	5.28
Total mainline track	309.21	314.49	5.28
Set-out and MOW equipment tracks	1.97	4.02	2.05
Yard tracks[3/]	18.59	24.10	5.51
Total track miles	**329.77**	**342.61**	**12.84**

[1/] Single track miles equal total constructed route miles, including branch lines and industrial leads (spurs)
[2/] Equals total miles for second main tracks and passing sidings
[3/] Includes all tracks in yards, such as relay tracks, leads, locomotive inspection tracks, and MOW equipment storage tracks, and tracks used to interchange trains with other railroads

Source: UP Reply workpaper "Route & Track Miles Summary UP Reply," Tab "Rail Type by Subdivision."

i. Mainlines

The principal difference between the mileage calculated by IPA and UP relates to the "mainline – other main track" category. As described in Section III.C below, this difference results in part from Mr. Murphy's decision to increase to two miles the length of all sidings on the Provo-Price segment replicated by IRR in order to accommodate the 10,000-foot trains that IPA identified for the IRR traffic group. Both IRR trains and BNSF trackage-rights trains will need longer sidings than IPA proposed when operating over the single-track IRR. This increase in siding lengths results in the following changes to siding endpoints:

Table III.B.3
Provo Subdivision – End of Siding Mileposts (Switch Points)

	IPA Endpoints	Reply Endpoints	Additional Track Miles
Siding 1	686.39 to 684.79	686.78 to 684.79	0.39
Siding 2	678.20 to 676.60	678.59 to 676.60	0.39
Siding 3	673.78 to 672.18	673.78 to 671.79	0.39
Siding 4	661.48 to 659.82	661.48 to 659.49	0.33
Siding 5	651.84 to 650.06	652.05 to 650.06	0.21
Siding 6	639.99 to 638.92	640.91 to 638.92	0.92
Siding 7	627.25 to 625.45	627.45 to 625.45	0.20
Total Additional Miles:			**2.83**

Source: UP Reply workpaper "Route & Track Miles Summary UP Reply,"
Tab "Rail Type by Subdivision."

In addition, as explained in Section III.C below, Mr. Murphy concluded that approximately 2.5 miles of additional mainline track is needed on the Sharp Subdivision between MP 747.7 and MP 750.22. This additional track, which will parallel the existing track on the east side of IPA's Springville car facility, will facilitate movement of trains to and from the Coal Wye tracks that connect the Provo and Sharp Subdivisions.

UP accepts the proposed use of 136-pound continuous welded rail ("CWR") for all constructed mainline track. In addition, UP accepts IPA's proposed use of 115-pound CWR for the Pleasant Valley Branch and the IRR-owned portions of the two industrial leads, as well as for "yard and other tracks."[9] UP also agrees with IPA's specification that track and structures be designed to accommodate a gross weight on rail ("GWR") of 286,000 pounds per car. Finally, UP accepts IPA's general parameters regarding train speeds.

[9] IPA Opening Nar. at III-B-6.

ii. Branch Lines

There are no differences between IPA's and UP's calculations of branch line mileage and their track configuration for the Pleasant Valley Branch, the CV Spur, and the IRR portion of the IPP Industrial Lead.

iii. Sidings

IPA treats sidings as part of IRR's mainline and branch line tracks.

iv. Other Tracks

IPA has provided insufficient set-out track near the locations of FEDs on IRR. IPA states that it has provided for two set-out tracks, one on each side of each FED.[10] However, it has included only one set-out track per FED in its track diagrams and construction costs.[11] As discussed in Section III.C below, because trains will be traveling in both directions on the single-track IRR, there must be set-out tracks on both sides of each FED. If they are installed on only one side, then to set out a car with a bad axle or wheel, the trains that pass the set-out track before the FED would have to stop, back up, and then set out the bad-order car. This would increase transit time for the train and would be difficult to implement on steep grades. It would also interfere with the movement of other trains that would be held while this operation was performed. UP has provided for two set-out tracks per FED, located 10,000 feet from either side of each detector.

In addition, UP adds a 10,820-foot track at IRR's Price Yard. As described in Sections III.B.2.c and III.C below, Mr. Murphy determined that this additional yard track is needed to facilitate movement through the yard and to ensure that the activities IPA designated for the yard can take place without blocking the IRR mainline.

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[10] *Id.* at III-B-13.

[11] IPA Opening Exh. III-B-1.

UP accepts IPA's proposed use of 115-pound CWR for set-out tracks and maintenance-of-way ("MOW") equipment storage tracks.

2. Yards

a. Locations and Purpose

UP accepts IPA's proposal for four yards, with Provo Yard serving as both a car inspection and interchange yard, and the yards at Price, Lynndyl, and Milford serving only as interchange facilities.[12] UP also accepts IPA's proposal for locomotive fueling, inspection, and repair at IRR's Springville locomotive facility.[13] As explained in the next section, UP moves IRR's Provo Yard approximately one mile from the location IPA proposed in its RTC model. Further, as explained in Section III.C below, each yard requires construction of additional yard tracks so that IRR can efficiently perform the functions IPA designated. UP Reply Exhibit III.B-2 reflects all of UP's modifications to IRR yards.

b. Provo Yard

IPA's evidence on the location of IRR's Provo Yard is inconsistent. In its Exhibits, IPA's proposed location for the yard is on Track No. 2, which is owned by URC.[14] Presumably this is an error. IPA is not free to appropriate the property of a non-party railroad for its SARR.[15]

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[12] IPA Opening Nar. at III-B-8 to III-B-9.

[13] *Id.* at III-B-9.

[14] IPA Opening Exh. III-B-2. In particular, IPA placed its Provo Yard on track near N. Ridge Way and E. Ridgefield Road. *Id.* at page 6. URC's Track No. 2 is near these roads; Track No. 1, owned by UP, is not. *See* UP Reply workpaper "Provo Yard Comparison.pdf."

[15] *See Public Serv. Co. of Colo. D/B/A Xcel Energy v. Burlington Northern R.R.*, 7 S.T.B. 589, 674-75 (2004) ("*PSCo/Xcel I*") (holding that complainant could not place a SARR yard on the same location as the existing yard of a non-party).

On the other hand, in IPA's RTC model, IRR's Provo Yard is located on Track No. 1, which is owned by UP. UP accepts IPA's location of the Provo Yard as reflected in its RTC model, except that UP moves the yard approximately one mile from the IPA placement, to a point parallel to the milepost location shown in IPA Opening Exhibit III-B-1. This modest relocation of the yard allows IRR to avoid curves and road crossings in the town of Springville, resulting in a more efficient operation than at IPA's proposed placement for the yard in its RTC model.[16] UP Reply Exhibit III.B-2 shows UP's placement for the IRR Provo Yard.[17]

UP accepts IPA's proposal that IRR perform repair, inspection, and fueling functions at its Provo Yard.[18] However, IPA has failed to include lead tracks necessary to perform the proposed work. Without such tracks, the process of removing bad-order cars and inserting spare or repaired cars so that mechanical personnel could work on them would block the mainline. The result would be to prevent or delay the entry of other trains that need to be refueled and inspected, or to block departure from the yard by trains that are otherwise ready to depart. IPA's provision for just a single-track mainline makes it even more important to avoid blocking the mainline. Further, without lead tracks, switching activity at either end of the yard would interfere with access to and from other yard tracks.

Mr. Murphy addresses this problem by adding a lead track at each end of the yard. Addition of these tracks will allow switching activity to take place without interfering with trains entering and exiting the fueling and inspection tracks. UP proposes that each of these lead tracks

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[16] IPA Reply workpaper "Ironton-Springville Provo Sub Constraints.pdf."

[17] Due to milepost equalizations between Track No. 1 and Track No. 2, the milepost of the Provo Yard endpoint will move from MP 691.85, as shown in IPA Opening Exhibit III-B-2, to MP 694.06; however, UP's proposed yard location remains approximately the same distance from Provo as the location IPA proposed in its exhibits.

[18] IPA Opening Nar. at III-B-9.

be 5,000 feet in length, so that cars can be set out or inserted near the rear of the train without impeding traffic on the mainline.[19]

UP accepts IPA's location of the IPA Springville car shop. As previously noted (at page III.B-6 above) and in Section III.C below, Mr. Murphy has concluded that a second mainline track is needed on the east side of the facility, between MP 747.7 to MP 750.22, in order to facilitate movement of trains to and from the Coal Wye tracks located between Sharp and Provo. This will allow trains to move on and off the wye tracks without interference from activity at the car facility. A schematic detailing the Coal Wye tracks is located at UP Reply Exhibit III.B-3.

UP accepts IPA's proposal to use two relay tracks and tracks for repairing bad-order cars and storing repaired cars. UP also accepts IPA's proposal to fuel locomotives using tanker trucks, known as direct-to-locomotive ("DTL") fueling.

c. Interchange Yards

i. Price

UP accepts IPA's location for IRR's Price Yard. However, as discussed in Section III.C below, Mr. Murphy has added a second 10,820-foot yard track to ensure that IRR can keep the mainline clear during the operations IPA has designated for the yard. IRR has constructed only a single-track mainline. It will need to keep that mainline clear to avoid impeding the BNSF trackage rights trains passing Price Yard. In the judgment of UP's experts, the additional track is needed due to the complexity of operations IPA has assumed for Price Yard, as explained below.

[19] Unlike sidings, which need to be extended to two miles, these lead tracks require only 5,000 feet, a sufficient length to allow a train to pull up past the switch and remove a car without interfering with the mainline.

Otherwise, there is a high risk that the activity at Price Yard would interfere with mainline operations.[20]

Rather than provide for a connection that would give coal trains direct access to the CV Spur whether they are moving east or west on the mainline, IPA provides for a connection that allows direct movement only for trains coming from or going to the west. As IPA recognizes, this means that there will be reverse movements of trains at Price.[21] Empty coal trains received from UP that move into the Savage Coal Terminal for loading will change direction (by reprogramming the distributed power computer) at Price Yard. In addition, loaded coal trains coming from Savage bound toward the east (towards Wellington) will need to switch ends (again, by reprogramming of the distributed power computer) at Price before moving onto residual UP lines. The additional track will provide more room for these operations and will also permit the addition or removal of locomotives for coal trains moving to or from Provo to occur off the mainline. (IPA assumes that IRR will add locomotives to westbound loaded coal trains at Price, rather than using a helper operation at Soldier Summit.)[22] The extra track will also permit crew changes between IRR and UP crews to occur off the mainline. There will be times when multiple trains will need to use the yard simultaneously, for example, when a westbound train adds locomotives and an eastbound train moves off the CV Spur into the yard and reverses direction. In addition, the extra track can serve as an interchange track, which IRR must provide to permit the residual UP to pick up local shipments without blocking the mainline (IPA did not

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[20] IRR will also need to avoid using the mainline for yard operations for efficiency reasons, as well as safety reasons. IPA has chosen to place Price Yard in dark territory, which means that crews will need to go through a cumbersome process of obtaining track warrants before entering the mainline. *See* 49 CFR 218.105(d).

[21] IPA Opening Nar. at III-C-27 n.18.

[22] *Id.* at III-B-10.

account for this function). A diagram illustrating some of the events at Price Yard appears as UP Reply Exhibit III.B-4.

ii. Lynndyl

UP accepts IPA's location of the Lynndyl Yard. As discussed in Section III.C below, although IPA states that its trains will run through, the traffic IPA has chosen for IRR to interchange with UP at Lynndyl moves on UP trains that include cars that originate or terminate at local industries between Lynndyl and Milford. Under IPA's operating plan, the residual UP would be left to switch these cars at Lynndyl. As a result, UP increases IRR's set-out track at Lynndyl from 860 feet to 5,000 feet in order to hold these cars for pick-up or set out by the residual UP. As noted above under the discussion of Provo Yard, 5,000 feet is a sufficient length to allow a train to pull up past the switch and remove a car without interfering with the mainline.

iii. Milford

UP accepts IPA's location of the Milford Yard. As with Lynndyl, the traffic IPA has chosen for IRR to interchange with UP at Milford moves on UP trains that include some cars that originate or terminate at local industries between Lynndyl and Milford. As in the case of Lynndyl, UP increases the set-out track at Milford from 860 feet to 5,000 feet in order to hold cars for pick-up or set-out by the residual UP.

d. Miles and Weight of Yard Track

UP accepts the use of 115-pound relay CWR for the IRR yards. For the reasons set forth above, IRR needs 24.10 miles of yard track to operate efficiently, or 5.51 miles more than IPA's proposal of 18.59 miles.

3. Other

a. Joint Facilities

UP accepts IPA's assumption that IRR will replicate UP's joint facility agreement with URC for the two-mile segment between IPA's Springville car facility and the connection with URC's tracks at Provo, allowing URC trains to move to and from the car shop over IRR track. UP also accepts IPA's proposal to reconfigure the Price-Provo line segment to carry only IRR traffic without accounting for URC traffic. IPA's provision for just a single mainline track on this segment (rather than the double track UP uses) reduces IRR's operating flexibility and increases the need for adequate passing sidings. This is especially true in view of the steep grades on this line, which will cause trains to operate more slowly, and the existence of BNSF trackage rights trains operating over this line.[23] Because of the importance of adequate sidings on this segment, UP extended the length of the sidings IPA provided on the Provo Subdivision to ensure that they would accommodate the longer trains that operate on this segment.

b. Signal/Communications System

UP accepts IPA's proposed signal/communications system for IRR. As described in Section III.D below, the residual UP will incur additional costs due to the need to integrate its signal system with IRR's systems.

c. Turnouts, FEDs and AEI Scanners

UP accepts IPA's proposed locations for turnouts and automatic equipment identification ("AEI") scanners. UP accepts IPA's placement of FEDs, except at one location on the Provo Subdivision, where UP's extension of a siding required relocation of an FED. As discussed above and in Section III.C below, IPA has provided insufficient set-out track for the FEDs.

[23] A topographical map of this segment is located at UP Reply Exh. III.B-5.

IPA's track charts show set-out tracks on only one side of each FED.[24] Set-out track is required on both sides of each FED location because trains will be passing the FEDs in both directions. Mr. Murphy has provided for two set-out tracks per FED location, located 10,000 feet from either side of each detector.

[24] IPA Opening Exh. III-B-1.

III.C: Stand-Alone Railroad Operating Plan

III. C. STAND-ALONE RAILROAD OPERATING PLAN

IPA designed IRR to include a limited number of lines, all within the State of Utah. IRR originates issue traffic from one mine origin (Skyline Mine). It also handles issue traffic received in interchange from URC at Provo. All of the issue traffic is delivered to a single destination power plant, IGS.

IPA has positioned IRR primarily as a bridge carrier. The great majority of the traffic IPA has selected for its SARR is handled as overhead traffic. IRR will receive this traffic from UP, move it over the UP lines that IRR replicates, and deliver it back to UP. In fact, all of the IRR non-coal traffic is assumed to be handled in such bridge service. This includes large volumes of intermodal traffic that UP handles between Southern California and Chicago, as to which IRR substitutes for UP for just 89 miles between Milford and Lynndyl.[1] The next largest group of traffic is coal that IRR originates at the Skyline Mine or one of two coal loadouts (the Savage Coal Terminal and Sharp Loadout) located on IRR and delivers to UP for termination off-SARR. Traffic that is local to IRR, *i.e.*, IRR serves both the origin and destination, represents less than 10% of total IRR traffic.

IPA provides for four interchange points on the IRR system – Price, Provo, Lynndyl, and Milford. IPA states that IRR will transport the overhead traffic "intact," without any classification or switching activities performed at interchange points.[2] However, the UP trains carrying non-coal traffic IPA has selected for IRR include cars that originate or terminate at local industries on IRR lines. IPA has not shown how these local cars will be handled and has not provided for any operations by which these customers will be served. Given its stated intent for

[1] A small portion of the intermodal traffic (the majority of the high priority Z trains) moves between Southern California and Denver.

[2] IPA Opening Nar. at III-C-3.

IRR to handle trains intact and the fact that neither its operating plan nor its model incorporates any work on these cars between SARR endpoints, IPA apparently assumes that the residual UP will be responsible for the switching and local-service functions required to handle these cars.

IPA also assumes that BNSF trains will move over the IRR line between Provo and Price, subject to the terms of the UP/BNSF trackage rights agreement under which BNSF operates over UP's line. This UP/BNSF trackage rights agreement (which applies to a much broader group of lines throughout the west) resulted from a condition the Board imposed in connection with the UP/SP merger proceeding. IPA assumes that IRR will step into UP's shoes in connection with this arrangement as it relates to movement over the Provo-Price segment.[3]

As described above in Section III.A, UP adjusted IPA's traffic data to correct various errors, to update 2011 volume levels with more current data, to apply more accurate forecasts of future volumes for the SARR traffic, and to remove certain traffic for which IRR could not provide an adequate level of service. Table III.C.1 shows the adjusted peak-year traffic volumes (cars/containers).

[3] *Id.* at III-A-7.

Table III.C.1
IRR 2020 Revenue Traffic Volume
(Cars and Intermodal Containers)

	IPA	Reply	Difference
Coal			
Local	17,817	17,817	0
Interline Forwarded	39,919	35,662	(4,257)
Interline Received	26,564	26,564	0
Overhead	15,124	12,469	(2,655)
Coal - Total	99,424	92,512	(6,912)
Intermodal - Overhead	509,268	379,371	(129,897)
General Freight - Overhead	115,933	110,084	(5,849)
Total	**724,625**	**581,966**	**(142,659)**

Source: UP Reply workpaper "Traffic and Revenue Summary Reply.xlsx."

In analyzing IPA's operating plan for IRR, UP relied on experts who are highly familiar with the routes at issue.

Thomas Murphy was a long-time employee of UP and the Chicago and North Western Railway Company. From 1999 to 2009, Mr. Murphy held the position of Assistant Vice President for UP's Western Region. His responsibilities in that position included the territory between Price and Provo and between Provo, Lynndyl and Milford, which includes all the UP lines IPA has replicated for IRR. Prior to holding that position, Mr. Murphy served for approximately 18 months as the General Manager of UP's Harriman Dispatch Center.

David Wheeler, President of Rail Network Analytics, held a number of positions with UP before starting his own business. Among other positions, Mr. Wheeler served as UP's General Director, Capacity Planning and Analysis. He also led teams within UP's Finance, Network and Capital Planning, and Network Design and Integration Departments. Mr. Wheeler has extensive experience with use of the Rail Traffic Controller ("RTC") model. Mr. Murphy worked with Mr. Wheeler to identify the operating requirements for IRR so that Mr. Wheeler could perform an accurate simulation of peak-period operations for IRR using the RTC model.

1. General Parameters

UP's experts have accepted most features of IPA's operating plan for IRR. However, UP has identified various errors in IPA's analysis that require correction. As described below in Section III.C.3.f, Mr. Wheeler has identified certain flaws in IPA's RTC model and has corrected these flaws. In addition, some of the operations IPA assumes are unworkable, or at least highly inefficient. UP has revised IPA's operating plan to correct these situations.

As described further in Section III.C.2.b below, UP's experts concluded that IPA's operating plan does not allow IRR to replicate the level of service UP provides for intermodal Z trains (the intermodal trains with the highest priority of all UP trains) that move on the Lynndyl-Milford segment. UP therefore removed this traffic from the IRR traffic group.

As described below in Section III.C.3.a, UP's experts concluded that the operations IPA assumed for certain trains interchanged to or from the residual UP on the Sharp Subdivision at Provo would be inefficient, introducing an out-of-route movement to the Provo Subdivision and IRR's Provo Yard. UP modified these operations to provide for interchange directly to or from the Sharp Subdivision, avoiding the unnecessary detour. UP also modified the movement of the BNSF trackage rights trains to avoid having them stop at IRR's Provo Yard; UP assumes these trains will run through on the IRR mainline and avoid an inefficient diversion. In addition, UP provided that certain general freight trains will terminate at Helper, rather than Price Yard (as IPA's plan assumes), consistent with the real-world termination point for these trains.

a. Traffic Flow and Interchange Points

IPA used UP traffic data for the year 2010 to select traffic for its SARR and then applied various traffic forecasts to adjust 2010 traffic volumes to 2020 levels. As explained in Section III.A above, UP made certain corrections and updates to IPA's traffic data and applied more accurate growth rates for the IRR traffic. UP accepts IPA's assumption that IRR could appropriate the benefits of a broad trackage rights agreement between UP and BNSF by carrying BNSF trains on the Provo to Price segment and receiving the trackage rights fee prescribed by this agreement.

IPA has provided that IRR will directly serve just one coal mine (Skyline Mine), two coal loadouts (Savage Coal Terminal and the Sharp Loadout), and one destination power plant (IGS). The IRR traffic includes:

(a) issue and non-issue coal traffic moving to IGS from three IRR-served sources (Skyline Mine, the Savage Coal Terminal, and the Sharp Loadout) or from the interchange with URC at Provo;

(b) non-issue coal traffic and non-coal traffic moving between Price and Provo or between Price and Milford, including coal traffic between IRR-served sources and UP interchanges at Provo and Milford;[4]

(c) non-coal overhead traffic moving between Provo and Milford or between Lynndyl and Milford; and

(d) BNSF trackage rights trains moving between Provo and Price.[5]

The trains IRR will transport during the peak week identified by IPA (February 12-18, 2020), as reflected in the revised RTC model simulation of IRR operations prepared by Mr. Wheeler, are shown in UP Reply Exhibit III.C-1. Mr. Wheeler's modifications to IPA's RTC model simulation are described in Section III.C.3.f below.

With a few minor exceptions described in Section III.C.3.a below, IPA replicated the existing UP routing of the traffic it chose. However, IPA did not replicate all of UP's facilities. In particular, IPA constructed only a single track between Price and Provo. This is a segment on

[4] The overhead coal traffic is (a) Colorado coal that UP originates and that terminates in Nevada, California, and Montana and (b) Wyoming coal that UP originates and that terminates in Nevada. IPA Opening Nar. at III-C-4 to III-C-5.

[5] *Id.* at III-C-3 to III-C-4.

which UP and BNSF trackage rights trains move on double track, including UP's own second track on some stretches and a parallel URC track on other stretches. IPA does not assume that IRR will use the URC track. Providing for operations over only a single track in this mountainous territory reduces the capacity of this 83-mile segment, increasing the importance of adequate sidings to allow meets and passes.

IPA asserts that trains moving overhead on the IRR system will be transported intact, with no classification or switching activities performed except for occasional switching of bad-order/repaired cars.[6] As noted above, however, the UP trains that handle the non-coal traffic that IPA chose for the IRR traffic group include some cars that originate or terminate at local industries located on IRR lines. These local cars are currently picked up or set out by UP merchandise trains at both the on-SARR and off-SARR locations IPA designated (*e.g.*, Milford) and at industries located along the IRR route, at Helper, Sutro, Delta, and Bloom. For both the IRR interchange points and the local industries that UP serves en route, IPA has made no provision for IRR to perform this switching on through trains. In addition, IPA identified UP trains that originate or terminate at SARR points Milford or Helper,[7] but did not provide that IRR will build trains or classify cars as UP does in the real world at those locations.

Table III.C.2 shows the locations at which UP picked up or set out local cars on the IRR routes in 2010.

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[6] IPA Opening Nar. at III-C-3.

[7] *E.g.*, IPA Opening Exh. III-C-1 and IPA Opening workpaper "IRR Base Year Trains with RTC results.xlsx," which each show numerous train symbols with "MF" or "HP," referring to trains that originate or terminate in Milford or Helper, respectively.

Table III.C.2
2010 Pick-up and Delivery Points for Cars Switched on Trains IPA Identified[1/]

	General Freight Trains with Local Cars			Number of Cars Switched		
	Pick-Ups	Set-Outs	Total	Pick-Ups	Set-Outs	Total
At On-SARR Station						
Milford	187	30	217	6,630	472	7,102
Lynndyl	117	2	119	1,077	7	1,084
Price	38	0	38	188	0	188
On-SARR Total	**342**	**32**	**374**	**7,895**	**479**	**8,374**
Along SARR Route						
Helper	15	31	46	93	313	406
Sutro	5	9	14	35	68	103
Delta	7	6	13	11	7	18
Bloom	8	3	11	9	3	12
Along-SARR Total	**35**	**49**	**84**	**148**	**391**	**539**
At Off-SARR Station						
Milford	4	203	207	24	6,848	6,872
Lynndyl	3	5	8	3	24	27
Price	0	2	2	0	2	2
Off-SARR Total	**7**	**210**	**217**	**27**	**6,874**	**6,901**

[1/] Amounts shown include only cars switched on or off through trains; they exclude cars associated with trains that UP originates or terminates at Milford or Helper. The amounts shown also exclude UP's local switching activity at Provo for the trains that IPA selected. At Provo, IPA did not replicate the UP facilities; rather, it placed IRR's Provo Yard further south on the Provo Subdivision, as explained in Section III.B above.

Source: UP Reply workpaper "UP Trains Local Stations.xlsx."

IPA apparently assumes that the residual UP will be responsible for (1) handling the pick-up and delivery of the cars switched along the route today; (2) switching cars on and off the through trains at the on-SARR and off-SARR stations; and (3) building trains and classifying cars for trains that originate or terminate at Milford and Helper. UP adds tracks at the interchange yards to accommodate the operations required to remove and store the cars that UP picks up or sets out along the route today so that IRR can operate its trains intact from the on-SARR point to the off-SARR point.

Moreover, IPA’s decision to insert IRR as a bridge carrier on UP routes and its failure to provide for local service for cars carried by the IRR trains means extra work (and additional expense) for the residual UP on local moves involving industries at locations other than the on-SARR and off-SARR points. For example, rather than setting out cars at local industry at Delta as it operates over the mainline from Milford to Lynndyl, the residual UP would have to pick up the cars from IRR at the nearest interchange point (Lynndyl), then move them to the local industry location at Delta. Instead of picking up cars at local industry at Bloom as it moves over the mainline from Milford to Lynndyl, UP will need to send a locomotive and crew from Milford to pick up the cars at Bloom and move them back to Milford, then (if the cars are to move to the east) interchange them with IRR at Milford. As discussed in Section III.D below, UP provides for certain additional expenses related to switching this local traffic that the residual UP would incur as a result of IPA’s assumption that IRR would not be responsible for this switching.

UP accepts IPA’s description of the IRR traffic flows, except in the limited respects described in Section III.C.3.a below. UP also accepts the four interchange locations that IPA identified for IRR – Price, Provo, Lynndyl, and Milford. As described below, UP adds an interchange between IRR and the residual UP at Helper, where certain UP trains carrying traffic that IPA selected for the IRR traffic group terminate in the real world. IRR interchanges traffic with UP at all of the interchange locations and with URC at Provo.

Table III.C.3 shows traffic density by line segment in 2011 for IRR.

Table III.C.3
IRR 2011 Traffic Density by Line Segment (Million Gross Tons)

Segment	IPA	Reply	Difference
Savage to Price (CV Spur)	4.58	4.16	(0.42)
Price (CV Spur) to Colton	11.89	11.26	(0.63)
Colton to Provo	15.60	14.63	(0.97)
Provo to Sharp	11.97	11.19	(0.78)
Sharp to Lynndyl	15.56	14.75	(0.81)
Lynndyl to IPP Industrial Lead	39.06	36.00	(3.06)
IPP Industrial Lead to Milford	31.32	28.26	(3.06)
Pleasant Valley Branch (Skyline to Colton)	3.71	3.37	(0.34)

Source: UP Reply workpaper "Line Density By Segment Reply.xlsx."

For the issue traffic received from URC at Provo, IPA assumes that IRR operations will mirror UP's operations. UP receives these loaded trains in interchange from URC at the Coal Wye tracks that connect the Provo Subdivision and the Sharp Subdivision. At the interchange point, URC removes its locomotives from the train, and UP attaches its own locomotives and operates the train westward on the Sharp Subdivision towards IGS. IPA assumes that IRR will replicate the Coal Wye tracks and receive the trains from URC in the same manner as UP does today.[8]

IPA states that IRR will return empty trains to IPA's car shop near Springville (on the Sharp Subdivision just south of Provo), consistent with UP's current practice. According to IPA, IRR will remove the locomotives, and, following inspection and servicing of the empty train, a URC crew will bring URC locomotives to the car shop and attach them to the empty cars. For

[8] IPA Opening Nar. at III-C-5 to III-C-6.

both the loaded and empty interchanges, the URC crew and power are assumed to operate over a portion of the IRR track between Ironton and Springville, as they do over the UP track today.[9]

UP accepts IPA's description of this set of activities. However, as described in Section III.C.2.c.v. below, UP's experts have increased IPA's assumed dwell time for the loaded trains because IPA's estimates do not account for the time required to complete all the activities that must occur during this operation.

b. <u>Track and Yard Facilities</u>

The IRR track and yard facilities are described in Section III.B.2 above. As discussed there, UP adopts most of IPA's assumptions about these facilities. On the single-track Provo-Price segment, UP lengthened the IRR sidings to accommodate the 10,000-foot trains that would operate on this route. Because IPA constructed only a single track for this segment, the sidings must be long enough to accommodate longer trains so that they do not constrain the operations of other trains on this segment. In addition, as described in Section III.B.1.e.i above, UP's experts concluded that an additional mainline track of approximately 2.5 miles would be needed on the east side of the IPA car shop and that additional yard tracks would be needed in Provo Yard and Price Yard in order to provide enough room for the activities IPA assumed at those locations. Schematics of the tracks and yard facilities are shown in UP Reply Exhibits III.B-1 and III.B-2.

UP accepts IPA's standards for track construction corresponding to various train speeds and for maximum GWR. IPA has chosen to construct the IRR mainline to a standard that permits maximum train speeds of 60 mph (conditions permitting) for trains other than loaded coal trains, which are limited to 50 mph on the mainlines.

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[9] *Id.* at III-C-6. It is unclear whether IRR would always interchange these empty trains with URC. In some cases, a trainset that had been used in service to and from Savage Coal Terminal might be sent to a different origin.

IPA has provided for centralized traffic control ("CTC") on the Lynndyl-Milford segment and a portion of the Provo Subdivision (between West Thistle and Castle Gate), but it has assumed all other portions of the IRR lines will be "dark" (*i.e.*, without CTC).[10] In dark territory, the IRR trains will be limited to a maximum speed of 49 mph.[11] As the existing UP track on the IRR routes is all CTC (permitting higher maximum speeds), IRR operations will be slower and more cumbersome than UP operations over most of the lines.

UP accepts IPA's conclusion that engineer-controlled power switches will be used for turnouts connecting the non-CTC mainline track with passing sidings and for the connections with the CV Spur and IPP Industrial Lead.[12] This will require installation of the proper remote control equipment in IRR locomotives and adequate training of engineers for the use of this equipment. UP accepts IPA's use of wood crossties, as well as its tie, other track, and subgrade specifications.

UP accepts IPA's identification of IRR yards.[13] The IRR yard at Provo is an interchange yard that is also used for inspections. There are also three small interchange yards at Price, Lynndyl, and Milford. The four yards are described at Section III.B.2 above, and the activities at the yards are described in Section III.C.2 below. (As noted in these sections, UP also includes an interchange at Helper for certain trains that terminate at that location.)

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[10] *Id.* at III-C-7.

[11] 49 C.F.R. § 236.1029.

[12] IPA Opening Nar. at III-C-7. Contrary to IPA's suggestion (*see id.*), there is no need for engineer-controlled switches for the connection with the Pleasant Valley Branch, since IPA has assumed use of CTC on the mainline in this area.

[13] *Id.* at III-C-8.

c. Trains and Equipment

i. Train Sizes

UP accepts IPA's assumptions regarding train sizes and its methodology of adding "growth" trains to reflect anticipated traffic growth.[14] UP disagrees with IPA's assertion that IPA has assigned sufficient locomotives to adequately power the traffic it has chosen for the IRR traffic group.[15] As discussed in the next section, IPA has undercounted IRR's locomotive needs.

ii. Locomotives

UP accepts IPA's choice of locomotive types.[16] IPA asserts that IRR will require a total of 16 locomotives to handle its peak-period traffic volume. According to IPA, this figure takes into account the need to equalize the locomotive power used in run-through service for interline trains and also a spare margin and peaking factor.[17] As described below, UP disagrees with IPA's determination of the number of locomotives needed to serve the traffic IPA has identified for IRR.

(a) Road Locomotives

IPA has underestimated the number of road locomotives IRR will need for the traffic IPA identifies, in several respects.

First, IPA developed locomotive hours for IRR through analysis of peak-period operations using the RTC model. As described below in Section III.C.3.f, UP's experts identified a number of errors in IPA's use of this model. For example, IPA failed to include all the trains necessary to handle empty returns of cars associated with IRR loaded movements for

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[14] *Id*. at III-C-8 to III-C-9.

[15] *Id.* at III-C-9.

[16] *Id.* at III-C-9 to III-C-11.

[17] *Id.* at III-C-9.

which it claimed the revenue. In reaching this conclusion, UP's experts analyzed the detailed car event data UP produced in discovery. They first identified the loaded cars used in the revenue movements that IPA selected for the IRR traffic group. They then traced these cars to find their subsequent movements as empties. UP's experts determined whether those moves occurred over the UP routes replicated by IRR, and in those cases identified the UP trains on which the empty cars moved over the SARR route.

A number of these trains were ones that IPA had identified to handle the IRR traffic group, but the analysis also confirmed that there were 110 trains from the 2010 UP data that IPA had not included in the IRR operating plan. These trains carried the empty returns following loaded movements for which IPA had included SARR revenues.[18] As an example, IPA included in the IRR train list 28 OISRM trains that moved in 2010 on the UP segment from Milford to Provo, trains that averaged 73 loaded cars and no empties. However, IPA included *none* of the ORMIS trains that returned in the opposite direction (Provo to Milford), which averaged no loaded cars and 73 empties. The analysis conducted by UP's experts identified 24 ORMIS trains (not identified by IPA) comprised of the subsequent empty return for loaded cars on the 28 IRR trains that IPA identified.

In excluding these 110 trains carrying empty returns from its IRR operating plan, IPA omitted any costs for locomotives, fuel, train crews, and railcars for these trains. Because the URCS variable costs used for the ATC revenue allocation include the cost of an empty return for the SARR portion of the movement, it was improper for IPA not to provide for that empty return

[18] UP Reply workpaper "Analysis of Empty Trains for IRR Traffic.xlsx."

and take account of the associated costs. UP included these costs in the calculation of IRR operating expenses.[19]

Table III.C.4 shows the imbalance between loads and empties on the trains IPA identified to carry the traffic it selected for IRR.

Table III.C.4
Imbalance Between IRR Revenue Loads and Empty Returns

Train Type	Trains	Loads	Empties	Trains	Loads	Empties	Empty Return Ratio
	Lynndyl-Milford			Milford-Lynndyl			
Grain (G)	59	5,743	12	6	1	443	8%
Special (S)	24	1,304	2	7	347	61	5%
Unit (U)	50	3,917	152	4	6	322	8%
	Milford-Provo			Provo-Milford			
Ore (O)	28	2,037	0	0	0	0	0%

Source: UP Reply workpaper "irr gen freight train imbalance.xls."

Second, UP identified various errors in the inputs IPA used for its RTC model. For example, as discussed in Section III.C.2.c below, IPA understated loading and unloading times and some dwell times. When these and other errors are corrected, the simulation shows that IRR operations would require a greater number of locomotive hours than IPA assumes. As a result, IRR needs a higher number of locomotives than IPA allocated.

Third, IPA incorporated a spare margin of {   } percent and a peaking factor of 1.185 (actually 18.5%) for locomotives.[20] IPA purports to have derived the spare margin figure from a UP spreadsheet produced in discovery. However, IPA misinterpreted this spreadsheet. As explained in Section III.D.1.a below, UP developed a corrected spare margin based on UP

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[19] Only one of the 110 trains IPA omitted (GSKISO) moved during the peak period. Thus, Mr. Wheeler added only this one train when he ran UP's RTC simulation.

[20] IPA Opening Nar. at III-C-11 to III-C-12.

locomotive data weighted for the types of traffic IPA selected. The corrected spare margin is { }%.[21]

In addition, UP's experts conducted a special study of dwell times for locomotives in Provo. IPA assumed that locomotive units would run through at the interchanges with the residual UP.[22] Thus, only certain IRR trains – a subset of the coal trains (those carrying coal for IGS and those that need additional power when traversing Soldier Summit) – would have IRR units added or removed. In light of the infrequency of trains for which IRR power would be changed out, there will be waiting time for these units. UP's experts analyzed the RTC results for the peak period, when the highest train volumes would provide the most opportunities for units removed from trains to be added to others, resulting in higher utilization. This analysis determined that the locomotives arriving at Provo with an empty train frequently would have to wait to be redeployed to another train that needed power.[23] In addition, locomotives added at Price (to provide extra power for westbound coal trains traversing Soldier Summit) and removed at Provo would have longer waiting times, as units removed from trains frequently would have to wait for an eastbound train that could ferry them back to Price. Based on this study, UP determined that a 17% spare margin more accurately accounted for the fact that IRR units would

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[21] UP Reply workpaper "UP IRR Loco Utilization 2010 Reply.xlsx."

[22] IPA Opening Nar. at III-C-9.

[23] For example, IPA assumed that IRR would return IPA's empty coal trains, as well as those for other utility customers, to the IPA car shop at Springville, where the locomotives would drop the empty cars. *Id.* at III-C-26 to III-C-27. In some cases URC would pick up the empty train, and there would not immediately be another train needing the units that delivered the empty train.

be powering trains a lower percentage of the time.[24] UP applied this factor to the subset of IRR coal trains included in the study.[25]

For the peaking factor, IPA applied the Board's statement of a formula in the *Xcel II* case, dividing the average number of train starts per day for the SARR in the peak week by the average number of train starts in the peak year.[26] When the lower traffic levels UP developed are used, this formula yields a peaking factor of 16%.[27]

UP has adjusted IRR road locomotive requirements by taking into account the missing empty returns, using the correct spare margin and peaking factor, and reflecting the corrected traffic levels UP developed. UP concludes that IRR would need a total of 18 road locomotives in 2011.

(b) <u>Switch/Work Train Locomotives</u>

The only switching activity IPA provides for on IRR (other than for the issue traffic) involves trains inspected at Provo Yard, *i.e.*, switching of bad-order and spare cars. Because a maximum of one train per day requires inspection, IPA asserts that one switch locomotive will be enough; it proposes that a road locomotive be used for switching at times when the switch locomotive is unavailable.[28] UP's experts believe IRR will need a second switch locomotive in case the first one fails. IRR could not afford to be without switching capability, and a high horsepower road locomotive would not be equipped with the remote control equipment that IPA

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[24] UP Reply workpaper "Unutilized Provo Locomotive Hours.xlsx."

[25] UP Reply workpaper "IRR Base Year Trains with RTC results Reply.xlsx."

[26] *See Public Serv. Co. of Colo. D/B/A Xcel Energy v. Burlington Northern R.R.*, STB Docket No. 42057, slip op. at 13 (STB served Jan. 19, 2005).

[27] UP Reply workpaper "IRR Peaking Factor Reply.xlsx."

[28] IPA Opening Nar. at III-C-12 to III-C-13.

assumes for the switch operation at Provo Yard. UP has therefore provided for a spare switch locomotive at Provo Yard.

IPA concludes that a single, one-person, 24/7 switch crew assignment at Provo will be sufficient to perform the switching function. It assumes that the crew person will not have to dismount from the locomotive in order to throw switches, since switching will be done from the ground through remote control.[29] If remote control technology is assumed, IRR costs must include the expense associated with power switches, other remote control technology, and associated training. UP accepts a one-person crew for Provo Yard so long as it is assumed that IRR provides for remote control technology and training.[30]

(c) Helper Locomotives

IPA asserts that IRR will not need manned helper locomotives, even on the 2.84% ruling grade toward the east of Soldier Summit.[31] Instead, IPA provides that IRR will add road locomotives to westbound loaded coal trains at Price and then remove those extra locomotives when the trains reach Provo. UP accepts this proposal and therefore does not include any manned helper locomotives. However, IPA failed to provide for sufficient repositioning of road locomotives from Provo to Price, so that the necessary power would be available to assist loaded coal trains over Soldier Summit on an ongoing basis. UP has corrected for this omission by

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[29] *Id.* at III-C-13. While IPA states that there will be remote control switching, it includes a confusing reference to "internal hand switches." *Id.* UP assumes remote control will be used for all switching activity at Provo Yard.

[30] UP Reply workpaper "Remote Control Costs.xlsx." UP does not accept the twelve-hour shifts IPA assumes for the switch crew position. For safety reasons, UP believes it is inappropriate to have a single yard employee working alone on dangerous switching activities for twelve hours straight. UP provides instead for eight-hour shifts for this job.

[31] IPA Opening Nar. at III-C-10 to III-C-11.

having the same number of locomotives removed from loaded trains at Provo return on empty trains operating from Provo to Price.

Table III.C.5 shows the 2011 locomotive requirements for IRR.

Table III.C.5
IRR 2011 Locomotive Requirements

	IPA	Reply	Difference
ES44 Units	15	18	3
SW1500 Units	1	2	1
Total	16	20	4

Source: UP Reply workpaper "IRR Operating Statistics Reply.xlsx."

iii. Railcars

UP accepts IPA's summary of ownership of railcars and intermodal units for each traffic type.[32] IPA assumes that the majority of IRR traffic will move in shipper-provided equipment. UP adjusts IRR's railcar requirements to reflect the lower traffic levels UP projects, exclusion of the intermodal Z trains from the traffic base due to IRR's inadequate level of service, and the longer transit times resulting from UP's corrections to IPA's RTC model. UP accepts IPA's conclusion that IRR car requirements should be increased by a five percent spare margin, based on Board precedent.[33] UP applies the revised peaking factor (16%) it computed based on its lower traffic figures. *See* Section III.C.1.c.ii.(a) above.

Section III.D.2 below and UP's workpapers detail UP's development of car ownership costs for system, foreign, and private cars.[34]

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[32] *Id*.

[33] *Id.* at III-C-14.

[34] UP Reply workpaper "IRR Car Costs Reply.xlsx."

2. Cycle Times and Capacity

IPA properly recognizes[35] that the operating plan for a SARR must enable it "to meet the transportation needs of the traffic [it] proposes to serve,"[36] "must be capable of providing, at a minimum, the level of service to which the shippers in the traffic group are accustomed,"[37] and "must be realistic, i.e., consistent with the underlying realities of real-world railroading."[38] In several significant respects, however, IPA's operating plan for IRR fails to satisfy these criteria. UP has corrected various errors in IPA's analysis, and Mr. Wheeler has incorporated the resulting adjustments into UP's RTC model, producing revised figures for cycle times and other operational data. Mr. Wheeler's adjustments are described in Section III.C.3.f below.

a. Procedure Used to Determine Configuration and Capacity

In developing IRR's capacity, IPA started with 2010 traffic data for its chosen traffic group and determined the "growth" trains, *i.e.*, the increased number of trains that would be required to handle the 2020 volumes IPA projected for the IRR traffic group. As explained in Section III.A above, UP revised IPA's traffic levels to reflect actual non-coal volumes in the first three quarters of 2011, to correct certain errors, and to use more appropriate traffic growth forecasts.

As described above, UP's operating witnesses are former UP employees who are highly knowledgeable about the IRR routes. In advising Mr. Wheeler about the proper track, yard, and interchange configurations, Mr. Murphy drew on his years of experience with the UP lines and

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[35] IPA Opening Nar. at III-C-14 to III-C-15.

[36] *Western Fuels Ass'n, Inc. & Basin Elec. Power Coop. v. BNSF Ry.*, STB Docket No. 42088, slip op. at 15 (STB served Sept. 10, 2007) ("*WFA I*").

[37] *Public Serv. Co. of Colo. D/B/A Xcel Energy v. Burlington Northern R.R.*, 7 S.T.B. 589, 598 (2004).

[38] *WFA I*, slip op. at 15.

facilities located on these routes. In addition, in September 2011 Mr. Murphy took a hi-rail trip over the entire IRR route, visiting key locations on the route.[39] He also drove along parts of the IRR route (on the Provo and Sharp Subdivisions) in March 2011. On these recent trips Mr. Murphy conducted interviews with current UP operating personnel. Based on information he gathered on these trips, as well as his long experience with the relevant routes and locations, Mr. Murphy advised Mr. Wheeler about the track configurations, yard facilities, and other facilities that would be needed for IRR operations.

Mr. Wheeler started with the routes and trains IPA chose for IRR and reviewed IPA's RTC model. He used data from UP track charts and timetables, as well as information and recommendations from Mr. Murphy, as input for his RTC model simulations. Mr. Wheeler corrected IPA's model assumptions in various respects, as described in Section III.C.3.f below. He populated the RTC model with UP's revised numbers for IRR trains during the simulation period, including the peak volume week identified by IPA (February 12-18, 2020). After confirming through the RTC model simulations that IRR would not provide the necessary level of service for the high priority, service-sensitive intermodal Z trains, Mr. Wheeler adjusted his simulations to omit those trains.

b. <u>Development of Peak Period Trains</u>

UP accepts IPA's choice of a seven-day peak period (February 12-18, 2020) and a ten-day period for RTC model simulation (February 10-19, 2020). UP also accepted IPA's development of 269 trains for the simulation period as a starting point for the analysis. UP then adjusted this train count downward based on the differences between its calculation of 2020 traffic volumes and that of IPA. These differences reflected UP's use of actual non-coal traffic

[39] UP Reply workpaper "Murphy Trip Summary 2011.pdf."

volumes for the first three quarters of 2011 and correction of errors in IPA's volume calculations. In addition, while UP accepts IPA's general approach of adding "growth" trains to reflect traffic growth over time, UP used forecasts of traffic growth that are more precisely tailored to the commodities carried by the IRR trains. *See* Section III.A above. The use of actual non-coal traffic volumes for the first three-quarters of 2011, the correction of errors, and the use of more accurate growth rates resulted in a lower number of peak-period trains for IRR.

In addition, as noted above, UP's experts concluded that IPA's operating plan does not allow IRR to replicate the level of service UP provides for the highest priority, service-sensitive intermodal trains (the Z trains) that move on the Milford-Lynndyl segment, as part of a movement to or from Southern California. IPA chose to insert IRR as a bridge carrier for a small part of this movement. IPA asserted that IRR meets or exceeds UP's service for all IRR traffic flows (including traffic on the Milford-Lynndyl segment),[40] but this assertion rests on a flawed analysis.

First, IPA cited IRR segment transit times shown in its RTC model, but it used times for trains moving in an "unopposed" operation. In other words, the times IPA used to compare to actual UP transit times assumed that each train in IPA's RTC model operated from its origin to its destination as the only train on the network.[41] These unopposed times do not provide a meaningful comparison. (Like IPA's failure to provide for trains to carry all the empty returns required for the IRR traffic (*see* page III-C-13 above), its use of unopposed times disregards real-world operations.) A train ordinarily encounters other trains along its path, causing the train to hold in a terminal until an opposing train operates on a single track toward the terminal or to

[40] IPA Opening Nar. at III-C-34.

[41] In its workpapers IPA referred to this unopposed operation in the RTC model as producing an "ideal" run time. IPA Opening workpaper "IPA Open Final v7.REPORT."

move into a siding to allow another train to proceed. There are many obstacles that increase transit times in the real world and in the RTC model. This is particularly true for IPA's single-track IRR network, on which a train might need to stop and wait for another train to meet or pass. The purpose of the RTC simulation is to test whether the SARR operating plan would provide at least the level of service provided by the real-world incumbent. In order to perform this comparison properly, the simulation must include all train operations.

Second, besides using the wrong kind of transit time data, IPA developed average transit times for *all* trains on each segment and cited these average segment times to support its claim that IRR service would be adequate to meet customer commitments.[42] IPA ignored the fact that real-world railroads commit to a range of transit times based on customer needs (or expectations) and different operating characteristics. For example, intermodal traffic must often meet demanding customer schedules. On the other hand, coal trains take longer to accelerate and have lower maximum speeds than intermodal trains, and coal customers generally have lower transit time expectations. As shown in Table III.C.6, a different picture emerges when average opposed transit times for particular categories of trains are compared to actual UP transit times.

[42] IPA Opening Nar. at III-C-34; IPA Opening workpaper "Comparison of Real World Transit Times to RTC Transit Times.xlsx."

Table III.C.6
Comparison of Transit Times Between Milford and Lynndyl[/1]

		IPA Opening RTC	
	Average UP Actual Transit Times[/2]	**Average Unopposed Times[/3]**	**Average Opposed Times[/3]**
Milford - Lynndyl			
Z-Premium Intermodal	1.66	**1.91**	**2.04**
K-Priority Intermodal	2.01	1.98	**2.49**
I-Standard Intermodal	2.11	1.95	2.00
G-Grain	2.50	1.94	**2.80**
M-Manifest	2.78	1.98	2.78
Lynndyl - Milford			
K-Priority Intermodal	2.14	1.93	**2.16**
I-Standard Intermodal	2.33	1.72	1.95
S-Special	2.36	1.50	1.63
G-Grain	2.90	2.09	2.24
M-Manifest	3.14	2.10	2.56

[/1] Times are shown in decimal hours and do not include any dwell time at Milford or Lynndyl.
[/2] Sources: IPA Opening workpaper "Comparison of Real World Transit Times to RTC Transit Times.xls"; IPA Opening workpaper "2010_Train Event Data_avg transit times for 7 Utah Cities as OD Pairs_ns.xls."
[/3] Sources: IPA Opening workpaper "IPA Open Final v7.REPORT"; UP Reply workpaper "IPA Opening RTC Transit Time Calculations.xls."

This comparison shows that on average, and without consideration of interchange times, IRR would take 2.04 hours to transport a Z train from Milford to Lynndyl, compared with an average of 1.66 hours for UP. It is not surprising that IRR would not meet UP's performance. IPA chose to construct the IRR track on the Lynndyl-Milford segment to a standard that permits a maximum train speed of 60 miles per hour ("mph") rather than the 70 mph maximum to which UP constructed and operates its track infrastructure on that segment.[43] This slower maximum speed alone will increase the transit times for the service-sensitive intermodal trains on this segment.

[43] IPA Opening Nar. at III-C-6 to III-C-7.

Moreover, Z trains traveling on IRR would take even longer than the times shown on Table III.C.6. Insertion of IRR as a bridge carrier on the route introduces new interchange operations. While UP trains change crews at Milford, the Z trains do not stop at Lynndyl today, but operate directly from Milford to Salt Lake City. Insertion of IRR between Milford and Lynndyl would add another 30 minutes for the Lynndyl interchange (the IRR-residual UP movement) that does not currently occur. Thus, the appropriate comparison is between 1.66 hours for UP currently and 2.54 hours for the IRR movement with the interchange to the residual UP. In other words, the average time to handle the Z trains on this segment will be *more than 50% greater* than UP's average actual time. This increase in transit time is too great for the service-sensitive Z trains.

UP attempted multiple modifications to the operations on the Milford-Lynndyl segment to determine whether IRR could meet the level of service UP provides − lengthening the sidings, increasing the yard track capacities, and undoing IPA's "shut-off" of some locomotives received from UP. Despite these efforts, UP's experts were unable to identify operational changes that would allow IRR to make up the difference in transit times.[44] UP therefore removed the Z trains from IRR's peak-period trains.

The number of peak-period trains for IRR is shown in Table III.C.7.

[44] UP Reply workpaper "Alternative Scenarios.zip."

Table III.C.7
2020 Peak-Period Trains in RTC Model

Train Type	IPA	Reply	Difference
COAL TRAINS			
Loaded Coal ("C")	31	27	-4
Empty Coal ("C")	32	27	-5
GENERAL FREIGHT TRAINS			
Manifest ("M")	65	63	-2
Grain ("G")	4	5	1
Special ("S")	1	1	0
INTERMODAL TRAINS			
Intermodal ("I")	31	26	-5
Priority Intermodal ("K")	60	51	-9
Premium Intermodal ("Z")	18	0	-18
BNSF TRACKAGE RIGHTS TRAINS			
Foreign ("Q")	27	26	-1
TOTAL	**269**	**226**	**-43**

Source: UP Reply workpaper "IRR peak traffic adjustments - with RTC train selection.xls."

The peak-period trains are listed in UP Reply Exhibit III.C-1.

c. Operating Inputs to the RTC Model

The elements discussed in this section are inputs to the RTC model. UP accepts many of IPA's inputs for IRR. In some cases, however, UP's experts concluded that it was necessary to adjust the inputs, for reasons discussed below. These adjustments in turn affected the results of the simulation of IRR's peak-period operations and the resulting transit times for IRR trains.

i. Road Locomotive Consists

UP accepts IPA's assumptions about the locomotive consists used for particular types of trains. As discussed in Section III.D.1.a below, IRR is responsible for supplying locomotives in two separate situations. For the majority of the IRR traffic, including all non-coal trains and coal trains interchanged with UP, IRR is providing power to a run-through "pool." For trains for which IRR is solely responsible for providing the necessary power (*i.e.*, for the issue traffic, which is entirely local to IRR), there would be a separate pool of locomotives. This pool would include IRR units that are added to westbound loaded coal trains at Price in order to help these trains operate over Soldier Summit.

UP accepts IPA's proposal to use extra road locomotives, rather than a helper operation, on the Provo Subdivision, to ensure that westbound loaded coal trains are able to traverse the grade to Soldier Summit. However, IPA's operating plan does not ensure that all road locomotives that are removed at Provo are returned to Price so they will be available to continue this operation on an ongoing basis. UP has modified IPA's operating plan to return these locomotives to Price, by having the same number of locomotives removed from loaded trains at Provo return on empty trains operating from Provo to Price.

As described in Section III.C.1.c.ii.(a) above, IPA has underestimated IRR road locomotive requirements for its traffic group in certain respects. On the other hand, as a result of UP's adjustment to IPA's traffic growth rates, correction of errors, and removal of the Z trains, UP's traffic group for IRR is smaller. Considering all of these factors, UP's experts have determined that IRR would require 18 road locomotives in 2011, rather than the 15 for which IPA provides.[45]

IPA states that in the case of overhead service, where one or more locomotives on a train received by IRR are not needed to move the train over IRR, these locomotives are assumed to be shut down so they are not contributing power for the movement of the train while it is on the IRR

[45] The power assignments UP developed appear at UP Reply workpaper "IRR Base Year Trains with RTC results Reply.xlsx."

system.[46] UP accepts this assumed shut-down of power, which would result in some fuel saving for IRR. However, shutting down locomotives will not reduce the IRR locomotive requirements, since IRR would still have a locomotive equalization obligation for any foreign locomotive on its system, whether or not the locomotive is powered up.[47]

ii. Train Size and Weight

UP accepts IPA's assumptions regarding train size and weight, except that UP excludes the Z trains entirely due to IRR's failure to provide satisfactory transit times.

iii. Maximum Train Speeds

UP accepts IPA's decisions regarding maximum train speeds.

iv. Unloading Times at IGS

IPA provides that IRR will deliver traffic to only one power plant, IGS, and it allots train dwell time of three hours for that delivery. According to IPA, plant personnel at IGS advised that the unloading process normally takes 1.5 hours and that, even when frozen coal is delivered, unloading a train takes three hours or less.[48]

UP's records of actual time spent unloading trains at IGS show that the average actual unloading time in 2010 was five hours.[49] Board precedent supports the use of actual loading and

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[46] IPA Opening Nar. at III-C-21.

[47] Under standard locomotive equalization agreements, a railroad owes horsepower hours to the owner of a locomotive for the entire time the locomotive is on the railroad's property, regardless of whether that locomotive is idle or shut down. *See, e.g.*, UP Reply workpaper "equalization agreement.pdf." Of course, so long as a locomotive is in a foreign carrier's possession, it remains unavailable to the owning railroad.

[48] IPA Opening Nar. at III-C-23.

[49] *See* UP Reply workpaper "Unload time - Lynndyl.xlsx." These records were produced to IPA in discovery at UP-IPA-00037652 through UP-IPA-00037663.

unloading times in rate cases.[50] UP has substituted the average real-world unloading time for IPA's estimate of three hours.

v. Loading Times at Mines and Other Origins

IPA proposes that IRR will serve only one coal mine (Skyline Mine) and two coal loadouts (Savage Coal Terminal and the Sharp Loadout). IPA allocated three hours of train dwell time at these facilities, asserting (without citation) that this is consistent with actual experience at these facilities. IPA also cites a provision for maximum loading time of three hours for these origins under UP Circular 66[0]2-C, Item 340-D.[51] However, Board precedent has rejected use of tariff free-time provisions in favor of actual loading times.[52]

UP's experts have analyzed real-world UP data to determine actual train loading times at each mine origin and loadout IPA selected for IRR to serve.[53] Based on that analysis, they conclude that the loading process took approximately twice the time IPA allotted at each location. Mr. Wheeler substituted the average actual loading time for each of the origins.

Table III.C.8 shows the actual loading and unloading times for the origins and destinations served by IRR.

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[50] *See WFA I*, slip op. at 17; *Tex. Mun. Power Agency v. Burlington. & Santa Fe Ry.*, 6 S.T.B. 573, 656 (2003) ("*TMPA*").

[51] IPA Opening Nar. at III-C-23 to III-C-24.

[52] *See TMPA*, 6 S.T.B. at 656; *Bituminous Coal – Hiawatha, UT, to Moapa, NV*, 10 I.C.C.2d 259, 289-90 (1994).

[53] UP Reply workpaper Train Load Time Summary.xlsx." The UP data were produced to IPA in discovery at UP-IPA-000006051, file "IPA_Trn_Data_2010.txt."

Table III.C.8
Loading and Unloading Times for IRR Origins and Destinations (hours)

	IPA	Reply	Difference
Unloading			
IGS	3.0	5.0	2.0
Loading			
Savage	3.0	5.8	2.8
Sharp	3.0	6.0	3.0
Skyline	3.0	6.1	3.1

Source: UP Reply workpapers "Train Load Time Summary.xlsx" & "Unload Time - Lynndyl.xlsx."

vi. Dwell Times at Yards

IPA assigns various train dwell times for IRR yards, depending on the activities it proposes for those yards. It is significant that IPA has chosen not to equip some portions of IRR with CTC, including those in the vicinity of Provo Yard and Price Yard. As a result, movements at those yards will be subject to the requirement that the train crew obtain track warrant authority from the IRR dispatcher before moving onto mainline track. The process of obtaining a track warrant can be cumbersome, requiring multiple radio communications between the crew and the dispatcher before the crew will be authorized to move onto the mainline.[54] Following this procedure is essential for safety in dark territory, but it will add substantial time to any yard activity that involves movements onto mainline track.

IPA assigns 30 minutes of dwell time for interchanges at yards where no other activity is performed. It asserts that only interchange activity occurs at Price, Lynndyl, and Milford and therefore assigns 30 minutes of dwell time at each of these locations. UP accepts 30 minutes of dwell time for these three locations. However, to achieve this time at Price Yard, Mr. Murphy concludes that an additional yard track would be needed, given the complex nature of activities

[54] UP Reply workpaper "track warrant procedures.pdf."

IPA assumes for that yard. IPA has chosen to provide only a single track for the mainline between Price and Provo, rather than the two mainline tracks that are available for UP and the BNSF trackage rights trains today. Thus, it is important to avoid blocking the mainline with yard activities. Since BNSF trackage rights trains will run through at Price, it is especially important for IRR crews to avoid blocking the mainline.[55] IPA acknowledges that empty coal trains IRR receives from UP at Price that move to the Savage Coal Terminal for loading will reverse directions at Price Yard.[56] In addition, IPA assumes that extra locomotives will be added to westbound loaded coal trains at Price.[57] Some trains will be interchanged with UP at Price, requiring a location to park these trains if the UP crew is late arriving from their base at Helper. Addition of a second yard track will ensure that activities at Price can be performed efficiently and without the need to move onto the mainline.[58]

IPA asserts that 30 minutes of dwell time can be assumed for simple interchanges because interchange of run-through trains involves only a change of crews, a brake set/release, and a roll-by inspection.[59] This reflects IPA's choice to have IRR act solely as a bridge carrier. In fact, UP train records show that some of the trains carrying the traffic IPA has selected for

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[55] Because IPA has not provided for CTC in this area, IRR crews would need to go through the time-consuming process of obtaining a track warrant to move onto the mainline. *See* page III.C-29 above.

Again, as in the case of its omission of trains needed to handle all empty returns required for the IRR traffic, IPA has failed to appreciate real-world operating concerns when it builds limited yard capacity without regard to the risk that yard operations will interfere with mainline operations.

[56] IPA Opening Nar. at III-C-27 n.18.

[57] *Id.* at III-C-20 to III-C-21.

[58] UP Reply Exh. III.B-4 illustrates activities that would occur at Price Yard under IPA's assumptions.

[59] IPA Opening Nar. at III-C-27.

IRR set out or pick up cars for local industry at various locations on IRR lines. IPA has not provided any additional time for this activity, apparently on the assumption that the residual UP would handle switching functions for these local cars. The residual UP would incur additional costs in performing the local switching for these cars, as discussed below at Section III.D.10.

IPA provides longer dwell times for certain categories of trains at Provo. Eastbound empty coal trains received in interchange from UP at Provo and destined for loading on IRR or URC are assumed to receive a 1,500-mile inspection at Provo Yard.[60] IPA states that locomotives on these trains will be removed and moved to IRR's Springville locomotive facility for fueling, servicing, and 92-day inspections "when needed."[61] These or other locomotives are returned to the train when the inspection process has been completed. IPA allots three hours of dwell time for the 1,500-mile inspection and locomotive removal/addition for these trains.[62] UP accepts three hours of dwell time for these activities, although more time would almost certainly be needed in those instances when locomotives are removed and replaced.

IPA states that other trains moving through Provo Yard, including loaded Utah coal trains, coal trains moving to or from Colorado origins, and all non-coal trains, do not require inspection or fueling while on IRR.[63] It allots 30 minutes of dwell time for interchange for all westbound coal trains and all non-coal trains interchanged between IRR and UP at Provo Yard.[64] UP accepts 30 minutes of dwell time for these trains.

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[60] *Id.* at III-C-24.

[61] *Id*.

[62] *Id*. at III-C-25.

[63] *Id*. at III-C-24.

[64] *Id*. at III-C-25.

IPA assumes that coal and other trains moving between the Provo Subdivision and Lynndyl or beyond (including the IPA trains) will use the Coal Wye tracks connecting the Provo and Sharp Subdivisions, rather than move into and out of Provo Yard.[65] Locomotives on trains interchanged between UP and URC are not run-through, and IPA assumes the same will be true for IRR and URC. IPA assumes that, for loaded coal trains originating on URC, the inbound URC crew will remove the URC locomotives on the Coal Wye and take them to URC's Provo Yard. The IRR crew will then bring three locomotives from the IRR Springville locomotive facility and place them on the train in a 2x1 distributed power ("DP") configuration.[66] IPA allots 45 minutes for the locomotive transfer, activation of the DP unit, and performance of an air test.[67]

UP concludes that 45 minutes is clearly insufficient for the activities that IPA assumes for this interchange with URC. Due to the track curvature, locomotives must move slowly in this area; in addition, because this is dark territory, crews will need to obtain track warrants each time they operate onto mainline tracks (including the two wye tracks). In Mr. Murphy's judgment, the interchange operation IPA assumes for loaded trains coming off URC would entail at least the following activities:

- The URC train stops on the #2 wye track. URC trains typically have three or four locomotive units on the head end (front of the train), two in the middle, and sometimes one or two on the rear.[68] The crew riding on the middle units would turn the angle cock on the car ahead and pull the coupling lever. The head-end crew would then obtain a track warrant from the IRR dispatcher, make sure that the switch

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[65] *Id*.

[66] *Id.* at III-C-25 to III-C-26.

[67] *Id.* at III-C-26.

[68] URC trains do not have DP units. This helps explain why UP and URC do not have a run-through agreement and why IPA has not proposed such an arrangement for IRR and URC.

at MP 1.19 is properly aligned, and pull the front portion of the train forward onto the Sharp Subdivision at MP 750.22 at restricted speed (about 7 mph) until the rear car is far enough on the Sharp Subdivision to provide adequate space for switching the middle locomotives onto the #1 wye track. The crew of the middle locomotives would then uncouple those units from the cars behind after securing the hand brakes on five cars. The middle unit crew would obtain a track warrant, take the middle units down the #2 wye track past the switch at MP 1.19, realign the switch to the #1 wye track, and take the middle units back in the direction of URC property. Mr. Murphy estimates that this set of activities would take at least 30 minutes.

- After the middle unit crew departs with the middle units, the URC head-end crew members who had moved the front portion of the train to the Sharp Subdivision track would realign the switch at MP 1.19, move the front portion back onto the #2 wye track, and shove these cars back to join the rear portion of the train. The head-end crew would make the coupling to the rear part of the train and cut the air in. The URC conductor would release the five hand brakes and walk back to the head end of the train. Mr. Murphy estimates that these activities would take at least 30 minutes.

- The URC crew would set the hand brakes on five cars at the head end of the train, uncouple the head-end units from the train, and take these units past the switch at MP 1.19. They would secure a track warrant to operate back on the #1 wye track, realign the switch to the #1 wye track, and take the URC head-end units back in the direction of URC property. Mr. Murphy estimates that these activities would take at least 25 minutes.

- The IRR crew would obtain a track warrant to leave the IRR locomotive facility and operate three IRR locomotives eastward on the #1 wye track (at 5 mph), checking to be sure the URC crew is not on the track. The IRR crew would continue eastward until the rear unit clears the switch at MP 0.03, realign the switch to the #2 wye track, and then move west to the rear of the train. The IRR crew would then couple the rear DP unit onto the train, cut in the air, and check the DP communication. The IRR crew would operate the other two units eastward until both units clear the switch at MP 0.03, realign the switch to the #1 wye track, and then operate the two units westward on the #1 wye track until both units clear the switch at MP 1.19. The crew would obtain a track warrant to operate on the #2 wye track, realign the switch to the #2 wye track, and move the two units onto the #2 wye track to the head end of the train. Mr. Murphy estimates that these activities would take at least 30 minutes.

- The IRR crew would couple the head-end DP units onto the front of the train, cut in the air, release the hand brakes, set up the DP communication, obtain a track warrant, and wait for the carmen to drive along the train to perform a brake inspection before heading west onto the Sharp Subdivision. Mr. Murphy estimates that these activities would take 15 minutes.

The total time for these activities is at least two hours and ten minutes.[69] Mr. Wheeler used this as the dwell time for the loaded coal trains interchanged between URC and IRR at Provo.

IPA assumes that empty IPA coal trains and empty coal trains received from UP at Milford and destined for URC origins will be interchanged at IPA's Springville car shop. According to IPA, its own personnel will perform inspection, bad-order/spare switching, and repairs for these trains, charging IRR an hourly fee for these services. Other empty coal trains received by IRR at Milford and destined for loading at IRR-served origins will also stop for inspection at the IPA car shop. IPA allots three hours of dwell time for inspection and fueling of the non-IPA empty coal trains.[70]

UP accepts IPA's assumption that the Springville car repair facility will perform these functions and will charge IRR the same hourly fee it charges to third parties. UP also accepts IPA's allotment of three hours of dwell time for inspection and fueling of the non-IPA empty coal trains.

IPA allots no dwell time for empty IPA trains that are interchanged with URC. Instead, IPA treats these trains as terminating and then originating at the Springville car shop.[71] UP accepts IPA's treatment of these empty IPA trains. IPA assumes there will be URC movements

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[69] UP Reply Exhibit III.C-2 illustrates the activities described in the text. If the URC train had locomotive units on the rear of the train, more activities would be required to remove these units, adding to the dwell time.

UP's estimate of the URC interchange time is quite conservative. In fact, this estimate is more than an hour lower than the actual interchange time for the URC trains in February 2010, based on UP car event records produced to IPA in discovery. UP workpaper "Provo Interchange Time-Feb IPPX.xlsx."

[70] IPA Opening Nar. at III-C-26.

[71] *Id*. at III-C-26 n.17.

over IRR tracks to pick up these trains,[72] although it did not include these movements in its RTC simulation.

Instead of providing for a manned helper operation to assist loaded coal trains in operating over the grade on the east side of Soldier Summit, IPA provides that IRR will add two extra locomotives at Price Yard and remove those locomotives at Provo. IPA allots 20 minutes for adding the locomotives and 15 minutes for removing them.[73] While UP believes that IPA's allotments underestimate the time required for these activities, it nevertheless accepts these allotments for purposes of this case.

vii. Crew-Change Locations/Time

IPA provides for IRR crew changes at Price, Provo (including Provo Yard, the Coal Wye tracks, and the IPA car shop), the Sharp Loadout, Lynndyl, Milford, and IGS. It allots 15 minutes for a crew change at points where this is the only activity and no extra time at points where other functions are performed.[74] UP accepts these time allotments.

IPA's operating plan for IRR specifies eight crew districts and assignments.[75] UP accepts these proposed districts and assignments.

IPA acknowledges that some IRR crews will expire under the Hours of Service Law and that there will be re-crew and taxi expenses in these situations.[76] When crews outlaw, there is additional delay, as well as greater cost; a second crew must be called, and both crews must be taxied between the train and their home terminal. Outlawed crews will occur more frequently on

[72] *Id.*

[73] *Id.* at III-C-20.

[74] *Id.* at III-C-28.

[75] *Id.* at III-C-28 to III-C-29.

[76] *Id*. at III-C-28 n.19.

IRR than IPA assumes. Historical recrew experience for UP supports the conclusion that, despite a railroad's best efforts, there will be delays that cause crews to outlaw. Causes of re-crews include, for example, winter weather, broken rails, engine failure, and bad-order cars identified by an FED. IRR re-crews will be particularly common on its longer-haul coal trains operating between the Skyline Mine or Savage Coal Terminal and Milford. Indeed, it is surprising that IPA would expect that a single crew could operate the entire length of IRR – over 250 miles.

Based on its RTC simulation runs, IPA concluded that 11 trains in the peak week required a re-crew.[77] When UP corrected IPA's understated loading and unloading times and its traffic group, UP determined that 15 trains required a re-crew.[78]

IPA states that its crew districts and crew assignments reflect IRR's ability to operate in a manner not constrained by prior mergers or union work rules. It asserts that IRR has more flexibility than Class I railroads in scheduling crews and maximizing their use.[79] However, this flexibility is limited by FRA requirements that apply to all railroads, and IPA acknowledges that IRR crews must operate within the constraints of the federal Hours of Service Law.[80] IRR's purported flexibility is further limited by the low train volumes, as trains will not always be available for the crew to operate back to their home terminal "after receiving their minimum rest under FRA rules."[81]

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[77] *Id.*

[78] UP Reply workpaper "IRR Base Year Trains with RTC results Reply.xlsx."

[79] IPA Opening Nar. at III-C-29 to III-C-30.

[80] *Id.*

[81] *Id*. at III-C-28.

viii. Track Inspections and Maintenance Windows

IPA allots no separate time for FRA-prescribed track inspections in its RTC model, assuming instead that such inspections would be performed between train movements, or in the wake of a train during periods of heavier traffic.[82] IPA also does not budget time for program maintenance based on its assumption that such maintenance will occur during periods other than the peak traffic period it models.[83] UP accepts IPA's assumption regarding track inspections and program maintenance for purposes of its reply RTC model simulations in this case.

ix. Time for Random Outages

IPA acknowledges that random events that affect rail operations would inevitably occur during the peak period used for its RTC model simulation.[84] It allots time for two random outages during the peak week it models, citing review of data produced by UP during discovery.[85] UP accepts use of these two random outages and incorporates them in its reply RTC model simulation.

d. Results of the RTC Simulation

Mr. Wheeler reviewed IPA's RTC model and analyzed the assumptions IPA made in developing the model. As discussed below in Section III.C.3.f, Mr. Wheeler identified a variety of problems with IPA's RTC simulation. In addition, as explained above, UP's experts identified certain respects in which IPA's operating plan is not consistent with efficiency, safety, or customer requirements. In particular, IPA's comparison of UP and IRR average transit times on the Lynndyl-Milford segment does not take proper account of the transit times of individual

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[82] *Id.* at III-C-30 to III-C-31.

[83] *Id.* at III-C-31.

[84] *Id.*

[85] *Id.* at III-C-31 to III-C-33.

classes of trains. As explained above, when the transit times for individual categories of trains are compared, it is clear that IRR would not meet UP's level of performance for the high priority, service-sensitive intermodal Z trains. Mr. Wheeler therefore removed these trains from the RTC simulation.

Mr. Wheeler used the RTC model to run a corrected simulation of IRR operations. He used IPA's peak week for modeling purposes, but corrected for the errors he identified. With the advice of Mr. Murphy and UP's engineering experts, Mr. Wheeler incorporated appropriate track and yard configurations and various revisions to IPA's operating parameters, as described above. Mr. Wheeler ran UP's RTC model and obtained outputs in the form of running times for each line segment and transit times and cycle times for IRR trains.[86] These outputs were used to develop locomotive and car hours and train crew counts. UP used the output of Mr. Wheeler's RTC simulation to develop revised operating cost information for the SAC analysis of IRR.

3. Other

a. Rerouted Traffic

IPA asserts that the IRR traffic group does not include any traffic that has been re-routed from its real-world route of movement.[87] UP has identified two instances in which IPA's proposed IRR operations would deviate from the actual routing of the traffic. First, certain UP trains carrying traffic that IPA selected for the IRR traffic group move between UP's Roper Yard at Salt Lake City and UP's Helper Yard (trains with symbol MROHP). Instead of providing that these trains would terminate at Helper, however, IPA assumed that they would move nine miles

[86] Schematic diagrams of the IRR tracks as they appear in UP's RTC model are attached as UP Reply Exhibit III.B-1. The electronic files containing UP's RTC model run, output, and case files are included in UP Reply workpaper "UP Reply RTC Case.zip."

[87] IPA Opening Nar. at III-C-35.

further east beyond their existing route of movement to IRR's Price Yard, where IPA assumed that IRR would deliver the train to the residual UP.[88] UP does not operate these trains to or through Price Yard in the real world. Thus, the change in termination point would require the residual UP to incur additional costs in moving these trains back to Helper Yard – a yard IRR operated past en route to Price. UP has revised the IRR operating plan to provide that the MROHP trains will interchange to the residual UP at Helper, on their actual route of movement.

Second, IPA assumes that trains IRR interchanges with UP at Provo that move to or from the Sharp Subdivision (train symbols MWCSC, MSCWC, MWCRO) will move through Provo Yard,[89] and it models this movement in its RTC simulation. In the real world, UP does not move these trains to the Provo Subdivision, which would add substantially to the transit time for these trains. UP has revised the IRR operating plan to conform to the real-world movement of these trains by providing that they will be interchanged to the residual UP at MP 750.22 on the Sharp Subdivision.

b. Fueling of Locomotives

IPA proposes that IRR will re-fuel road locomotives on coal trains that pass through Provo Yard in the eastbound direction, "as needed."[90] According to IPA, a contractor will perform DTL fueling of these locomotives and the switch locomotive at Provo Yard.[91] IPA

[88] IPA Opening Exh. III-C-1; IPA Opening workpaper "IRR Base Year Trains with RTC results.xlsx."

[89] IPA Opening Nar. at III-C-27 n.18.

[90] *Id*. at III-C-35.

[91] *Id*. at III-C-35 to III-C-36.

assumes that all locomotives on other IRR trains will be fueled while on UP.[92] UP accepts IPA's proposals for locomotive fueling.

c. Car Inspections

i. Inspection Locations

UP accepts IPA's assumption that IRR will conduct 1,500-mile inspections of eastbound empty coal trains received in interchange from UP at Provo at IRR's Provo Yard, that empty coal trains moving via the Sharp Subdivision to loading points on IRR are inspected by IPA personnel at IPA's Springville car repair facility, and that IPA will charge IRR its normal fee for this service.[93]

ii. Inspection Procedures

UP accepts IPA's description of the inspection procedures that IRR would follow for eastbound coal trains at Provo, the staffing it proposes for these activities, and its allotment of three hours of dwell time for these trains.[94]

d. Train Control and Communication

i. CTC/Communications System

IPA provides for CTC on only part of the IRR system – the mainline between Castle Gate and West Thistle on the Provo Subdivision and the mainline between Lynndyl and Milford. The remaining IRR mainline – approximately half of the system – is dark, although IPA assumes that locomotive engineers will control mainline switches remotely.[95] IPA assumes that a single

[92] *Id*. at III-C-36. This assumption is consistent with common railroad operating practice. However, IRR is responsible for the cost of all fuel used by locomotives while they are on IRR lines.

[93] *Id.* at III-C-36 to III-C-37.

[94] *Id.* at III-C-37.

[95] *Id*. at III-C-38 to III-C-39.

dispatcher located at Lynndyl will control train operations in dark territory through radio communications and issuance of track warrants.[96] As noted above, the need to obtain a track warrant when moving onto mainline track will add time to yard operations in dark territory, including at Provo Yard and Price Yard. UP accepts IPA's assumptions on these subjects. IPA's assumptions regarding communications equipment are discussed in Section III.F.6 below.

IPA provides for installation of FEDs at intervals along IRR tracks.[97] UP accepts IPA's placement of the FEDs, except at one location on the Provo Subdivision, where extension of a siding required relocation of an FED and set-out track. IPA states that if set-out of a car is required, the train crew will use set-out tracks located on either side of each FED, with one on each track where there is a passing siding.[98] As discussed above in Section III.B.3.c, IPA has failed to provide sufficient set-out tracks at most FED locations. On single track, there must be set-out tracks on both sides of an FED, because trains will pass the FED in both directions. IPA's track charts show set-out tracks on only one side of each FED.[99] If IPA assumed that passing sidings could be used in place of set-out tracks when defective cars must be removed, this is not practical, particularly in view of the distances between FEDs and sidings. Some of the set-out tracks IPA provides are too close to the FEDs to permit the train to stop in time to set out a car on the tracks. UP's engineering experts have added the necessary set-out tracks and adjusted their spacing, as described in Section III.F.3.c below.

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[96] *Id*. at III-C-39.

[97] *Id.*

[98] *Id*.

[99] IPA Opening Exh. III-B-1.

ii. Dispatching Districts

IPA provides for a single dispatching district for IRR, with one dispatcher position.[100] UP accepts this proposal. UP addresses IPA's proposal for dispatching equipment in Section III.F.6 below.

iii. PTC Implementation Under RSIA

IPA properly recognizes that its locomotives will need Positive Train Control ("PTC") equipment that is compatible with the PTC equipment on UP's road locomotives, since IRR road locomotives will operate in run-through service over UP lines.[101]

e. BNSF Trackage Rights Operation

As noted in Section III.A above, UP accepts IPA's assumption that the IRR traffic group will include BNSF trains operating on the Price to Provo segment pursuant to the terms of a trackage rights agreement between UP and BNSF. In its RTC model, IPA codes these trains to begin at IRR's Provo Yard (MP 693.50). In the real world, these trains run through on this segment and do not stop at a yard. Rather than accept IPA's assumption that they will dwell at Provo Yard, UP has recoded the BNSF trains to enter or exit IRR at MP 698.5 at a speed of 10 mph, consistent with the yard limits that apply to the off-SARR lines north of the junction between IRR and the residual UP.

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[100] IPA Opening Nar. at III-C-40. IPA's provision of just one dispatcher for a broad area with large amounts of dark territory means that crews at Provo, Price and Helper that need to enter the mainline may face delays due to the need to obtain a track warrant.

[101] *Id*. at III-C-40 to III-C-41.

f. Corrections to IPA's RTC Simulation

As discussed above, UP's experts identified errors or unacceptable inefficiencies reflected in IPA's RTC model simulation, and Mr. Wheeler corrected the model accordingly. The following list summarizes the changes Mr. Wheeler made to IPA's RTC simulation.

Correction of Train and Track Coding Errors:

- Adjust termination point to Helper for MROHP trains
- Correct tail node for Q Growth 3 train so it does not depart in eastbound direction
- Recode BNSF trackage rights trains to originate at MP 698.5 with velocity of 10 mph, rather than originate at Provo Yard at zero mph
- Recode CSKR140228 for 15 minutes of dwell time, rather than three minutes
- Change termination point for MWCRO from Provo Yard to MP 750.22
- Correct track coding for Sharp Loadout to avoid having empty trains load on the mainline
- Correct north end milepost for Milford Yard to MP 579.17 to match location shown on IPA Opening Exhibit III-B-1
- Adjust location of Provo Yard to MP 694.06 - MP 691.85

Traffic Selection Changes:

- Remove high priority intermodal Z trains
- Reduce peak-period train counts to account for Reply adjustments to traffic levels
- Add train GSKISO needed for IRR to serve the empty portion of revenue movements in IRR traffic group

Operating Changes:

- Correction of mine and plant loading and unloading times to reflect actual times
- Add 30 minute interchange dwell time for trains at off-SARR points (as well as on-SARR points) per IPA Narrative
- Change UPC-IRR loaded train interchange dwell time at Provo from 45 minutes to two hours and ten minutes
- Reposition empty locomotives from Provo to Price to maintain balance with locomotives added to westbound trains at Price
- Add URC movements to and from IPA car shop area

Capacity Adjustments:

- Extend all sidings on the Provo Subdivision to two miles in order to accommodate IRR and BNSF 10,000-foot trains
- Add a second mainline track on the east side of the IPA car shop to facilitate train movements in this area
- Add a second yard track at Price Yard to accommodate addition of locomotives and other activities at this location
- Add one yard track each at Milford and Lynndyl

III.D: Stand-Alone Railroad Operating Expenses

III. D. OPERATING EXPENSES

In Section III.D of its opening evidence, IPA summarized the annual operating expenses of its SARR, based on the traffic and operations that it assumed for IRR. IPA calculated total expenses of $43.6 million for 2011, the first year of IRR operations, associated with expenses for equipment, personnel, information technology, maintenance of way, taxes, and loss and damage.[1] In this section, UP presents its development of the operating expenses for its reply case. UP's numbers differ from IPA's numbers in two material respects. First, UP determined the expenses associated with its reply SARR traffic group, which as explained in Section III.A above, has lower volumes than IPA's opening traffic group.[2] Second, UP identified many items for which IPA has understated – or failed to provide altogether – the expenses associated with the operations, maintenance, and support that are required for IRR. In addition to understating the costs that IRR will incur, IPA failed to account for additional costs that the residual UP would incur as a result of IRR's operations, costs that are properly included in a SAC analysis. Table III.D.1 below compares the parties' operating expense results, summarized by expense item. Following the table, UP addresses each item in turn.

[1] IPA Opening Nar. at III-D-3, Table III-D-1.

[2] UP's lower reply volumes result from correcting IPA's various errors, updating 2011 volume levels with more current data, applying more accurate forecasts of future volumes for the SARR traffic and eliminating certain intermodal trains for which IRR would not provide service comparable to that which UP's customers receive today.

Table III.D.1
IRR 2011 Operating Expense Summary
($ millions)

Expense Item	IPA	Reply	Difference
Locomotive Lease	$1.30	$1.80	$0.50
Locomotive Maintenance	$1.13	$1.27	$0.14
Locomotive Operations	$13.67	$17.89	$4.22
Railcar Lease	$3.57	$4.02	$0.45
Material & Supply Operating	$0.37	$0.55	$0.18
Train & Engine Personnel	$2.89	$5.40	$2.51
Operating Managers	$3.03	$3.21	$0.18
General & Administrative	$7.08	$8.69	$1.61
Loss and Damage	$0.06	$0.06	$0.00
Ad Valorem Tax	$1.48	$1.48	$0.00
Maintenance of Way	$5.60	$9.84	$4.24
Insurance	$1.57	$1.74	$0.17
Startup and Training	$1.82	$2.24	$0.42
Total	**$43.58**	**$58.19**	**$14.62**

Source: UP Reply workpaper "IRR Operating Expense Reply.xlsx."

1. Locomotives

IPA proposes powering IRR with two classes of locomotives: high-horsepower General Electric ES44-AC units ("ES44s") for road service, and an EMD SW1500 locomotive for yard service. As explained in Section III.C above, IPA made several errors that led it to understate the number of locomotives that would be required to handle the IRR traffic. Those errors, as well as others that led IPA to understate its locomotive acquisition, maintenance, and fueling costs, are discussed in detail below.

a. Acquisition

IPA assumes that IRR would lease all of its locomotives. For the ES44s, IPA calculated an annual lease cost of { } from an ES44 lease that UP produced in discovery. While UP accepts the use of this lease, it corrects an error IPA committed in calculating the annual cost. IPA erred when it discounted the stream of lease payments to an amount in 2011 dollars that would be input to the SAC cost model and inflated over the analysis period (*i.e.*, 2011-2020). While IPA apparently intended to use the "hybrid" RCAF index by which operating expenses are inflated for future years, the formula in IPA's workpaper spreadsheet reflects a misinterpretation of the RCAF *index figure* as the period-over-period *inflation rate*.[3] This error (which improperly inflates the discount rate) affects the discounting throughout the analysis period and thus permeates the calculations for the remainder of the lease payment period. The result is a significant understatement of the average lease payment when it is discounted back to 2011 levels. When this error is corrected and the index is matched to the hybrid RCAF index used to inflate operating expenses, the annual lease cost input in 2011 dollars is { }. UP uses this figure on reply.

UP accepts IPA's annual lease cost assumption for the SW1500 units.[4]

In determining its locomotive requirements, IPA incorporated both a peaking factor and a spare margin. Although IPA states that it "applied a peaking factor of { } percent,"[5] in fact its workpapers show that the factor it used was 18.5%.[6] UP accepts IPA's peak-factor calculation methodology, and determines a peak factor of 16% for its reply traffic group.[7]

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[3] Specifically, the RCAF-U index value in 3Q 2011 was 120.6, which IPA erroneously interpreted as a 20.6% increase from 2Q 2011. In fact, the 120.6 represents only a 2.6% increase from the 2Q 2011 index value of 117.6. IPA Opening workpaper "Lease Payments-ES44AC.xls."

[4] IPA Opening Nar. at III-D-4.

[5] *Id.*

[6] IPA Opening workpaper "IRR Peaking Factor.xlsx."

[7] UP Reply workpaper "IRR Peaking Factor Reply.xlsx."

IPA applied a spare margin of {   }% to account for the time that locomotives are in the shop or otherwise unavailable.[8] This number is absurdly low. It is clear that IPA committed two errors in determining this number: it erred when it calculated a factor from the UP locomotive utilization information that was produced in discovery, and it failed to account for the fact that the locomotives in local IRR service would achieve much lower utilization due to the lower train volumes and relatively lesser frequency of use.

First, while IPA indicated that it calculated its locomotive utilization factor from materials that UP produced in discovery, it misinterpreted that information. Specifically, IPA treated as the unavailable factor for a particular train type (*e.g.*, coal) the proportion of time that units associated with that train type were unavailable as measured against the *total time* across all train types.[9] This is incorrect. The following example with hypothetical numbers demonstrates the nature of IPA's mis-step. Assume that there are three types of trains – coal, general freight, and intermodal – and that each represents one-third of the total locomotive hours. Further assume that the units are out of service 10% of the total time overall, and that the unavailable percent varies by train type. Table III.D.2 below summarizes the locomotive hour statistics for this hypothetical system, assuming total system hours of 900.

[8] IPA Opening Nar. at III-D-4.

[9] IPA Opening workpaper "UP IRR Loco Utilization 2010.xls."

Table III.D.2
Hypothetical Example
to Demonstrate Error in IPA's Locomotive Utilization Calculations

Train Type	**Total Hours**	**Unavailable Hours**	**% Unavailable, By Train Type**	**Unavailable Hours % of Total System Hours**
(1)	(2)	(3)	Col (3) / Col (2)	Col (3) / Total of Col (2)
Coal	300	20	6.7%	2.2%
General Freight	300	30	10.0%	3.3%
Intermodal	300	40	13.3%	4.4%
Total	**900**	**90**		

Table III.D.2 identifies that out of the total hours of 900, 90 are unavailable, or 10% of the total. This is consistent with the percentages under the column "% Unavailable, by Train Type," which average 10%. When applied to this hypothetical, IPA's approach would not, however, calculate a spare margin from the "% Unavailable, By Train Type" factors, but instead would erroneously use the "% of Total" percentages in the right-most column of the table (*i.e.*, 2-4%). By basing its average on the lower percentages,[10] IPA falls short of reflecting the 10% overall unavailable time. The "% of Total" figures represent the amount of time that units in each train service are unavailable as a percentage of the system total, *e.g.*, the 20 hours that coal units are unavailable represent 2.2% of the total system hours of 900. But IPA applies that unavailability factor to the 300 coal trains, mixing apples and oranges and understating the unavailability of the locomotives used for the coal trains. When only IPA's mis-use of the unavailable percentages is corrected – for the above hypothetical, the equivalent of replacing the

[10] For example, IPA's workpaper indicates that it determined a 2010 average spare margin for coal of { }%, and for intermodal of { }%. IPA Opening workpaper "UP IRR Loco Utilization 2010.xls."

2-4% factors with the appropriate 7-13% averages – the result is an average spare margin of { }%.[11]

There is a second reason why IPA's spare margin is inappropriately low for the fleet required to serve the IRR traffic. As explained in Section III.C above, IRR is responsible for supplying locomotives in two separate situations. For the majority of the IRR traffic, including all non-coal trains and coal trains interchanged with UP, IRR is providing power to a run-through "pool."[12] For these moves, units are assumed to run through between IRR and the residual UP, and IPA has provided for no locomotive switching on these trains, with the lone exception of some empty coal trains received from UP at Provo, some of the time.[13] For these trains, UP accepts IPA's approach to determining the IRR locomotive requirements, calculating the on-SARR operating hours based on the results of the RTC model simulation of IRR operations, adjusted by both the peaking factor and the spare margin, corrected as described above.

For trains for which IRR is responsible for providing the necessary power, however, there is a separate pool of locomotives for which a separate calculation must be made. These trains represent a subset of IRR traffic – consisting largely of issue-traffic shipments from interchange with URC at Provo, for which locomotives are added to loaded trains and removed from empty trains at Provo.[14] In addition, IRR units are removed from other coal trains that IRR returns

[11] UP Reply workpaper "UP IRR Loco Utilization 2010 Reply.xlsx."

[12] IPA Opening Nar. at III-C-9 and III-C-27.

[13] IPA explains that it sands and services units on the empty coal trains that move to IRR from UP at Provo, and suggests that only a subset of those actually have the power removed. *Id.* at III-C-24 to III-C-25.

[14] Although interline received, these shipments are included in this group because the URC power does not run through and IRR must operate these trains with its own power.

empty to the IPA car shop,[15] and IRR units are also occasionally added to westbound loaded coal trains from Colorado when they enter IRR at Price and require additional power to operate over Soldier Summit to Provo.[16] As these operations involve specified movements and relatively low train volumes, it will be difficult for IRR to coordinate locomotive assignments and obtain a degree of utilization equivalent to a system average, let alone achieve the { }% utilization that IPA has assumed.

In order to evaluate the locomotive requirements associated with these local movements for which IRR would be responsible, UP analyzed the train movements from the RTC model. Because it is based on the train detail from the peak week of the peak year of IRR's operations, and thus includes the maximum number of trains, UP's estimate represents the *minimum* potential down-time that locomotives would incur. From the RTC results, UP identified when locomotives would need to be added to trains and when they would be removed from trains, and determined on that basis that the locomotive dwell time at Provo would well exceed { }% of these units' time. Based on these calculations, the spare margin for this pool of locomotive power increases to 17% in order to account properly for the fact that train movements are too infrequent for the locomotive units to avoid substantial periods of waiting time.[17] When the results of this study of the local locomotive pool operations are combined with the experience of

[15] IPA Opening Nar. at III-C-26.

[16] IPA did not provide a separate helper operation for IRR; rather, it assumed power would be added to certain trains at Price. *Id.* at III-C-10 to III-C-11; IPA Opening workpaper "IPA Open Final v7.zip."

[17] UP Reply workpaper "Unutilized Provo Locomotive Hours.xlsx."

units that IRR would supply to the run-through pool to power interline trains, IRR's total road locomotive requirement is 18 ES44 units.[18]

In addition, as explained in Section III.C above, IRR would need a second SW1500 engine. It would be infeasible for IRR to depend on only one engine 24/7 year-round, and the high-horsepower ES44 units would not be appropriate for switching operations in the Provo Yard, not only because these locomotives are not well suited to switch operations, but because they would not be equipped with the necessary remote control equipment that IPA assumes. Thus, UP includes two SW1500 units for IRR's switching operations.

Table III.D.3 below summarizes the 2011 locomotive counts and associated lease expenses, by type of unit.

Table III.D.3
IRR 2011 Locomotive Lease Expense

	IPA	Reply	Difference
ES44 Units	15	18	3
ES44 Lease Costs	{ }	{ }	{ }
SW1500 Units	1	2	1
SW1500 Lease Costs	$37,342	$74,684	$37,342

Source: UP Reply workpaper "IRR Operating Expense Reply.xlsx."

b. Maintenance

IPA assumes that its ES44 locomotives are maintained by a contractor and bases the associated IRR operating expenses on the terms of an agreement between UP and { } that UP produced in discovery.[19] UP accepts IPA's calculation of the {

[18] UP Reply workpaper "IRR Operating Statistics Reply.xlsx." UP's workpapers include calculations showing that if IPA's locomotive-hour approach were used to determine the total locomotive requirement, rather than just the requirement for the run-through pool – using UP's transit and dwell times and correcting IPA's erroneous calculation of the spare margin – IRR would need one fewer ES44 unit.

[19] IPA Opening Nar. at III-D-5.

} and

tailors those calculations to the reply traffic group, operations, and locomotive counts. In addition, UP accepts IPA's determination that these units would require an overhaul every six years.[20]

UP accepts IPA's annual maintenance cost assumption for the SW1500 units.[21]

Table III.D.4 below summarizes IRR's 2011 locomotive maintenance expenses, by type of unit.

Table III.D.4
IRR 2011 Locomotive Maintenance Expense

	IPA	Reply	Difference
ES44 Maintenance Costs	{ }	{ }	{ }
SW1500 Maintenance Costs	$54,410	$108,820	$54,410

Source: UP Reply workpaper "IRR Operating Expense Reply.xlsx."

c. Servicing

IPA bases IRR's servicing expenses (other than fueling) on certain figures from UP's 2010 R-1 report and UP's lube oil expense information from materials that UP produced in discovery.[22] UP accepts IPA's calculation of the locomotive servicing expense (other than fueling) per locomotive unit-mile.

d. Fueling

The cost of fuel is IRR's single largest operating expense item. IPA's figures considerably understate the fuel expense that IRR would incur. IPA based its IRR fuel costs on two sets of materials that UP produced in discovery: a document identifying fuel costs at

[20] *Id.* at III-D-6.

[21] *Id.*

[22] *Id.* at III-D-7.

different locations, and a dataset containing records of fuel consumption for trains operating in Utah.

Regarding the fuel cost per gallon, UP accepts IPA's use of the fuel price paid at Provo in 2010.[23] However, UP rejects IPA's use of the AAR Western Region average fuel index to escalate fuel costs from 2010 to 1Q 2011, and instead incorporates the change in UP's actual fuel cost per gallon over that period. As IPA assumed that IRR would incur fuel cost based on UP's 2010 costs, it is appropriate to reflect the actual inflation in UP's costs from 2010 to 1Q 2011. This results in a 1Q 2011 fuel cost that is 7% higher than IPA's assumption.[24]

IPA made even more serious errors when it determined the amount of fuel IRR would consume. IPA concluded from UP records that 4400-HP units consume on average { } gallons per LUM,[25] a rate that is { }% below UP's 2010 system average.[26] IPA then made a further 4.2% reduction to reflect what it labeled a "fuel efficiency gain" associated with the ES44 units.[27] The result of these assumptions is absurd: IPA assumed that the high-horsepower road units in IRR service, used to operate heavy coal and merchandise trains over the Wasatch Mountains, would consume { }*% less fuel* than UP's system average gallons per LUM, an average that is weighted heavily by trains operating across the Great Plains. Beyond the fact that this result is wholly unrealistic on its face, review of the process that IPA followed to select UP records for its calculations reveals that its average fails to correspond to the IRR operations. As

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[23] *Id.*

[24] UP Reply workpaper "Locomotive Fuel Price.xlsx."

[25] IPA Opening Nar. at III-D-8.

[26] UP's system average is 2.41 per LUM, based on system-wide reported totals of 1.06 billion gallons and 442 locomotive unit miles. *See* Schedules 750 and 755 to UP 2010 R-1 report, included as UP Reply workpaper "UP 2010 R-1 Excerpts.pdf."

[27] IPA Opening Nar. at III-D-8.

explained below, IPA's average does not reflect the mix of trains IRR would handle, the relevant time period, or the type of units IRR would use. While any one of these shortcomings would render IPA's estimate invalid, the combination yields a consumption figure that is unusable for IRR road operations by ES44s. When IPA's non-representative sample is corrected, analysis of the proper UP records yields an average consumption of { } gallons per LUM. UP uses this figure on reply.

IPA based its average fuel consumption calculation on a total number of gallons and total number of LUMs associated with a subset of the fuel consumption records that UP produced in discovery. However, the mix of trains by type in the subset of records that IPA used was significantly different from that of the IRR traffic. Specifically, coal train LUMs comprised *only 1%* of the LUMs IPA used, yet they represent the single-largest group of IRR's LUMs, at 44%.[28] More than half of IPA's LUMs was comprised of intermodal train LUMs, although intermodal represents the lowest volume IRR train type, behind coal and general freight. Correcting IPA's disproportionate mix by weighting the train-type consumption figures from IPA's workpaper by the corresponding LUMs for each train type would increase IPA's average by 9%, from { } to { } gallons per LUM.

IPA's consumption-record subset is also inappropriate because it reflects operations from the wrong period. UP's discovery production covered the years 2008 through 2010. However, nearly 60% of the LUMs underlying IPA's average are from 2008 records, and there are more

[28] Compare IPA Opening workpapers "UP IRR Loco Utilization 2010.xls" and "IRR Operating Statistics.xls."

from 2009 than from 2010. Records of fuel consumption from 2008 should not be used as the basis for evaluating fuel costs for trains that operated in 2010, let alone 2011-2020.[29]

Finally, IPA selected the subset of fuel consumption records the UP records identified as related to a 4400HP locomotive. But despite this apparent effort to use records relevant to ES44AC units, IPA failed to identify the vast majority of records for consists that included ES44's, and found hardly any for 2010. IPA missed these records because it incorrectly concluded that the locomotive models could not be identified. While UP's fuel consumption records did not specify the horsepower for most of the 2010 records, they did identify the train symbol, train date, and on and off stations corresponding to the gallons consumed and LUM figures contained in the consumption records. UP used this information to match to the 2010 detailed locomotive history records that were produced to IPA in discovery.[30] This allowed UP to identify the individual locomotives and the corresponding locomotive models (*e.g.*, SD70MAC) that were powering the trains identified in the fuel consumption records. UP used this information to determine the average consumption for two groups of trains: trains that were powered exclusively by ES44AC units, and trains for which ES44's represented at least one-half of the total locomotive consist (which includes the trains in the first group).[31] As summarized in

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[29] During the 2008 recession, there were considerable reductions in traffic volumes, resulting in both fewer trains and smaller trains, each of which contributed to lower fuel consumption.

[30] UP's locomotive history records were produced with the traffic and train movement data at UP-IPA-00006051, and are included as UP Reply workpaper "IPA_Loco_Data_2010 (006051).zip."

[31] In the detailed locomotive history records, ES44AC units are identified as C45ACCs. The models for specific unit numbers can be confirmed by other materials that UP produced in discovery, and also from IPA's own workpapers, which include the note that ES44ACs were "Classified by UP as C45ACCTEs." UP Reply workpaper "UP Loco Models.xls" (UP-IPA-00042512); IPA Opening workpaper "III-D-1 Locomotive Cost.pdf," p. 39.

Table III.D.5 below, when the results for either group are weighted by the train-type-specific LUMs UP developed on reply, the average consumption is similar.[32]

Table III.D.5
UP 2010 Locomotive Fuel Consumption in Utah, Weighted by Mix of LUMs for IRR Trains

	Trains for which ES44AC Units Are:	
	100% of Units	50%+ of Units
Gallons per LUM	{ }	{ }

Source: UP Reply workpaper "Loco Fuel Analysis 2010.xlsx."

As the results are quite close and the second group (all trains for which ES44's comprised at least one-half of the locomotive consist), represents a much larger sample, UP relies upon the specific fuel consumption factors by train type from the second group to calculate the number of gallons for which IRR will be responsible.[33] The use of consumption factors based on consists that have some non-ESS44 units is not inappropriate for IRR. While IPA has posited that all IRR road power will be ES44s, the IRR units will be powering run-through trains with UP units, which the fuel consumption records indicate reflect a mix of ES44 and non-ES44 models on the trains that IPA identified to handle the IRR traffic group.

UP accepts the fuel-consumption rate IPA used for the SW1500 units.[34]

Table III.D.6 below summarizes the 2011 fuel costs by type of unit.

[32] UP excluded fuel consumption records for train types that did not match its IRR trains, *e.g.*, L, Q, W, and Z.

[33] UP Reply workpaper "IRR Operating Expense Reply.xlsx."

[34] IPA Opening Nar. at III-D-8.

Table III.D.6
IRR 2011 Fuel Expense

	IPA	Reply	Difference
ES44 Fuel Cost	$12,610,277	$16,317,767	$3,707,490
SW1500 Fuel Cost	$416,023	$888,684	$472,661

Source: UP Reply workpaper "IRR Operating Expense Reply.xlsx."

2. Railcars

a. Acquisition

IPA assumed that the IRR traffic would be handled by a mix of railroad-provided, foreign, and private equipment.[35] For railroad-provided equipment, UP accepts IPA's assumption that all such equipment would be leased, the annual lease costs that IPA used for the different car types (*e.g.*, boxcars, gondolas), and the spare margin used to calculate the overall equipment requirement. For foreign and private equipment, UP accepts IPA's use of the figures from UP's 2010 R-1 report, from which IPA determined the corresponding costs per mile, but makes two corrections to IPA's calculations. First, although IPA's workpaper indicates that the payments for shipments on foreign multi-level flatcars include the costs of auto racks, it did not actually include such payments in the calculation.[36] UP corrects this omission by including $34 million in per diem payments for auto racks, based on information that UP reported in Schedule 414 to its R-1 report.[37] Second, UP corrects a minor error in IPA's private boxcar input, reducing the payment figure used to calculate the cost per mile to the $6.6 million that UP reported in Schedule 414. Because UP generally accepted IPA's car-cost assumptions,

[35] *Id.*

[36] IPA Opening workpaper "IRR Car Costs.xlsx," Worksheet "Foreign Cars" contains the following footnote: "5/ Includes auto Racks."

[37] UP Reply workpaper "IRR Car Costs Reply.xlsx."

differences between the parties' railcar costs are largely driven by differences in their traffic levels and transit times.

b. Maintenance

IPA assumed that the lease payment amounts it used reflected full-service leases and that IRR would not be responsible for any other maintenance costs.[38] UP also notes that IPA assumed that IRR would out-source the car-inspection function to IPA at the IPA Car Shop in Springville, presumably replicating the use of the IPA shop by other coal customers for this function today. As explained in the discussion of outsourced expenses below, UP accepts IPA's assumptions regarding the time and cost of such inspections, and modifies the calculation of total expense to reflect the lower IRR coal traffic volumes in UP's reply case.

UP also accepts IPA's proposed expense for End-of-Train Devices ("EOTDs").

3. Personnel

a. Operating

i. Staffing

(a) Train and Switch Crew

As indicated in Section III.C above, UP accepts IPA's proposed crew districts and assignments, and it follows IPA's approach to apply those assignments to the corresponding number of trains traversing each district to determine the number of crewpersons. UP also follows IPA's use of the train-time results from the RTC simulation model to calculate the re-crews that would be required. UP notes that while IPA concluded that eleven trains would require re-crews during its peak week,[39] it incorrectly divided that number by the total trains

[38] IPA Opening Nar. at III-D-10.

[39] IPA's RTC results included 11 trains that operated more than 10.5 hours. IPA Opening workpaper "IRR Base Year Trains with RTC results.xlsx."

modeled during the entire ten-day simulation period (269), not just the peak week trains (193).[40] As the trains modeled outside the peak week are incomplete, only the peak week should be used. Correcting IPA's calculation would result in a re-crew rate of 6%, not 4%.

As described in Section III.C above, however, the train times from IPA's RTC simulation run cannot be accepted, because (1) they fail to include the appropriate number of trains (reflecting offsetting effects of overstated volume growth assumptions and understated trains to handle the empty movements associated with IRR revenue loads); (2) they fail to incorporate the actual loading and unloading times for UP customers that IRR would serve, *i.e.*, the loading times at Skyline Mine, the Sharp Loadout, and the Savage Coal Terminal; and (3) they understate the interchange time to receive issue-traffic trains from URC at Provo and add UP power. When these shortcomings are corrected in UP's reply RTC model, 15 trains during the peak week require re-crewing,[41] or 9% of UP's 163 total peak-week trains in UP's reply case.

In order to incorporate the re-crew frequency, however, UP does not apply the overall rate to all crews as IPA did, but determines the specific re-crew rates by train type, On-SARR station, and Off-SARR station. This results in a total road crew requirement of 37 crew members.[42]

In addition, IPA assumed twelve-hour shifts for the single member of the lone switch crew that works at IRR's Provo Yard.[43] This assumption presents significant safety concerns. Requiring a twelve-hour shift for an engineer working alone – where the engineer would be the only crew member working the entire yard – would greatly increase the risk of an accident due to

[40] IPA Opening Nar. at III-D-14.

[41] UP Reply workpaper "IRR Base Year Trains with RTC results Reply.xlsx."

[42] UP Reply workpaper "IRR Crews Hotels & Taxis Reply.xlsx."

[43] IPA Opening Nar. at III-C-13.

fatigue. Further, the Board has previously rejected the assumption that crews scheduled to work twelve-hour shifts each day would work 270 shifts per year.[44] IPA has offered no arguments to address the considerable safety concerns associated with a crewperson's working 2,920 hours annually, alone. Thus, UP provides for eight-hour shifts for IRR's switch crew at Provo. This results in an increase from three to five switch crew people.

Table III.D.7 below summarizes the parties' evidence regarding the number of train and switch personnel that IRR would require.

Table III.D.7
IRR 2011 Train and Switch Crew Requirements

	IPA	Reply	Difference
Train Crews	35	37	2
Switch Crews	3	5	2
Total Crews	38	42	4

Source: UP Reply workpaper "IRR Operating Expense Reply.xlsx."

(b) Non-Train Operating Personnel

IPA concluded that IRR would require a non-train operating staff of 27 people. UP accepts IPA's proposals for most of these positions, with three exceptions. First, UP determined that IRR would require a second Manager of Locomotive Operations ("MLO"). Although IPA provided for three Managers of Train Operations to cover the 24/7 position, it included only one MLO. The breadth of the IRR system, the mix of trains operating over the system, and the size of the fleet would require a second MLO. Second, UP determined that IPA's proposed equipment inspector staff was insufficient. In addition to the four-person crew working in the Provo Yard,[45] a separate two-person crew would need to be available to travel to repair cars that

[44] *AEP Tex. N. Co. v. BNSF Ry.*, STB Docket No. 41191 (Sub-No. 1), slip op. at 48 (STB served Sept. 10, 2007).

[45] IPA Opening Nar. at III-C-37 to III-C-38.

were bad-ordered en route. Finally, UP concluded that the Manager of Mechanical Operations was unnecessary, as that person's responsibilities could be addressed by IRR's Chief Engineer. As a result, UP non-train operating personnel total 29, two more than IPA's proposal, as summarized in Table III.D.8 below.

Table III.D.8
IRR Non-Train Operating Personnel

Position	IPA	Reply
Vice President – Operations	1	1
Director of Operations Control	1	1
Manager – Train Operations	3	3
Manger – Locomotive Operations	**1**	**2**
Crew Callers	5	5
Dispatchers	5	5
Manager – Operating Rules, Safety and Training	1	1
Customer Service Managers	2	2
Chief Engineer	1	1
Manager of Mechanical Operations	**1**	**0**
Equipment Inspectors	**6**	**8**
TOTAL	**27**	**29**

Source: UP Reply workpaper "IRR Operating Expense Reply.xlsx."

ii. Compensation

IPA developed the compensation for IRR train and engine crews using a figure from the website salary.com.[46] This figure – which IPA's own workpaper indicates is one-third less than UP's average train and engine crew compensation[47] – is not an appropriate basis for IRR compensation, due to the higher utilization that IPA assumes its crews will achieve. The Board has found in past cases that "employees working more hours would command more

[46] *Id.* at III-D-21.

[47] IPA Opening workpaper "IRR Salaries.xlsx."

compensation,"[48] and the same logic applies here. UP performed a study of the UP payroll records to identify the proportion of train and engine crew employees that worked 270 shifts and the average compensation they received. The study indicated that fewer than { }% of UP crewpersons achieved 270 shifts in 2010, and their average compensation was { }. By contrast, IPA used a salary.com figure associated with the top quartile of wages;[49] for UP, crew people in the 75th percentile worked { } shifts, { } fewer than the utilization IPA assumed.

UP follows Board precedent and incorporates the compensation level for extraordinarily highly-utilized UP crews as a better estimate of the wage expense IRR would incur in attracting and retaining train and engine crew members expected to work 270 shifts.

b. General and Administrative

i. Introduction

The general and administrative ("G&A") category encompasses essential core functions that support the management of an enterprise. Most G&A functions are the direct result of a company's need to comply with financial, commercial, legal, or regulatory requirements – they must be performed by any efficient company, regardless of size. In order to survive, any railroad must bill customers and ensure timely and accurate payment. Any railroad operating in the 21st century must provide adequate computer systems and support for those systems. A railroad that transports interline shipments must manage relationships with both customers and other

[48] *Western Fuels Ass'n, Inc. & Basin Elec. Power Coop. v. BNSF Ry.*, STB Docket No. 42088, slip op. at 30 (STB served Sept. 10, 2007) ("*WFA I*").

[49] The figure IPA used reflected salary only, and did not account for total compensation, including Paid Time Off. *See* http://swz.salary.com/SalaryWizard/Railroad-Conductors-and-Yardmasters-Salary-Details-provo-ut.aspx.

railroads: it must negotiate contracts, coordinate with connecting carriers, develop and review rates, and monitor receivables related to joint moves.

IPA glosses over important G&A functions in its opening evidence. While IRR is a railroad with over $110 million in annual revenue, IPA proposes a G&A staff of only 21 (excluding outside directors).

This proposed G&A staffing level is much too low, even for a relatively small railroad. In fact, it is far below the 36 G&A employees the Board approved for a SARR of comparable size in *WFA I*. IPA relies heavily on *WFA I* in support of its G&A staffing proposal, asserting that IRR staffing levels should be lower.[50] UP agrees that *WFA I* is a reasonable benchmark and that IRR's staffing should be lower than that accepted in *WFA I* in some respects. However, there is no basis for IPA's suggestion that IRR can operate with 15 fewer G&A employees than the SARR in *WFA I*.

IPA incorrectly relies on the presumption that, since IRR has lower traffic density and lower revenues than the *WFA I* SARR, IRR can survive with over a third fewer G&A staff than that SARR. However, most G&A staffing functions must be provided, whatever the size of the railroad. In addition, there are ways in which IRR operations are more complex than those of the *WFA I* SARR. For example, the *WFA I* SARR interchanged trains with only one other railroad, BNSF. Here two railroads (the residual UP and URC) will interchange with IRR, and BNSF trains will move over a portion of the IRR system. Moreover, while the traffic selected for the SARR in *WFA I* was confined to relatively simple coal movements, much of IRR's traffic is

[50] IPA Opening Nar. at III-D-2 to III-D-25. IPA also cites *Western Fuels Ass'n, Inc. & Basin Elec. Power Coop. v. BNSF Ry.*, STB Docket No. 42088 (STB served Feb. 18, 2009) ("*WFA II*"), in support of its proposed staffing levels. Because BNSF did not contest G&A staffing in *WFA II*, that decision is not an appropriate reference point. *See WFA II*, slip op. at 39.

carload or intermodal shipments. Unlike coal trains for utilities, for which there is one bill per train, general freight trains require separate billing for individual carloads. Likewise, some intermodal trains are "retail" rather than "wholesale." In other words, for some trains, the railroad must deal with billing for multiple customers instead of just a single customer.

UP's proposed G&A staff of 31 for IRR is five fewer than the 36 G&A staff the Board accepted in *WFA I.* However, the real question is whether IPA has shown that its proposed G&A staffing will be sufficient to meet IRR's needs or whether IRR will require more G&A staff to perform the tasks needed to operate efficiently. UP believes that IPA has failed to make the necessary showing. Among other things, IPA failed to provide sufficient staffing to handle revenue accounting for interline shipments, including monitoring of the Interline Settlement System ("ISS"), a labor intensive process IPA chose to handle IRR's interline revenues. In addition, IPA has assumed that IRR could operate with numerous off-the-shelf computer systems without staff responsible for integrating these systems. IPA has also assumed that IRR could function with a help desk that operates through an answering machine part of the time, rather than with 24/7 live coverage. In these and other areas, IPA has failed to provide staff levels that are essential to safe and efficient operations, let alone to the optimally efficient rail carrier it claims to describe.

If UP were to begin with a clean slate in designing the G&A functions for IRR, it would organize these functions somewhat differently than IPA's proposed structure. For example, assuming there is to be no separate marketing department, it appears more logical to place marketing functions in Finance, rather than in Operations. However, for purposes of this reply, UP accepts the general structure that IPA has proposed. Where IPA has overlooked critical functions or has seriously underestimated the resources needed for a function, UP proposes the minimum staffing that would be necessary to cover these functions.

UP's analysis of G&A expense requirements was developed by Richard W. Brown. Mr. Brown, a Director with FTI Consulting, has almost 30 years of experience working in the North American railroad industry, for BNSF and predecessor carriers. While at BNSF, Mr. Brown gained significant experience managing functional reorganizations and implementing technological solutions to streamline administrative functions. For the last twelve years, he has managed rail carrier strategic planning and merger and acquisition studies at FTI. In developing UP's G&A expense requirements, Mr. Brown relied on his broad industry experience and also on interviews with several UP managers to generate specific types of information for the G&A analysis.

ii. Staffing Requirements

Table III.D.9 summarizes IPA's headcounts for IRR's G&A functions and UP's G&A staffing plan for IRR. Staffing levels the Board accepted in *WFA I* are included as a reference point.

Table III.D.9
IRR General &Administrative Staffing Summary

Position	*WFA I*[51]	IPA	Reply	Difference
President	1	1	1	0
Administrative Assistants	2	2	3	1
Director - Corporate Relations	1	0	0	0
Manager - Operating Rules and Safety	1	0	0	0
Marketing Managers	2	1	2	1
Vice President - Finance & Accounting	1	1	1	0
Treasurer	1	1	1	0
Ass't Treasurer	1	0	0	0
Cash Manager	1	0	0	0
Controller	1	1	1	0
Asst. Controller	0	1	1	0
Taxes	1	0	0	0
Revenue Accounting	1	0	0	0
Revenue Managers	3	0	3	3
Accounts Payable Manager	1	0	1	1
Manager - Budget and Purchasing	2	1	1	0
Director Financial Reporting	1	0	1	1
Vice President - Law and Admin.	1	1	1	0
General Attorneys	2	1	1	0
Paralegals/Admin Assist.	1	0	0	0
Manager of Safety and Claims	1	1	1	0
Director of Human Resources	1	1	1	0
Manager of Training	1	1	1	0
Director of Information Technology	1	1	1	0
IT Specialists	7	6	9	3
Total	**36**	**21**	**31**	**10**

Source: UP Reply workpaper "IRR Operating Expense Reply.xlsx."

(a) Executive Department/Marketing

UP agrees that IRR needs only a President and several Administrative Assistants for the executive function. IPA states that two Administrative Assistants would support the President

[51] *WFA I*, slip op. at 43, Table C-4. Although a few position titles for IRR differ from those in *WFA I*, job functions and salaries for the positions are essentially the same.

and three Vice Presidents. UP believes the Administrative Assistants should support the entire Headquarters staff, not just these officers. Because Mr. Brown has concluded that the G&A staff must be larger than IPA has assumed in order to meet all of IRR's needs, UP has provided for three Administrative Assistants, rather than two. The third Administrative Assistant would have primary responsibility for supporting the Finance and Accounting staff.[52]

IPA assumes IRR would have a board with three outside directors. It asserts that these directors would be willing to serve without compensation because they would have a substantial interest in IRR's affairs. UP believes this assumption is unrealistic and that IRR will need to provide substantial compensation to attract high quality directors who are in fact independent and who will spend the time necessary to meet their corporate responsibilities. Nevertheless, for purposes of this case, UP (like IPA) provides only for travel expenses to board meetings for these directors.

For its marketing function, IPA assumes only one Marketing Manager, who reports to the Vice President Operations.[53] According to IPA, one Marketing Manager is adequate to "[interface] with the IRR's customers and [handle] day-to-day marketing functions as well as contract renewals."[54] IPA assumes this single manager will manage only IRR's coal customers; it states that UP will "largely undertake[ ] the marketing effort" for the large volume and diverse mix of overhead traffic that IRR serves.[55] Although UP accepts this assumption that it will take

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[52] IRR's Finance and Accounting Staff is leaner than the Finance and Accounting staff in *WFA I* and thus would need the added support that a dedicated Administrative Assistant could provide.

[53] IPA Opening Nar. at III-D-28. IPA also has two Customer Service Managers included as Operating personnel.

[54] *Id.*

[55] *Id.* at III-D-29.

the lead on marketing the overhead traffic, IRR marketing personnel will still need to perform many activities that cannot be outsourced to a connecting carrier.

IRR will need at least two Marketing Managers. IRR serves two very different market segments, coal and non-coal (including intermodal, grain, and general merchandise). These segments include customers with a wide variety of service and equipment needs. UP believes it would be appropriate to have one Marketing Manager for coal and other bulk commodities (grain and ore) and one for intermodal and general manifest.

Responsibilities of the Marketing Managers will include:

- Setting rates for new business and as existing contracts expire: this requires analyzing the market, understanding customers' business, developing IRR costs and understanding IRR's requirements for contribution to fixed costs, and evaluating the most favorable terms for new arrangements (one year, three years, or longer; seasonal or terminable on 30 days' notice). The Marketing Managers will have to undertake this analysis regardless of the form the rates take.
  - Local traffic: IRR must set these rates.
  - URC interchange Rule 11: IRR must set its proportional rates.
  - UP interchange joint rates: IRR will need to analyze each new rate from UP to determine whether it wishes to participate in the move. It will have to communicate with and/or negotiate with UP its desired level of participation.
- Negotiating terms of contracts, administering contracts, and responding to customer questions. Advising customers of changes in rates and fuel surcharge revenues.
- Preparing revenue and volume forecasts for IRR's annual budget, by communicating with customers on shipping plans and projecting how rates and fuel surcharges will be adjusted. Such forecasts are critical to the Financing Department for budgeting and for the Operating Department to ensure it has enough equipment and crews, and for the Engineering Department to plan its maintenance program.
- Coordinating with revenue managers to make sure that the revenue accounting system has correct updates on rates (updates can be quarterly or annual) and fuel surcharges (which may change monthly). Since IRR will have joint rates with UP, it will have to manage many different surcharge programs for a diverse traffic base.

- Coordinating with mines, loadouts, and IPA on monthly shipping plans to make sure that equipment and crews are available when needed. For example, since Skyline Mine originates trains that will move east, IRR must coordinate with the mine to know when it will load IRR trains and when it will load other railroads' trains.
- Monitoring service metrics. On intermodal and other scheduled trains, it is typical to assign a transit time to each carrier so that if the customer has a service claim, the connections know how to allocate responsibility.

The length of this list (encompassing marketing duties related to interline relationships, as well as duties relating to local customer relationships) demonstrates that a single Marketing Manager could not meet all of IRR's needs. UP's provision for two Marketing Managers is consistent with the number of Marketing Managers the Board accepted in *WFA I*, a case that involved fewer customers and homogeneous traffic.

(b) Finance and Accounting Department

IPA provides for a Vice President-Finance and Accounting with two direct reports, a Treasurer and a Controller. UP accepts these positions and the responsibilities IPA assigns to them. However, IPA does not appear to appreciate the breadth of additional responsibilities the Treasurer and the Comptroller would have.

IPA assumes that the Treasurer would handle all of IRR's cash management functions. UP agrees that one person could oversee the cash management functions. However, cash management is a critical function that must be managed on a daily basis. This is particularly true here because, while IRR will have daily cash needs, IPA has provided that much of IRR's revenue will come through ISS settlement, which involves monthly transfer of funds, rather than payments spread throughout the month. Thus, IRR would need backup for the Treasurer to cover this function. As discussed below, a Director of Financial Reporting would fill this role.

The Treasurer would have a number of other responsibilities. These would include the responsibility for managing debt. He or she would have to decide when and how to borrow, negotiate terms with the lenders or underwriters, manage payments, and supply lenders with information. In addition, the Treasurer typically handles risk management, including decisions on what insurance coverage is needed, purchase of the insurance, and administration of any self-insured retention. The Treasurer would also manage the company's pension plan.

IPA assumes that, with supervision from the Controller, an Assistant Controller, with some assistance from a Manager of Budgets and Purchasing, would handle all the remaining accounting functions, including billing, accounts payable, budgeting, purchasing, and audit. Although this is a logical span of responsibility for these positions, more staff would be required to accomplish the work that IRR would need within these functions. Mr. Brown has reviewed the "computerized accounting packages and programs available" that IPA assumes will eliminate the need for additional support,[56] and concluded that these programs are insufficient. In fact, use of ISS for interline revenue management (which IPA assumes for IRR) requires additional personnel to run efficiently, as described below. Mr. Brown believes five additional personnel are necessary to support the Controller: three Revenue Managers, an Accounts Payable Manager, and a Director of Financial Reporting. This staffing is consistent with that in *WFA I.*

In addition, as noted above, one additional Administrative Assistant will primarily assist the ten-person Finance and Accounting staff.

Revenue Billing

IPA's assignment of only an Assistant Controller to handle IRR's entire revenue billing function is insufficient for the important work that IRR must perform to ensure it is timely and accurately paid for its services. IRR will need to devote effort to ensuring that it receives the

[56] IPA Opening Nar. at III-D-30.

revenue it must have to support its operations. This is particularly important for a small railroad that operates leanly, like IRR.

There are four functions that IRR will have to accomplish in order to make certain that it gets the revenue to which it is entitled.

First, IRR will need to create freight bills for customers on all traffic that IRR originates (a total of 55,000 cars per year, or ten trains per week) and for all traffic it receives in Rule 11 service (a total of 26,000 cars per year, or five trains per week). IPA assumes that URC traffic – a small part of IRR's interline carloads – will be handled under Rule 11. IRR will also have to handle billing for the BNSF trackage rights.

Second, IRR will need to maintain a rate database that includes rate authorities for all traffic UP will route via IRR. Over 80% of the carloads IRR handles are interline traffic received from UP. There are more than 1,600 rate authorities currently governing the UP traffic IPA selected for IRR. While these authorities will remain relatively stable, there will be some changes, including quarterly or annual adjustments to contract rates and monthly changes to the fuel surcharge. UP's fuel surcharge applies differently to different types of traffic. Because IPA has chosen to have IRR participate in joint rates with UP (and thus follow UP's lead), IRR will need to calculate these different surcharges for its miles in each movement. In addition, the residual UP will always be searching for new business and will generate some new traffic on this corridor. This will result in new rates IRR must manage.[57]

[57] Although IPA's traffic and revenue projections assume growth in the volume of existing traffic movements, any railroad will gain and lose business over time, so as a practical matter, at least some IRR traffic in future years will represent new traffic movements governed by new rates. *See Carolina Power & Light Co. v. Norfolk Southern Ry.*, 7 S.T.B. 235, 250 (2003).

Third, IRR will need to record revenue divisions on any new moves for which UP will choose an IRR routing. For each new traffic move, there will be a new division of revenue. In the SARR world, the division calculation is based on URCS cost; thus, IRR's division presumably will change with changes in origin, destination, car type, or shipment weight. And whether divisions are based on market analysis and negotiation or on URCS calculations, IRR personnel (not UP staff) would have to determine IRR's division. IRR will need someone in Finance and Accounting to calculate the division for new traffic using the approved division methodology.

Fourth, IRR will need to update its revenue accounting system so that it can validate amounts it receives and to monitor results from ISS to be certain that IRR is getting the amount to which it is entitled. IPA has chosen to have IRR use ISS for a substantial portion of its interline traffic (over 540,000 carloads in 2011). As discussed below, administration and monitoring of ISS payments will be a particularly time consuming function for IRR.

Under IPA's proposal, IRR will use the RMI Revenue System to handle messaging with ISS. However, IRR must understand what revenue it is due on every shipment. The only way IRR can know the amount due is to have a solid understanding of the rate governing each shipment and the corresponding revenue that IRR should expect to receive. Thus, it will need to update its "rate master" database so that it can identify the proper rate and fuel surcharge for each shipment handled. In the ISS process, a participating carrier must take exception to a revenue determination within ten days or it is deemed accepted with no further review. If IRR is not up to date on rates and the revenue to which it is entitled under each rate, it runs the risk of losing revenue.

IRR will need to monitor the ISS revenue determinations to make sure that it is receiving the full amount due. IRR could not afford to assume that all ISS revenue determinations are correct. If IRR did not check the ISS revenue determinations, it would risk losing a substantial amount of the revenue to which it is entitled. This is not because UP or any other railroad will be looking to cheat IRR. Rather, data entry errors, misunderstandings, and many other factors can lead to errors.

UP's experience shows that a railroad will sacrifice substantial revenue if it does not monitor its revenues for errors. UP's ISS dispute staff recovers more than { } of the initial billed amount. Table III.D.10 below sets forth the amount of revenue recovered by UP's ISS dispute staff in 2010. Of the more than { } that UP settled through ISS in 2010, over { } was recovered through revenue auditing.

Table III.D.10
UP 2010 ISS Settlements

Initial Billed Amount	Settlement Amount	Variance Amount	Variance Percentage
{ }	{ }	{ }	{ }

Source: UP Reply workpaper "ISS Settlements.pdf."

If IRR did not make similar efforts, it could not count on receiving the full amount of revenue due to it. UP's experience suggests that, assuming IRR interline revenues of approximately $100 million, IRR would lose approximately { } million if it did not engage in ISS revenue auditing. IPA could not expect that UP or any other foreign railroad would perform the auditing validation function for IRR. An assumption that IRR, an independent rail carrier, could rely on its connecting carrier to make the myriad adjustments to divisions and fuel surcharge updates for IRR, rather than performing this vital business function for itself, is clearly a case of shifting costs to UP, amounting to an improper subsidy.

IPA may suggest that monitoring of revenue receipts is unnecessary because errors in IRR's favor will balance any errors against it, but this is not a reasonable assumption. UP and any other railroads involved in a move will diligently look for errors that have reduced their revenue, and they presumably will seek correction of any such errors they identify. Thus, it is unlikely that IRR will be able to retain any substantial revenue resulting from errors in its favor. Moreover, it is highly unlikely that IRR's auditors would accept a failure to audit revenues regularly based on a hope that any errors would balance out.

IRR will have to deal with billing disputes in any event. If UP or another origin carrier bills a shipment at an incorrect rate, the shipper will dispute the rate and the origin carrier will issue a corrected freight bill. That shipment may already have settled through ISS. Settlement corrections to disputed rates are made through an overcharge claims process, which is largely manual. IRR will need to be able to work with its connections to resolve such claims.

Given the volume of price documents and shipments billed, and the frequent need to update the rate database, IRR's assertion that an Assistant Controller could handle all revenue accounting matters in addition to all other accounting tasks is unrealistic.[58] In Mr. Brown's judgment, staffing of this function should include three Revenue Managers. One position should be designated to create and manage freight bills. That individual would also be responsible for assisting with maintenance of IRR's rate database. A second position would have primary responsibility to maintain and manage the rate database and to handle fuel surcharge adjustments, divisions calculations, and accounting for new traffic moves. A third position would have primary responsibility to monitor ISS settlements and claims.

[58] IPA Opening Nar. at III-D-30 to III-D-31.

As suggested by the discussion above, designating only one Revenue Manager to monitor ISS settlements and claims is conservative. Even though ISS billing and review can be automated, a staff person will need to review any discrepancies daily. With over 500,000 overhead shipments per year, even if only 5% of the payments showed discrepancies, the Revenue Manager would need to review 100 bills per day. The Revenue Manager assigned to ISS would also have to oversee the claims process for differences that materialize after settlement. UP and other originating railroads have accurate, automated billing systems, but even a small error rate could result in daily claims that IRR will need to resolve.

UP's real world experience with ISS staffing supports the addition of a Revenue Manager for ISS. Although UP relies more on Rule 11 revenue arrangements (in part to avoid the cumbersome ISS process), it averages about 1.5 million ISS shipments per year, approximately three times as many as for IRR. UP has 23 staff responsible for handling ISS and other interline issues. In addition, UP has a sophisticated computer system to support the ISS function that automates and facilitates the revenue accounting process, ensuring accuracy and improving efficiency. The acquisition of this computer system permitted UP to shrink its revenue accounting staff, including ISS staff, to a fraction of its original size. IRR, which does not provide for such a computer system to support its ISS work, would certainly need at least one person to handle the ISS settlement process.

Accounts Payable

IPA does not provide any separate staff for handling payables, again assuming that the Assistant Controller will handle the workload.[59] While IRR is not a large railroad, it will need to handle a wide variety of functions under the Accounts Payable umbrella. First, someone will

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[59] *Id.* at III-D-30 to III-D-31.

need to verify bills received from vendors. The accounting system will handle the administrative aspects of this process, but a human will need to check with others within the organization to confirm that incoming bills are indeed valid and correct.

In addition, Accounts Payable will handle the timekeeping and payroll functions. UP agrees that the accounting system can handle timekeeping and that Paychex can handle payroll check processing.[60] However, a human will need to make proper inputs into the system. While IRR would not be subject to the complex labor agreements to which most Class I railroads are held, it will still face a wide variety of payroll issues requiring resolution. The railroad retirement system requires reporting on all aspects of employee work status, while withholding for taxes, health care, and other benefits, garnishment, and similar kinds of issues all require some level of human intervention, regardless of how sophisticated the payroll computer system is. Moreover, there will inevitably be questions from employees, and someone must be available to answer these questions.

IRR will also have to cover equipment accounting. As with many of its other technology assumptions, IRR significantly understates the need for human participation in this critical process. IPA assumes IRR will use an RMI car hire system that could track IRR cars off the IRR system and non-IRR cars on the IRR system, and compute charges due IRR from other railroads and IRR's payables to other railroads. However, this system is not automatic. IRR will need someone to manage and coordinate the interfaces and outputs of numerous accounting systems (accounts receivable, accounts payable, tax reporting, journal entries, general ledger account reconciliations, and audit requirements); the physical mailing of reports, payments, statements and collection letters; handling issues involving Railinc, monthly statements to car owners about

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[60] *Id.* at III-D-31.

miles on IRR, and car hire payments; handling of TTX and third-party billing issues; [61] reconciliation of statements from other railroads; and the resolution of discrepancies and data reporting errors. Human effort is particularly important in connection with handling exceptions and adjustments, maintaining files, and responding to audits and external inquiries. A SARR cannot avoid exceptions (such as disputes about number of miles or days a car was on IRR's system); they are the natural result of differences between internal processing and third-party processing. Mr. Brown believes IRR must have at least one position to handle accounts payable, with assistance from the additional Administrative Assistant UP provides.

Purchasing and Budgets

UP agrees that a single manager could adequately perform the Purchasing and Budgeting function of a railroad the size of IRR. This manager would interact with other IRR staff to develop material and supply needs, including fuel for rail operations. This position would handle relationships with vendors and manage the purchasing process to ensure that material flows in an orderly way. The manager would participate in the revenue budgeting process and help track whether IRR's revenue levels were meeting expectations. This position would also have primary responsibility for preparing the IRR budget and managing the budget process throughout the year.

Financial Reporting

IPA assumes that a stand-alone computer system that has financial reporting capabilities is all that is needed to perform financial reporting tasks. However, there must be a human to operate the system, extract data, and plan for the future. In Mr. Brown's judgment, IRR would need a Director of Financial Reporting, who would report to the Controller. This position would

[61] TTX is a railcar and related freight car management service.

handle all the reporting needs of IRR and is consistent with the staffing the Board approved in *WFA I.* In addition, this individual would provide backup for the Treasurer, as well as oversight for the Accounts Payable, Purchasing, and Budgeting functions. This would allow the Assistant Controller to focus on the complex and important revenue accounting process. In addition, the Director of Financial Reporting would have responsibility for interaction with audit and tax personnel. This would include preparing all the necessary data and documentation required by the outside audit firm. The Director of Financial Reporting would also manage the property accounting function, preparing all the inputs that would go to outside contractors and responding to issues and questions. He or she would prepare financial statements for lenders and obtain other information requested by lenders.

(c) Law and Administration Department

UP accepts IPA's staffing and functions for Legal/Claims and Human Resources ("HR").[62] However, in Mr. Brown's judgment, the information technology ("IT") staffing IPA describes would not be adequate to maintain an effective rail operation. IPA provides for an IT Director, a Lead RMI Technician, a Network/Exchange Engineer, an IT Security/Service Manager, two Programmers, and one Help Desk PC Technician.[63]

There are two major deficiencies in IPA's proposed IT staffing. First, while IPA purports to have provided IRR with state of the art systems for a long list of functions, including Operations, Crew Calling, Dispatch, Human Resources and Accounting, it has provided no interface among these systems. In the 21st century, an entity the size of IRR would likely power its computer system using a state of the art integrated platform provided by enterprise software

[62] IPA Opening Nar. at III-D-31 to III-D-32.

[63] *Id.* at III-D-34 to III-D-35.

vendors such as SAP or Oracle. Instead, IPA has chosen to acquire computer systems for each IRR business function as a stand-alone unit. UP recognizes that IRR could function with stand-alone systems for operating, crew calling, dispatch, accounting, and HR functions; therefore, UP accepts these systems at the cost specified by IPA. However, Mr. Brown concludes that IRR would need additional system enhancements to integrate the inputs and outputs of the various stand-alone systems it uses to handle individual tasks. Individual systems must be integrated so that data from one system will flow through to other systems. For example, to have an efficient billing operation, tonnage data from the RMI system must flow through to the accounting system, and to handle the accounts payable function effectively the accounting staff should be able to cross check invoices with an inventory control system. Systems Analysts must write the code to create these system integration processes.[64] If the various data systems were not integrated, IRR would need more personnel to perform the tasks these systems support.

The second major deficiency involves IT support functions. IPA has provided computer support staff only during "normal business hours"; it assumes that a monitored answering machine will handle calls during nights and weekends.[65] However, IRR will operate 24/7/365, with trains operating throughout the day and night every day of the year. These trains will handle service sensitive freight as well as some hazardous commodities. IPA assumes that the IRR system will operate with no redundancy, so even minor computer glitches could halt train operations. IPA's provision of separate systems for a wide range of functions will strain IRR's ability to provide support. In addition, IRR will be relying on modern data applications, including email, smart phones, and tablets, to make employees more productive.

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[64] The two Programmers IPA provides for do not fill this systems integration role. Rather, they are tasked with maintaining and updating the stand-alone systems. *Id.* at III-D-34.

[65] *Id.*

It is unreasonable to assume that such an operation could rely on IT staffers on call to handle emergencies. On-call support through an answering machine arrangement is simply not sufficient. To ensure safe and efficient IRR operations, there needs to be 24/7/365 live coverage for the IT function, so that questions can be answered and issues resolved without delay.

To cover both the development and maintenance of the integration systems and to ensure 24/7 IT support coverage, UP has added two Systems Analysts to the IT function. These two positions, along with the two Programmers and Help Desk Technician specified by IPA and an additional Help Desk Technician for overnight shifts, will be sufficient to provide 24/7 coverage. In addition, Mr. Brown shifts the web design and maintenance functions from the two Programmers to the two Systems Analysts. These six computer professionals would be cross-trained to handle technical questions and issue resolution. Other than the additional Help Desk Technician assigned to overnight shifts, the computer professionals would cover primarily daylight shifts, seven days a week, with occasional overnight shifts.

Along with these six professionals, UP accepts the IT Director and the other IT specialists IPA proposes – the Lead RMI Technician, Network/Exchange 2007 Engineer, and IT Security/Server Manager.[66] Thus, UP provides a total of ten IT positions, compared with IPA's seven positions.

iii. Compensation

UP accepts IPA's proposed salaries and benefits for IRR personnel for all positions below the Vice President level. For positions at the Vice President level and above, UP accepts the use of compensation paid by the similar-sized Providence & Worcester Railroad ("P&W"), as described by IPA. IPA used compensation for executives as listed in P&W's 10-K report for

[66] *Id.* at III-D-34 to III-D-35.

2010. However, IPA used only the base salary column from that schedule to the 10-K report. UP uses the total compensation column in that same schedule to obtain compensation amounts for IRR executives.

Total IRR G&A compensation by functional area is presented in Table III.D.11 below.

Table III.D.11
IRR General & Administrative Salaries

Position	IPA	Reply	Difference
President	$ 432,046	$ 515,153	$ 83,107
Administrative Assistants	$ 90,455	$ 135,681	$ 45,227
Marketing Managers	$ 93,536	$ 187,073	$ 93,536
Vice President - Finance & Accounting	$ 176,089	$ 189,683	$ 13,594
Treasurer	$ 176,089	$ 189,683	$ 13,594
Controller	$ 102,592	$ 102,592	$ -
Asst. Controller	$ 93,782	$ 93,782	$ -
Revenue Managers	$ -	$ 180,580	$ 180,580
Accounts Payable Manager	$ -	$ 60,193	$ 60,193
Manager - Budget and Purchasing	$ 93,782	$ 93,782	$ -
Director Financial Reporting	$ -	$ 93,782	$ 93,782
Vice President - Law and Administration	$ 176,089	$ 189,683	$ 13,594
General Attorney	$ 102,592	$ 102,592	$ -
Manager of Safety and Claims	$ 93,782	$ 93,782	$ -
Director of Human Resources	$ 93,782	$ 93,782	$ -
Manager of Training	$ 93,782	$ 93,782	$ -
Director of Information Technology	$ 93,782	$ 93,782	$ -
IT Specialists	$ 428,557	$ 642,836	$ 214,279
Total	**$ 2,340,737**	**$ 3,152,223**	**$ 811,487**

Source: UP Reply workpaper "IRR Operating Expense Reply.xlsx."

iv. Materials, Supplies, and Equipment

UP accepts IPA's proposed unit costs for the materials and supplies to support IRR employees. UP accepts IPA's designation of three vehicles, but adjusts the unit costs to reflect usage of all-wheel drive ("AWD") vehicles purchased in Provo, Utah.[67] In addition, IPA omitted any fuel and maintenance costs for the company vehicles required by IRR. UP has added those costs.[68] UP's corrections to IRR staffing, discussed above, require a corresponding

[67] Although IPA's opening narrative claims the IRR vehicles are AWD, *id.* at III-D-37, the price quotes in its workpapers are for standard vehicles purchased in Maryland. IPA Opening workpaper "III-D-3 Material and Supplies.pdf."

[68] UP Reply workpaper "IRR Operating Expenses Reply.xlsx."

increase in the total expenditure for materials, supplies, and equipment. Table III.D.12 below summarizes these expenditures.

Table III.D.12
IRR Materials and Supplies

	IPA	Reply	Difference	Percent
Desks, Chairs, Etc.	$ 8,126	$ 11,996	$ 3,870	48%
Copier Maintenance Contracts	$ 864	$ 1,275	$ 411	48%
Utilities	$ 40,000	$ 59,048	$ 19,048	48%
Automobiles	$ 17,128	$ 31,007	$ 13,879	81%
Travel Budgets	$ 120,000	$ 144,000	$ 24,000	20%
Office Supplies	$ 6,406	$ 9,456	$ 3,050	48%
Outside Services	$ 968,155	$ 1,352,925	$ 384,769	40%
Sub Total	$ 1,160,679	$ 1,609,706	$ 449,027	39%
IT Capital	$ 306,666	$ 352,051	$ 45,385	15%
IT Expense	$ 2,396,875	$ 2,396,094	$ (781)	0%
Total	$ 3,864,220	$ 4,357,852	$ 493,632	13%

Source: UP Reply workpaper "IRR Operating Expense Reply.xlsx."

v. Other

(a) IT Systems

IPA claims IRR's operations are similar to or smaller than the SARR operations in *WFA I* and other small SAC cases, and that IRR therefore does not need "colossally expensive mainframe systems."[69] UP agrees that IRR does not need complicated computer and communication systems. However, IRR will need a more comprehensive IT system than IPA provided.

As stated above, IRR will need two Systems Analysts to create the integration processes necessary to coordinate the various stand-alone systems so that data from one system will flow through to other systems. To facilitate the development and maintenance of the systems required

[69] IPA Opening Nar. at III-D-38.

to allow IRR to function in an efficient manner, Mr. Brown concludes that a separate test and development system will be required. This will allow IRR's IT staff to develop new systems without putting the primary system at risk. UP specifies a test and development system identical to the system specified by IPA to run the IRR Network System. The test system also provides for full storage capabilities to permit IRR to back up data generated and maintained by the stand alone systems.[70]

This is a minimal amount of back up. IPA points out that it has back up of its operating system provided by RMI. This is true as far as it goes. But RMI does not back up the data generated by other IRR systems, nor does it provide any back up in the event the IRR main network computer fails. UP accomplishes all of this with test and development system, which could be activated to operate the IRR system in the event of failure of the IRR network computer.

Since each of the IRR applications systems runs on a Dell PowerEdge T710 server, IPA provides a single Dell PowerEdge T710 for back up. UP agrees with this strategy.

IPA has failed to provide for email for IRR employees. Mr. Brown concludes that IRR will need one account for each employee. Email will facilitate communication among employees and permit them to perform HR functions, crew status checks, and other functions. In addition, they will require email to communicate with customers, connecting carriers, vendors, and contractors. In Mr. Brown's judgment, Microsoft Cloud is the most efficient method for providing email service to IRR employees.[71] This will save IRR the expense of owning,

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[70] UP Reply workpaper "IRR IT Systems Reply.xlsx."

[71] Cloud computing delivers traditional software functions as a service rather than a product, providing shared resources, software, and information to computers and other devices over the Internet.

operating, and licensing the software necessary to host email internally. Cloud services for email would cost $585 per month for 175 accounts.[72]

UP accepts IPA's proposals for IRR's transportation, crew management, dispatching, revenue accounting, car accounting, general accounting, and human resources management systems.[73]

UP accepts IPA's proposal for network and router equipment, subject to the additions discussed above.[74]

UP accepts IPA's plan and per unit price for laptops, PCs and printers. UP revises the total number of these units purchased to be consistent with UP's staffing figures.[75]

UP accepts IPA's proposals for voice and data communications, software maintenance, Railinc services, and security software.[76]

(b) Other Out-Sourced Functions

UP accepts IPA's assumption that IRR will outsource some of its functions and accepts most of IPA's proposals on outsourcing, with some revisions. Although IPA recognized the need for an outsourced employee assistance program ("EAP"),[77] it failed to include EAP costs. The only outsourcing cost IPA provided for HR is the cost of payroll services, at $44 per person.

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[72] UP Reply workpaper "Microsoft Cloud.pdf."

[73] IPA Opening Nar. at III-D-39 to III-D-43.

[74] *Id.* at III-D-43.

[75] UP Reply workpaper "IRR Operating Expense Reply.xlsx."

[76] IPA Opening Nar. at III-D-44 to III-D-46.

[77] IPA Opening workpaper "IRR outsourcing.xls."

To account for EAP costs, UP adds $21 per employee per year. This estimate is based on UP's actual EAP expenses for 2010.[78]

IRR provides for outsourcing of some IRR legal services, employing retainers for one law firm in Utah and a second firm for federal matters. UP accepts this approach; however, IPA provides no evidence as to how it developed its cost estimate of $50,000 per year for each retainer. This number is unreasonably low. Even assuming a modest average hourly fee of $250 per hour and no expenses, the proposed retainers would cover only 2,120 hours, or the equivalent of approximately one full-time attorney. Yet this outside legal expense would have to cover specialized legal assistance for a wide variety of legal subjects on which two in-house attorneys could not have the necessary expertise. This would include matters before such regulatory agencies as the Federal Railroad Administration, the Occupational Safety and Health Administration, and the Equal Employment Opportunity Commission. In addition, outside counsel will be needed to advise on state and federal employment, environmental, antitrust, and insurance issues. IRR will also need outside counsel for occasional litigation matters.

According to a 2006 benchmarking study prepared by the consulting firm of Altman Weil, total legal spending as a percent of revenue for firms with less than $250 million in revenue was 0.96%.[79] UP adjusts the percentage downward to { } to reflect the decline in legal spending since 2006.[80] Assuming that IRR's VP Law and one general attorney represent

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[78] UP Reply workpaper "EAP Cost.pdf."

[79] UP Reply workpaper "Altman Weil.pdf," p. 6.

[80] This percentage represents the decline in UP legal spend as a percent of UP revenue during the same time frame. UP Reply workpaper "UP Legal Spend.xls." UP's use of { } is conservative. According to a 2010 study, legal spend for companies with revenues between $350 and $600 million was 0.944% of revenue. UP Reply workpaper "Corporate Executive Board.pdf." Usually, the lower a company's revenues, the higher the percentage of revenue spent on legal expenses. UP Reply workpaper "Altman Weil.pdf," p. 6. Therefore, IRR's

the in house legal spend for IRR, UP estimates the outsourced legal spend to be $530,000, divided evenly between the state and federal retainers.

IPA also includes expense for outsourced equipment inspection. This covers IPA trains that are inspected by IPA's outside contractor. UP concurs with this approach but reduces the total amount paid to the contractor to reflect the reduced coal traffic volume that UP assumes.

UP accepts IPA's estimates for Tax, Audit and Claims.[81]

(c) Start-Up and Training Costs

UP accepts IPA's assumptions on training and initial hiring expense. UP accepts the process IPA used to estimate ongoing restaffing costs. However, UP does not accept the 3% attrition rate IPA assumed. IPA failed to provide supporting evidence for this incredibly low figure. It cited only a training failure rate for MODOC Railroad Academy – not at all the same as an attrition rate over time after employees are trained.[82]

Mr. Brown reviewed UP's attrition rates by category of employee and uses that data to estimate attrition that IRR will experience. UP's actual attrition rates for categories of employees used by IRR range from 4.3% to 7.8%. Applying these rates to its adjusted IRR staffing levels, UP calculates that restaffing costs would be $154,167 per year compared to IPA's proposal of $54,745.[83]

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percentage of revenue spent on legal expenses likely would be higher than even the 0.944% figure, let alone the { } UP proposes.

[81] All of these calculations can be seen in UP Reply workpaper "IRR Operating Expense Reply.xlsx," Tab "Outsourcing."

[82] IPA Opening Nar. at III-D-49.

[83] UP Reply workpaper "IRR Operating Expense Reply.xlsx."

vi. Travel Expense

UP accepts IPA's proposed travel expense calculation of $8,000 per employee at the manager level and higher, and for the three outside members of the Board of Directors. However, Mr. Brown believes the Assistant Controller is a manager level position that requires travel and has applied the travel expense to that position. In addition, UP adds the travel expense for the two additional manager level employees UP has added to IRR's G&A staff: a second Marketing Manager and an Accounts Payable Manager. This results in a total travel expense of $120,000 for 15 G&A employees, or $24,000 more than IRR's travel expense for 12 G&A employees.[84]

4. Maintenance-of-Way

UP's maintenance-of-way ("MOW") plan for IRR was developed by David Hughes.[85] Mr. Hughes has over 30 years of experience as a professional engineer in the fields of railroad engineering, railroad operations, and maintenance supervision. He has substantial experience with small regional freight railroads, as well as larger railroads.

Mr. Hughes has experience with a broad range of railroads. Early in his career, Mr. Hughes held numerous positions in the Engineering Department of Southern Pacific Railroad, including as a General Track Foreman in Utah. As a General Track Foreman, he inspected track for defects and either personally made repairs or scheduled the repairs by a maintenance gang. He also supervised the work of section gangs, smoothing gangs, and welders. In addition, Mr. Hughes served as Bridge and Building Supervisor in Houston, Texas. As a

[84] *Id.*

[85] Mr. Hughes' detailed Statement of Qualifications is set forth in Part IV.

Bridge and Building Supervisor, he was personally responsible for performing annual bridge inspections and prioritizing bridge maintenance.

Mr. Hughes later served as Vice President of Engineering for the Boston and Maine Railroad ("B&M"), where he was responsible for all track structures and signal systems maintenance, and for planning the reconfiguration and reconstruction of 155 route miles of mainline. B&M's size and traffic density were similar to those of IRR.[86] As B&M was in bankruptcy reorganization when Mr. Hughes was chief engineer, he gained valuable experience in effectively maintaining track and structures at the lowest possible cost.

After leaving B&M, Mr. Hughes served as President of Pandrol, Inc. (a manufacturer of track fastening systems) and Speno Rail Services (a railroad track maintenance contractor), where he assisted railroads in developing high-performance track components and mechanized rail and ballast maintenance practices. In those positions, he spent extensive time in the field observing maintenance problems first hand and devising solutions to those problems.

Mr. Hughes has also served as President of the Bangor & Aroostook Railroad, Chief Engineer for the National Railway Passenger Corporation ("Amtrak"), and Acting President and Chief Executive Officer of Amtrak.

Mr. Hughes has also had a long career as a consultant in the rail industry. As a consultant, Mr. Hughes has performed due diligence reviews of dozens of MOW plans for lines being spun off by Class I railroads or being bought or sold by private parties. These reviews generally involved hi-rail inspection trips over lines and interviews with MOW officials regarding their MOW maintenance organizations and plans for maintaining the lines. Through the due diligence reviews, Mr. Hughes gained extensive familiarity with the MOW practices of

[86] B&M was sold to Guilford Transportation Industries in 1981.

non-union railroads. These reviews, performed for financial institutions and borrowers, are an ongoing part of his work, allowing him to keep up to date with the most recent MOW practices. Mr. Hughes' testimony addresses the reasonableness of IPA's MOW assumptions and the need to consider real-world evidence in evaluating IPA's MOW plan.

a. General Approach to Developing the MOW Plan

Mr. Hughes' MOW plan for IRR follows the precepts approved by the Board in prior SAC cases. In developing his MOW plan for IRR, Mr. Hughes gave particular attention to the Board's discussion of the SARR MOW plan in *WFA I*, which involved an SARR similar in size to IRR.

Mr. Hughes analyzed IPA's MOW evidence and developed an IRR MOW organization from the ground up, taking into account UP practice only when it related to a maintenance task specific to the IRR lines.[87] He called heavily on knowledge and insights gained while performing MOW due diligence studies related to investments in non-union regional and shortline railroads. The labor and equipment resources he proposes are closely aligned with the practices of shortline and regional railroads, adjusted for the increased magnitude of the MOW task on the higher density, more demanding mainlines on the IRR system.

i. Conditions on the IRR Lines

Mr. Hughes carefully reviewed IPA's proposed MOW plan for IRR and carefully evaluated the existing territory and lines covered by IRR. In September 2011, he took a three day hi-rail inspection trip of the lines from Price to Provo and Provo to Delta (located on UP's Lynndyl Subdivision). During the inspection trip Mr. Hughes interviewed UP managers of track,

[87] Extraordinary ditch cleaning and curve maintenance requirements are examples of maintenance tasks for which IRR will have special needs, as explained below.

signal, and bridge maintenance on these lines to get a first-hand understanding of the day-to-day work that must be performed to keep the railroad functioning adequately and of the unique characteristics of the lines included in IRR. His summary of the conditions on each track segment is set out below.

The Lynndyl Subdivision from Milford (MP 577) through Delta and Lynndyl (MP 666) is 89 miles of generally flat and straight railroad with infrequent curves of less than three degrees. The subgrade is well drained and stable. Taken together, the characteristics of the Lynndyl Subdivision create no special challenges for maintaining a railroad moving the approximately 33 MGT of traffic per year that IRR is assumed to move over this territory.

The characteristics of the Sharp Subdivision change as the line goes from Lynndyl (MP 666) to Provo (MP 750). From Lynndyl to Martmar (MP 676), the line is generally flat with few curves. From Martmar to Juab (MP 690), the line follows the Sevier River valley with curves generally in the three to six degree range on a water grade. The railroad closely parallels the Sevier River and crosses it nine times. The area was flooded in 2010, requiring an estimated $500,000 in repairs to restore track and roadbed. Over the years, this area has been subject to less severe seasonal flooding, requiring spot bank repair and increased track maintenance along the line. From Juab to Ironton (MP 750), the line has intermittent curves of up to six degrees interspersed with long tangents. The maximum gradient on this stretch is one percent.

The Provo and Green River Subdivisions, which include IRR's lines from Provo and Price (MP 619), consist of extremely challenging railroading territory, including the 7,428-foot high mountain pass at Soldier Summit. The conditions on these Subdivisions sharply contrast with the mostly benign environment on the Lynndyl and Sharp Subdivisions. The assumed IRR traffic density of approximately 15 MGT per year is half that on the Lynndyl Subdivision, but the axle loads associated with the unit trains of coal that IRR would move over these lines, the train lengths, the terrain, and the weather combine to make this an extremely high territory with specialized maintenance needs.

From Ironton (MP 699) to MP 688, the line runs through the Utah Valley, a broad valley between mountain ranges with curves under three degrees and grades under one percent. Starting from MP 688, however, the grade and curvature increase toward Soldier Summit (MP 651), with 3.5 miles of curves greater than six degrees and 2.4 miles of curves between eight and ten degrees on two percent gradients.[88] These stretches of track present unusual maintenance challenges.[89]

In addition to the extreme curvature and steep grades, this area experiences constant rock slides. To protect the track from these slides, UP has installed almost two miles of slide detector fences between MP 683 and MP 623, covering eight stretches of track. These fences are connected to the signal system; if a rock slide breaks the detector fence wires, a restrictive signal is displayed, advising passing trains to operate at restricted speed.[90] Rock slides on this portion of track are so pervasive that cuts in some areas must be cleaned several times per year,

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[88] UP's workpapers contain topographical maps that help illustrate the extreme conditions. UP Reply workpaper "IPA_SARR Topo.pdf."

[89] On mainline railroads, curvature over eight degrees is extremely rare; they typically have no more than one short curve over eight degrees per 100 miles, even in mountainous territory. Even curvature greater than six degrees is very infrequent on mainline railroads in mountainous territory. In fact, curvature between three and six degrees is considered sharp curvature. Curves over three degrees require high maintenance (including lubrication) to maintain proper track geometry and lubrication of curves to avoid high rail wear.

[90] Restricted speed is 20 mph or less. Trains must be prepared to stop short of a blockage of the track. Photographs of this area that show the fencing and the result of rock slides are included in UP Reply workpaper "IRR MOW Photographs.pdf."

necessitating a year-round ditch cleaning operation that is supplemented periodically with use of a contracted Herzog Multipurpose Machine.

From approximately MP 671 to Soldier Summit, there is a parallel access road that provides access to track and trains for maintenance and emergencies. UP maintains and keeps this road open year round.

From MP 688 to MP 665, the Soldier River meanders adjacent to the embankment on which the track lies, which results in occasional high water incidents and associated erosion of the embankment. In 2010, there were several serious high water incidents that resulted in washouts of the embankment in three locations and incursion into the track, halting railroad operations temporarily. These washouts were classified as casualty losses. Other years, less significant high-water damage has been handled as operating expense.

From Soldier Summit to Helper (MP 626), grades are again in excess of two percent, with 6.7 miles of curves over six degrees and 4.2 miles of extreme curvature over eight degrees.[91] As noted above, such portions of the track present special maintenance challenges. The geology in this stretch is similar to that between MP 688 and Soldier Summit, though slide detector fences are less frequent, and frequency of required ditch cleaning is slightly lower. Between Helper and CV Spur (MP 616), curvature and gradient are unexceptional.

Winter conditions reduce capital maintenance activity on the UP lines replicated by IRR from MP 688 to Helper for almost five months, between late November and mid-April, with up to 18 feet of snow on Soldier Summit. Elsewhere, the lines commonly receive four to five feet of snow per year, and weather prevents certain track-related maintenance for three to four

[91] UP Reply workpaper "IRR Track Summary with UP Additions.xlsx," Tab "Curves."

months per year. During that time, snow removal is a major and expensive activity on this line, along with addressing increased rail failures due to cold weather.

ii. Factors Affecting IRR's MOW Needs

Without careful assessment of the particular maintenance challenges that IRR will face, it is impossible to devise a feasible MOW plan for the SARR. In Mr. Hughes' judgment, IPA's proposed MOW plan fails to address many of these particular challenges. Mr. Davis, IPA's MOW witness, has failed to recognize critical maintenance needs and has provided for resources that are insufficient to address those needs. If Mr. Hughes were performing due diligence for a client looking to acquire the IRR lines, he would never rely on a MOW analysis as obviously incomplete and unfeasible as the one provided by IPA.

IPA describes four factors that Mr. Davis considered in developing the IRR field MOW organization: the railroad's geographic scope (route miles), track miles, and peak-year traffic volume measured by the gross tons traversing each line segment, and the distances that field forces must travel to cover their assigned territory.[92]

The four factors IPA lists are relevant, but they are not at all sufficient for analyzing the necessary maintenance resources for IRR. There are eight other important factors that are key to understanding the MOW workload and resulting resource requirements of IRR. Those factors, discussed below, are: curvature, track gradients, type of cross ties, number of mainline switches, weather conditions, geotechnical conditions, signal equipment, and natural features. Three of these factors – extent and severity of curvature, the use of wooden ties, and geotechnical conditions – are especially critical in developing an MOW plan for IRR, especially for the eastern end of IRR, where IRR's coal trains operate.

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[92] IPA Opening Nar. at III-D-55.

The length of curved track and the severity of curvature. The length of curved track is an important measure of the quantity of track that will require more frequent maintenance. The more severe the curvature, the greater the added maintenance per mile of track to maintain the track gage, surface, and alignment.

The extent and severity of curvature on IRR are extraordinary. IRR has 100 times more extreme curvature, 16 times more severe curvature, and three times more sharp curvature than would be expected on a normal railroad with normal maintenance requirements.[93] That curvature is concentrated on the portion of IRR from MP 688 over Soldier Summit to Helper, with a small portion on the Sharp Subdivision. Sharp curves make up 9.4% of IRR track, severe curves make up 4.8% of IRR track, and extreme curves make up 3.0% of IRR track.[94] These high degree curves (over three degrees) require many times more surfacing, alignment, gaging, lubrication, grinding, and rail and tie renewal than common curves and tangents. The sharper the curvature, the greater the maintenance requirement. As IPA recognizes, though without mention of the extent or severity of curvature on IRR, "[m]ost surfacing and lining takes place in areas featuring the highest number of curves."[95]

Wood ties. The high lateral forces that are generated in sharp curves will cut the life of wooden ties between MP 688 and Helper to between one third and one quarter of tie life elsewhere on the IRR system. Even though IPA employs Pandrol clips, tie plates, and screw spikes, tie life in these curves will be seven to ten years, compared to 25 years elsewhere on the

[93] UP Reply workpaper "Analysis of Curvature.pdf"; UP Reply workpaper "IRR Track Summary with UP Additions.xlsx," Tabs "Analysis of Track Geometry" & "Curves."

[94] As noted above, "sharp" curves have between three and six degrees of curvature; "severe" curves have between six and eight degrees of curvature, and "extreme" curves have more than eight degrees of curvature.

[95] IPA Opening Nar. at III-D-62.

IRR system.[96] Between major tie renewal cycles, constant track gaging with spot installation of ties will be required.

Track gradient. The track gradient is the main determinant of the amount of traction and braking forces on the track. High traction and braking forces work to shift track longitudinally (and in extreme cases, laterally), causing rail pull-aparts and bunching of track (leading to track buckles), both of which increase track maintenance.

Number of mainline switches. Mainline switches are among the highest maintenance items in the track. They require frequent inspection and adjustment and must be welded from time to time to maintain a smooth running surface. In signaled territory, they may also have insulated joints that require maintenance and replacement.

Weather conditions. Weather conditions determine the amount of moisture and range of temperatures to which the track is exposed. Heavy snow, as is common in IRR territory, requires switches to be fitted with switch heaters or cold air blowers to prevent snow from rendering switch points inoperable. Snow removal equipment requires routine servicing and maintenance. Other snow fighting operations include clearing yards and roads of snow and sometimes clearing the mainline. Soldier Summit has received as much as 18 feet of snow in a single season, and average snowfall is almost ten feet.[97] Other areas on IRR lines commonly receive four to five feet of snow per year.

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[96] Mr. Hughes' opinion regarding tie life is based partly on his experience as chief engineer of B&M and an early adopter of Pandrol clips in the late 1970s on the Fitchburg mainline of the B&M, a line carrying 20 MGT, close to the 15 MGT that IRR will move over the Provo Subdivision. His opinion is also supported by his field experience working with railroad MOW customers as president of Pandrol for five years.

[97] Western Regional Climate Center data, *available at* http://www.wrcc.dri.edu/cgi-bin/cliMONtsnf.pl?utsold.

Geotechnical conditions. The geotechnical conditions between MP 688 and Helper on the Provo Subdivision are some of the most unusual conditions found in mountain railroads. Much of the material above the track on the side hill cut is a conglomerate material made up of boulders interspersed with finer material with a small amount of clay binder that is easily washed out. The finer material continuously weathers away, exposing more and more of the boulders until the boulders finally fall, sometimes from high altitudes, down the slopes and onto the track. As noted above, UP has placed slide detector fences in locations where these events occur most frequently. These detector fences are connected to the railroad signal system, so trains receive early warning of possible track blockages ahead.

Maintenance of the track under these conditions requires constant cleaning of both ditches behind slide detector fences and ditches without slide detectors, principally in the 62 miles between MP 688 and Helper. UP cleans some cuts six times per year to keep them clear and to provide a landing place for falling material. If the ditches are not kept clean, falling material would spill over the clogged ditch onto the track.[98]

The type, location and amount of signal equipment to be maintained. The type and amount of signal equipment, the travel time between equipment locations, and the experience and skill of the maintainers determine the requirement for signal maintainers. Even on lines without train movement control signals, there are signal protected highway grade crossings that require testing and maintenance.

Natural features. Any MOW plan must account for natural hazards that may cause service outages. For example, IRR is subject to seasonal flooding on the Provo Subdivision

[98] UP Reply workpaper "IRR MOW Photographs.pdf" (photographs of line conditions).

between MP 688 and MP 660 and on the Sharp Subdivision between Martmar (MP 676) and Juab (MP 690).

In contrast to Mr. Davis' MOW plan, which fails to take into account all relevant factors, Mr. Hughes' MOW plan is based on a detailed assessment of all of the factors discussed above, including the projected traffic densities, physical conditions, and extraordinary curvature, geotechnical, and weather conditions that exist on IRR. His plan is specifically tailored to the maintenance needs of the various line segments.

b. MOW Personnel

UP's plan for the IRR's MOW personnel (employee) requirements, as compared to IPA's plan, is summarized in Table III.D.13 below.

Table III.D.13
IRR MOW Personnel

Position	IPA No. of Employees	UP No. of Employees
HQ Office/Supervisory (based at Lynndyl)		
Track Engineer	1	1
Project Engineer	0	1
Compliance Engineer	0	1
Communications & Signals Engineer	1	1
Bridge Engineer	1	1
Engineer of Budgets, Safety & Training	1	0
Resource Coordinator	0	1
Subtotal	4	6
Field		
Roadmasters	2	2
Assistant Roadmasters	3	3
Track Crew Foremen	4	4
Track Crew Members	8	12
Curve lubricator repairman	0	1
Roadway Machine Operators (maintenance)	4	6
Welders/Helpers/Grinders	4	5
Roadway Equipment Mechanic	1	1
Smoothing Crew Foreman	1	2
Smoothing Crew Member/Machine Operator	1	4
C&S Supervisor	1	1
Signal Maintainers	3	7
Signal Technician/Inspector	0	1
Communications Technician	1	1
Communications Maintainer	1	1
B &B Supervisor	1	1
B &B Inspector	1	1
B&B Machine Operator (bridge crane)	1	1
B &B Foreman	1	1
B &B Carpenter/Helper & Water Service	1	1
Subtotal	39	56
Total	**43**	**62**
Track miles per MOW employee	7.2	5.0

Source: UP Reply workpaper "UP MOW Costs.xlsx."

Mr. Hughes' MOW plan results in a ratio of 5.0 track miles per MOW employee, an even leaner organization than the 4.0 track miles per MOW employee plan adopted by the Board in

WFA I.[99] By contrast, IPA's MOW plan reflects a ratio of 7.2 track miles per MOW employee. IPA's high ratio of track miles maintained to MOW employees compared to *WFA I* and UP's MOW plan reflects Mr. Davis' failure to account for all of the maintenance tasks that must be performed and to provide the manpower to perform them. Stated simply, Mr. Davis's MOW plan is not feasible for a railroad with the characteristics of the IRR system.

c. MOW Organization by Function

Mr. Hughes' judgment concerning the proper staffing for IRR's field MOW organization is guided by the eleven factors enumerated in Section III.D.4.b. The general office MOW staff (which reports to the Chief Engineer) provides adequate supervisory and administrative support to the field forces, prepares the annual MOW budget and supervises contractors in their performance of MOW work. The field and office support personnel requirements of each MOW function are discussed below.

i. Track Department

As noted above, Mr. Davis' plan fails to take into account the additional maintenance IRR track will require due in large part to: (a) the extraordinary curvature of IRR's lines, which necessitates higher levels of track surfacing and gaging, lubrication and general maintenance; (b) the unstable geotechnical conditions along IRR's lines, which will require IRR to engage in constant maintenance activities; and (c) extreme weather, which will burden the performance of work and restrict the movement of MOW forces on IRR. Taking these factors into account, Mr. Hughes recommends that IRR's Track Department consist of 42 employees, organized into the positions shown in Table III.D.14 below. Mr. Hughes' provision for 42 track employees (13

[99] *WFA I*, slip op. at 57, Table C-6.

more employees than Mr. Davis provides) is similar to the total of 54 track employees that the Board accepted when it adopted the shippers' extremely lean MOW plan in *WFA I.*[100]

The annual compensation associated with each position in UP's MOW plan is consistent with the compensation assumed in IPA's MOW plan.

Table III.D.14
IRR Track Employees

Position	**No. of Employees**	**Comp. Per Employee**	**Total Comp.**
Track Engineer	1	$102,592	$ 102,592
Projects Engineer	1	$ 93,536	$ 93,536
Roadmasters	2	$ 93,536	$ 187,073
Assistant Roadmasters	3	$ 79,391	$ 238,174
Track Crew Foremen	4	$ 65,097	$ 260,388
Track Crew Members	12	$ 49,673	$ 596,071
Curve lubricator repairman	1	$ 56,775	$ 56,775
Roadway Machine Operators (maintenance)	6	$ 56,775	$ 340,651
Welders/Helpers/Grinders	5	$ 58,481	$ 292,403
Roadway Equipment Mechanic	1	$ 58,481	$ 58,481
Smoothing Crew Foreman	2	$ 65,097	$ 130,194
Smoothing Crew Member/Machine Operator	4	$ 56,775	$ 227,101
Total:	42	–	$ 2,583,440

Source: UP Reply workpaper "UP MOW Costs.xlsx."

General Office Staff. UP agrees with IPA that the IRR Track Department should be headed by the Track Engineer.[101] This individual is responsible for maintaining all IRR track and ensuring that the track operating and capital budget are properly prepared, overall management of the track maintenance program, supervision of the Project Engineer and

[100] *WFA I*, slip op. at 60.

[101] IPA Opening Nar. at III-D-56.

Roadmasters, and ensuring that his function is in compliance with applicable company and regulatory requirements.

Roadmasters and Assistant Roadmasters. The Roadmasters are IRR's principal field track maintenance supervisors. They are responsible for day-to-day track maintenance in assigned geographic districts. There will be two roadmaster districts for IRR, each headed by a Roadmaster. The specific territories, for which each Roadmaster is responsible, by subdivision and milepost, are shown in Table III.D.15 below.

Table III.D.15
Roadmaster Territories

Roadmaster Territory	Route Miles	Track Miles	Territory
1	118.1	139.9	Includes Pleasant Valley Branch, CV Spur, all of Green River Sub main track, Provo Sub main track and between Provo and the East Switch at Payson (MP 737.1) on the Sharp Sub.
2	160.6	189.9	Includes the IRR portion of the IPP Industrial Lead, all of the Lynndyl Sub main track and between Lynndyl and the East Switch at Payson (MP 737.1) on the Sharp Sub.
Total	278.7	329.8	

The sole difference between these territories and those proposed by IPA is that the dividing point between the two territories is MP 713 (on the Sharp Subdivision) in the IPA plan and at the East Switch at Payson (MP 737.1) in UP's plan.[102] In Mr. Hughes' judgment, his division of the territories will better balance the workload.

Territory 1 is shorter than proposed by IPA, reflecting the additional maintenance that will be required for the more difficult terrain, greater curvature, more extreme weather and

[102] IPA Opening Nar. at III-D-57.

grades on the route traversing Soldier Summit. Territory 2 is longer, reflecting the lower maintenance requirements of the largely straight, flat track of the Lynndyl and Sharp Subdivisions.

Mr. Hughes accepts Mr. Davis' plan to have three Assistant Roadmasters perform track inspection Monday, Tuesday, Thursday and Friday.[103] However, Mr. Hughes does not accept Mr. Davis' claim that these Assistant Roadmasters could perform substantial additional tasks on the Wednesdays that they are not inspecting track. No doubt they could help organize vehicle maintenance and do other odd jobs that come up on Wednesday or that can wait until Wednesday, but realistically, the Roadmaster cannot rely upon them for help with important matters. That leaves a broad range of activities that must be accomplished without anyone designated in the IPA plan to perform them. Mr. Hughes therefore provides the additional position of Projects Engineer to support the Track Engineer and the Roadmasters by handling the preparations and logistics for and supervising the various inspection and contract maintenance activities such as rail grinding, vegetation control, ultrasonic rail inspection, track geometry testing, track strength testing, and switch inspections. Combined, these activities would take about half of the time of the Projects Engineer. The remaining time would be used handling preparations and logistics for capital programs and supporting the Track Engineer and Roadmaster in developing capital programs and working with state and local road agencies and public utility companies on public works projects and utility crossings. This constant stream of activities is much too time consuming for either the Engineer of Track or the Roadmasters to accomplish.

[103] *Id.*

Track Crews. UP and IPA both provide for four track crews. However, the three-person track crews proposed by IPA are undersized and underequipped for a mainline railroad like IRR.[104]

Mr. Hughes provides for four-person track maintenance crews, consistent with the crew sizes agreed upon by the parties and accepted by the Board in *WFA I.*[105] IPA assumes, and Mr. Hughes agrees, that in the case of IRR, track maintenance can be done between trains without adding to track capacity, but only if those crews are fully equipped and fully manned mainline track maintenance crews. To successfully work between trains in a mainline environment, it is important that track crews are able to move in, complete their work quickly, and move out. The three-person crews with a light duty maintenance truck (discussed below) proposed by Mr. Davis are more appropriate for branch line maintenance, where more track occupancy time is available for maintenance. Mr. Davis asserts that the availability of a backhoe and dump truck mitigates the need for additional forces.[106] Mr. Hughes believes that a backhoe and dump truck are essential resources for a properly equipped roadmaster territory and help the Roadmaster maintain the territory with only two crews, but they are not a substitute for an adequate number of men on each track crew.

Mr. Hughes also provides for one Curve Lubricator Maintainer position. IPA's plan calls on track maintenance crews to maintain curve lubricators. On Roadmaster Territory 2, where there are just 41 curve lubricators clustered together on the west end of the Sharp Subdivision and no curve lubricators on the Lynndyl Subdivision, the track maintenance crews can

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[104] *Id.* at III-D-58.

[105] *WFI I*, slip op. at 58.

[106] IPA Opening Nar. at III-D-59.

reasonably maintain the curve lubricators. However, on Roadmaster Territory 1, where there are 225 curve lubricators, many protecting severe to extreme curves, the addition of a curve lubricator maintainer is necessary. Even short-term outages of a curve lubricator in this territory can have serious rail wear consequences in areas of extreme and severe curvature.

IPA argues that maintenance crews can take on the work of a curve lubricator repairman. However, experience has shown that curve lubricators maintained by section forces gradually fall into disrepair because curve lubricator maintenance has lower priority than broken rails and other urgent work performed by track maintenance crews. For IRR, Mr. Hughes has chosen a middle road, employing a curve lubricator repairman on Roadmaster Territory 1, where there are 225 lubricators, many protecting extreme curves, and relying on the maintenance forces on Roadmaster Territory 2, where there are only 41 lubricators and no extreme curvature.

In addition to under-manning his track crews, Mr. Davis has equipped them with a light duty maintenance truck that is more appropriate for branch line maintenance than the mainline maintenance activities that will be required on IRR.

Mr. Davis' proposed gang truck is based on an F650 or F750 chassis (IPA does not specify which) with an articulated crane of unspecified capacity.[107] This truck is a light duty track gang truck with limited capacity and flexibility that makes it relatively slow in performing maintenance tasks. Mr. Davis says that the truck will "allow the crew to load 39 foot rails, frogs, switch points, switch ties, cross ties and other materials necessary to perform track maintenance."[108] But contrary to Mr. Davis' assessment, the truck he selected can neither lift

[107] IPA Opening workpaper "MOW Costs Final.xlsx," Tab "Annual MOW Equipment Cost," cells U23 & Y23.

[108] IPA Opening Nar. at III-D-85.

nor carry a #15 frog weighing 7,100 pounds,[109] and its capacity to handle other track material is highly limited, though the degree of disability is uncertain since Mr. Davis is unclear about the vehicle and equipment he is proposing. The F650 and F750 chassis he proposes are medium duty truck chassis with a gross vehicle weight rating ("GVWR") of 26,000 pounds to 37,000 pounds, depending on the model.[110] Normally, light gang trucks in this GVWR range can carry only a 19.5-foot rail plug or at most a single 39-foot rail for repairing broken rails, and their carrying capacity for ties and other track material is quite restricted because the weight of a crane, utility body, lift gate, tools, crew, fuel, and other equipment that they must carry consumes most of the vehicle's carrying capacity.[111]

On the other hand, a full-function mainline track maintenance truck, such as UP specification 8606,[112] requires at least a heavy duty 54,000-pound GVWR chassis. Many Class I railroad mainline gang trucks are built on even heavier chassis. The advantage of the full-function gang truck is the ability to carry a reasonable amount of track material plus two rails

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[109] Delivery of a #15 rail bound manganese frog would require a tractor with a 40-foot trailer. Need for a tractor-trailer is infrequent, and it would be hired on the few occasions when it is necessary.

[110] GVWR is the maximum total weight of a vehicle when loaded, including passengers, fuel, equipment and material.

[111] For example, the GM5500 chassis has a 26,000-pound GVWR. with a 15,100-pound empty weight, leaving a 10,900-pound available payload. The upfit equipment (*i.e.*, the utility body, crane, and all of the equipment and supplies that are added to the bare truck chassis) adds over 8,200 pounds, leaving only 2,700 pounds for material. A single 132 pound, 30-foot switch point that the truck would frequently need to carry weighs 2,730 pounds, meaning the truck would be overloaded even if it did not carry a single spike, tie plate, angle bar or bold, and most trucks always carry approximately 1,000 pounds of these items to perform routine maintenance.

[112] For specification, see UP Reply workpaper "UP MOW Vehicle Spec Report.xlsx," Tab "Track Gang Truck with Crane."

overhead to facilitate rail replacement behind the ultrasonic rail inspection car[113] and to support a larger crane that can handle heavy materials at greater boom extension distances and wider boom angles. The higher capacity crane shortens the time required to perform maintenance tasks. While a crane sized for a lighter truck might be able to lift a particular load, it could not lift it at the boom angles and distances required to work quickly and efficiently. Railroads have moved more and more to heavier vehicles on mainlines in recent years because of the flexibility and capacity they provide. Even with a high GVWR chassis, overloading is a common problem, and railroads have been fined for operating these vehicles overloaded on highways.

Roadway Machine Operators. Mr. Hughes has provided for six roadway machine operators for general maintenance, two more than are specified in IPA's plan.[114] As in IPA's plan, Mr. Hughes assigns one operator to each of two backhoes, with one backhoe assigned to each roadmaster district. The two roadway machine operators operate the excavator and a Prentice loader, as in the IPA plan. The two additional roadway machine operators provided in Mr. Hughes' plan operate a second Prentice Loader and the rotary dump truck, for which IPA provided no operator.

In Mr. Hughes' judgment, IPA's provision for only one Prentice loader truck would be inadequate in view of the distances and driving times and the severe weather on IRR. Road connections between the Lynndyl Subdivision and the Provo Subdivision run through mountains and are circuitous. Much of the work of the Prentice loader trucks will be in the winter when rail

[113] It is common for the detector car to find far more defective rails in a day than a track gang can replace in a day. Replacing defective rails discovered with the detector car may take two to three weeks after the detector car has left the district. A large truck can do this work much more quickly than a truck of limited capacity.

[114] IPA Opening Nar. at III-D-59. Additional machine operators are assigned for other maintenance functions, such as smoothing crews and a gaging crew. Track crew members who operate a Hi-rail Boom Truck, are not considered machine operators.

failures and switch component failures are higher and when travel times are often longer due to snow or ice.

In Mr. Hughes' judgment, one Prentice loader truck (the key vehicle for material handling) must be available for material distribution and to respond to emergencies in each Roadmaster Territory.

UP and IPA both assign a hi-rail, rotary dump truck to work with the excavator, which is used to maintain IRR's ditches. The dump truck is also used to transport ballast, crushed rock or other materials needed for various MOW activities. The IPA MOW plan does not include a separate operator for the rotary dump truck. In Mr. Hughes' judgment, an efficient material handling operation requires a separate operator to position the truck for loading, maneuver the truck, and drive it to and from an unloading site. When the rotary dump is at the work site, the rotary driver repositions the truck for loading as the excavator moves ahead. When the truck is loaded, the driver takes it to the end of the cut and dumps the load. While the truck is gone from the worksite, the excavator operator continues working on slope grading and staging material for quick loading when the truck returns. A separate operator is particularly needed if the truck is occupying the main track while being loaded. A separate operator is also needed when moving the equipment between work sites along the track as a single operator cannot move both machines. Moreover, one-man heavy equipment operations adjacent to mainline track operations, and in an isolated area, is simply a poor safety practice.

IPA suggests that the combination of the excavator, rotary dump and roadmaster backhoes would be adequate to keep the ditches clean.[115] Based on his discussion with UP's local Roadmaster and UP's Manager of Track Maintenance covering the Provo Subdivision,

[115] IPA Opening Nar. at III-D-59.

Mr. Hughes has concluded that this equipment would not be adequate to keep IRR's ditches clean. Currently, UP uses a similar complement of equipment with even more ditch cleaning capacity on a full-time basis to clean ditches on both sides of Soldier Summit, but this has not been adequate to keep the ditches clean without use of a special purpose contract ditch cleaner.

IPA simply underestimates the magnitude of the ditch cleaning task on IRR. IPA asserts that "much of the UP roadbed underlying the lines being replicated by IRR is on fill or embankment with no parallel ditches except in cut sections. Thus, much of the IRR route does not feature ditches that need cleaning or repairing."[116] However, a large proportion of IRR between MP 688 and Helper is built on side hill cuts where one slope rises high above the railroad and there is fill on the down slope side of the track.[117] The side hill cut slopes throughout the MP 688 to Helper section are highly unstable. It is in these unstable side hill cuts where extensive ditch cleaning is required. As discussed in more detail below in the section on non-program MOW work performed by contractors, Mr. Hughes concluded that to adequately maintain the ditches for IRR, full-time use of an excavator or bucket loader is required, as is use of a special purpose rail mounted ditching machine for approximately 60 days per year.[118]

Welder/Helpers/Grinders. The IPA MOW plan for IRR employs two, two-person welding crews, one for each of the two roadmaster districts.[119] Mr. Hughes concurs that one welding crew for each roadmaster district is adequate, considering the gross tonnage over the lines and the number of turnouts to be maintained. However, he provides for a three-person crew in Roadmaster Territory 1. Due to high fire hazard during most of the year in Roadmaster

[116] *Id.*

[117] UP Reply workpaper "IRR MOW Photographs.pdf."

[118] UP Reply workpaper "MOW Costs Final.xlsx," Tab "UP Annual MOW Equipment Cost."

[119] IPA Opening Nar. at III-D-60.

Territory 1, a third person (designated a fire watcher) is assigned solely to observe hot work and the resultant hot material and ensure that products of hot work do not become airborne. The welding crew may take other fire mitigation steps, including full tenting of a hot work site, if dictated by the fire risk assessment.

In making his judgment about proper staffing, Mr. Hughes considered UP's current practice for lines in this territory. UP's required fire mitigation actions will depend on the results of a Fire Risk Assessment of 13 factors that must be assessed prior to starting work at each work site.[120] The Risk Assessment results in a numerical score. A score of 33-54 signifies low risk of fire, as when the ground is covered with snow. A score of 55-69 signifies a moderate risk of fire, reflecting conditions such as precipitation within the three previous days and humidity between 25% and 50%. A Fire Risk Assessment score above 70 signifies high fire risk, based on conditions such as low humidity, high temperature, and no precipitation within three days. If the fire risk is determined to be moderate or high, a fire watcher is required, along with other preventive measures. Except during the winter months when the ground is snow covered, risk on the Provo Subdivision is almost always high or moderate, requiring a fire watcher.

UP adopted these fire prevention measures as a response to fire incidents that resulted in large property losses and liability claims. While IRR would not be obligated to adopt the same policies, Mr. Hughes believes that if IRR management ignores the lessons of experience, it

[120] The factors considered in the Fire Risk Assessment are elevation, slope, slope facing, emergency access, fuel type, adjacent property, fire danger class, time of day, distance to vegetation, wind speed, temperature, humidity and precipitation. UP Reply workpaper "Fire Risk Assessment.pdf."

would face fire damage claims and the costs of defending them, as well as claims for the costs associated with evacuations in the event of fires.[121]

Mr. Hughes assigns each welding crew a hi-rail flatbed truck equipped with a self-contained, diesel-driven electric welding generator, cable crane winches for handling molds, and oxygen and acetylene tanks, as well as necessary hand tools and other welding equipment.

Roadway Equipment Mechanic. Mr. Hughes agrees that one roadway equipment mechanic is adequate for IRR.[122]

Gaging Gang. IPA's MOW Plan disregards the need for extensive track gaging – ongoing work that will be required due to long distances of IRR track with sharp and extreme curvature. The two three-person maintenance crews that IPA proposes for IRR's Roadmaster Territory 1 could not possibly handle the gaging workload on those lines.

The need for gaging arises due to IPA's proposed use of wooden ties in track construction (though concrete ties would also require extraordinary maintenance of pads, insulators, clips and the rail seat area of ties given the extreme nature of curvature on IRR). High lateral forces exerted by wheels against rails (the higher the degree of curvature, the higher the forces) will cause the wood holding the screw spikes to fail, permitting the distance between the rails to increase beyond allowable FRA track safety limits. UP currently performs an annual track strength measurement on lines replicated by IRR using a Gage Restraint Measurement System ("GRMS") to prioritize gaging work.[123] Without using this measurement system and the

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[121] UP Reply workpaper "Utah National Guard Chief Takes Blame for Fire.pdf."

[122] IPA Opening Nar. at III-D-61.

[123] The Holland Company currently performs track strength testing for UP using GRMS on the lines included in IRR to ensure the gage strength integrity of the track. GRMS tests track strength by applying a 10,000-pound lateral force to spread the rails and measuring the resultant widening of the track gage. This is critically important in the high curvature section of MP 688

follow-on gaging work, IRR cannot assume that it will have the same low rate of random outages (based on UP experience) that IPA's RTC modeling relied upon in developing IRR's operating plan.

To restore the track to proper gage, screw spikes in the curve must be removed, the holes plugged, and the rails pulled together to the proper gage, which may require adzing the tie so it is flat under the tie plate. Once the rails are properly spaced, and the tie plate sits flat on the tie, the screw spikes are again driven into the tie to hold the rails at the proper gage. Where damage to the spike hole is too severe to permit plugging and respiking, ties must be replaced. In sharp and extreme curves, tie life can be as short as five years, compared to perhaps 25 years on tangents. Thus, maintenance gangs may need to install many new ties before ties are changed out by a tie gang under a capital program.

IRR will require a seasonal gaging crew four months per year to maintain track gage, principally on the Provo Subdivision. IRR has almost 29 miles of sharp curves (greater than three degrees) that require curve lubricators and frequent maintenance.[124] Of those, almost 15 miles are severe curves of over six degrees, and over nine miles are extreme curves of between eight degrees and ten degrees. The significance of these figures becomes clear when a comparison is made with the curvature found on a normal railroad.

As UP's workpapers show in detail, curved track makes up 18% of the track miles on IRR, as compared with 15% of miles on a typical western railroad.[125] However, IRR has 100.5

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to Helper area on the Provo Subdivision. This technology has been widely adopted by many railroads in recent years as an effective method to avoid wide gage derailments and to plan tie renewal programs.

[124] UP Reply workpaper "Analysis of Curvature.pdf."

[125] *Id.*

times more extreme curvature, 16.1 times more severe curvature and 3.1 times more sharp curvature than a typical western railroad.[126] Mr. Davis's failure to adjust his analysis to take this dramatic physical characteristic into consideration reflects his misunderstanding of the magnitude of the maintenance that will be required by IRR.

To remedy IPA's oversight regarding required tie maintenance for IRR's curved track, Mr. Hughes has provided for a gaging crew for four months consisting of nine men, including a foreman, five roadway machine operators (screw spike puller, gager/spiker, tie remover/inserter, tie crane operator, adzer) and three track workers, two of whom are licensed truck drivers.[127] The crew is equipped with a crew cab pickup truck and one stake bed truck similar to that provided to the smoothing crew. The gaging crew is also supported by the Prentice loader (discussed above). The smoothing gang works behind the gaging crew to smooth the disturbed track.

Smoothing Crew. Smoothing is necessary to eliminate irregularities in the track geometry that develop over time. IPA's proposal to use one two-person smoothing crew is not feasible in view the frequent lining and surface maintaining that will be required on IRR's lines in the Provo and Green River Subdivisions.[128] Mr. Hughes proposes two standard three-person smoothing crews, consisting of a foreman, a tamper operator, and a ballast regulator operator. Each smoothing crew is assigned a tamper and a ballast regulator. The tamper is used to lift and

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[126] *Id.* Only 0.03% of track on a typical railroad consists of curves over eight degrees, while 2.0% of IRR consists of curves over eight degrees. *Id.*

[127] Gaging cost calculations are shown in UP Reply workpaper "Curves and Gaging.xlsx," Tab "Gaging Cost Summary"; gaging cost is then included in UP Reply workpaper "UP MOW Cost.xlsx," Tab "UP Annual MOW Expenses."

IRR will also require MOW storage tracks for the gaging crew's machinery off of the passing sidings at MPs 639, 660 and 677 to minimize time lost traveling to and from worksites.

[128] IPA Opening Nar. at III-D-61.

line track. The ballast regulator is used to move ballast, restore the roadbed section and shoulder ballast, fill the cribs with ballast and sweep excess ballast from the track following surfacing and lining.

Mr. Davis would have the foreman also operate the one of the machines.[129] However, the foreman is responsible for the occupancy of the track and the safety and quality of the work performed. The foreman could, however, serves as a backup operator when one Roadway Machine Operator is on vacation or otherwise not available.

IPA correctly observes that "[m]ost surfacing and lining takes place in areas featuring the highest number of curves."[130] Yet, IPA's MOW plan fails to take into account the magnitude of the challenge of maintaining curves on IRR, as discussed above. Mr. Hughes concludes that one crew could not keep up with the surfacing workload on the two roadmaster territories. UP managers of track maintenance advised Mr. Hughes that UP currently assigns two smoothing crews to the IRR territory and that those crews are insufficient to remove the need for some speed restrictions between runs of the track geometry car.

Under Mr. Hughes' plan, one smoothing crew will be busy full time with maintaining track on the sharp curvature and steep grades on the Provo Subdivision and the remainder of Roadmaster Territory 1, along with surfacing behind gaging work. The second smoothing crew will be occupied with surfacing on the Lynndyl and Sharp Subdivisions, with their higher speed and heavier traffic density, and on the curves on the west end of the Sharp Subdivision. (The lengths of the two roadmaster territories, 139.9 and 189.9 miles, reflect, in part, the different surfacing workload on each territory.) IPA states that IRR's new track structure makes it

[129] *Id.* at III-D-62.

[130] *Id.*

unlikely the railroad will suffer from surface or line irregularities during the first ten years of IRR's existence.[131] In Mr. Hughes' judgment, that is an erroneous assessment. In fact, extra smoothing can be expected on a newly constructed railroad. While construction specifications call for uniform compaction and even specify how that compaction shall be accomplished, there is inevitably somewhat uneven compaction of the embankment that results in some differential settlement between cuts and fills and at bridge abutments and over culverts. Keeping up with surfacing in response to this track settlement requires more smoothing capacity than simply maintaining track that has been in place for decades.

Even apart from the effects of differential settlement, periodic smoothing will be necessary to keep new track up to standards and avoid speed restrictions. On IRR's Lynndyl Subdivision, traffic density is assumed to be 33 MGT per year over FRA Class IV track. Maintaining Class IV track geometry will require frequent spot tamping to avoid speed restrictions and out of face tamping every two to three years. The Sharp Subdivision is likewise to be maintained to Class IV standards and will require periodic spot tamping and lining, particularly in the curves on the west end of the subdivision. In addition, occasional tamping of switches and some tamping in yards will be required. The Provo Subdivision is lighter density, but it still has traffic of 15 MGT per year over steep grades and extreme curvature, and IPA assumes it will be maintained to FRA Class IV standards. This territory will require spot surfacing on a regular basis, and the smoothing crew will also support the gaging gang.

IPA suggests that UP's experience on these lines is irrelevant because "[e]ven where existing railroads have installed CWR, it usually replaced older, jointed rail whose joints took a pounding that tended to damage the roadbed over time. The IRR does not maintain any old

[131] *Id.*

roadbed that has been pounded/ damaged by trains running over jointed rail for many years."[132] However, UP's experience is not affected by the condition of the roadbed before installation of CWR. Those effects have long since disappeared on Class I railroads, as track has been tamped many times, new ballast has been added, ties have been replaced, and decades have passed without rail joints in place. All of these activities have tended to break up the dirty ballast pockets that resulted from joints. If residual effects of having rail joints in the UP track had remained, Mr. Hughes would have observed them during his hi-rail inspection. He did not.

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In assessing IPA's and UP's MOW plans for track maintenance, it is useful to compare the ratios for track employees reflected in *WFA I.* In that case, the Board accepted a ratio of 7.2 track miles per track employee.[133] Mr. Davis' proposal for IRR track staffing amounts to 10.7 miles per track employee. Mr. Hughes' plan, including maintenance of extraordinary curvature found on IRR, results in 7.4 track miles per employee. However, if the additional labor required to maintain the extraordinary curvature between MP 688 and Helper (*i.e.*, the extra smoothing crew of three and a Curve Lubricator Maintainer) is deducted from the MOW staffing proposed by Mr. Hughes to reflect a railroad with more normal curvature, the adjusted ratio for Mr. Hughes' plan becomes 8.1 track miles per track employee, compared to the *WFA I* ratio of 7.2 miles per track employee. From review of topographical maps of the territory covered by the SARR in *WFA I*, it is clear that the SARR in that case traversed terrain with unextraordinary amounts or sharpness of curvature. With that in mind, it becomes clear that UP's MOW staff in this case is even leaner than the MOW staff the Board accepted in *WFA I.*

[132] *Id.* at III-D-62 n.32.

[133] This ratio reflected 54 track employees for 391 track miles. *WFA I*, slip op. at 57, Table C-6.

ii. Communications & Signals Department

UP provides for an IRR Communications & Signals ("C&S") Department consisting of twelve employees, five more than IPA proposed. The specific positions and compensation levels for this department are shown in Table III.D.16 below.

Table III.D.16
IRR Signal and Communications Employees

Position	No. of Employees	Comp. Per Employee	Total Comp.
C&S Engineer	1	$102,592	$ 102,592
C&S supervisor	1	$79,391	$ 79,391
Signal Maintainers	7	$73,910	$ 517,370
Signal Technician/Inspector	1	$67,378	$ 67,378
Communications Technician	1	$67,378	$ 67,378
Communications Maintainer	1	$67,378	$ 67,378
	12	–	$ 901,487

Source: UP Reply workpaper "UP MOW Costs.xlsx."

General Office Staff. UP agrees that the C&S Department would be headed by the Communications & Signals Engineer.[134] This Engineer position is responsible for all communications- and signals-related functions, assuring that the proper tests are conducted and that any necessary maintenance is being performed. This position is also responsible for developing the necessary capital programs to keep all signal and communication equipment functioning reliably, as well as supervising outside contractors who maintain the communications equipment, including microwave towers and associated equipment and radios.

[134] IPA Opening Nar. at III-D-63.

This individual works closely with the C&S Supervisor to ensure that any signal or communication problems are handled promptly.

Field Staff. UP agrees that the field staff should be led by one C&S Supervisor.[135] The C&S Supervisor position is responsible for field supervision of the Signal Maintainers, Signal Technician/Inspector, Communications Maintainer and Communications Technician (described below). The C&S Supervisor is located at Provo to provide adequate coverage of IRR territory.

Signal Maintainers. Mr. Davis sizes his signal maintenance staff based on 4,181 AREMA signal units.[136] However, IPA has tabulated the number of signal units incorrectly. There are actually 7,647 signal units.[137] Mr. Davis assumes that three signal maintainers are adequate because that number of maintainers results in a ratio of 1,394 signal units per maintainer. IPA asserts that "[t]his number is reflective of practice at several Class I railroads,"[138] but it provides no analytical support or other evidence for this statement.

Even if 1,394 signal units per maintainer represented an average over a large railroad system, that is not an appropriate measure of the proper size of any individual signal maintainer territory.

The geographical density of signal equipment and travel time vary substantially among territories. For example, in terminal areas the distance between protected road crossings may be only a few hundred feet, and control points may be a mile or so apart in the case of a complicated terminal network such as Chicago, St. Louis and similar railroad-dense metropolitan areas. In

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[135] *Id.*

[136] *Id.* at III-D-64.

[137] UP Reply workpaper "Discussion of AREMA Signal Units.pdf."

[138] IPA Opening Nar. at III-D-64.

these areas, a single maintainer may have over 1,400 signal units to maintain because so little time is lost to travel for maintenance and emergency calls.

On open track outside urban areas, where control points and protected highway grade crossings are miles apart, it would not be unusual for a signal maintainer to have to drive 100 miles or more to trouble shoot a failure in the train movement or highway crossing protection system. In these conditions, a maintainer may be assigned fewer than 900 signal units to maintain, because so much time is lost to travel.

Thus, while average signal units per maintainer provides a rough rule of thumb for signal maintainer capacity, it is not useful in determining the size of individual signal maintainer territories, and it can be very misleading. On IRR, there is no densely packed railroad signaling equipment in urban areas that would permit a high ratio of units per maintainer. The Provo area (the closest area IRR has to an urban area) has no CTC and has a relatively low number of protected grade crossings for an urban area.

The signaled section on IRR from Castle Gate to West Thistle is entirely outside major urban limits with very few protected crossings. This segment is single track, meaning signal density is lower than would be the case for double track. The segment runs over Soldier Summit where winter conditions are extreme, greatly increasing travel time during part of the year. In this segment, access to signal locations is often difficult, as IPA provides for no right-of-way road for most of the distance.

IPA also provides for CTC between Lynndyl and Milford. Signal density in this segment is light, with very few protected road crossings. This segment is single track, meaning that the distance between signal locations is relatively long.

Moreover, it is not possible for a signal maintainer on the Provo or Green River Subdivision to support a maintainer on the Lynndyl Subdivision. The east-west road system between the Lynndyl-Milford CTC section and the Castle Gate-West Thistle CTC section is so circuitous that a maintainer on one section could not realistically cover for a maintainer on the other section. Travel time for the 213 miles from Milford to Price is three hours and 46 minutes, according to Microsoft Streets and Trips.

In addition, IRR grade crossings are relatively far apart, the signal system is for a single track, winter weather lengthens travel time to respond to signal outages and perform routine maintenance, and signal maintenance in winter weather is more time consuming – all factors that reduce the number of signal units a maintainer can maintain. With these factors in mind, Mr. Hughes believes that seven signal maintainers are appropriate, resulting in a ratio of 1,092 signal units per maintainer. By way of comparison, BNSF stated in *WFA I* that their standard is 900 to 1200 units per signal maintainer, and the Board accepted 1239 units per maintainer.[139]

Notwithstanding the *WFA I* finding regarding the ratio of signal units per maintainer, Mr. Hughes believes that seven maintainers are required. The SARR in *WFA I* was a double track railroad, meaning the density of signal equipment was almost twice that of IRR, allowing a maintainer to handle a higher number of signal units due to decreased travel time. The Board's finding in *WFA I* was not an affirmative finding that 1,239 signal units was the correct number of units per signal maintainer; it merely found that BNSF had not met its burden of proof in arguing that a lower ratio than 1,239 was necessary for the SARR to operate successfully.

In addition, IPA has failed to account for both electronic maintenance, which requires a skilled Signal Technician, and more complex two-person signal tests, requiring a Signal

[139] *WFA I*, slip op. at 63.

Inspector in addition to Signal Maintainers. While Signal Maintainers can perform routine maintenance of electronic equipment, such as changing out circuit boards, they are not generally sufficiently skilled to handle unusual problems such as recurring "no fault found" conditions.[140] A Signal Technician is skilled at solving unusual problems, performing maintenance and troubleshooting on electronic signal equipment such as code units, electronic track circuits, and electronic grade crossing gate controls. This work is beyond the required skills of a Signal Maintainer.

In order have the skill set and man-hours necessary to maintain the IRR signal equipment, Mr. Hughes concludes that IRR needs at least one, and perhaps two, combination Signal Technician/Signal Inspectors to handle more complex trouble shooting, complex testing that requires two persons, and inspection. To be conservative, Mr. Hughes included just one Signal Technician/Signal Inspector.

Mr. Hughes agrees that one Communications Technician and one Communications Maintainer are adequate for IRR.

iii. Bridge & Building Department

Mr. Hughes accepts IPA's plan for Bridge & Building.[141]

Table III.D.17
IRR Bridge Employees

Position	No. of Employees	Comp. Per Employee	Total Comp.
Bridge &Building Engineer	1	$102,592	$ 102,592
B &B Supervisor	1	$79,391	$ 79,391
B &B Inspector	1	$70,018	$ 70,018

[140] This condition occurs when a circuit fails intermittently, and because no cause is found, the fault is not corrected and the circuit fails again.

[141] IPA Opening Nar. at III-65 to III-D-67.

B&B Machine Operator (bridge crane)	1	$56,775	$ 56,775
B &B Foreman	1	$60,679	$ 60,679
B &B Carpenter/Helper & Water Service	1	$52,874	$ 52,874
Total	6	[redacted]	$ 422,329

Source: UP Reply workpaper "UP MOW Costs.xlsx."

iv. Miscellaneous Administrative/Support Personnel

Mr. Davis proposes a single Administrative/Support position titled Engineer of Programs, Budgets, Safety & Training reporting to the Chief Engineer.[142] Mr. Hughes finds that Mr. Davis has not identified the all of the functions that must be performed by the Engineers and that greater support is required for the Roadmasters to handle contracting and the logistics related to capital projects. Mr. Hughes eliminates Mr. Davis' single administrative position and creates one inside and one outside engineering position and one Resource Coordinator to support the five engineers and four supervisors.[143] The inside position is Compliance Engineer, who is responsible for creating and monitoring budgets, performing MOW safety and technical training, evaluating performance reports, ensuring that FRA inspection records are properly kept and inspecting those records to see that supervisors have taken appropriate action to comply with record keeping and responses to reported defects as specified in Federal Safety Regulations.

The outside position is Projects Engineer, who is responsible for contract testing and maintenance, planning for and liaison with capital projects, and public projects such as new highway crossings and bridges, utility crossings of the railroad, and other third party contracting work related to the railroad.

[142] IPA Opening Nar. at III-D-67.

[143] Track Engineer, Projects Engineer, Compliance Engineer, Bridge Engineer, Signal Engineer, two Roadmasters, one B&B Supervisor, and one Signal Supervisor

The Resource Coordinator will provide general administrative support for the five senior engineers and the four supervisors. The job description would include ordering materials, confirming material receipt, matching invoices and arranging payment to suppliers and contractors, managing vacation schedules and relief schedules, scheduling requalification training, and miscellaneous office management and administration. While IPA notes that other IRR procurement activity is centralized within the Finance and Accounting function, ordering of material subject to approved procurement policies and confirming receipt and approval for payment remain MOW functions.

d. Compensation of MOW Employees

Mr. Hughes concurs with the compensation assumptions made in the IPA MOW plan. To the extent the UP MOW plan includes additional positions, Mr. Hughes has drawn from the same source of compensation information used by IPA, which relied on information drawn from UP's Wage Forms A and B.[144]

e. Allocation of MOW Employee Costs to Operating Expense

Employee costs for field maintenance forces are entirely allocated to operating expense, as all capital work is performed by others. Management and supervisory forces, however, perform some work for which the costs are not treated as operating expenses. Table III.D.18 below shows Mr. Hughes allocation of employee costs to operating expense.

Table III.D.18
Employee Allocation to Operating Expenses

Title	Percentage Allocated to Daily Maintenance	No of employees
Track Engineer	70%	1
Projects Engineer	60%	1

144 IPA Opening Nar. at III-D-68.

Compliance Engineer	80%	1
Roadmasters	80%	2
Assistant Roadmaster	80%	3
Communications & Signals Engineer	90%	1
Bridge Engineer	90%	1
B&B Supervisor	90%	1
Resource coordinator	80%	1

Source: UP Reply workpaper "UP MOW Costs.xlsx."

Bridge and signal engineer and supervisor employee costs are allocated 90% to operating expense. There should be no need to replace the facilities for which they are responsible, but a 10% allowance is made for their participation in planning of replacement or expansion capital projects or participation in public projects.

Roadmaster and Assistant Roadmaster employee costs are allocated 80% to operating expense, as some of the assets for which they are responsible will require replacement within the DCF period and therefore will require some involvement on their part.

The Projects Engineer is 60% chargeable to operating expense, as he is responsible principally for contract services and maintenance, which is an operating expense, but also for coordinating and logistics for capital projects, and he does the majority of work associated with public projects.[145]

The Track Engineer is 70% chargeable to operating expense, as he also has some duties related to capital, public works and public utility work, but less public work than the Projects Engineer.

[145] Public projects are crossings of highways and roadways, water lines and sewer lines that cross over or under the railroad lines, and other publicly funded projects that require railroad participation. He also handles public utility crossings and the engineering related work for all easements, which is collectible from others.

The Compliance Engineer and the Resource Coordinator are 80% charged to operating expense.[146]

f. Non-Program MOW Work Performed by Contractors

i. Planned Contract Maintenance

UP does not contest IPA's assumptions regarding Planned Contract Maintenance for Track Geometry Testing, Ultrasonic Rail Testing, Rail Grinding, Ballast Cleaning/Undercutting, Yard Cleaning, Vegetation Control, Crossing Repaving, Equipment Maintenance, Bridge Inspections and Building Maintenance.[147] However, IPA's MOW plan fails to address adequately several important elements of planned contract maintenance, as discussed below.

Track Strength Testing. IPA's failure to consider the specific challenges associated with maintaining IRR is demonstrated yet again in IPA's failure to provide for critically important track strength testing. Track strength is the ability of the two rails to withstand rail spreading (or gage widening) forces. The Gage Restraint Measurement System applies between 3,000 and 8,000 pounds of lateral force to spread the rails while exerting a 10,000 downward pressure on the rails. The distance that the rails spread under these forces is an indication of the condition of the crossties and the rail to tie fastener system.

For a section of track like that between MP 688 and Helper, this kind of testing is critically important to plan the activities of the gaging crew and to program capitalized tie replacement programs. In recent years, UP has tested track strength in this area annually. The

[146] Eighty percent is the weighted average of the percentage that the people they support are charged to operating expense.

[147] IPA Opening Nar. at III-D-69 to III-D-77.

recent historical cost for track strength testing is an average of $171 per mile.[148] Mr. Hughes provides for track strength testing in his MOW plan.

Communications System Inspection and Repair. UP does not object to IPA's decision to estimate annual communications maintenance costs at two percent of the original purchase cost.[149] However, UP applies this percentage to UP's estimated original purchase cost of $8,890,717 and arrives at an annual communications maintenance cost of $177,814.[150]

Ditching. IPA discussed ditching under the category of "Large Magnitude Unplanned Maintenance."[151] IPA asserts that IRR requires little ditching because it "starts operations with a newly-constructed roadbed/track structure with clear, open ditches."[152] That statement disregards the geologic conditions that exist on parts of IRR. UP includes an allowance for ditching as Planned Contract Maintenance in addition to the Unplanned Maintenance provided by IPA. As discussed earlier, ditching between MP 688 and Helper on the Provo Subdivision is a full time activity, year after year. If anything, the freshly opened cuts of IRR would require more ditching in early years than the existing line requires after 100 years, during which the weakest slopes have been slipping, with slopes reaching a lower angle of repose each year. Moreover, the fresh cuts would be saturated with rainwater for the first time during the first year of IRR operation, resulting in substantial falling rock and sedimentary material. As a result, ditch cleaning requirements could be several times the current requirement for the existing matured slopes.

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[148] UP Reply workpaper "GRMS Testing Cost.pdf."

[149] IPA Opening Nar. at III-D-76.

[150] UP Reply workpaper "UP MOW Costs.xlsx," Tab "Other MOW Costs."

[151] IPA Opening Nar. at III-D-81.

[152] *Id.*

Currently, UP employs a Herzog Multipurpose Machine, a specialized ditching machine, 30 working days per year on top of full time ditch cleaning by a ditching crew.[153] Mr. Hughes conservatively estimates that, in early years, 90 working days of contract ditching would be required until the least stable slope areas reached a more stable angle of repose. However, to be conservative, and in recognition that the amount of required contract ditching would be reduced over time, Mr. Hughes has provided for 60 work days per year of contract ditching to supplement full time ditching by IRR employees. The daily rate for the Herzog Multipurpose Machine is $3428.63, plus 354.68 per day overtime,[154] for a total daily rate of $3,783.31.[155] The annual cost for 60 working days is $226,999.

ii. Unplanned Contract Maintenance

UP does not contest IPA's assumptions regarding Unplanned Contract Maintenance for Snow Removal, Storm Debris Removal and Building Repairs.[156]

iii. Large Magnitude, Unplanned Maintenance

UP does not contest IPA's assumptions regarding Large Magnitude, Unplanned Contract Maintenance for Derailments, Ditching (as Large Magnitude, Unplanned Maintenance; however

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[153] Because UP needs to employ a specialized ditch cleaning machine in addition to its regular ditching crew, IPA certainly will have to do the same. UP's existing practice on the Provo Subdivision is to keep a CAT 980 loader cleaning ditches full time, weather permitting, supplemented by a CAT 420E backhoe almost full time. This provides UP with more ditch cleaning capacity than is provided by the equipment in IPA's MOW plan. UP's 270 horsepower CAT 980 loader is a higher capacity earth moving machine than the 110 horsepower Case CX130 excavator included in IPA's plan. Moreover, UP's CAT 980 loader does not require track occupancy to work. By contrast, the rotary dump truck included in IPA's plan can access ditching sites only by hi-rail as there is no road access to the ditching sites. The capacity of the CX130 plus rotary dump truck combination would thus be limited by availability of on-track time for the truck and the low production rate of the low powered CX130.

[154] UP Reply workpaper "Contract Ditching Cost.pdf."

[155] UP Reply workpaper "UP MOW Costs-Final.xlsx," Tab "Annual MOW Expenses."

[156] IPA Opening Nar. at III-D-77 to III-D-79.

Planned Maintenance for ditching is discussed above), or Environmental Cleanups.[157] However, IPA's MOW plan fails to address adequately the costs associated with Washouts.

Mr. Hughes concludes that IRR will need more resources for washouts and contract ditch cleaning than the amounts IPA has provided. IPA provided an annual operating expense allowance of $50,000 for washouts.[158] That amount pales compared to the estimated hundreds of thousands of dollars of actual washout losses UP incurred for the IRR lines in 2010.[159] Based on his inspection trip and interviews he conducted with UP's Managers of Track Maintenance about experience with flood damage in years prior to 2010, Mr. Hughes estimates that IRR would need to set aside much more than IPA's $50,000 operating expense allowance to cover washout damage. IPA estimates the cost of washout repairs would not exceed $50,000 "[b]ased on the relatively arid territory in which much of the IRR route is situated,"[160] but some of the worst flood damage occurs in arid terrain, as there is no ground cover to slow the flow of water and steep slopes result in fast moving water. Even new construction is not immune to this damage, particularly in early years as the waterways adjust to the presence of new drainage structures. The combination of no ground cover and fast moving water often produces flash floods that cause frequent and recurring flood damage. For these reasons, and in light of the history of flood

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[157] *Id.* at III-D-79 to III-D-82.

[158] *Id.* at III-D-80.

[159] During his hi-rail inspection of the line, Mr. Hughes stopped at several locations along the Soldier River between MP 688 and MP 665 to see the extent of the repairs made following the 2010 flooding. He also observed 2010 flood damage repairs on the Sharp Subdivision between MP 676 and MP 690, where the railroad crosses the Sevier River nine times. In an interview, UP's Manager of Track Maintenance for this area advised Mr. Hughes that Soldier River and Sevier River have caused repeated minor flood damage, with the cost of repairs charged to operating expenses. UP Reply workpaper "IRR MOW Photographs.pdf."

[160] IPA Opening Nar. at III-D-80.

damage in this area, Mr. Hughes determined that a more realistic annual washout allowance would be $100,000.[161]

g. Contract Maintenance

UP does not contest IPA's assumptions regarding Contract Maintenance for Surfacing, Rail Grinding, Crossing Repaving, Bridge Substructure and Superstructure Repair.[162]

h. Equipment

Mr. Hughes has identified the equipment and vehicles required for IRR's MOW maintenance.[163] He has provided unit costs and specifications for vehicles based on IPA figures in some cases and independent research in other cases.[164] In addition to the equipment IPA proposed, IRR will need gaging equipment for use by the gaging gang, as discussed above. This equipment includes a spiker/gager, tie inserter, tie crane, spike puller and adzer.[165]

Like the IPA plan, Mr. Hughes' MOW equipment plan incorporates an allowance of 5% of vehicle and equipment purchase price as the cost of equipment maintenance.[166] However, IPA failed to include the cost of ownership of MOW equipment. Mr. Hughes' plan also includes the cost of ownership of MOW vehicles and equipment that was omitted from the IPA MOW plan. To account for the ownership costs of MOW vehicles and equipment, Mr. Hughes adopted the approach that IPA used to calculate the costs of vehicle ownership for the IRR general and administrative employees. For those costs, IPA calculated an annuity based on an assumed asset

[161] UP Reply workpaper "UP MOW Costs.xlsx," Tab "Annual MOW Expenses."

[162] IPA Opening Nar. at III-D-82 to III-D-84.

[163] UP Reply workpaper "UP MOW Costs.xlsx," Tab "UP Annual MOW Equipment Cost."

[164] UP Reply workpaper "MOW Vehicle Spec Report.xlsx."

[165] UP Reply workpaper "Curves and Gaging.xlsx," Tab "Gaging Equipment Cost."

[166] UP Reply workpaper "UP MOW Costs.xlsx," Tab "UP Annual MOW Equipment costs."

life, a 10.15% railroad cost of capital, a 13% salvage value and a 5% tax rate.[167] Mr. Hughes' calculations of Annual MOW Equipment cost adopt IPA's cost of capital, salvage value, and tax rate, and assume that light trucks have a life of four years, heavy trucks (over 13,000 pounds) have a life of six years and that track equipment and other maintenance machinery has a life of 14 years.[168]

5. Leased Facilities

UP accepts IPA's assumption that IRR has no leased facilities other than the trackage rights arrangement that allows BNSF to operate over the IRR facilities between Price and Provo.

6. Loss and Damage

UP accepts IPA's approach to calculating IRR's loss and damage expense and uses that approach to calculate the costs associated with handling the reply traffic group.[169]

7. Insurance

UP accepts IPA's calculation of IRR's insurance expense as 3.73% of other operating expenses[170] and applies that factor to IRR's operating expenses as developed for the reply case.

8. Ad Valorem Tax

UP accepts IPA's calculation of IRR's ad valorem tax expense.

9. Calculation of Annual Operating Expenses

UP accepts IPA's approach[171] to calculating the operating statistics for the initial year of SARR operations (2011) by calculating the totals for 2010 trains (which IPA referred to as the

[167] IPA Opening workpaper "IRR Materials and Supplies.xlsx."

[168] Mr. Hughes used Asset Class Life as defined in IRS Publication 946, 2010. UP Reply workpaper "IRS Publication 946 excerpt.pdf."

[169] UP Reply workpaper "IRR Loss and Damage Reply.xlsx."

[170] IPA Opening Nar. at III-D-95.

"Base Year") and indexing them based on the ratio of 2011 tons to 2010 tons for each traffic type.[172]

10. Impact and Costs of IRR Operations for the Residual UP

As a result of IPA's decision to insert IRR in the middle of Utah, its selective traffic grouping, and its creation of hypothetical interchanges with the residual UP, operations of the residual UP will be affected. In these circumstances, Board precedent requires the complainant to identify and assume responsibility for any new costs that its operations impose on the residual incumbent.[173] IPA failed entirely to address this issue in its opening evidence. In this case, IPA's proposed operations will cause the residual UP to incur four specific types of additional costs:

1. Additional switching at IRR's interchanges associated with serving local customers at stations along the SARR routes;
2. Additional taxis to bring UP crews to or from trains at IRR's interchanges at Lynndyl, Price, and Provo;
3. A crew facility office and crew manager at the new UP crew change location at Lynndyl; and
4. Additional UP dwell time at Lynndyl and Provo following IRR's delivery of trains at those locations.

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[171] *Id.* at III-D-1 to III-D-2.

[172] UP Reply workpaper "IRR Operating Statistics Reply.xlsx."

[173] *See, e.g.*, *Tex. Mun. Power Agency v. Burlington N. & Santa Fe Ry.*, 7 S.T.B. 573, 818 (2003) (explaining that a complainant may not increase SARR traffic through assumption that would create additional infrastructure or operational costs for the defendant, "unless the complainant shows that it has identified what these additional infrastructure and operational costs would be and ensured that these costs are fully accounted for"); *Duke Energy Corp. v. Norfolk Southern Ry.* 7 S.T.B. 89, 112 (2003) ("At a minimum, the complainant must fully account for all of the ramifications of requiring the residual carrier to alter its handling of [its] traffic and any changes in the level of service received by the shippers."); *Duke Energy Corp. v. CSX Transp.*, 7 S.T.B. 402, 443 (2004) ("[W]hile the proponent of a SARR can determine (within reason) how the SARR would operate, it cannot assume that a connecting carrier . . . would alter its existing operations for the benefit of the SARR.").

In its reply, UP has quantified these new costs to the residual UP and, consistent with STB precedent, added them to the operating expenses incurred by the SARR.

Additional Switching. As described in Section III.C above, hundreds of the UP trains that IPA selected to operate the IRR traffic currently stop along the SARR route to serve local customers. As IPA assumes that IRR will operate these trains intact without stopping between On-SARR and Off-SARR stations, and does not provide for any switching upon receipt of trains, the residual UP will have to remove the local set-outs from the through train at the On-SARR station before delivery to IRR. Similarly, as IRR will not perform any local pick-ups along the route, the residual UP will need to pick up those cars and bring them to the Off-SARR station for switching onto the through train that IRR operated. As UP currently incurs the costs of transporting the cars to or from the local stations, and switching at the local station, UP has conservatively included as the additional costs associated with IRR's operations only the two new switching events at the On-SARR and Off-SARR stations – one to add or remove the car from the through train assumed to be operated intact by IRR, and the other to add or remove the car from a separate train that IPA's proposed operations require the residual UP to operate. In order to estimate this cost, UP uses the UP 2010 URCS variable cost for switching,[174] applied to 15 minutes of switching per event to add or remove the car from the trains. Based on these calculations, the additional 2011 switching costs that the residual UP incurs are \$0.11 million.[175]

Additional Taxis. IPA assumes that IRR will interchange with the residual UP at four locations: Lynndyl, Milford, Price, and Provo. Milford is the only location where IPA assumed

[174] UP uses the preliminary UP 2010 URCS created by IPA and included with its opening workpapers. While URCS costs are typically inappropriate substitutes for specific SARR operating costs, they can provide a reasonable basis for quantifying the additional costs that the residual incumbent would incur when it interchanges traffic with a new interline partner.

[175] UP Reply workpaper "Residual UP Costs.xls."

the site of the interchange would replicate the location of an existing crew change on UP. Lynndyl and Price are not UP crew change points today, and IPA placed IRR's Provo Yard more than six miles down the Provo Subdivision from UP's Provo Yard. As a result, in order to pick up or deliver trains at IRR's interchanges, the residual UP will have to bring its crews to the interchange point (when IRR delivers a train to UP) or will have to pick up its crews from the interchange point and bring them back to their home terminal (when UP delivers a train to IRR). UP accepted the cost per mile that IPA assumed for taxiing IRR crews,[176] and applied it to every IRR train interchanged with the residual UP at Lynndyl, Price, and Provo. This produced a total 2011 cost to the residual UP of $0.16 million for additional taxis.[177]

Lynndyl Crew Change. In addition to the additional switching and taxi costs resulting from IRR's interchange at Lynndyl, the introduction of a new crew change there would require UP to construct a small office building for crews to check in and check out before and after duty, and to provide a manager position. Each day at Lynndyl, IRR will interchange an average of 9 trains,[178] which will be operated by UP crews to or from Salt Lake City, more than 100 miles away. Given these volumes and the fact that Lynndyl is approximately 90 miles from other UP crew change locations at Milford or Provo, UP would need to provide a facility for the crews. Using the assumptions on which it relied to develop the costs of a similar small facility for IRR, UP estimates that the residual UP would incur costs of $60,000 to construct the facility, and $14,000 in annual expenses to provide a computer and utilities for the facility. UP used the

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[176] IPA Reply workpaper "IRR Crews Hotels &Taxis.xlsx."

[177] UP Reply workpaper "Residual UP Costs.xls."

[178] This figure excludes the highest-priority intermodal trains (the Z trains) that UP removed from the SARR traffic group because the SARR cannot match the level of service that UP currently provides for those trains.

average salary that IPA assumed for IRR's managers, $93,536, and applied the fringe rate to determine total wage & benefits expense of $128,612 for the additional crew manager. In total, the residual UP would incur an annual expense of $0.15 million[179] associated with addition of the new crew facility office and crew manager at Lynndyl due to IRR's interchange there.

Additional Dwell Time. IPA recognizes that IRR's interchanges with the residual UP will take 30 minutes.[180] IPA includes the 30 minutes when IRR receives a train from the residual UP (*i.e.*, at the On-SARR station) in determining IRR's total locomotive hours, and thus IRR's costs. IPA does not, however, include the 30 minutes of interchange time when IRR delivers a train to the residual UP (*i.e.*, at the Off-SARR station) in either its RTC model simulation or its cost calculations. As these interchanges would be new events for the residual UP – and occur mostly at places where UP does not currently perform an interchange or crew change – the costs associated with the locomotive dwell are not borne by the SARR, yet are above and beyond what UP currently incurs. In order to estimate these additional costs, UP evaluated the operations at each interchange. Because UP currently changes crews at Milford, it did not include the dwell time for IRR-residual UP interchanges at that location. Similarly, as IRR's operation of IRR trains between Provo and Price replaces the UP crew change for these trains that currently occurs at Helper, UP does not include the dwell time at Price. The 30 minutes of interchange time for IRR deliveries to the residual UP at Lynndyl and Provo, however, represents dwell time that is an additional cost to the residual UP.[181] For these trains, UP determined the total dwell time in

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[179] UP converted the construction investment to an annual expense based on an annual factor following the approach used by IPA for IRR's materials and supplies expenses.

[180] IPA Opening Nar. at III-C-20.

[181] Although Provo is a current UP crew change location, IRR's entry does not replace that event. As described above and in Section III.C, IPA located IRR's Provo Yard miles from UP's Provo facilities, and left to the residual UP switching on many trains. As a result, these trains would

hours and converted it to a number of locomotives using the same approach it followed to develop the total IRR locomotive requirements, using the 16% peaking factor and { }% spare margin for run-through power. Based on this analysis, the residual UP would need an additional locomotive unit, which would cost { } to lease and maintain annually, based on the UP locomotive lease and maintenance costs that UP uses on reply for IRR.

In summary, the additional costs that the residual UP would incur as a result of IRR's operations total $0.55 million in 2011.

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have to dwell at both UP's and IRR's Provo Yards, and UP includes the locomotive costs associated with the 30-minute dwell time for trains that IRR delivers to UP at IRR's Provo Yard.

III.E: Stand-Alone Railroad Non-Road Property Investment

III. E. NON-ROAD PROPERTY INVESTMENT

Non-road property investment costs, including costs for locomotives, railcars, and other equipment, are addressed in other sections of UP's reply evidence.

III.F: Stand-Alone Railroad Road Property Investment

III. F. ROAD PROPERTY INVESTMENT

UP's evidence regarding road property investment is sponsored by several engineering experts (collectively, "UP's engineering experts"). The primary sponsors are Robert C. Phillips and Randall G. Frederick of STV/Whitehead Engineering, with specialized assistance from Paul Bobby and Patrick Bryant on earthwork and drainage; Roberto Guardia of Shannon and Wilson on geotechnical issues and tunnels; David Magistro on bridges and structures; George Zimmerman on track construction; Rick Ray of RR Railroad Highway Crossing Consultants, Inc. on signals and communications; and Mark Peterson on buildings and facilities. Individual witnesses' qualifications appear in Part IV.

These experts have reviewed in detail IPA's proposed construction costs for IRR and have identified numerous significant flaws in IPA's opening evidence.

Table III.F.1 below compares the construction costs for IRR included in IPA's opening evidence with the properly developed construction costs detailed in this reply.

Table III.F.1
Comparison of IRR Road Property Investment Cost
($ millions)

	IPA	Reply	Difference
Land	$34.7	$44.9	$10.2
Roadbed Preparation	$150.4	$335.3	$184.9
Track	$242.0	$441.7	$199.7
Tunnels	$28.9	$58.9	$30.0
Bridges	$26.6	$48.1	$21.5
Signals & Communications	$26.4	$49.9	$23.5
Buildings & Facilities	$10.4	$23.2	$12.8
Public Improvements	$3.5	$8.6	$5.1
Subtotal	$523.0	$1,010.6	$487.6
Mobilization	$13.6	$30.1	$16.5
Engineering	$48.8	$96.6	$47.8
Contingencies	$55.0	$109.2	$54.2
Total Road Property Investment	**$640.5**	**$1,246.6**	**$606.2**

1. Land

UP accepts IPA's valuation of the land on the IRR route but rejects its assertion that it need not include a cost for parcels obtained through land grants and easements for two reasons.

First, the ICC has held that land obtained by land grant is properly included in the costs a new entrant would have to incur, but that value of easements will not be included without documentation of the cost to obtain them.[1] Interestingly, in calculating its cost for land, IPA excludes some of the same parcels of land that the ICC held that the SARR needed to acquire at market value in *Nevada Power I*. UP's engineering experts have corrected IPA's land costs by including the parcels obtained by land grant, which IPA improperly excluded.

Second, in 1996, UP purchased the assets of Southern Pacific ("SP"), which included the lines of the former Denver and Rio Grande Western ("D&RGW"). UP's 1997 10-K shows more

[1] *See Bituminous Coal – Hiawatha, UT, to Moapa, NV*, 6 I.C.C.2d 1, 135-36 (1989) ("*Nevada Power I*").

than $3.5 billion of the SP purchase price was allocated to land, including the lines of the former D&RGW included as part of IRR.[2] Indeed, UP assigned a ledger value of nearly one-half million dollars to the former D&RGW parcels that IPA asserts were acquired at no cost.[3]

In calculating its land costs, UP has included values for all of the parcels excluded from IPA's land costs, with the exception of an easement for a road crossing in Provo valued at $44,766.[4] Based on these calculations, UP's total IRR land value is $44.9 million.[5]

2. Roadbed Preparation

IPA's makes several fundamental errors in calculating roadbed preparation costs, which are detailed below. A summary comparison of UP's reply IRR roadbed preparation costs with IPA's opening evidence is presented in Table III.F.2.

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[2] UP Reply workpaper "UPSP.pdf."

[3] UP Reply workpaper "Ledger Values for IPA Easement Deductions.xlsx."

[4] IPA Opening workpaper "IRR Opening Land.xlsx."

[5] UP Reply workpaper "UP Reply Land.xlsx."

Table III.F.2
Roadbed Preparation Costs
($ thousands)

Item		IPA	Reply	Difference
1.	Clearing and Grubbing	$1,350	$1,848	$498
2.	Earthwork			
	a. Common	$17,096	$44,312	$27,216
	b. Loose Rock	$33,612	$44,108	$10,496
	c. Solid Rock	$61,045	$84,048	$23,003
	d. Borrow	$27,271	$79,202	$51,931
	e. Land for Waste Excavation	$71	$85	$14
3.	Drainage			
	a. Lateral Drainage	$0.121	$533	$533
4.	Culverts	$5,138	$8,894	$3,756
5.	Retaining Walls	$1,013	$1,662	$649
6.	Rip Rap	$2,415	$2,384	-$31
7.	Relocation of Utilities	$30	$30	$0
8.	Topsoil Placement/Seeding	$749	$749	$0
9.	Water for Compaction	$574	$24,464	$23,890
10.	Environmental Compliance	$36	$36	$0
11.	Finish Grading	--	$19,751	$19,751
	Total	**$150,399**	**$312,106**	**$161,706**

a. Clearing and Grubbing

i. Clearing and Grubbing Quantities

UP accepts IPA's approach to developing IRR clearing quantities and applies the same method here.[6] Likewise, UP accepts and applies IPA's approach to grubbing quantities.[7] The

[6] This method calculates clearing quantities (acres per track mile) by valuation section based on the clearing and grubbing quantities in the ICC Bureau of Valuation B.V. Form 561 ("ICC Engineering Reports") and related documents. Those amounts are then increased by the ratio of the current roadbed specifications to the original construction specifications. Next, the adjusted quantities by valuation section are applied to track miles (including yards and sidings) of IRR's line segments in the same manner as the grading quantities discussed below.

[7] Grubbing quantities are calculated similarly to clearing quantities. The ICC Engineering Reports provide acres per track mile of grubbing, which UP adjusted in the same way as the clearing numbers and applied to IRR.

total clearing and grubbing quantities have been adjusted to reflect the changes discussed elsewhere in this section.

ii. Clearing & Grubbing Costs

UP accepts IPA's grubbing costs but rejects IPA's clearing costs. IPA makes two significant errors in determining the clearing costs for the quantities generated from the ICC Engineering Reports: (a) applying the Means costs for equipment that could not clear land at the rate of speed assumed by IPA; and (b) neglecting to include the Means cost of the equipment and labor necessary to load and haul away loose material created during clearing.

First, IPA understates clearing costs because the equipment selected cannot clear land at the rate IPA claims. The Means unit cost that IPA used is based on a 200-horsepower dozer capable of clearing eight acres per day using a twelve-foot wide brush rake. However, IPA specifies only one dozer to both pull the rake and stockpile organic materials. The dozer would therefore have to split its time between the two tasks. UP's engineering experts have adjusted the clearing rate to four acres per day to reflect this division of time.[8]

Second, IPA fails to account for the time, labor, and equipment necessary to load and haul away unsuitable material left after clearing. To adjust for this omission, UP's engineering experts added the Means cost of a crew – an equipment operator, an excavator, two dump trucks and drivers – to remove such material.[9]

After reducing the clearing rate to a realistic four acres per day and adding the cost of a crew to load and haul away materials after clearing, the total daily rate of clearing and loading a 30-foot wide section for over a mile is $1,382.17 per acre.[10]

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[8] UP Reply workpaper "Equipment Selection UP Reply.xlsx," Tab "Clearing Cost Adj."

[9] *Id.*

[10] UP Reply workpaper "IRR Grading Opening_UP_Reply.xlsx," Tab "IIIF Unit Costs."

iii. Other

(a) Stripping

IPA fails to include stripping costs. While the Board has held that stripping costs are subsumed in waste costs in some circumstances, this does not excuse IPA's failure to include them elsewhere.[11] Specifically, stripping is required when building roadbed on embankments.

The *PSCo/Xcel I* holding does not obviate IRR's need for separate stripping when building roadbed on embankments because building a roadbed on an embankment requires far more than simply removing a layer of soil. As a result, stripping costs are not subsumed in the initial excavation. Before building an embankment, all vegetation at the base of the embankment must be removed down to the root mat.[12] This requires removing all roots exceeding three inches.[13] Otherwise, the roots will decompose, leaving soft spots that will cause the embankment to shift under the pressure of the tracks and train. Where roots and stumps have been removed, the ground must be filled and compacted.[14] Then, the entire area to receive the embankment is proof-rolled to locate any soft areas.[15] If a soft area is found, the entire area will need to be plowed or scarified, then compacted with water.[16] Only after all those steps is it possible to place embankment. Organic material removed also must be disposed of in waste pits. These costs of stripping are not included in waste – and IPA fails to include them elsewhere.

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[11] *See Public Serv. Co. of Colo. v. Burlington N. & Santa Fe Ry.*, 7 S.T.B. 589, 671 (2004) ("*PSCo/Xcel I*") (holding that "because the top 6 inches of soil would be removed during excavation and because topsoil removal is included in waste costs," a separate stripping cost could be duplicative).

[12] UP Reply workpaper "UP Exc & Emb Specs.pdf."

[13] *Id.*

[14] *Id.*

[15] *Id.*

[16] *Id.*

UP, however, does not develop a separate cost for stripping. Instead, stripping costs are included in the undercutting costs necessary when constructing an embankment.

(b) Undercutting

Undercutting and/or stripping is required when constructing an embankment. However, IPA does not include them in its costs. Therefore, UP developed them in the first instance.

To determine how much of the IRR roadbed requires embankment, UP's engineering experts relied on the embankment quantities in the ICC Engineering Reports. Unfortunately, the ICC Engineering Reports do not specify the amount of undercutting. The ICC Engineering Reports are based on post-construction cross-sections taken every 100 feet and observations of physical characteristics of topography or structures that were an observable part of the roadbed construction effort. This information does not aid in estimates of subsurface roadbed or slope stabilization devices – including undercutting of unsuitable material – subsurface under-drainage, subsurface excavation or subsurface fill preparation. A cross-section viewed long after construction simply cannot show what was removed or added to make the roadbed.

Therefore, to determine the amount of the IRR roadbed that would require undercutting, UP's engineering experts developed the square footage of the roadbed under embankment based on the relative proportion of embankment to excavation calculated based on the ICC Engineering Report quantities. The amount of undercutting needed to stabilize roadbed varies based on the amount of organic material in a given location. Depending on the local conditions, up to four feet of undercutting could be required. However, UP's engineering experts conservatively assumed an average of six inches of undercutting would be needed to stabilize the roadbed properly to support embankment. This depth was then used to convert the square footage to cubic yards. Unit costs were then developed using the following assumptions: removal and disposal of all subsurface vegetation down to the root; undercutting of an average of six inches of material to reach material suitable for compaction; and ground compaction for placement of the embankment, as required by UP's construction standards. [17]

To incorporate the undercutting quantities, UP's engineering experts added the volume of undercutting to the total common excavation quantity and the volume of borrow needed for fill to the total borrow quantity.[18]

(c) Over-Excavation

In addition to undercutting, modern roadbed construction requires that, when solid rock is found at subgrade levels in cuts, at least twelve inches of over-excavation occur and that the rock be replaced with at least of twelve inches of select material and compacted to the same specifications as embankments.[19] On many projects, subballast is used for the twelve inches of material to bring the level back to subgrade elevation. However, a lower-cost alternative is to use compacted fill for the quantities and costs to replace the over-excavation of solid rock.

UP's engineering experts used the roadbed dimensions provided by IPA to calculate cubic yard quantities of solid rock over-excavation required in rock cuts and adjusted the quantity of rock excavation accordingly, using the unit cost developed in Section III.F.2.b.iii.(d).[20]

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[17] UP Reply workpaper "UP Exc & Emb Specs.pdf."

[18] UP Reply workpaper "IRR Grading Opening_UP_Reply.xlsx," Tab "Under-Cutting."

[19] UP Reply workpaper "UP Exc & Emb Specs.pdf."

[20] UP Reply workpaper "IRR Grading Opening_UP_Reply.xlsx," Tab "Over-Excavate Solid Rock"; IPA Opening workpaper "IRR Grading Opening.xlsx."

b. Earthworks

With the exception of undercutting and solid rock over-excavation discussed above, UP generally accepts IPA's earthwork quantities for mainline, siding, and yard track construction. However, UP rejects IPA's earthwork unit costs.

i. Earthwork Quantities from ICC Engineering Reports

Except where quantities must be adjusted based on changes included in other portions of this reply, UP accepts IPA's earthwork and other grading quantities, its assignment of valuation sections to the IRR route, and its adjustment of ICC Engineering Reports quantities to reflect modern day construction standards.

ii. Earthwork Quantities for Segments Not Covered by ICC Engineering Reports

Except where quantities must be adjusted based on changes included in other portions of this reply, UP accepts IPA's methodology for determining earthwork quantities for the IPP Industrial Lead and the CV Spur which are not covered by ICC Engineering Reports.

iii. IRR Earthwork Quantities and Costs

(a) IRR Line Segments

UP accepts the IRR route.

(b) IRR Yards

IPA has selected to use four yards, a single maintenance-of-way ("MOW") storage track and a locomotive repair facility at Provo. IPA developed the earthwork calculations for all of these facilities by assuming an average fill height of one foot. The one-foot fill assumption for yard tracks is a function of the assumptions made to remove earthwork quantities attributable to yard and other tracks from the quantities reported in the ICC Engineering Reports. This assumption has been generally accepted for those locations in which a new stand-alone entrant has assumed that it would place its yards in the same locations in which they exist in the real world. However, two of IPA's proposed yard locations – Provo and Price – and the locomotive repair facility in Provo are placed where no yards or similar facilities exist today and are as such outside the purview of the one-foot fill assumption. Because the Provo and Price yards are relatively small, to minimize the amount of discrepancies between the parties, UP accepts the one-foot fill assumption for all four of the IRR yards.

UP rejects this assumption for the Provo locomotive shop because of the special circumstances there. This is discussed in Section III.F.7.c.

(c) Total Earthwork Quantities

UP rejects IPA's total earthwork quantities. The particular errors and omissions are set out in the relevant sections below.

(d) Earthwork Unit Costs

Before addressing IPA's unit costs for specific types of earthwork, UP addresses one issue that affects all IPA's Means-based earthwork unit costs – shrinkage and swell.[21] The volume and density of earth undergo considerable changes when the earth is excavated, hauled, placed, and compacted. This is commonly referred to as "shrinkage and swell," and IPA does not account for it when developing costs based on Means.

The different volume characteristics are typically defined as follows:

- The bank-measure cubic yards (BCY), or original position volume, is the volume of the earth measured in the borrow pit, trench, canal, or cut prior to loosening. This is the volume on which payment is usually based.

[21] Shrinkage and swell have not been an issue in the development of Means earthwork costs in earlier Board stand-alone proceedings because the unit price information published by Means before 2005 did not identify the characteristics of the cubic yard earthwork quantities to which its unit costs applied. Since 2005, Means has included the BCY, LCY, and ECY unit designations, as discussed in this section.

- The loose-measure cubic yards (LCY) is the volume of earth after it has been removed from its natural position and deposited into trucks, scrapers, or spoil piles.

- The compacted cubic yards (ECY), or "fill-after-compaction volume," is the volume of the earth after it has been placed in a fill (*e.g.*, a dam or road) and compacted.

The Means catalog now provides the applicable measures for each price component. UP's engineering experts have conformed the IPA's quantities to these different measures.

UP's workpapers contain charts and graphs that detail the swell and shrinkage factors for various soil types.[22] The various factors are summarized below. UP's engineering experts conservatively used the adjusted factors – which are all at the low end of the relevant ranges – for adjusting quantities.

Sandy-Gravely-Earth	15% to 35%
Loose Rock (including ripped limestone & shale)	40% to 85%
Rock, well blasted	50% to 100%

UP's engineering experts then adjusted the Means based earthwork costs to consider properly earthwork materials as BCY, LCY, or ECY.

(i) Common Earthwork

IPA bases its unit cost for common earthwork excavation for the nearly 300-mile IRR on a 15-mile UP capacity expansion project near Lusk, Wyoming. To justify this comparison, IPA makes two unfounded assertions. Relying on U.S. Department of Agriculture ("USDA") soil maps, IPA claims that the soil near Lusk is comparable to the soil along the IRR route, meaning that excavation costs would be similar. IPA also claims that there are no relevant differences between expansion projects and performing earthwork in virgin territory. A close look at both assertions reveals that neither is true.

[22] UP Reply workpaper "Swell and Shrinkage.pdf."

The soil conditions encountered by UP on the Lusk, Wyoming, expansion project are not at all comparable to the soils along the IRR route. IPA concedes that 30% of the IRR line from Helper to Spanish Fork is mountainous terrain that follows the valleys and passes of the Price and Spanish Fork Rivers and that earthwork activities along this portion of the line would be more challenging.[23] IPA then asserts that the earthwork construction characteristics of the remaining 70% of the IRR route is similar to a section of track west of Lusk. IPA bases this claim on USDA soil maps comparing the shallow excavation characteristics between the two areas.[24] However, the maps do not provide the right information to allow this kind of comparison and, regardless, the information in them does not support IPA's position.

As explained in the soil map documentation, shallow excavations are intended for graves, utility lines, and open ditches dug to a maximum depth of five or six feet. Data in IPA's grading workpapers show that the average cut height for the IRR is 8.6 feet.[25] Even more significantly, 51% of IRR's total excavation is along the IRR route from Helper to Thistle. That section has an average cut of 17.1 feet.[26] The soil characteristics for the top one-third of the excavation do not provide sufficient information to make a valid comparison.

Further, even if the USDA soil maps could be used to compare soil conditions, the maps themselves show that earthwork activities would be more difficult along the IRR route than in Wyoming. The maps have three classifications for shallow excavations:

- "Not Limited" means that the soil is very favorable for shallow excavations;

[23] IPA Opening Nar. at III-F-9 to III-F-10. Not surprisingly, IPA makes no adjustment to its earthwork unit costs to reflect this more difficult construction.

[24] IPA Opening Nar. at III-F-10; IPA Opening workpaper "Shallow Excavation Comparison.pdf."

[25] IPA Opening workpaper "IRR Grading Opening.xlsx," Tab "IIIF CALC."

[26] *Id.*

- "Somewhat Limited" means that the conditions are moderately favorable for shallow excavation and that special planning and design or installation are required; and

- "Very Limited" means that the soil has one or more features that are unfavorable for shallow excavation.

The soil maps indicate that only 2.3% of soil in Lusk, Wyoming, is classified as Very Limited.[27] By contrast, IPA's own workpaper shows that 26.5% of the soil along the IRR route is Very Limited.[28] IPA cannot simply ignore a ten-fold difference in the amount of Very Limited soil in developing its unit costs for excavation.

Furthermore, a close look at the USDA soil maps reveals that even the ten-fold difference in the proportion of Very Limited soil is understated. The maps show the soil classification in the area surrounding highways, but the area for which soil classification is shown is not a consistent width. Examining the maps reveals that the area shown with soil classifications shown are wider where the soil is Somewhat Limited and narrower where it is Very Limited. As a result, the proportion of Very Limited soil is understated.[29] In addition, the maps do not include the soil classification of the 40-mile section of the IRR route between Thistle and Horse Creek (just east of Colton), which is surrounded by soil classified as 100% Very Limited, meaning that it almost certainly has Very Limited soil as well.[30] If that is the case, then Very Limited soil would comprise roughly 36% of the soil along the IRR route, more than 15 times the percentage near Lusk, Wyoming. In short, the maps upon which IPA relies demonstrate that the Lusk expansion project is not a valid basis for developing the earthwork costs for IRR.

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[27] IPA Opening workpaper "Shallow Excavation Comparison.pdf."

[28] IPA Opening workpaper "Soils Distribution.xlsx."

[29] Two examples are the soils maps in IPA's workpapers: IPA Opening workpaper "203- IPA S of Clear Lake to N of Clear Lake.pdf"; IPA Opening workpaper "205- IPA Delta to Lynndyl.pdf."

[30] IPA Opening workpaper "Shallow Excavation Comparison.pdf."

IPA's second assertion – that the cost of doing excavation on an expansion project is the same as doing the same excavation in virgin territory – is equally baseless. The Lusk, Wyoming, project added a third main line to the existing tracks, so the excavation performed there benefitted from work done while building the original line. There are three types of costs associated with building new roadbed that are omitted in the unit costs from the UP expansion project: (a) certain types of excavation costs; (b) costs to build infrastructure to support the earthwork; and (c) costs to obtaining information necessary to perform the earthwork.

The common earthwork costs of expansion projects are substantially lower than building a new line because some types of excavation have already been done. For roadbed that is not on embankment, expansion projects fail to capture the costs of stripping/waste. Whether it is termed "stripping" or "waste," soil must be removed to provide a stable base for track (except when undercutting is required). When constructing a new roadbed, the area under the sideslopes and track center is stripped before being built up. When a new track center is added to an existing roadbed, the existing sideslope provides a pre-stripped, partially built-up area on which to construct the new track center. Additional stripping is only required for the area outside the existing sideslope where the new sideslope will be built. Depending on the width of the sideslope (which is a function of roadbed height), the proportion of the common earthwork that does not require additional stripping will vary.

When building roadbed on embankment, undercutting is necessary instead of stripping. And, because embankments have wider sideslopes than non-embankment roadbed, the proportion of the expanded embankment roadbed that would require undercutting is even smaller than the proportion of the expanded non-embankment roadbed that requires stripping. Therefore, the common earthwork unit costs will be even less representative of the unit costs incurred in building a new roadbed.

IRR's roadbed would not be constructed where stripping and undercutting have already been done. Therefore, it is improper for IPA to derive its common earthwork costs from projects expanding existing roadbeds.

Expansion projects also have the benefit of infrastructure from the original construction. Equipment can be brought in faster and more cheaply because there is already a railroad line where the construction occurs. Also, access roads have already been cut. Vehicles can traverse canyons and rivers because bridges have already been built. Construction offices can be erected faster because site improvements have already been made. This existing infrastructure eliminates ancillary costs associated with common earthwork that would otherwise increase unit costs. IRR's roadbed would not be constructed where there was preexisting infrastructure to support earthwork, so it is improper for IPA to take earthworking costs from projects that did benefit from that infrastructure.

Because the expansion project that IPA identifies is not a fair basis for earthwork unit costs, UP's engineering experts developed them in the first instance. UP's engineering experts developed these costs using the Means prices for common excavation that IPA identified (but did not apply) with four necessary modifications.

First, as discussed in Section III.F.2.b.iii.(d), UP adjusts IPA's unit costs to include shrinkage and swell using the Means line items specified by IPA.[31]

Second, IPA's evidence omits necessary equipment for shaping roadbeds and sideslopes. While UP accepts IPA's selection of an elevating scraper for excavation and borrow of common

[31] UP Reply workpaper "IRR Grading Opening_UP_Reply.xlsx," Tab "IIIF_Unit Costs."

earth, self-propelled scrapers are not capable of shaping the roadbed or sideslopes. UP therefore adds a dozer for spreading dumped material.[32]

Third, IPA's evidence specifies an equal 50%-50% ratio between sheepsfoot rollers and steel wheel rollers for compaction. Although the equipment selected is not problematic, the ratio is impractical. When embankments are initially constructed, the terrain is uneven. Steel wheel rollers are almost impossible to maneuver on uneven surfaces because the smoothness of the steel drum causes them to slide downhill. Therefore, sheepsfoot rollers are used to compact embankments until they reach subgrade elevation, which is the majority of the compaction. Steel wheel rollers are used only for the top one to two feet. As a result, the correct ratio between sheepsfoot rollers and steel drum rollers is 80%-20%.

Fourth, a one-mile haulage charge was added for taking the 30% of waste excavation quantity to the purchased waste material disposal sites.[33] The adjusted unit cost for common excavation using Means is $8.79 per cubic yard..

(ii) Loose Rock Excavation

For its loose rock excavation costs, IPA uses Means, an approach that UP accepts. However, UP makes five necessary modifications to unit costs.

First, UP applies the volume changes in earthwork materials due to shrinkage and swell discussed in Section III.F.2.b.iii.(d).[34]

Second, UP rejects IPA's selection of 42-cubic-yard haulers because the stress from those vehicles would crush standard culverts. A two-foot diameter culvert is designed to bear the

[32] *Id.*

[33] Thirty percent of all excavation is classified as waste and will need to be hauled off site. IPA did not include a haulage for this waste. UP assumed a very conservative one-mile haul for waste and included this in the unit cost. *Id.*

[34] *Id.*

stress of the embankment on top of it. A typical ten-foot high embankment[35] with a train loading exerts a stress of 2,063 pounds per square foot at the base of the embankment (and thus on the culvert).[36] The axle load of a 42-cubic-yard hauler creates approximately 5,000 pounds per square foot of stress at the top of the pipe.[37] In other words, when a 42-cubic-yard hauler travels over a two-foot diameter culvert, the culvert would have to support 2.4 times the stress that it is designed to bear. Unless IPA is willing to purchase culverts 2.4 times stronger than what is needed to support an embankment and train loading, 42-cubic-yard haulers cannot be used on IRR's roadbed. IPA has failed to meet its burden of demonstrating the feasibility of this equipment. UP therefore adjusts the Means-derived earthwork costs to reflect the use of standard 22-cubic-yard haulers.[38]

Third, UP adjusts IPA's costs for the equipment selections in its narrative for ripping and piling rock. In its narrative, IPA states that it would use "two 300 HP dozers for ripping the loose rock and pushing it into piles."[39] However, in its workpapers, IPA uses the Means price for ripping rock with a 300-horsepower dozer and piling the rock with a 410-horsepower dozer.[40] UP corrects this error in its workpapers.[41]

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[35] The average embankment height for the IRR is 9.2 feet. UP Reply workpaper "IRR Grading Opening_UP_Reply.xls," Tab "IIIF CALC."

[36] UP Reply workpaper "42 CY Truck.pdf."

[37] *Id.*

[38] UP Reply workpaper "IRR Grading Opening_UP_Reply.xlsx," Tab "IIIF_Unit Costs."

[39] IPA Opening Nar. at III-F-22.

[40] IPA Opening workpaper "IRR Grading Opening.xlsx," Tab "IIIF Unit Costs."

[41] UP Reply workpaper "IRR Grading Opening_UP_Reply.xlsx," Tab "IIIF_Unit Costs."

Fourth, UP includes the cost of transporting waste materials to landfills, which IPA omitted (as discussed in Section III.F.2.b.iii.(d).(i)).[42] UP's engineering experts conservatively assumed a one-mile haul.[43]

Finally, UP corrects the ratio of sheepsfoot rollers and steel drum rollers used to compact embankments (as discussed in Section III.F.2.b.iii.(d).(i)).

(iii) <u>Solid Rock Excavation</u>

In developing solid rock excavation unit costs from Means, IPA makes four errors. The first three are simply additional instances of errors discussed above. First, IPA again neglects shrinkage and swell in its calculations (as discussed in Section III.F.2.b.iii.(d)). Thus, UP's engineering experts adjusted costs to remedy this omission.[44] Second, IPA again selected the infeasible 42-cubic-yard haulers (as discussed in Section III.F.2.b.iii.(d).(i)). UP's engineering experts have again corrected this by assuming a 22-cubic-yard hauler instead.[45] Third, IPA again omitted waste hauling costs, and UP's engineering experts have again included the cost of transporting the waste an average of one mile to landfills (as discussed in Section III.F.2.b.iii.(d).(i)).[46]

The fourth error in IPA's solid rock excavation costs is that IPA ignores the boulders produced by blasting. IPA's calculations assume that blasted rock produces only fine materials that can be handled by a three-cubic-yard bucket. However, blasting produces large boulders as

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[42] *Id.*

[43] *Id.*

[44] *Id.*

[45] *Id.*

[46] *Id.*

well.[47] A conservative estimate based on UP's engineering experts' observations of blasting operations is that one-tenth of the material left by blasting solid rock will be boulders.[48] Boulders, even those under one cubic yard, take significantly more time to handle and load than fine materials. Means accommodates this by lowering the production rate when handling boulders.[49] UP's engineering experts included this reduced production rate in IPA's solid rock excavation costs to account for the boulders produced during blasting.[50]

(iv) Embankment/Borrow

UP rejects IPA's novel approach for developing unit cost for borrow because it fails to account for the vast majority of costs incurred in excavating borrow. IPA develops its material cost for borrow by assuming that it can simply purchase the land for borrow pits as needed along the IRR route.[51] IPA's cost also includes the unrealistic assertion – with no supporting analysis – that its borrow pits will be an average of one mile from the excavation sites.[52]

For this to be the case, IPA would need to purchase a borrow pit every two miles along the 175 miles of the IRR route that requires borrow, for a total of 88 pits.[53] To produce sufficient quantities of borrow, each pit would need to provide seven acres of borrow.[54] IPA has not demonstrated the feasibility of locating and acquiring the substantial number of required

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[47] UP Reply workpaper "Hondo Valley Equipment 030603 RCP.pdf," p. 5.

[48] UP Reply workpaper "US 70 Hondo Valley Project 021203.pdf."

[49] UP Reply workpaper "Means Unit Costs 2011.pdf," p. 295 (Means Item 31-23-16.30-5000).

[50] UP Reply workpaper "IRR Grading Opening_UP_Reply.xlsx," Tab "IIIF_Unit Costs."

[51] IPA Opening Nar. at III-F-24.

[52] IPA Opening workpaper "IRR Grading.Opening.xlsx," Tab "IIIF Unit Costs."

[53] 175 miles ÷ 2 miles per pit = 88 Borrow Pits. IPA Opening workpaper "IRR Grading Opening.xlsx," Tab "IIIF EW Cost."

[54] 609 Acres required ÷ 88 pits = 7 Acresper pit. UP Reply workpaper "IRR Grading Opening_UP_Reply.xlsx," Tab "IIIF Unit Costs."

parcels suitable for borrow pits at such regular intervals. Even assuming that such a feat would be possible, IPA's price for borrow fails to include the vast majority of costs to obtain borrow.

In developing its unit cost for borrow, IPA took into account only the costs of buying the land for the pit (at an assumed and unsubstantiated price), extracting the borrow, hauling it one mile, and spreading/compacting it.[55] This does not include the costs of the infrastructure necessary to operate the pit, such as access roads, entrances, an office, a trailer, a parking lot, and a weigh scale. IPA's unit cost also ignores the need for land required for this infrastructure and the land needed for stockpiling topsoil, perimeter setbacks, and 1:1 side slopes. Because IPA has chosen to have so many small borrow pits, each of these costs would be duplicated at each location. Without accounting for the cost of infrastructure and additional land, IPA's unit cost for borrow is completely baseless.

Because IPA has failed to demonstrate the feasibility of its proposal for borrow costs and because it has failed to include many of the necessary costs required to implement its plan, UP rejects IPA's borrow cost proposal and instead develops the cost for the IRR borrow from Means, consistent with prior Board precedent.[56]

(v) Fine Grading

While IPA accepts that fine grading is necessary when constructing roadbed, it argues that it need not include a separate cost for fine grading because the documents from the Lusk, Wyoming, expansion project gave a single unit cost for both fine grading and common earthwork.[57] However, as explained in Section III.F.2.b.iii.(d).(i), above, the unit cost of

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[55] UP Reply workpaper "IRR Grading Opening_UP_Reply.xlsx," Tab "IIIF Unit Costs."

[56] *Id.*

[57] IPA Opening Nar. at III-F-25. In the fine grading portion of its narrative, IPA refers to the "Shawnee-Jireh unit cost," but this is just the unit cost from the expansion project near Lusk, Wyoming.

common earthwork on an expansion project is substantially lower than the cost when constructing a new roadbed. Even if UP's experience on the Lusk project were remotely relevant, because the supporting documents do not differentiate between costs for fine grading and costs for common earthwork, it is impossible to use them to determine the separate cost of fine grading from the expansion project's artificially low cost for common earthwork.[58]

The corrected unit cost for common earthwork came from Means, and fine grading is not included in that price.[59] Therefore, UP's engineering experts developed the fine grading unit costs in the first instance.

UP's engineering experts again relied on the Means unit cost for fine grading.[60] The base Means cost is then adjusted to include the additional equipment and labor for fine grading.[61] To maximize cost efficiency, UP's engineering experts have assumed that the contractor doing the fine grading will use as much of the equipment that IPA has selected for other tasks as possible.

UP's engineering experts determined the quantity of fine grading needed using IPA's specifications for the dimensions of single- and double-track roadbed.[62]

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[58] Even if the cost of fine grading were listed as a separate line item in the documents from the Lusk expansion project, those costs might not be representative of the costs of fine grading a new roadbed. The benefits of existing infrastructure, such as access roads and the use of the existing rail line, would make it faster and easier for a contractor to bring in equipment, lowering the overall unit cost. Additionally, doing fine grading on the new portion of an expanded roadbed is easier because the old portion of the roadbed provides a reference point for the grade of the new portion.

[59] UP Reply workpaper "Means Unit Costs 2011.pdf," p. 6 (Means 31-22-16.10-0200).

[60] *Id.* at p. 5 (Means 31-22-16.10-0200).

[61] UP Reply workpaper "Equipment Selection UP Reply.xls."

[62] UP Reply workpaper "Finish Grading.pdf"; UP Reply workpaper "IRR Grading Opening_UP_Reply.xlsx," Tab "IIIF_12 Othr Cst." UP's engineering experts did not include slopes, swales, ditches, or yards in the quantities of earthwork requiring fine grading. *Id.*

(e) Land for Waste Excavation

UP accepts IPA's cost per acre of land for dumping waste material but rejects IPA's calculation of the area of land needed for this purpose. There are two major flaws with how IPA calculates the necessary land for waste. The first flaw is that the area calculations assume that waste can be piled 15 feet in the air with a perfectly vertical sideslope. Without a sideslope or a retaining wall of some sort, a pile of waste would immediately collapse into a wider, lower heap. UP has corrected the footprint to include a 1:1 sideslope for the waste pile.[63] The second flaw is that the area of land identified is exactly the same size as the area needed for the waste, leaving no way for equipment to work the site. UP's engineering experts corrected this by including land for a standard 20-foot setback from the toe of the slope to also allow equipment to move safely as they work on the site.[64]

(f) Total Earthwork Cost

The adjustments described above increase the costs associated with total earthwork, including additional land purchases, for IRR to a total of $271.5 million, an increase of $132.4 million.

c. Drainage

i. Lateral Drainage

UP rejects IPA's use of the ICC Engineering Reports to quantify lateral drainage needed for the IRR route. While the ICC Engineering Reports accurately reflect the drainage that existed at the time of the reports, the insufficient drainage in place at that time led to perpetual problems with rock and mud slides. For example, the drainage in place when the ICC Engineering Reports were created failed to prevent the Thistle Slide, which required massive

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[63] UP Reply workpaper "IRR Grading Opening_UP_Reply.xlsx," Tab "IIIF_12 Othr Cst."
[64] *Id.*

expenditures by UP.[65] To prevent another major slide, UP installed additional drainage in the mountainside above the track.[66] While IPA need not incur the cost of adding drainage after a major slide (or the roughly $40 million that UP paid to remedy the Thistle Slide), IRR does need additional lateral drainage to prevent rainfall and snowmelt from starting rock and mud slides.

UP's engineering experts have developed the costs of adding standard drainage trenches used in areas with high slide risk.[67] These trenches would be placed in the 16 highest slide risk locations along the IRR route.[68] The total cost for adding lateral drainage sufficient to prevent most major slides is $533,186, rather than the $121 that IPA allots.

ii. Yard Drainage

IPA has included yard drainage with the cost of the facilities. Therefore, to the extent necessary, UP addresses yard drainage costs when responding to IPA's facilities costs.

d. Culverts

UP rejects IPA's culvert costs and corrects IPA's culvert quantities.

i. Culvert Unit Costs

UP rejects IPA's culvert unit costs because they either omitted or incorrectly applied many of the costs associated with the installation of culverts.

IPA understates its costs for corrugated metal pipe ("CMP") culverts and for pre-cast reinforced concrete pipe ("RCP") culverts. Instead of including all of the costs for these items, IPA uses the cost from suppliers' quotes, then adds a railroad haulage charge from the suppliers

[65] UP Reply workpaper "Utah Geo Survey-thistle.pdf"; UP Reply workpaper "Thistle Mudslide.pdf"; UP Reply workpaper "Thistle from Wiki.pdf."

[66] UP Reply workpaper "Railroad Slide Trench Drains.pdf."

[67] UP Reply workpaper "IRR Grading Opening_UP_Reply.xlsx," Tab "Thistle Slide Lateral Drainage."

[68] UP Reply workpaper "IRR Grading Opening_UP_Reply.xlsx," Tab "IIIF_Unit Costs."

to three delivery points (Provo, Price, and Lynndyl). However, IPA omitted the cost of transporting the culverts from the delivery points to the installation sites and the cost of the labor and equipment needed to handle and set the culverts. It also omits any overhead and profit for the installer.[69] UP revised the CMP culverts unit cost by using the Means unit cost. For the few CMP culvert sizes not included in Means, the unit costs were interpolated from CMP culverts of similar size. Because Means does not have most of the RCP culvert sizes, UP revised the RCP unit costs by using IPA's material cost and adding the cost for the labor and equipment needed for installation as well as the cost of overhead and contractor profit.[70]

IPA also understates its cost for bedding material. IPA derives its bedding material cost by using Means, then replacing the Means material cost with a price quote from a quarry. However, the quote did not include the cost of transporting the material from the quarry to the installation site.[71] For the Helper-Price area on the IRR route, the quarry that IPA selected would need to haul the bedding material 278 miles. One indication of the implausibility of this haul distance is that Means has a maximum haulage distance of 50 miles.[72] By again failing to include transportation costs in its unit costs, IPA again fails to demonstrate that its price for materials is plausible. UP's engineering experts therefore applied the Means cost for bedding

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[69] IPA Opening workpaper "Big R Bridge Quote.pdf"; IPA Opening workpaper "Lane1.pdf"; IPA Opening workpaper "Lane2.pdf"; IPA Opening workpaper "SDConcrete1.pdf"; IPA Opening workpaper "SDConcrete2.pdf"; IPA Opening workpaper "SDConcrete3.pdf."

[70] UP Reply workpaper "Culvert List 2011_UP_Reply.xls," Tab "Reference Worksheet."

[71] IPA Opening workpaper "Milford Quarry - Phone Log.pdf"; IPA Opening workpaper "Bedding Cost.pdf."

[72] UP Reply workpaper "Means Cost Data 2011.pdf," p. 308 (Means 31-23-23.20).

installation.[73] UP's engineering experts also included the cost of backfilling culvert trenches that IPA neglects to include in its unit cost.[74]

Finally, IPA understates its culvert unit costs by applying the incorrect Means location factor to its excavation and compaction costs for culverts. Also, IPA used Means to develop excavation cost for culverts and compaction costs but used the incorrect Means location factor. UP's engineering experts corrected this error.[75]

ii. Culvert Installation Plans

IPA incorrectly calculates the costs associated with culvert installation. Specifically, the culvert installation plan in IPA's opening narrative and workpapers have incomplete and conflicting descriptions. In its narrative, IPA states that a trench will be excavated to one foot below the flow line of the culvert, the bedding and culvert will be installed, and the trench will then be backfilled. [76] IPA's workpapers shows backfill to top of trench but only includes one foot of excavation.[77] Neither document states a total trench depth.

To correct these errors, UP assumes a trench depth that is comprised of one foot for bedding, plus the outside diameter of the pipe, plus two feet of cover above the top of the pipe. The two feet of cover is needed to protect pipe from equipment driving above.[78] The trench width will be the width of the pipe plus one foot on each side of pipe for bedding material.

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[73] UP Reply workpaper "Culvert List 2011_UP_Reply.xls," Tab "Installation Reference costs."

[74] UP Reply workpaper "Culvert List 2011_UP_Reply.xls."

[75] UP Reply workpaper "Culvert List 2011_UP_Reply.xls," Tab "Installation Reference costs."

[76] IPA Opening Nar. III-F-29.

[77] IPA Opening workpaper "Bedding Detail.pdf."

[78] UP Reply workpaper "UP_Section_02434_Culverts.pdf."

Additionally, IPA's culvert installation plan neglects to include the cost of trench backfill needed from the top of the bedding to the top of the trench. UP has corrected IPA's trench backfill error by using Means to develop a unit cost. [79]

Finally, IPA's workpapers include several errors in calculating culvert costs. Not only do errors throughout the workpapers cause IPA to understate the excavation, bedding, and compaction quantities by a factor of four,[80] but IPA's calculations fail to include the $726,168 for rip rap in its total culvert costs.[81] UP's engineering experts have corrected IPA's errors.[82]

iii. Culvert Quantities

UP generally accepts the IPA's culvert length quantities, other than to correct IPA's duplication of the costs of three box culverts.[83] UP accepts IPA's substitution of culverts for bridges and bridges for culverts. However, for seven of the bridges that IPA has converted to culverts, IPA used an incorrect (and lower) unit cost. UP's engineering experts have corrected this mistake. [84]

iv. Total Culvert Costs

UP has determined the cost of culverts to be $8.9 million, rather than the $5.2 million calculated by IPA. [85]

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[79] UP Reply workpaper "Culvert List 2011_UP_Reply.xls."

[80] UP Reply workpaper "Culvert List 2011_UP_Reply.xls," Tab "Stone Cons Culvert List."

[81] IPA Opening workpaper "Culvert List 2011.xls," Tab "Culverts Summary Sheet."

[82] UP Reply workpaper "Culvert List 2011_UP_Reply.xls," Tab "Culverts Summary Sheet."

[83] UP Reply workpaper "Culvert List 2011_UP_Reply.xls."

[84] UP Reply workpaper "Culvert List 2011_UP_Reply.xls," Tab "Bridge to culvert."

[85] UP Reply workpaper "Culvert List 2011_UP_Reply.xls," Tab "Culvert Summary Sheet."

e. Other

i. Sideslopes

UP accept IPA's average sideslope ratio of 1.5:1.

ii. Ditches

UP accepts IPA's specifications of side ditches in trapezoidal sections with cuts two feet wide and two feet deep for all locations except MP 678.28 to MP 683.78 which is through the area of the Thistle. Based on the historical battle of slides in this area, a two-foot wide ditch bottom would not provide sufficient area to catch any sloughing or falling debris before it fouled the track. The UP's engineers applied six-foot wide ditch section in cut locations along this track segment to provide additional capacity to capture this falling debris. This is consistent with the ditches along this segment of the real UP route.[86] Without this additional ditch capacity, IPA would have operational impacts and additional maintenance costs to clear this debris.

iii. Retaining Walls

UP rejects IPA's quantities for retaining walls and methodology for converting ICC quantities to quantities of gabion baskets. UP accepts the proposed unit costs for retaining walls, other than to correct the location factor. The location factor that IPA used – 0.9289 – is an average for multiple locations, but IPA opted to use on-site material.[87] Therefore, the proper location factor is the one for where the retaining walls are located – 0.9780.

(a) Gabion Quantities

IPA understates the quantity of gabion needed to build IRR's retaining walls. IPA opts to replace the masonry and timber of the retaining walls in the ICC Engineering Reports with

[86] UP Reply workpaper "East End Helper2.jpg."

[87] IPA Opening Nar. at III-F-31.

gabion walls.[88] While this is feasible, IPA does not properly calculate how much gabion is needed to make the substitution. Specifically, where the ICC Engineering Reports list masonry walls, IPA substitutes only one cubic yard of gabion to replace one cubic yard of masonry.[89] However, the retaining power of a masonry gravity-type wall is based on weight, not volume.

A cubic yard of gabion (a rectangular wire basket filled with small pieces of stone) weighs significantly less than a cubic yard of masonry (larger chunks of stone kept together with or without mortar). As a result, gabion has a significantly lower load-carrying capacity than masonry. To substitute gabion for masonry, the weight of gabion used must equal the weight of the masonry replaced. IPA improperly substitutes based only on volume. UP's engineering experts develop the proper volume conversion ratio below.

To determine the correct gabion-to-masonry substitution ratio, it is necessary to determine both the average weight of a cubic yard of masonry and the average weight of a cubic yard of gabion. Masonry walls are composed of units of solid material like that found around the right-of-way. The ICC Engineering Report lists examples of this material, including: blocks of cut stone, cobbles, rubble, and (in some cases) concrete or brick. In the regions that IRR traverses, the most common stone that could be used for masonry would be sandstone and soft- to medium-density limestone.

The sandstone and limestone have solid unit weights of 140 pounds per cubic foot and 138 pounds per cubic foot, respectively (averaging 139 pounds per cubic foot).[90] The broken-stone unit weight of both types of stone is 90 pounds per cubic foot. Incorporating all of these factors produces an average of 3,753 pounds per cubic yard of sandstone/limestone masonry. A

[88] *Id.* at III-F-44.

[89] IPA Opening workpaper "IRR Grading Opening.xlsx," Tab "IIIF_4 Othr EW."

[90] UP Reply workpaper "Retaining Wall.pdf," drawing "RET_WALL-1."

gabion basket containing one cubic yard of broken sandstone or limestone will weigh only 2,430 pounds.[91]

The quantity of gabion needed to replace all the masonry walls in the ICC Engineering Reports is equal to the ratio between the weight of masonry that is being replaced and the weight of gabion that will be used to replace the masonry (slightly over 1.54:1)[92], multiplied by the total quantity of masonry being replaced. Design charts created by Maccaferri, a company specializing in retaining wall construction, show that the same type of calculation is used when substituting solid stone gabion basket unit weights for broken stone gabion basket unit weights for gravity retaining walls.[93] Applying these calculations, UP's engineering experts adjusted the volume of gabion.[94]

Similar to the masonry stone wall, IPA miscalculated the conversion for timber walls to walls made of gabion baskets. UP agrees with IPA's conversion of MBM (a unit of volume equal to 1000 board feet) to square yards but disagrees with the conversion of square yards of timber to cubic yards of gabion wall.

IPA converted of one square yard of timber wall to one cubic yard of gabion wall. This conversion assumes that a square yard of exposed timber wall is interchangeable with the exposed gabion surface. However, this assumption is only valid for short walls that have only a single course of gabion baskets. The retaining walls actually in service along the alignment

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[91] UP Reply workpaper "Maccaferri.pdf," Section "Effective weight of a structure made up with gabions."

[92] This calculation is as follows: $3{,}753 \div 2{,}430 = 1.5\overline{4}$.

[93] UP Reply workpaper "Maccaferri.pdf," Section "Effective weight of a structure made up with gabions," Table 2.

[94] UP Reply workpaper "Retaining Wall.pdf."

clearly retain far more than one 3-foot high course of gabion.[95] UP's engineers experts estimated the volume of gabion baskets in service along the alignment at MP 630 to calculate a more appropriate conversion of square yards of surface area to cubic yards of gabion basket. Based on that estimate, UP's engineering experts applied a conversion factor of 2.2 cubic yards per square yard of exposed surface.[96]

These two quantity adjustment increases the cost for retaining walls from $1,013 to $1,662..

iv. Rip Rap

UP accepts IPA's quantity of rip rap but rejects the unit cost. Specifically, when developing the unit costs of rip rap, IPA makes a baseless assumption concerning the distance that suitable rock would need to be transported. The Means cost IPA selects assumes that rock suitable for use as rip rap is located within two miles of where the rip rap would be used. It is extremely unrealistic to assume that all the remote areas traversed by IRR would be within two miles of the 30% of the worksites on the IRR route that have excess rock. UP's engineering experts modified IPA's rip rap unit cost by assuming a more realistic ten-mile haul.[97]

v. Relocating and Protecting Utilities

UP accepts IPA's costs for relocating and protecting utilities.

vi. Seeding/Topsoil Placement

UP accepts IPA's embankment protection costs and quantities.

vii. Water for Compaction

IPA miscalculates both the unit cost and quantity of the water needed for compaction.

[95] UP Reply workpaper "MP 630 Bind Wall Ex Gabion.pdf," drawing "RET_WALL-1."

[96] UP Reply workpaper "IRR Grading Opening_UP_Reply.xlsx," Tab "III F_4 Othr EW."

[97] IPA Opening workpaper "IRR Grading Opening.xlsx," Tab "IIIF Unit Cost."

In calculating its unit cost, IPA incorrectly applies Means cost to cubic yards of water, rather than embankment cubic yards ("ECY"). IPA's workpapers state that this is based on a communication from Means.[98] However, UP's engineering experts contacted Means and verified that the unit specified in the catalog – ECY – is the proper unit for water for compaction.[99] UP's engineering experts have corrected this in UP's workpapers.[100]

IPA also erred in calculating the quantity of water needed for compaction. IPA claims that it need only include the water for compaction for borrow, not embankment.[101] IPA makes this assertion because the invoices for the expansion project near Lusk, Wyoming, do not include a line-item for water for compaction.[102] However, IPA's position is untenable.

As discussed in Section III.F.2.b.iii.(d)., the soil near Lusk is very different from the soil on the IRR route, meaning that quantity of water needed to compact a cubic yard of embankment will not be the same.

Even if the amount were the same, the bid price for the Lusk expansion project would not reveal the appropriate cost of water for compaction on IRR. The bid documents for the Lusk project did not include a line-item for water for compaction. If water for compaction was not included in the bid price, then IPA cannot rely on that document. If water for compaction was included in the bid price, then there is no way to know what proportion of the bid price was due to this cost.

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[98] IPA Opening workpaper "IRR Grading Opening.xlsx," Tab "IIIF Unit Cost."

[99] UP Reply workpaper "RSMeans_Email_11-03-11.pdf."

[100] IPA Opening workpaper "IRR Grading Opening.xlsx," Tab "IIIF Unit Cost."

[101] IPA Opening Nar. at III-F-34.

[102] *Id.*

Assuming that the latter is true, the only way for the bid price to apply to the IRR route would be if the cost for common excavation and water for compaction for Lusk were the same as on the IRR route. However, as discussed in Section III.F.2.b.iii.(d).(i)., that is not the case. The lack of a line-item for water for compaction makes it impossible to distinguish between the unit price of water for compaction and the unit price for common earthwork.

The Means price for common excavation, which UP has shown is a more accurate reflection of the cost IRR would have to pay, does not include water for compaction. Given the impossibility of determining what – if any – portion of the Lusk bid price was for water for compaction, UP applies the Means price of water for compaction to the IRR embankment and borrow quantities.[103]

UP has determined the cost of water for compaction to be $24.54 million, rather than the $573,963 calculated by IPA. [104]

viii. Surfacing for Detour Roads

UP accepts IPA's costs for surfacing detour roads.

ix. Environmental Compliance

UP accepts IPA's costs of environmental compliance.

3. Track Construction

UP rejects IPA's costs for track construction. The specific problems with those costs are detailed below.

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[103] UP Reply workpaper "IRR Grading Opening_UP_Reply.xlsx," Tab "IIIF_12 Othr Cst."

[104] IPA Opening workpaper "IRR Grading Opening.xlsx," Tab "III_12 Othr Cst."

Table III.F.3
Track Costs Comparison

		IPA	Reply	Difference
1.	Ties	$ 43,648	$ 49,110	$ 5,462
2.	Ballast	$ 28,662	$ 191,670	$ 163,008
3.	Labor	$ 84,179	$ 106,813	$ 22,634
4.	Rail & Other Track Material	$ 85,530	$ 94,144	$ 8,614

a. Geotextile Fabric

UP accepts IPA's costs for geotextile fabrics under turnouts. However, IPA fails to present sufficient evidence to establish the costs for geotextile fabric under at-grade crossings. The document on which IPA relies includes a line-item for "Rebuild Crossings," but it does not specify whether geotextiles are included in that cost.[105]

Rather than develop the cost of geotextile fabric under at-grade crossings here, the total cost of the crossings will be addressed in Section III.F.8.c., which discusses at-grade crossings.

b. Ballast and Subballast

UP rejects IPA's costs and quantities for ballast and subballast.

i. Quantities

UP accepts IPA's ballast and subballast quantities, except where adjustments in those quantities are needed because of changes discussed in other sections of this reply.

ii. Unit Prices

As explained below, IPA incorrectly develops both its ballast and subballast unit prices.

(a) Ballast

UP rejects IPA's unit price for ballast because it fails to account properly for transportation costs. IPA makes three mistakes in calculating its transportation costs.

[105] UP Reply workpaper "Utah DOT 2009 Average Bid Prices, Item 020750010, Geosynthetics – Separation."

First, IPA understates the shipping distance from Lynndyl to Provo.[106] UP's engineering experts have corrected this in UP's workpapers.[107]

Second, IPA assumes a transportation cost of $0.035 per ton-mile for the portion of the shipping performed by UP.[108] This rate was first used in *Arizona Public Service v. Atchison, Topeka & Santa Fe Railway*, where the parties "agree[d] that the transportation cost for track materials would be $0.035 per ton-mile" in 1994.[109] UP was not a party to the case, and there is no legitimate reason to believe that $0.035 is now accurate, given that it dates back 17 years and covers only track materials (as opposed to all shipping). One indication of how inaccurate this price is today is that diesel fuel has increased in price by just over 350% since 1994.[110]

To determine the actual cost that IRR would incur shipping its ballast on UP, UP's engineering experts used the UP website to obtain the rate for transporting ballast materials. The per-car cost for transporting ballast in a 100-ton open-top hopper car is $2,348 plus a fuel surcharge of $0.36 per mile.[111] Over the 163 miles that IPA's contractor would have to ship the ballast, this results in a transportation additive of $0.15 per ton-mile.[112] Notably, this increase

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[106] UP Reply workpaper "Rail Transportation Mileage from UPRR.pdf."

[107] UP Reply workpaper "Ballast & subballast UP Reply.xls."

[108] IPA Opening Nar. at III-F-39.

[109] *Ariz. Pub. Serv. Co. v. Atchison, Topeka & Santa Fe Ry.*, 2 S.T.B. 367, 410 (1997). IPA cites to *Wisconsin Power & Light Co. v. Union Pacific Railroad*, 5 S.T.B. 995, 1029-30 (2001), for this rate. IPA Opening Nar at III-F-39 n.8. However, in that case, the Board used a transportation rate of $0.028 per ton-mile, not $0.035. Moreover, it did so because that rate was supported by better evidence. Here, IPA presents no evidence of the $0.035 rate at all.

[110] UP Reply workpaper "Weekly US No 2 Diesel Retail Prices.xls."

[111] The rate and fuel surcharge vary from month to month. UP's engineering experts applied the $0.36 surcharge in place at the time of this filing.

[112] UP Reply workpaper "Rail Transportation Miles.pdf."

over the $0.035 per ton-mile rate is approximately the same as the increase in the cost of fuel since 1994.

Third, IPA fails to account for the cost of transporting ballast from the railheads to other points on the IRR route. IPA attempts to justify this omission by stating that "the track construction contractor is responsible for marshaling and moving the ballast as needed once it reaches a railhead."[113] Track construction labor costs typically include the cost of transporting materials from the railhead to where they are placed in the track structure.[114] Here, however, IPA is expanding the scope of the contractor's responsibility to include transportation of ballast (and subballast) from the quarry near Milford to ultimate placement along the entire IRR route.

IPA implicitly assumes that the track construction contractor would not increase its price for ballast, despite a massive increase in expenses. This is obviously wrong.[115] To make a profit, a contractor must increase its prices to at least cover the additional costs being imposed on it. Therefore, UP's engineering experts have also included the $0.15 per ton-mile transportation additive for the miles that the contractor would have to transport the ballast.[116]

(b) Subballast

As in the case of ballast, UP rejects IPA's unit costs for subballast because it understates the costs of transportation. To avoid the costs of transporting subballast, IPA assumes that these costs would be subsumed in the track construction contractor's price.[117] A contractor's labor

[113] IPA Opening Nar. at III-F-38 to III-F-39.

[114] Indeed, the track construction quote relied upon by IPA has been used in other stand-alone proceedings using that very assumption.

[115] In addition, it is unclear whether the contractor even has the capacity to handle that amount of transportation over those distances.

[116] UP Reply workpaper "Ballast & subballast UP Reply.xls."

[117] IPA Opening Nar. at III-F-40 ("The subballast for the Lynndyl Subdivision is moved by truck to the turnout for the Milford Quarry. From there the contractor places the subballast as needed

quote includes the cost of trucking materials from the construction railheads to where the materials are needed on the track route. Assuming that the contractor would offer the same price to transport materials along the entire route is extremely unrealistic. In fact, a track contractor that offered subballast and transportation at IPA's unit cost would lose $32.7 million on the Lynndyl Subdivision alone.[118] Because the quote upon which IPA relies does not specify that the transportation included exceeds what is typically implied in such quotes, UP's engineering experts have developed the additional cost per ton-mile that a contractor would need to charge to cover the costs of its new transportation responsibilities.

IPA claims that it can move subballast for the Lynndyl Subdivision "by truck to the Milford Quarry" and for the Sharp, Provo, Green River, and Pleasant Valley Subdivisions "in the same manner as the ballast."[119] However, as IPA's own narrative acknowledges, unlike ballast, subballast must be placed before any track is laid.[120] Therefore, while ballast can be transported in railcars over the IRR track, subballast cannot.

Under IPA's construction schedule, the Sharp Subdivision would not exist when the subballast for the eastern section of the IRR would need to be shipped. As a result, the subballast would have to be trucked from the Milford Quarry to Lynndyl, then sent over UP to Provo via

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along the subdivision. Subballast for the Sharp, Provo, Green River and Pleasant Valley Subdivisions is transported in the same manner as the ballast being used for these subdivisions."); *id.* at III-F-38 to III-F-39 ("IPA notes that the track construction contractor is responsible for marshaling and moving the ballast as needed once it reaches a railhead (*i.e.*, the Milford Quarry.")).

[118] UP Reply Workpaper "Ballast & subballast UP Reply.xls," Tab "Ballast and Subballast Total Cost."

[119] IPA Opening Nar. at III-F-40.

[120] IPA Opening Nar. at III-F-38 ("IPA's engineers assumed that ballast could not be delivered to a railhead using a ballast train until the subballast, ties and rail had been laid.").

Salt Lake City. [121] And, as the first to be built, all of the Lynndyl Subdivision's subballast would have to be trucked. Multiple quarries could decrease this cost, but the Milford Quarry is one of only two in Utah that can provide crushed aggregate, and the location of the second quarry makes it even more costly.[122]

UP's engineering experts have developed transportation additives that a track construction contractor would need to include in its subballast based on the specific modes of transportation dictated by geography and IPA track construction schedule. This additive is based on IPA's proposed routing, IPA's own cost of $0.72 per ton-mile for trucking subballast, and, for the portion of the subballast transportation that can be done by rail, the public rail transportation rate of $0.15 per ton-mile developed in the section of this reply on ballast.[123] Averaging the costs based on transportation, IPA's subballast unit cost increases by $39.36 per ton.

In addition to the increase due to the transportation additive, UP's engineering experts increased IPA's unit cost for subballast to account for the track miles from the IRR route that IPA omitted and an incorrect calculation in the ballast needed for a typical double track section.[124] This brings the total unit cost for subballast to $133.8 million.[125]

[121] UP Reply workpaper "IRR revised subballast transportation costs.xls."

[122] UP Reply workpaper "Scanned Map.pdf"; UP Reply workpaper "Scanned Large Mines in Utah Report.pdf."

[123] UP Reply workpaper "IRR revised subballast transportation costs.pdf."

[124] UP Reply workpaper "Scanned Subballast Comparison from Typical Sections.pdf."

[125] UP Reply workpaper "Ballast & subballast UP Reply.xls."

c. Ties

UP accepts IPA's crosstie costs but corrects two mistakes IPA made in developing its quantities. First, while the crosstie spacing specified in IPA's narrative is acceptable, that is not the spacing used in its workpapers.[126] As a result, IPA overstates the number of crossties (and accompanying equipment) required for IRR. Second, in its workpapers, IPA understates the total quantity of cross ties needed by failing to add the ties needed for curves three degrees and over to the overall total.[127] UP's engineering experts have corrected these errors.[128]

d. Track (Rail)

UP rejects IPA's rail pricing because it omits the cost of transporting continuous welded rail ("CWR") and includes computation errors.

IPA's transportation cost for CWR applies the third party rail carrier rate to off-line rail transportation from Windgate Contractors in Pueblo, Colorado, to the IRR railhead at Lynndyl. From there, it assumes the track contractor will transport and distribute the CWR along the IRR route without additional charge.[129]

IPA's off-line transportation unit cost relies on the out-dated $0.035 per ton-mile shipping rate and fails to recognize the additional costs to ship CWR. UP rejects IPA's per-ton mile rate because it is long outdated, as discussed in Section III.F.3.b.ii.(a). Moreover, even if that rate were the proper one for most materials, it would not be the correct rate for CWR.

Shipping CWR requires a train made up of specialized railcars. The cars are equipped with track rollers to support the rail base and to permit the CWR rail to move with the track

[126] *Id.*

[127] UP Reply workpaper "Track Quantities UP Reply.xls."

[128] *Id.*

[129] IPA Opening Nar. at III-F-42.

curvature. In addition, the rollers allow the CWR to be threaded onto the train from one end, pulled across the rollers, and loaded. The specialized railcars also include a hold-down rack in the middle of the train needed to move without binding up the rail strands. Finally, the specialized railcars include specially designed ends that protect the locomotive from rail sliding forward in case of an emergency stop and allow the rail to be offloaded from the ends so that it can be pulled ahead of the rail train for construction of a skeleton track.

To calculate the cost of renting the necessary equipment and freight train to transport CWR, UP's engineering experts obtained a quote from A&K Railroad Materials, a rail and track material supplier that also contracts to ship rail.[130] The quote included an equipment rental of cost of $35,900 and a transportation cost of $255,633 to ship 80,000 linear feet of 136 pound CWR 1,620 miles (*i.e.*, from Pueblo, Colorado to Jacksonville, Florida).[131] From the quote – which excluded the costs for the rail, welding, rail handling, overhead, general administration, and miscellaneous expenses – UP's engineering experts calculated the per ton-mile cost assuming a fully loaded rail train of 136-pound CWR.[132] The result of this calculation was a transportation cost of $0.10 per ton-mile.[133]

IPA's assumption that Windgate Contractor's quote for CWR includes transportation along the IRR is baseless. Not only is transportation not typically included in rail quotes, but Windgate cannot transport CWR. For Windgate to own a rail train (and, thus, be able to offer transportation in its quoted price), it would need to have a side track able to support the train. However, aerial photographs of the Windgate facility show that this is not the case. One

[130] UP Reply workpaper "A&K Quote CWR.pdf."

[131] UP Reply workpaper "Rail Quantities UP Reply.xls."

[132] *Id.*

[133] *Id.*

photograph shows a single set-off track, but it is too small to support a rail train.[134] A photograph reveals that the set-off track is actually no longer connected to the mainline, meaning that it cannot be in current use.[135] Because Windgate could not have a rail train, its quote obviously could not include the use of such a train. This location would not be able to support the placement of a CWR train. Because Windgate could not own a rail train, its quote could not include the cost of transporting CWR on that train.

In addition, even if Windgate were to own a rail train, IPA's track construction schedule would require multiple rail trains to be used simultaneously on the IRR. Multiple trains would be needed, for example, when more than one section is under construction or when a rail train must return to the plant to be reloaded. Thus, IPA would have to pay for additional CWR transportation regardless.

Because the inter-railroad shipping rate is inapplicable to CWR and because Windgate's quote could not include transportation, UP's engineering experts applied the $0.10 per ton-mile cost to Windgate's rail deliveries, both from Pueblo to the railheads and along the IRR.[136]

In addition to including a transportation cost for CWR, UP's engineering experts corrected errors in IPA's workpapers, fixing several incorrect shipping distances and an improperly inputted material cost.[137]

i. <u>Main Line</u>

UP accepts IPA's quantity of main line track needed and applies the proper unit cost developed above to calculate the total cost of main line track for IRR.[138]

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[134] UP Reply workpaper "Scanned aerial view of Windgate facility.pdf," p. 1.

[135] *Id.* at p. 2.

[136] UP Reply workpaper "STV Corrected Rail Worksheet – 2011.xls."

[137] *Id.*

ii. Yard and Other Tracks

UP accepts IPA's quantity of yard track and other track, except as set forth in Section III-B of this reply, and applies the proper unit cost developed above to calculate IRR's total cost for these tracks.[139]

iii. Field Welds

UP accepts IPA's quantities for field welds, subject to the adjustments discussed in other sections. However, IPA fails to account properly for the unit costs of field welds. IPA asserts that the cost of its field welds are included in a quote from Windgate Constructors, Inc., but the extensive itemized list (which includes field weld material) does not include labor cost of performing field welds.[140] UP develops this cost in Section III.F.6.e., below.

iv. Insulated Joints

Insulated joint requirements are addressed in the signals and communications costs discussed in Section III.F.6., below.

e. Switches (Turnouts)

UP rejects IPA's costs for turnouts because it fails to account properly for transportation costs. In addition, UP's engineering experts corrected a minor error in price in IPA's workpapers.[141]

IPA's transportation cost for turnouts is based on two faulty assumptions. First, IPA assumes that turnouts can be shipped at the third party rail carrier.[142] However, like transporting

[138] *Id.*

[139] *Id.*

[140] UP Reply workpaper "Field Weld Labor.pdf."

[141] IPA Opening workpaper "Turnouts.pdf."

[142] UP Reply workpaper "Rail Quantities UP Reply.xls."

CWR, transporting turnouts requires specialized railcars. Therefore, UP's engineering experts included the $0.10 per ton-mile transportation cost developed in Section III.F.3.d in the total unit cost for turnouts.[143]

Second, IPA calculated its transportation cost for turnouts based on each turnout weighing only one ton. The actual weights of turnouts (including an approximation of 500 lbs. per stand) are as follows:

Turnout Type	Weight Without Stand	Weight with Stand
#10 Turnout	39.13 tons	39.38 tons
#15 Turnout	51.93 tons	52.18 tons
#20 Turnout	64.43 tons	64.68 tons

Applying the per ton-mile transportation cost to the correct weights for each turnout and multiplying by distance from the shipper to the installation site,[144] the total additional cost for transporting turnouts is $$417,411.[145]

IPA's opening narrative states that "[s]witch heaters and related propane tanks are also included at each mainline turnout."[146] UP accepts IPA's costs for propane tanks but rejects its cost for switch heaters. IPA based its cost for switch heaters on shipment by rail at the third party railroad rate.[147] Again, the company that supplies switch heaters is not a railroad, and therefore does not qualify for this rate. Based on the weight of the switch heaters, delivery by

[143] UP Reply workpaper "Scanned pertinent UPRR turnout standard drawings.pdf."

[144] While it would be possible to unload turnouts at railheads, then reload them onto the contractor's equipment for delivery to the installation site, this extra step adds unnecessary costs: unloading and reloading the turnouts would require cranes; storing the turnouts at the railhead would require additional land, and having the contractor transport the turnouts would require additional specialized railcars. It is far more cost-efficient to keep the turnouts on the original railcars for the additional miles to the installation site.

[145] UP Reply workpaper "III – F TOTAL UP REPLY.xlsx."

[146] IPA Opening Nar. at III-F-43.

[147] UP Reply workpaper "Track Quantities UP Reply.xls."

truck is more realistic, regardless. UP's engineering experts therefore used IPA's rate for shipping by truck to calculate the shipping cost.[148]

f. Other

i. Rail Lubrication

UP rejects IPA's unit costs and quantities of rail lubricators for IRR.

IPA's unit cost for rail lubricators does not properly account for transportation to the installation site or the cost of matting. For transportation costs, IPA uses the out-dated third party railroad shipping rate. However, rail lubricators would not be sent by railcar because of the inefficiency of devoting an entire car to one 500-pound lubricator. UP's engineering experts instead used the price of transporting the lubricators by truck. Because IPA neglects to specify a rail lubricator manufacturer,[149] UP's engineering experts have identified a suitable supplier in Hillsboro, Ohio.[150] Shipping a rail lubricator from Ohio to the railhead at Provo, Utah, adds $416.73 to the unit cost.[151]

IPA also failed to include the cost of a protective mat to the cost of rail lubricators. Mats are necessary to protect the ballast around the lubricator. Without a mat, any rail lubricant that is thrown off by a train wheel will seep into the ballast. As the oily lubricant coats the roadbed material, it repels rainwater, rather than allowing drainage through the ballast and subballast. The result of this is to erode sideslopes, washing materials away and requiring replacement materials to be brought in.

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[148] UP Reply workpaper "Scanned IPA workpapers with pricing identified.pdf," p. 8.

[149] IPA uses an old price quote from A&K Rail Materials, but A&K's list of products no longer includes rail lubricators. IPA Opening Nar. at III-F-44; A&K Railroad Materials, Inc., Products Homepage, http://www.akrailroad.com/products.

[150] UP Reply workpaper "Scanned IPA Workpaper.pdf."

[151] UP Reply workpaper "Scanned UPS Shipping Workpaper.pdf."

Three mats are required per rail lubricator, one section outside each rail and one section between them. Due to the remote locations for these mats, UP's engineering experts selected the most absorbent mats to reduce maintenance costs.[152] Including the shipping, the mats add $692.43 per rail lubricator.[153] The unit cost for a rail lubricator, including shipping and the necessary matting, totals $5,729.

UP accepts IPA's calculation of the total number of rail lubricators required for IRR, other than to correct for a calculation error. In IPA's opening narrative, IPA states that rail lubrication will be used on all curves of four degrees or greater.[154] However, in its workpapers, IPA calculated the number of rail lubricators it would need as if they would be placed on all curves over three degrees.[155] UP's engineering experts have corrected this overstatement.[156]

ii. Plates, Spikes, and Anchors

UP accepts IPA's costs and quantities for plates, spikes, and anchors, other than adjusting for the change in ties addressed in Section III.F.3.c.

iii. Derails and Wheel Stops

UP accepts IPA's quantities for derails and wheel stops, except as adjusted to accommodate the changes in quantity discussed in other sections. UP also accepts IPA's unit cost for derails. However, UP rejects IPA's unit costs for wheel stops.

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[152] UP Reply workpaper "Scanned Track Mat pricing workpaper.pdf."

[153] *Id.*

[154] IPA Opening Nar. at III-F-44.

[155] IPA Opening workpaper "CURVE DATA WORKSHEET -2011.xlsx."

[156] UP Reply workpaper "CURVE DATA WORKSHEET UP Reply.xls."

IPA selects the basic material cost of wheel stops from Means, which omits the labor cost of installing them.[157] UP's engineering experts substituted the Means cost for wheel stops that includes their installation.[158]

iv. Materials Transportation

IPA frequently neglects to include the cost of transportation in its unit costs for materials. Rather than addressing that issue here, UP raises it as necessary in the sections devoted to those unit costs.

v. Track Labor and Equipment

UP generally accepts IPA's track labor and equipment costs and quantities, subject to the corrections discussed in other sections.

4. Tunnels

UP accepts IPA's selection of three concrete-lined, steel reinforced tunnels for IRR and IPA's length for those tunnels. However, UP rejects IPA's cost per linear foot.

Rather than develop the cost per linear foot of the concrete-lined, steel reinforced tunnels that IPA specifies for IRR, IPA baselessly asserts that the cost of building these tunnels is the same as the cost of building timber-lined tunnels.[159] Specifically, IPA claims that the cost of building a concrete-lined, steel reinforced tunnel is the same as a base unit cost for timber-lined tunnels that the Board has accepted in a past case, indexed to January 2011.[160]

IPA makes absolutely no effort to actually determine what the cost of building a concrete-lined tunnel is. Instead, IPA states that the cost of a timber-lined tunnel is appropriate

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[157] UP Reply workpaper "Scanned Corrected Means exhibit.pdf" (Means Item 34 11 93.50 2400).

[158] UP Reply workpaper "Scanned Corrected Means Exhibit.pdf."

[159] IPA Opening Nar. at III-F-48 to III-F-49.

[160] *Id.* at III-F-48 (citing *Coal Trading Corp. v. Baltimore & Ohio R.R.*, 6 I.C.C.2d 361 (1990)).

because concrete-lined tunnels are less expensive. This claim is supported only by another complainant's assertions in another case[161] and vague statements in a magazine article from 1986.[162] In other words, IPA presents no evidence of its own that is relevant to determining the cost of a concrete-lined tunnel.

Because IPA presents no evidence of the per linear foot cost of the type of tunnel that it specifies for the IRR, UP's engineering experts have developed the costs in the first instance. IRR has three tunnels – two shorts tunnels of about 400 feet and one tunnel just over 3,000 feet.[163] For convenience, UP will refer to the longest tunnel as the "IRR Thistle," after the real world tunnel that it replicates, and the two shorter tunnels as the "IRR Kyune" and the "IRR Nolan" for the same reason. Because some tunneling costs are directly related to tunnel length and others – such as portal work and ventilation – are independent of tunnel length, UP's engineering experts have developed the costs of the IRR Thistle separately from the costs of the IRR Nolan and IRR Kyune.[164]

UP's expert witnesses Roberto Guardia worked to develop unit costs for the tunnels. Mr. Guardia has extensive expertise in tunnel construction, as detailed in his qualifications in Section IV.

IPA did not provide detailed specifications for the tunnels. UP's engineering experts, therefore, have been forced to develop the tunnel specifications and construction methods. UP's engineering experts have based the design of the IRR tunnels on the real UP tunnels that they

[161] IPA Opening Nar. at III-F-49 (". . . AEPCO's engineers were directly involved with a railroad tunneling project . . ."); *id.* (". . . AEPCO noted that another tunnel project . . .").

[162] *Id.* at 50 (". . . tunnel boring accounted for approximately one-third of the cost of the project, and the two tunnels, when combined, totaled approximately 10.1 miles . . .").

[163] IPA Opening Nar. at III-F-46 to III-F-47.

[164] UP Reply workpaper "Thistle - TOTAL COST DETAIL.pdf"; UP Reply workpaper "Nolan-Kyune – TOTAL COST DETAIL.pdf."

replicate. This design includes: tunnel excavation by drill-and-blast methods;[165] horseshoe shaped tunnels with a finished width of 16 feet and a height of 19 feet from top of rail to top of arch; and twelve-inch reinforced cast-in-place concrete linings.

UP's engineering experts made the following conservative assumptions regarding excavation conditions: tunnel excavation would be in a non-gassy environment, meaning that methane or other explosive gasses usually found in coal deposits would not be encountered during construction; excavated rock from the tunnel could be stockpiled within one mile of the portals (disposal costs to the final disposal location have been disregarded); and electricity would be generated on-site with diesel generators, instead of using power grid electricity.

[165] This is method is appropriate because of the relatively short length and horseshoe shape of the tunnels. Large and sophisticated rock tunnel boring machines excavate tunnels in a circular shape and are typically used for much longer tunnels.

Geological Conditions

The geology of the area in which the tunnels are being constructed affects, among other things, the rate at which the tunnel can be excavated and the initial support requirements. The IRR Nolan and IRR Kyune would be excavated from Flagstaff Limestone and Borth Horn Formation, which consists primarily of mudstone with interbedded siltstone, sandstone, limestone and carbonaceous shale.[166] While excavating through these formations, initial support should consist of only rock bolts and shotcrete. Based on the construction records for the Thistle Tunnel, UP's engineering experts estimate that drilling/blasting/excavating for the IRR Nolan and IRR Kyune can progress at a rate of eleven feet per round through this material.[167]

The IRR Thistle is located in two distinct formations: Twin Creek Limestone and Navajo Sandstone.[168] Twin Creek Limestone consists of thin- to medium-bedded marine limestone, intensely folded and fractured in places.[169] Navajo Sandstone consists of thick-bedded to massive fine- to coarse-grained friable (*i.e.*, easily crumbled), quartzose sandstone.[170] UP's engineering experts assume that there is an even split between these geologic conditions based on these geologic maps.

Because the quartzose sandstone crumbles so easily, removing it during excavation is more difficult and requires shorter round lengths. Each round of drilling/blasting/excavating can move forward eleven feet for limestone but only six feet for sandstone.[171] As with the shorter

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[166] UP Reply workpaper "7 Kyune-Nolan Tunnels Geology.pdf"; UP Reply workpaper "10 Annotated USGS Miscellaneous Series Map M-69, 1983 S1.pdf."

[167] UP Reply workpaper "8 Weekly Construction Report 5 May 29 to June 4, 1983.pdf."

[168] UP Reply workpaper "10 Annotated USGS Miscellaneous Series Map M-69, 1983 S1.pdf."

[169] *Id.*

[170] *Id.*

[171] UP Reply workpaper "Weekly Construction Report 5 May 29 to June 4, 1983.pdf."

tunnels, initial support for the IRR Thistle should consist of rock bolts and shotcrete, but the sandstone will also require wire mesh to prevent breakage.

Ground conditions for all three tunnels are assumed to be stable enough to allow for full face excavation without a partial top heading and bench which would require a slower excavation rate in two steps of advance.

The assumptions concerning the distance advanced per blast round and initial support requirements were used to develop a Tunnel Cycle Time for each tunnel.[172] Taking these factors into account, the Tunnel Cycle Time for the two shorter tunnels and the limestone portion of the IRR Thistle is one blasting round every 27 hours, with each round advancing eleven feet.[173] For the sandstone portion of the IRR Thistle, the Tunnel Cycle Time is one round of blasting every 17 hours, with each round of blasting advancing six feet.[174] These cycle times are used in calculating various components of the costs for each tunnel.

Weather Conditions

The IRR Nolan and IRR Kyune tunnels are located at an elevation of 6,740 and 7,000 feet above mean sea level, respectively. This creates significant difficulties in construction during the winter months. Excessive ice forms inside the tunnel. Frost heave in the track requires removing icicles and re-leveling the track. To mitigate the effects of icing and frost heave, UP's engineering experts have included the use of three-inch thick insulated lining in the

[172] Tunnel Cycle Time is the time it takes to drill blast holes, load blast holes with explosives, detonate, excavate the blasted rock and install temporary support. It is based on the following assumptions: a drilling speed of approximately 2.2 feet per minute with two drills; a loading time of five minutes per hole; a muck excavation rate of 36 bank cubic yards per hour; a rockbolt installation rate of 15 minutes per bolt with two drills; a shotcrete installation rate of six cubic yards per hour; an wire fabric installation rate of 50 square feet per man-hour.

[173] UP Reply workpaper "Thistle – TOTAL COST DETAIL.pdf."

[174] *Id.*

construction cost of the IRR tunnels. Installing the lining throughout the IRR Kyune and the IRR Nolan will keep dripping water above freezing temperatures, preventing icing and frost heave.

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UP's workpapers include a detailed schedule of activities and accounting of all of the costs of constructing the IRR tunnels that takes into account the above considerations.[175] These workpapers calculate the total cost for all three IRR tunnels to be $58,856,748.[176]

Table III.F.4
Defendants' IRR Tunnel Lengths and Costs

Tunnel	Total Length (feet)	IPA Cost	UP Reply Cost	Difference
Nolan Tunnel	403	$3,047,083	$11,334,177	$8,287,094
Kyune Tunnel	410	$3,100,010	$11,531,050	$8,431,040
Thistle Tunnel	3,009	$22,751,049	$35,991,521	$13,240,472
Total	**3,822**	**$28,898,142**	**$58,856,748**	**$29,958,606**

5. Bridges

UP accepts IPA's bridge inventory and its design for the majority of the IRR bridges but rejects IPA's use of a certain bridge type at particular locations.

a. Bridge Inventory

UP accepts IPA's total number of bridges and bridge locations. As discussed below, however, UP rejects the type of bridge that IPA proposes for 22 of the 99 locations.

[175] UP Reply workpaper "Thistle Tunnel Schedule.pdf"; UP Reply workpaper "Nolan-Kyune Tunnels Schedule.pdf."

[176] UP Reply workpaper "Utah Rail Tunnels - Estimate Information Cost Summary Thistle and Nolan Kyune.pdf."

b. Bridge Design and Cost Overview

UP rejects IPA's bridge inventory and costs. IPA uses only a single bridge type – "a concrete deck bridge supported by steel piles" – for each of the 99 locations on the IRR route that requires a bridge.[177] For convenience, UP refers to these as "Type 1" bridges. IPA claims that the Type 1 bridge can be "scaled as needed for the particular bridge being built."[178] However, there are 22 bridge locations on the IRR route where a Type 1 bridge would not work.

IPA wrongly claims that a Type 1 bridge could be used at every bridge location on the IRR route because "there are no 'large' bridges on this railroad[179] However, IPA fails to account for effect of modifying how many piers a bridge has. The required number of piers (*i.e.* vertical supports other than the abutments at either end of the bridge) equals the number of spans minus one. IPA calculates the total required number of spans for each Type 1 bridge by dividing the total bridge length by 30 feet, rounding up to the next whole number.[180] UP accepts this calculation.[181] The number of piers affects the clearance under a bridge because water can only flow through the space between the piers. To permit the same water flow as the real UP bridges, the IRR bridges cannot have more piers than the UP bridges that they replace. IPA claims that "each IRR bridge either has the same number of spans, or has a decrease in the span number, while keeping the length the same as the existing bridge.[182] However, this is simply not true in reality. For example, the 64-foot UP bridge spanning the Price River (MP 641.78 of the Provo

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[177] IPA Opening Nar. at III-F-52.

[178] *Id.* at III-F-51.

[179] *Id.*

[180] IPA Opening workpaper "IPA Bridge Costs.xls," Tab "Bridge Segments," cells U2-U176.

[181] UP accepts this design choice but notes that Type 1 bridges could have a span up to 36 feet. UP Reply workpaper "30 Inch Deep Double Void Box Beam Details.pdf."

[182] IPA Opening Nar. at III-F-51.

Subdivision) has only one span (and, thus, no piers), while IPA's substitute bridge has three spans (meaning that it has two piers).[183] In other words, more water could travel under the UP bridge than if IPA's Type 1 bridge were used. IPA admits that "water flow increase/decrease was not taken into consideration in [IPA] the engineers' methodology."[184] IPA attempts to justify this omission on the ground that "no information was provided in discovery on the hydraulic area of the bridges."[185] The fact that UP did not have documents in its custody or control on this issue does not eliminate IPA's burden to demonstrate the feasibility of its proposed route.

Moreover, the fact that UP (or its predecessor railroads) built bridges with fewer piers is itself evidence that more piers were not feasible. The reason that IPA selects bridges with more spans is because they are cheaper. If a cheaper type of bridge were a legitimate possibility in the real world, the railroads would have built them. IPA had the burden of showing that cheaper bridges were feasible and failed to do so.

Decreasing the space for water to flow under a bridge can cause major damage, including the complete loss of the bridge.[186] IPA cannot simply ignore this. To remedy this oversight,

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[183] IPA Opening workpaper "IPA Bridge Costs.xls," Tab "Bridge Segments," cell U60; UP Reply workpaper "Price 641.75.jpg."

[184] IPA Opening Nar. at III-F-51.

[185] *Id.*

[186] When water is constrained by the placement of piers, the water level rises. During the spring, runoff swells rivers and streams. For the UP bridges on the eastern leg of the route (particularly those in the Wasatch Mountains), the water elevation comes very close to the bottom chord elevation of the bridges. Additional piers would cause the water level to rise, meaning that water would actually infringe on the bottom chord of these structures. This can result in bridge spans being ripped from their supports, or an entire bridge can be washed out. Decreasing the space through which streams and rivers flow also increases the velocity of the water moving through the gaps. Water moving at these speeds will erode the streambed around bridge piers and abutments, eventually causing the bridge to collapse. Avoiding this kind of erosion is one of the main reasons that most of the UP bridges were built with as few piers in the water as possible.

UP's engineering experts have developed additional bridge designs that keep the IRR bridge superstructures the same length as the UP bridges they would replace without adding additional piers. The cost for the other bridge types differs from the Type 1 bridges, so UP's engineering experts have adjusted IPA's bridge costs accordingly.

i. Bridge Design

As explained above, IPA has not shown that its bridge design is feasible for the 22 bridges on the IRR for which the number of piers would be greater than those on the UP bridges that they would replace. Therefore, UP's engineering experts have developed three additional bridge types that are feasible substitutes for those 19 UP bridges.

(a) Type 1 Bridges

UP accepts IPA's bridge design for Type 1 bridges. These structures are trestle-style bridges supported on pre-cast caps with abutments supported by driven steel piles. The superstructure is made up of pre-cast concrete double-void box beams with a 36-foot maximum span.

(b) Type 2 Bridges

UP's engineering experts developed a bridge design for locations on the IRR where a bridge with a span up to 49 feet is needed to result in the same number of piers as existing UP bridges. For convenience, these are referred to as "Type 2" bridges. Type 2 bridges are similar to Type 1 bridges, in that they use precast double void box beam superstructures. The two differences are that Type 2 bridges use 42-inch deep box beams in their superstructure instead of 30-inch deep box beams and deep abutments instead of abutments supported by driven steel piles. Type 2 bridges could be used at four IRR bridge locations where Type 1 bridges would not be sufficient.[187]

UP's engineering experts selected pre-cast concrete box beams for the superstructure because they are the least expensive option. Using the 42-inch box beam, which is deeper than the box beams on Type 1 bridges, increases the maximum span length to 49 feet. Having a longer span length means that a Type 2 bridge will have fewer piers than a Type 1 bridge of the same length. The pricing information for the 42-inch deep box beams came from Coreslab Structures, a manufacturer that has supplied large quantities of concrete components for UP's real-world bridge inventory.[188]

The details for the 42-inch deep concrete beams were taken from standard plans for this type of bridge used by BNSF.[189] These plans specify four steel piles per pier when using these 42-inch deep box beams at lengths of 49-feet. As a result, the IRR bridge at MP 624.09 on the Green River subdivision requires one additional pile.[190] All other Type 2 bridges are single span structures, so this difference does not affect them. Unit pricing for the additional material is as prescribed by IPA's engineers in their workpapers.[191]

All of UP's real-world bridges that cannot be substituted with Type 1 bridges use deep abutments, rather than abutments supported by driven steel piles specified by IPA for Type 1

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[187] UP Reply workpaper "RR Bridge Cost.xls," Tab "Railroad Master Bridge List," cells X10, X37, X39 & X46.

[188] UP Reply workpaper "42 Inch Deep Double Void Box Beam Cost.pdf."

[189] UP Reply workpaper "BNSF Standard Plans.pdf."

[190] UP Reply workpaper "RR Bridge Costs.xls," Tab "Type 2 Bridge Formula," cells C4-C7.

[191] The only other alternative would be to increase the length of the superstructure to move the abutments further from the water to accommodate their larger size. However, in addition to being more expensive, IPA specified that "the IRR's bridges [would] have the same lengths as the real-world bridges on the lines being replicated." IPA Opening Nar. at III-F-51.

bridges. Deep abutments provide a longer clear span length than abutments supported by driven steel piles on an abutment cap with a spill slope in front of it. Therefore, for the IRR bridges to have the same hydraulic area as the UP bridges for which they would substitute, the IRR bridges would also have to use deep abutments.[192] Using abutments supported by driven steel piles would decrease the space through which water could flow, leading to potential damage to the bridges when the river or stream was at its peak water level.

Because this logic holds true for all IRR bridges that are not Type 1 bridges, UP's engineering experts developed a standard deep abutment design, then calculated a weighted average height of 17 feet from the top-of-rail to the ground line for the 22 IRR bridges requiring deep abutments.[193] These proportions were then used to calculate the quantities of items needed to construct the deep abutments, including concrete, reinforcing steel, excavation, damp-proofing, drainage, and porous backfill. The total cost of the abutments was then calculated using unit costs from Means.[194]

(c) Type 3 Bridges

UP's engineering experts developed a bridge design for locations on the IRR where a bridge with a span up to 69 feet is needed to result in the same number of piers as existing UP bridges. For convenience, these are referred to as "Type 3" bridges. Unlike Type 1 and 2 bridges, Type 3 bridges use steel deck girder spans. UP's engineering experts relied on UP's steel beam standards in setting the maximum span length for this type of bridge.[195]

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[192] UP Reply workpaper "Abutment Cap with Spill Slope.jpg."

[193] UP Reply workpaper "Deep Abutment.pdf," p. 1.

[194] UP Reply workpaper "Deep Abutment.pdf."

[195] UP Reply workpaper "30 Inch Deep Double Void Box Beam Details.pdf."

UP's engineering experts selected steel deck girder spans for Type 3 bridges because they are an economical type of span to use for a "typical" bridge being constructed under "typical" conditions. In addition, this type of span is economical in this range of span lengths because the vast majority of the steel that makes up steel deck girder bridges is rolled steel beams. The rolled beams require no complicated labor-intensive fabrication, which keeps them cost competitive. It also insures a minimum amount of lead time for delivery. For these reasons, UP uses these standard details as often as possible when shorter concrete box beam spans cannot be used. Therefore, when replicating spans up to 69-feet in length, UP's engineers have developed quantities for the Type 3 bridges using UP's steel bridge standards.

Type 3 bridges are needed at 15 bridge locations on the IRR.[196] The average span length for these bridges is 61.47 feet, so UP's engineering experts used a span length of 62-feet to determine the required steel beam size and associated materials (bracing, diaphragms, etc.) based on UP's steel beam standards. The total weight of steel was multiplied by the unit cost for steel and then divided by 62 feet to determine a unit cost per linear foot for Type 3 bridge superstructures. Then, that unit cost per linear foot of bridge was multiplied by the actual length of the bridges in the Type 3 category to estimate costs.[197]

The deep abutment cost discussed above was also added to the total cost of constructing Type 3 bridges.[198]

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[196] UP Reply workpaper "RR Bridge Costs.xls," Tab "Type 3 Bridges," cell X21.

[197] UP Reply workpaper "Type 3 Bridge.pdf"; UP Reply workpaper "RR Bridge Cost.xls," Tab "Type 3 Steel Quantities," cell F33.

[198] UP Reply workpaper "RR Bridge Costs.xls," Tab "Type 3 Bridges," cells U31 & AD4-AD18.

(d) Type 4 Bridges

UP's engineering experts developed a bridge design for locations on the IRR where a bridge with a span greater than 69 feet is needed to result in the same number of piers as existing UP bridges. For convenience, these are referred to as "Type 4" bridges. Type 4 bridges are steel through plate girder bridges.

UP's engineering experts selected a through plate girder span because it is typically the most cost effective type of span for lengths exceeding 80-feet. There are three existing bridges longer than 69-feet that need to be replicated on the IRR, with an average span length of 82 feet for these three structures.[199]

Through plate girders are typically the most cost effective type of structure for span lengths of more than 80 feet because the alternative – deck girders – require multiple design accommodations at this length. For example, the most common problem with deck girders is getting enough ballast (typically 24 to 30 inches) under the ties to ensure that the live load in the lateral direction is distributed evenly among the girders. UP's engineering experts have assumed eight inches of ballast, which is consistent with the details proposed by IPA's engineers.[200] Another common problem using deck girders for spans of this length is access for inspection and maintenance. Deck girders have to be placed so close together for proper live load distribution that there is not enough space between them to inspect or make necessary repairs to connections, gusset plates, diaphragms, bracing members, and the like.

For these reasons, railroads typically use through plate girder bridges where span lengths exceed 80 feet. Except when there are special circumstances due to adverse site conditions or

[199] UP Reply workpaper "RR Bridge Costs.xls," Tab "Type 4 Bridges," cell X9.

[200] UP Reply workpaper "30 Inch Deep Double Void Box Beam Details.pdf."

construction sequencing, plate girder bridges are the most economical type of bridge span for these lengths over the life cycle of the structure.

Type 4 bridges are used at three of the 99 bridge locations on the IRR. The average span length for these three existing bridges is 82 feet, so UP's engineering experts used a span length of 82 feet to determine the required steel through girder beam size and associated materials (knee bracing, floor beams, stringers, deck plates, etc.). The total weight of steel was multiplied by the unit cost for steel and then divided by 82 feet to determine a unit cost per linear foot for Type 4 bridge superstructures. Then that unit cost per linear foot of bridge was multiplied by the actual length of the bridges in the Type 4 category to estimate costs.[201]

The deep abutment cost discussed above was also added to the total cost of constructing Type 4 bridges.[202]

ii. Bridge Cost

UP accepts IPA's unit prices for Type 1 bridges and applies those prices to those items also found in Type 2, 3, or 4 bridges. For items in Type 2, 3, and 4 bridges that are not found in Type 1 bridges, UP's engineering experts have used Means costs.

UP accepts IPA total cost for Type 1 bridges, other than to correct calculation errors in IPA's workpapers.[203] The cost implications of these corrections as well as the total costs for Type 2, 3, and 4 bridges are shown UP's workpapers.[204]

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[201] UP Reply workpaper "Type 4 Bridge.pdf"; UP Reply workpaper "RR Bridge Cost.xls," Tab "Type 4 Steel Quantities," cell F23 & Tab "Type 4 Bridges," cells U20 & AD4-AD6.

[202] UP Reply workpaper "RR Bridge Costs.xls," Tab "Type 4 Bridges," cells U19 & AD4-AD6.

[203] UP Reply workpaper "Bridge Cost Corrections.pdf."

[204] UP Reply workpaper "RR Bridge Cost.xlsx."

c. Highway Overpasses

UP rejects IPA highway overpass costs because IPA has not justified its deviation from Board precedent. IPA claims that IRR would need to pay only { }% of highway overpass project costs.[205] However, IPA fails to justify this assertion, particularly in light of the 10% that the Board has accepted in past cases. *See, e.g.*, *AEP Tex. N. Co. v. BNSF Ry. Co.*, STB Docket No. 41191 (Sub-No. 1), slip op. at 102-03 (served Sept. 7, 2007).

IPA bases its { }% assertion on only one project – the highway overpass located at MP 747.59 on the Sharp Subdivision.[206] In addition to the fact that IPA makes a generalization about all highway overpass projects based on only one, IPA's own narrative shows that this project is particularly unsuitable to be used as the basis for a general rule. First, the overpass at MP 747.59 is "unusually large."[207] Second, the documentation upon which IPA relies "provide[d] few details of the project."[208] Third, the project cost in that documentation "is inconsistent with the draft contract that is publicly available."[209] Fourth, railroads incur costs associated with highway overpass construction that cannot be submitted to a Department of Transportation. For example, railroads are typically solely responsible for the costs of removing warning devices, relocating or modifying ROW fencing, modifying signals systems, and the cost of train delays resulting from slow orders in the construction area.

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[205] IPA Opening Nar. at III-F-54.

[206] *Id.*

[207] *Id.*

[208] *Id.*

[209] *Id.* It should be noted that IPA makes this point because the publicly available draft did not assign any costs to UP. *Id.* When there is a conflict between an unsigned draft contract and the executed version, obviously the terms of the executed version control. However, the broader point is that there are serious questions about the documents upon which IPA bases its entire highway overpass cost argument.

UP rejects IPA's assertion that a single project – much less an admittedly unusual and poorly documented one – can establish the proportion of the costs of all highway overpass projects for which IRR would be responsible. If that were the case, then UP would be entitled assign { }% of highway overpass costs to IRR based on a grade separation project in Denver, Colorado.[210] UP accepts that IRR would have to pay only what UP paid for the MP 747.59 overpass. However, for the remainder of the highway overpasses on the IRR route, UP applies the 10% accepted in past rate cases before the Board.[211]

Table III.F.5
Summary of Bridge Costs
($ Millions)

	IPA	**Reply**
Railroad Bridges	$18.9 [212]	$29.3[213]
Highway Overpasses	$7.5[214]	$14.9[215]
Total Bridge Cost	**$26.5**	**44.3**

6. Signals and Communications

a. Centralized Traffic Control

UP's engineering experts have identified seven significant errors in IPA's development of the IRR Centralized Traffic Control ("CTC") costs. These errors are detailed below.

First, IPA did not include the cost of a disaster recovery dispatcher ("DRD") site in the IRR CTC costs. A DRD site is needed to allow continued normal train operations in the event

[210] UP Reply workpaper "Pecos Street Grade Separation AFE Request.pdf."

[211] UP Reply workpaper "RR Highway Overpass Costs.xlsx."

[212] IPA Opening workpaper "IPA Bridge Costs.xls," Tab "Bridge Segments," cell AA177.

[213] UP Reply workpaper "RR Bridge Costs.xls," Tab "RR Bridge Cost Summary," cell C7.

[214] IPA Opening workpaper "Highway Overpass Costs.xlsx," cell G21.

[215] UP Reply workpaper "RR Highway Overpass Costs.xlsx," cell I30.

that the primary train dispatching location becomes inoperable due to a natural disaster or other calamity. The DRD site must be far enough away from the primary site so that no single event can simultaneously disable both. UP's engineering experts therefore included a DRD site in the IRR's total CTC cost,[216] basing the cost on IPA's estimate for its CTC dispatching office.[217]

Second, IPA failed to include the costs of hold signals in the dark territory immediately before CTC territory. These signals are a necessary safety precaution that inform approaching trains of the status of the signal at the beginning of the CTC territory. UP's engineering experts obtained the cost of material and installation of these signals,[218] and added this cost to the IRR's total CTC cost.[219]

Third, IPA's materials package for its electronic lock locations does not include necessary components. Specifically, the package does not include insulated joints, a derail at the clearance point, or the switch circuit control boxes and rods needed to connect the derail. UP's engineering experts obtained cost estimates for these items and the installation labor,[220] and added this cost to IRR's total CTC cost.[221]

Fourth, IPA failed to include enough twelve-volt battery/charger sets to power its wayside equipment.[222] UP's engineering experts correct this understatement.[223]

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[216] UP Reply workpaper "UPRR Review S&C Estimate.xls," Tab "Components & Tabulation," roll 66.

[217] IPA Opening workpaper "IPA Signals and Communications.xls," roll 32.

[218] UP Reply workpaper "UP Hold Signal Estimate."

[219] UP Reply workpaper "UPRR Review S&C Estimate.xls," Tab "Components & Tabulation," roll 65.

[220] UP Reply workpaper "UP Estimate Leaving Signals.pdf."

[221] UP Reply workpaper "UPRR Review S&C Estimate.xls," Tab "Components & Tabulation," rolls 54 & 64.

[222] IPA Opening workpaper "IPA Signals & Communications.xls," cell M20.

Fifth, IPA did not include the cost of 24-volt batteries and 24-volt battery systems, which are needed for its 24-volt power switch machines and hot box detectors, in its total CTC cost.[224] UP's engineering experts located the prices for these items,[225] and included the total cost in UP's workpapers. [226]

Sixth, IPA's signal costs do not include the cost of the signal foundations needed to erect signals at crossings, hold signals, intermediate signals, and interlockings.[227] UP's engineering experts obtained the cost of these foundations[228] and estimated the costs to install them. This total cost was added to the total IRR CTC cost.[229]

Seventh, IPA's workpapers incorrectly calculated the cost of its power and manual mainline switch mechanisms because the prices entered in its spreadsheets do not match the prices shown in its workpapers.[230] UP's engineering experts correct this in UP's workpapers.[231]

b. <u>Detectors</u>

UP accepts IPA's proposed inventory and cost for failed equipment detectors and automatic equipment identifier detectors. UP also accepts IPA's cost per linear foot of slide fence. However, UP rejects IPA's inventory of slide detectors.

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[223] UP Reply workpaper "UPRR Review S&C Estimate.xls," Tab "Components & Tabulation," cell M19.

[224] UP Reply workpaper "IPA Signals & Communications.xls."

[225] UP Reply workpaper "S-C Workpapers.pdf," p. 17.

[226] UP Reply workpaper "UPRR Review S&C Estimate.xls," Tab "Components & Tabulation," roll 46.

[227] UP Reply workpaper "Email - Safetran Foundations.pdf."

[228] UP Reply workpaper "UP Intermediate Signal Material Cost.pdf."

[229] UP Reply workpaper "UPRR Review S&C Estimate.xls," Tab "Components & Tabulation," roll 52.

[230] IPA Opening workpaper "S-C Workpapers.pdf."

[231] UP Reply workpaper "UPRR Review S&C Estimate.xls," Tab "Components & Tabulation," cells C16-C17.

IPA's slide detector inventory is based on the detector locations shown on a UP track chart and one of its narrative sponsor's estimate of the detectors' lengths "based on the terrain."[232] UP's engineering experts developed the actual length of the slide fence used on the IRR route by traveling the track route in hi-rail equipment. Based on these first-hand observations, UP's engineering experts adjust IPA's inventory to reflect the roughly 10,300 feet of slide fences, an increase of 7,800 feet.[233]

The hi-rail trip also revealed three locations where the local geological conditions have required UP to install a total of 25 micro-seismic detectors to detect ground shift under the roadbed. If the track is not monitored, a ground shift could create an area where the rail is unsupported, leading to the rail deforming under the pressure of a train passing over it. If not fixed, this would eventually cause a derailment. Therefore, micro-seismic detectors are needed to ensure that any problems can be identified early and corrected. UP's engineering experts added the cost of these detectors to the total cost for detectors on IRR.[234]

c. Communication System

UP accepts IPA's communication system, other than to include the additional costs from fiber optic cables noted in Section III.F.6.f below and to include the cost of 63 miles of pole line.

In the mountainous terrain on the UP lines replicated by IRR, UP currently maintains 63 miles of pole line (essentially telephone poles) to transmit electricity, signal circuit control lines and CTC code lines. This is necessary because the topography of the terrain can disrupt radio communications and data transfers and because those areas lack other types of power

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[232] IPA Opening Nar. at III-F-59.

[233] UP Reply workpaper "UPRR Review S&C Estimate.xls," Tab "Components & Tabulation," cell M45.

[234] *Id.* at roll 70.

transmission lines. A lost communication or power interruptions can cause interruptions of train traffic in CTC territory, disrupting traffic on the entire route. To avoid this, IRR would have to replicate the pole line that UP installed.

For a dispatcher to be assured of the ability to control wayside signal equipment in these areas, there needs to be a cable connection. UP's engineering experts obtained a quote for this material from The Okonite Company, a wire and cable manufacturer, and included that cost in the total IRR CTC costs. [235] Georgia Power provided a quote for constructing the pole line with single phase power and transformers, and UP's engineering experts have included that cost as well.[236] UP's engineering experts also decreased the number of commercial power drops to reflect the substitution of power from the pole lines.[237]

d. Highway Grade Crossing Warning Systems

UP rejects IPA's cost for highway grade crossing warning systems because its inventory is inaccurate in four respects.

First, IPA omits the following signals that exist on the UP route that the IRR replicates: ten crossings with flashing light signals;[238] two additional signals at gated crossings;[239] seven cantilever signals; [240] and 45 additional light signals at crossings.[241]

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[235] *Id.* at roll 69.

[236] *Id.* at rolls 67 & 68.

[237] *Id.* at cell M20.

[238] *Id.* at roll 49.

[239] *Id.* at cell M15.

[240] *Id.* at rolls 50 & 53.

[241] *Id.* at roll 51.

Second, IPA specifies a single track highway crossing predictor hut at MP 626.97, which is a double track section.[242] UP's engineering experts substitute a double track highway crossing predictor in UP's workpapers.[243]

Third, the approach distance on IRR's passing is insufficient to provide a sufficient warning time for highway grade crossings. To extend the approach warning time, UP's engineering experts have added additional unidirectional equipment. Specifically, single track unidirectional huts have been added at seven crossing locations and multitrack unidirectional huts have been added at six crossing locations.[244] The unit cost for these huts was obtained from UP estimates.[245]

Finally, IPA fails to include the cost of 124 foundations for warning devices at 61 crossing locations. Because crossing signal foundations are essentially the same in cost and function as a train signal foundation, UP's engineering experts used the labor and material cost from a UP estimate for crossing signal foundations for the unit cost of the warning device foundations. [246] The total cost was then added to the IRR's total signals and communications costs.[247]

e. Insulated Joints

IPA's insulated joint inventory is incorrect because it fails to include insulated joints at any of its Failsafe Audible Signal – Power Assisted Switch ("FAS-PAS") locations or (as

[242] IPA Opening workpaper "III-B-1 Line Drawing.pdf."

[243] UP Reply workpaper "UPRR Review S&C Estimate.xls," Tab "Components & Tabulation," cells M7-M8.

[244] *Id.* at rolls 47 & 48.

[245] UP Reply workpaper "UP 1 TRK U-D.pdf"; UP Reply workpaper "UP 2 TRK U-D.pdf."

[246] UP Reply workpaper "UP Intermediate Signal Material Cost.pdf."

[247] UP Reply workpaper "UPRR Review S&C Estimate.xls," Tab "Components & Tabulation," roll 53.

discussed in Section III.F.6.a) at its hold signals. Also, IPA's calculations of the number of insulated joints contain multiple errors.[248] UP's engineering experts correct these problems in UP's workpapers. [249]

IPA also understates the labor costs to install insulated joints. IPA claims without justification that each installation would cost only $80.[250] This cost is simply implausible, given that an insulated joint plug is 16-feet long and weighs over 700 pounds and that installing it requires cutting the rail and then welding the joint in place. UP's engineering experts apply the actual cost paid by UP for installation of insulated joints, $2,040 per installation.[251] Installing the insulated joints requires weld kits, and UP's engineering experts have included the cost of those kits as well.[252]

f. Cost of Fiber Optic Interface

IPA's costs for using fiber optic cable in the communications and CTC system fails to include the expenses associated with connecting the existing fiber optic cable to wayside equipment. IPA "assume[s] that [a] telecom provider would install the fiber optic cable at its cost and the IRR and the provider would enter into a contract on terms that would entail no cost to the IRR to use it."[253] IPA then "include[s] the equipment costs required to access the relevant fiber optic facilities."[254] However, the wayside equipment must be connected to the fiber optic

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[248] *Id.* at cell M33.

[249] IPA Opening workpaper "IPA Signals and Communications.xls," cell M33.

[250] *Id.* at cell D33.

[251] UP Reply workpaper "UPRR Review S&C Estimate.xls," Tab "Components & Tabulation," cells D33 & E33.

[252] *Id.* at roll 63.

[253] IPA Opening Nar. at III-F-60.

[254] *Id.*

cable installed by the telecom provider (the "main cable") with a second fiber optic cable (the "secondary cable").

There are three components to the cost of connecting wayside equipment to the main fiber optic cable: the cost of the secondary cable; the material and labor cost of the splicing; and the cost of laying the secondary cable.

Unlike copper cable, which can be spliced at any point, fiber optic splicing must be done at a pull box – a housing where two lengths of main cable are connected – and at a place where there is enough slack in the cable to do the splice. Telecom providers typically place pull boxes every 3,000 feet, meaning that IRR wayside equipment would be a maximum of 1,500 feet from a pull box. UP's engineering experts therefore assume that wayside equipment is an average of 750 feet from a pull box. Connecting to a pull box 750 feet away requires approximately 1,000 feet of fiber optic cable, due to the need for slack to make the connection and the fact that local topography and obstructions prevent the cable from being laid in a perfectly straight line.

Industrial Networking Solutions offers fiber optic cable at $0.96 per linear foot.[255] Based on the 1,000 feet needed to connect the main cable to IRR wayside equipment and the 56 wayside locations receiving fiber optic connections, 56,000 feet of fiber optic cable would be needed. The total cost is included in UP's workpapers[256]

UP's engineering experts obtained two estimates for the cost of laying the fiber optic cable, one from Michels Corporation in Brownsville, Wisconsin, and another from T-Cubed, a Norfolk Southern Corporation subsidiary based in Norfolk, Virginia. The Michels estimate of

[255] UP Reply workpaper "Industrial Networking Solutions.pdf."

[256] UP Reply workpaper "UPRR Review S&C Estimate.xls," Tab "Components & Tabulation," roll 58.

$16.60 per foot of cable (including the cost of the pull box) was lower.[257] Therefore, UP's engineering experts use this cost. [258] However, this estimate did not include splicing.

T-Cubed's price for labor and equipment to do the necessary splicing was $1,000-$1,500 per day. Based on a rate of one splice every 90 minutes (including travel time), T-Cubed could do the necessary work at all 56 fiber optic link locations in just over five eight-hour days.[259]

The total cost for connecting IRR wayside equipment to the main cable would be $1,067,360.

g. Other

IPA notes that IPA improperly totaled the number of commercial power drops needed at wayside locations, microwave towers, and buildings.[260] UP's engineering experts have corrected this.[261] Also, UP's engineering experts have adjusted the quantity of cable and cable trench needed on the IRR route based on the modifications and corrections discussed in other sections of this reply.[262]

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[257] UP Reply workpaper "Comm Fiber Conn Estimate.pdf."

[258] UP Reply workpaper "UPRR Review S&C Estimate.xls," Tab "Components & Tabulation," roll 55.

[259] *Id.* at roll 56.

[260] IPA Opening workpaper "IPA Signals and Communications.xls," cell M:20.

[261] UP Reply workpaper "UPRR Review S&C Estimate.xls," Tab "Components & Tabulation," cell M:20.

[262] *Id.* at cells M20, M22-M25,M30, M31: & rolls 67-68.

7. Buildings and Facilities

a. Headquarters

IPA understates site development costs for IRR's headquarters by deriving them from an addition to an existing manufacturing facility.[263] Because the existing manufacturing building's site had already been built up, the addition did not require all improvements that would be needed to build the headquarters building on undeveloped land. For example, grading and paving were already completed. This explains why these costs amount to less than 2% of the total cost of the IRR headquarters building, while the grading and paving totaled more than 54% of the cost when UP built the Marysville Crew building.[264] Similarly, exterior improvements like lighting or landscaping were done before any money was spent building an addition to an existing building.

b. Fueling Facilities

UP accepts IPA's approach of performing locomotive fueling by truck on separate fueling tracks at the fueling facilities.[265] However, IPA's proposed facilities are insufficient in three ways.

First, the layout of the fueling facilities does not allow IRR to conduct the necessary fueling operations. IPA specifies one 40-foot light pole with a six-foot foundation and pole protection placed every 300 feet in the fueling facility.[266] Spacing the lights so far apart results in an uneven light distribution, which creates unsafe fueling conditions. To create even lighting, there must be a light at both ends of the locomotive. Locomotives are roughly 60 feet long, so

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[263] UP Reply workpaper "Buildings and Sites.xlsx," Tab "Headquarters."

[264] UP Reply workpaper "444105.xls"

[265] IPA Opening Nar. at III-F-62.

[266] IPA Opening workpaper "All Buildings - Yard Lighting and Drainage.pdf."

UP's engineering experts have adjusted the lighting scheme at the IRR fueling facilities to have light poles every 100 feet.

Second, the configuration of the fueling facility is not conducive to fueling operations. The roadway that IPA specifies is too narrow for a fueling truck to turn around or two trucks to pass each other.[267] UP's engineering experts have re-configured the roadway to permit fuel trucks to turn around and to allow two-way traffic.[268]

Third, IPA omits the cost of necessary items in accounting for the cost of its fueling operations. The fueling tracks require track pans to catch fuel spillage. Unfortunately, the track pans also catch rainwater, so they need to be connected to an oil-water separator and to an industrial water storage tank to collect the fuel for safe disposal. Given that these pans would be subject to the collection of rain water, an industrial water storage tank would be required to limit the outflow of treated water to the public system. UP's engineering expert obtained a quote[269] for these systems and have added their cost to the total cost for the IRR fueling facilities.[270]

c. Locomotive Shop

UP rejects IPA's designs and costs for its locomotive shop at Sharp because the facilities and equipment specified are inadequate to service IRR's locomotives.

Before addressing the problems with the locomotive shop itself, UP notes that IPA did not include the costs to prepare the site for the shop. IPA placed the shop in a low-lying area with visible standing water and wetland conditions.[271] Such a location would require

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[267] IPA Opening Exh. III-B-2 at 7.

[268] UP Reply workpaper "IPA-vs-UP-Fueling-Road.pdf."

[269] UP Reply workpaper "UPRR Rate Case Steel Track Pan Cost Info.msg."

[270] UP Reply workpaper "IPA Facilities Unit Cost Development," Tab "Fueling track."

[271] UP Reply workpaper "MP 750.26 wetlands.jpg."

undercutting a minimum of three feet to remove heavy organic material and replace it with at least four feet of compacted fill to elevate the ground level above the poor drainage area. UP's engineering experts added this quantity to the total common excavation quantity using the unit cost developed in Section III.F.2.b.iii.(d)..[272]

Once the site was prepared, IPA could build its locomotive shop. However, the shop's structural design does not meet the standards needed for this type of facility. IPA does not include many structural necessities - such as sloping concrete floor slabs to allow for drainage, the special slabs and foundations needed for pits used for drop tables and wheel truing, fluid storage systems for water and grease, raised platforms for maintenance work on engine compartments, and fall protection for workers performing maintenance more than six feet off the ground. Even when IPA does include necessary components for its locomotive shop, it specifies inferior and inappropriate materials or systems. For example, IPA proposes six-inch thick concrete slabs with welded wire mesh for its shop floor.[273] Non-special application slabs – the minimum necessary for warehousing and back shops – are typically eight-inches thick with half-inch diameter rebar. As another example, IPA's plumbing system includes a total of only 60 feet of pipe to distribute all the water, coolant, lubricant, and grease for the entire 18,500 square foot facility.[274]

IPA's locomotive shop also neglects many of the building features and types of equipment needed to perform repairs. The proposed design does not have embedded track (used for wheel sets, combos, and truck storage), back shops (where non-train repairs would take

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[272] UP Reply workpaper "IRR Grading Opening_UP_Reply.xlsx," Tab "IIIF 4 Othr EW" & Tab "IIIF 10 yards."

[273] UP Reply workpaper "Kessel Locomotive Shop.pdf."

[274] IPA Opening Nar. at III-F-63.

place), a pressure washing room (to clean vehicles and components so that repairs can be done), a train wash, a fluid distribution room, or a standby emergency generator to ensure that maintenance could continue in the event of a power outage. Again, even when IPA includes this sort of feature or equipment, it makes choices that would not be sufficient for the locomotive shop to function properly. For example, the drop table that IPA specifies is for a two-axle truck, but the majority of IRR's motive power will run on three-axle trucks. As another example, IPA's detail pit track design shows rail laying on top of the flat concrete floor. This is impractical because the raised rails would prevent forklifts and other non-rail vehicles from moving across the pit track, as well as pose a tripping hazard for workers.

UP's engineering experts obtained a quote for a real-world locomotive shop[275] and used those prices to develop the costs of a shop capable of performing the types of maintenance and repair that IPA has stated IRR would handle at Provo.[276] In addition, UP's engineering experts obtained specific price quotes on the required three-axle drop table[277] and emergency generator.[278] UP's engineering experts also obtained a price for an air compressor system, as IPA only included the cost of the air compressor itself.[279] All such costs have been added to the total cost of the locomotive shop.[280]

d. <u>Car Repair Shop</u>

UP accepts IPA's proposal for contracting out its major car repairs.

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[275] UP Reply workpaper "00 41 16 Schedule of Quantities and Prices - Flintco Revised 09.29.11.pdf."

[276] UP Reply workpaper "IPA Facilities Unit Cost Development.xls," Tab "Locomotive Shop."

[277] UP Reply workpaper "00 41 16 Schedule of Quantities and Prices - Flintco Revised 09.29.11.pdf."

[278] UP Reply workpaper "IPA vs UP Loco Shop Genset Cost.pdf."

[279] UP Reply workpaper "IPA vs UP Air Compressor costs.pdf."

[280] UP Reply workpaper "IPA Facilities Unit Cost Development.xls," Tab "Locomotive Shop."

e. Crew Change Facilities/Yard Offices

UP accepts IPA's proposed Crew Change Facilities/Yard Offices.

f. MOW Buildings

UP accepts IPA's MOW buildings, other than to add two items. First, IPA's proposed MOW buildings do not include adequate space for indoor storage. Certain MOW materials, like signals and communications equipment, cannot be stored outside because rain or heat can damage them. A small building would be needed to warehouse this type of material. Second, IPA's MOW buildings do not include pits with embedded rail for installing hi-rail assemblies and performing vehicle inspections. UP's engineering experts have included the cost of adding the pits and accompanying equipment, such as a vehicle lift, oil-water separator, pressure washing system, and jib crane.[281]

g. Wastewater Treatment

UP accepts IPA's wastewater treatment costs, except as discussed in Section III.F.7.b of this reply, discussing fueling facilities.

h. Yard Air, Lighting, and Drainage

UP accepts IPA's yard lighting costs, except as discussed in Section III.F.7.b of this reply, discussing fueling facilities.

8. Public Improvements

a. Fences

UP rejects IPA's fencing unit costs and quantities.

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[281] UP Reply workpaper "IPA Facilities Unit Cost Development.xls," Tab "MOW"; UP Reply workpaper "IPA vs. UP Loco Shop Genset cost - pressure washer.pdf."

IPA's unit cost for fencing does not include the cost of gates or the cost of installation. UP's engineering experts added the cost of one twelve-foot gate for every mile of fencing to allow crossings in fenced areas along the IRR route.[282] To develop a cost for fencing that includes installation, UP's engineering experts obtained a quote from Mountain State Fence, a company in Salt Lake City, Utah, that has performed fencing work on the UP right-of-way. Including installation, the cost of the 47-inch high wire mesh agricultural fencing used along the UP route replicated by IRR is $3.24 per linear foot.[283]

In addition, IPA understates the quantity of fencing along the IRR route. IPA's Opening Narrative states that only "82 miles of the IRR's right-of-way" is fenced.[284] However, a hi-rail trip over most of the lines being replicated by the IRR, revealed that a significant percentage of the UP right-of-way replicated by IRR was fenced.[285] This may be due to the State of Utah's requirement "every railroad company or corporation operating any steam or electric railroad in this state to erect and maintain fences on each side or either side of such railroad " Utah Code Ann. §56-2-6.[286]

UP's engineering experts observed that the majority of the ROW fencing was 47-inch high wire mesh agricultural fencing, although chain link and barbed wire fencing was also observed. Based on their observations on the hi-Rail trip, UP's engineering experts estimated the following percentages of fenced ROW:

Green River Subdivision (12.28 track miles) – 70% fenced (one side only)
Provo Subdivision (77.14 track miles) – 70% fenced (one side only)

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[282] UP Reply workpaper "ROW Fence Length Rebuttal 10_12_2011.xlsx," cell K18.

[283] UP Reply workpaper "ROW Fencing Cost Verification.pdf."

[284] IPA Opening Nar. at III-F-67.

[285] UP Reply workpaper "ROW Fencing Photos.pdf."

[286] UP Reply workpaper "Utah Code 56-2-6.pdf."

Sharp Subdivision (84.52 track miles) – 80% fenced (both sides)
Lynndyl Subdivision (89 track miles) – 90% fenced (both sides)

UP's engineering experts applied the unit cost for fencing to the additional quantities observed to calculate total fencing costs.[287] Based on these calculations, the total fencing cost for the IRR ROW is $6.4 million.[288]

b. Signs and Road Crossing Devices

UP's engineering experts accept IPA's assumption of a standard package of railroad signs including mileposts, whistle posts, yard limit and cross-buck signs and posts and the associated costs. However, IPA omitted the cost of installation of additional Emergency Notification Signs ("ENS") at various public and private railroad at-grade crossings.[289] Section 205 of FRA's Rail Safety Improvement Act 2008 requires two ENS signs at each crossing,[290] so UP's engineering experts have developed the necessary cost for it.

The IRR has 208 at-grade crossings, so it should have 416 ENS signs. However, IPA's workpapers show only 165 ENS signs.[291] Based on IPA's unit cost of $40.78 per installed sign and the 251 addition signs needed,[292] IPA's signage cost increases by $10,236..

c. Grade-Separated and At-Grade Crossings

Because all of IRR's grade-separated crossings are highway overpasses, these costs are addressed in Section III.F.5.c..

UP accepts IPA's at-grade unit costs but rejects its quantities for two reasons.

[287] UP Reply workpaper "ROW Fence Length Rebuttal 10_12_2011.xls."

[288] UP Reply workpaper "III-F-8 TOTAL REBUTTAL.xlsx."

[289] IPA Opening workpaper "Grade Crossings-2011.xlsx."

[290] UP Reply workpaper "RSIA-2008 ENS Sign Rqmts.pdf."

[291] IPA Opening workpaper "Grade Crossings-2011.xlsx," columns S & U.

[292] UP Reply workpaper "Crossing ENS Sign Count.xls," cell AK:61.

First, IPA neglected to account for the additional crossing surface footage due to crossing over double track sections.[293] As a result, IPA's total crossing surface footage should be increased by 1,330 track feet.[294]

Second, IPA applied the wrong unit of measure when calculating its at-grade crossing costs. IPA calculated its at-grade crossings based on linear feet.[295] However, material quantities for grade crossing installations are measured in track feet (*i.e.* a one-foot section of two side-by-side rails, anchored on ties sitting on a standard ballast roadbed). Therefore, when discussing a rail-seal type of rubber crossing surface material, four linear feet of rail-seal material would be required to accommodate one railroad track foot.

Using IPA's unit cost of $289.66 (but applying it per track foot instead of per linear foot), the at-grade crossing surface construction costs total $2,067,574.[296]

9. Mobilization

UP adjusts IPA's mobilization costs to reflect revised IRR construction costs and includes in the mobilization base certain necessary materials and labor costs excluded by IPA. The assets added to the mobilization base include propane tanks and rail lubricators for Track Construction; highway overpasses for Public Improvements; and locomotive repair, headquarters, and roadway buildings for Buildings and Facilities. The quotes provided for these assets do not state that mobilization is included in the costs.

[293] IPA Opening workpaper "Grade Crossings -2011.xlsx"; UP Reply workpaper "Track Quantities Rebuttal-2011.xlsx."

[294] UP Reply workpaper, "Track Quantities Rebuttal-2011.xls."

[295] IPA Opening workpaper "IPA Opening Grade Crossings – 2011.xls"; UP Reply workpaper "III-F Total UP Reply.xlsx."

[296] UP Reply workpaper, "III-F-8 REBUTTAL TOTAL.xlsx."

10. Engineering

UP accepts IPA's engineering additive.

11. Contingencies

UP accepts IPA's contingency factor.

12. Other

a. Construction Time Period

IPA's construction schedule requires building the IRR route in the Utah mountains in the winter and spring. While UP accepts this schedule, IPA is not entitled to ignore the costs of adhering to that schedule. The winter brings extreme cold and snowfall, followed by a thaw and heavy rain in the spring. Both sets of circumstances increase the costs and difficulty of constructing, operating, and maintaining a railroad. Weather's impact on construction is addressed here, while its effects on maintenance and operations are addressed in their respective sections.

UP's engineering experts have identified several sources that document the financial impact of performing construction in cold weather conditions.[297] This impact is not captured by any sources used by IPA and UP's engineering experts, including the Means catalog's labor, equipment, or production rates.[298]

Decreased productivity due to cold temperatures is well documented.[299] Work crews performing labor outdoors in extreme cold are less efficient than in more temperate weather.

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[297] UP Reply workpaper "Human Time Study-Env Aspect.pdf"; UP Reply workpaper "INDOT Hwy Production Study-selected pages.pdf"; UP Reply workpaper "Productivity Losses-Weather.pdf."

[298] UP Reply workpaper "RS Means Pages_IX&X.pdf."

[299] UP Reply workpaper "Human Time Study-Env Aspects.pdf"; UP Reply workpaper "INDOT Hwy Production Study-selected pages.pdf"; UP Reply workpaper "Productivity Losses-Weather.pdf."

Similarly, equipment requires more time to do the same work because machinery takes longer to start and hydraulics take longer to warm up to efficient operating levels. In the upper elevations of the Wasatch, diesel motors may require "Arctic Fuel" and special hydraulic fluid.[300]

Sub-freezing temperatures also cause problems with construction materials. Materials from one day's operation freeze overnight, requiring additional time the following day to thaw and dry (or additional costs to replace it).[301] For example, the moisture in ballast and subballast freezes, turning the entire mass into a solid block. Unloading the material becomes virtually impossible without arranging for the railcars to be heated, which is impractical in the field. Similarly, water used in compacting subballast freezes, making it difficult to reach the necessary moisture levels to produce the proper density necessary to distribute adequately axle loads.

Even when the temperature is somewhat above freezing, there are significant problems with track construction. Whenever the ambient air temperature falls below 40^{o} F, concrete will not set unless it is heated and cured under insulated blankets or controlled heated air.[302] Track laid in winter will expand when the temperature increases in the spring, even when rail heaters are used.[303] Rail therefore must be adjusted in the spring or summer.[304] Failure to do so can lead to "buckled track" derailments.[305]

[300] UP Reply workpaper "Memo Winter Working Conditions Al Lee 090803 RCP 2011.pdf."

[301] UP Reply workpaper "UP GRADING DURING FREEZING.pdf."

[302] UP Reply workpaper "UP REIN CONC.pdf."

[303] UP Reply workpaper "UP Track Buckling Prevention.pdf."

[304] *Id.*

[305] *Id.*

To quantify the costs due to cold temperatures, UP's engineering experts relied on the reference materials cited above[306] and records showing the weather conditions along the IRR route, including decrease in temperature due to wind chill.[307] The weather conditions were quantified by month and by subdivision. Based on this data, UP's engineering experts determined that equipment and labor costs are 1.49 times higher on the Provo, Green River, and Pleasant Valley Subdivisions during the winter months. [308] For the Sharp and Lynndyl Subdivisions, where winter conditions are more moderate, labor and equipment costs are 1.17 times higher during the winter months. [309]

The engineering experts then applied these multipliers to equipment when the temperature drops below freezing and to labor that must occur in the open air.[310] When Means costs or costs from other sources that identified cost breakdowns were used, the appropriate coefficient was applied to the line items. When costs were derived from sources that do not specify line item costs, UP's engineering experts estimated the proportions of costs due to each type of cost. The total effect of cold weather was then calculated using the adjusted unit costs, the total material quantities, and IPA's construction schedule.[311]

[306] UP Reply workpaper "Human Time Study-Env Aspect.pdf"; UP Reply workpaper "INDOT Hwy Production Study-selected pages.pdf"; UP Reply workpaper "Productivity Losses-Weather.pdf."

[307] UP Reply workpaper "Utah Weather data.pdf"; UP Reply workpaper "Climatic Data Winter Months.xls."

[308] UP Reply workpaper "Winter Costs by Subdivision.xls."

[309] *Id.*

[310] UP Reply workpaper "Productivity Losses-Weather.pdf," Figure 5-1.

[311] IPA Opening workpaper "Construction Schedule 7-30-11-3.xlsx."

The total additional cost due to productivity losses during winter months totals $32.6 million or roughly 2.6% of the total roadbed construction costs.[312]

[312] UP Reply workpaper "Winter Costs by Subdivision."

III.G: Stand-Alone Railroad DCF Analysis

III. G. DISCOUNTED CASH FLOW ANALYSIS

IPA's discounted cash flow ("DCF") model departs from the Board's standard DCF application in a number of key respects, the most significant of which are the truncating of the standard discounting of the interest and depreciation tax benefits after year 10 and the improper substitution of the 2008 through 2010 cost of equity derived from the Board's Capital Asset Pricing Model ("CAPM") in place of the Board-determined railroad industry cost of equity for those years that is based on a 50/50 mix of the CAPM-based cost of equity and the cost of equity determined using the Board's Multi-Stage Discounted Cash Flow model ("MSDCF"). These and other required corrections to IPA's DCF are discussed in this section.[1]

1. Cost of Capital

The Board should reject IPA's argument for calculating IRR's 2008 through 2010 cost of equity using only the cost-of-equity estimate determined by using the CAPM, and not the cost-of-equity estimate determined by using the average of the estimate produced by the CAPM and the MSDCF model.[2] IPA's argument is a collateral attack on the Board's decision to adopt a combined MSDCF-CAPM approach for determining the railroad industry cost of capital.[3]

IPA does little to disguise its challenge to the Board's use of the MSDCF approach in cost of capital determinations. IPA says that its position does not require the Board to conclude that its decision to adopt a combined MSDCF-CAPM approach produces a less accurate estimate

[1] IPA has also improperly changed the Board's long-standing debt amortization practice, which UP addresses in Section III.H. The effects of this unwarranted change are compounded by the problems with IPA's DCF application discussed in this section.

2 IPA Opening Nar. at III-G-5 to III-G-11.

[3] *Use of a Multi-Stage Discounted Cash Flow Model in Determining the Railroad Industry's Cost of Capital*, STB Ex Parte No. 664 (Sub-No. 1) (STB served Jan. 28, 2009).

than use of CAPM model alone.[4] In fact, however, IPA is challenging the Board's decision through the back door, by urging the Board to eliminate the MSDCF result from one of the primary uses of the railroad industry's cost of capital in regulatory applications, *i.e.*, its use to determine the permissible rate of return in rate reasonableness cases. The Board has already decided that the use of a combined MSDCF-CAPM approach yields the best estimate of the railroad industry's cost of equity, and IPA should not be permitted to challenge that decision in this case.[5]

Moreover, IPA cannot have it both ways. It cannot purport to use the railroad industry as a proxy for IRR in estimating IRR's cost of equity by embracing the result produced by Board's the CAPM model, but then use something other than the Board's official estimate of the railroad industry cost of equity – *i.e.*, the combined MSDCF-CAPM approach. Either the railroad industry is a valid proxy for IRR for purposes of estimating IRR's cost of equity, or it is not. If the railroad industry is a valid proxy for IRR, then the only railroad industry cost of equity estimate that the Board could reasonably use is the official estimate produced by the Board. Beginning in 2008, the Board's official estimate is based on a combined MSDCF-CAPM approach.

Indeed, this case presents one of the stronger cases that the Board has seen recently for the use of the railroad industry cost of equity as a proxy for the SARR's cost of equity. Unlike many prior rate reasonableness cases where the SARR predominately handled coal, IRR handles

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[4] IPA Opening Nar. at III-G-5 to III-G-6.

[5] IPA also tries to justify its rejection of the 2010 MSDCF-derived cost of equity on the strength of the submission by Western Coal Traffic League ("WCTL") in *Railroad Cost of Capital – 2010*, STB Ex Parte No. 558 (Sub-No. 14), which claimed that the earnings estimates relied on by the Association of American Railroads for MSDCF calculations were stale and overstated the 2010 cost of equity estimate. IPA Opening Nar. at III-G-5. However, the Board has since issued its decision in that proceeding rejecting WCTL's assertion. *Railroad Cost of Capital – 2010*, STB Ex Parte No. 558 (Sub-No. 14) (STB served Sept. 30, 2011).

a wide range of products that are carried in the real world by UP. IRR is not just a limited carve out of a real world railroad's coal network, but instead replaces a key segment of UP's network in Utah that will be subject to the same economic forces affecting real world railroads.

Moreover, IPA could have tried to develop a SARR-specific cost of equity, as opposed to using the Board's CAPM results for the railroad industry as a proxy, but that is not the approach it took. In fact, IPA's arguments hint strongly at the reason why IPA chose not to pursue that course: it might have produced an even higher estimated cost of equity for IRR than the Board's estimate for the railroad industry.

The centerpiece of IPA's argument against the use of the MSDCF model's results in this case is that the MSDCF portion of the railroad industry cost of equity estimate is based on growth assumptions that do not comport with IRR's forecasted growth.[6] However, the MSDCF results depend on both growth in earnings *and* free cash flow. Rather than evaluating all aspects of the MSDCF approach, IPA simply asserts that defining IRR's cash flow would be a "speculative exercise."[7]

IPA also argues that the Board's CAPM results provide a better proxy for IRR's cost of equity because the CAPM approach focuses on risk rather than growth rates.[8] However, if IPA had tried to develop an IRR-specific cost of equity based on the CAPM approach, it would have had to address the numerous factors specific to IRR that would make IRR a particularly risky venture for investors as compared to other firms in the economy with which IRR would compete

[6] IPA Opening Nar. at III-G-6 to III-G-9. IPA supports this argument by referring to claims made by WCTL in *Railroad Cost of Capital – 2010*. As noted above, however, the Board recently issued a decision rejecting the arguments raised by WCTL.

[7] IPA Opening Nar. at III-G-7 n.7.

[8] *Id.* at III-G-10.

for capital.[9] For example, IRR has no network redundancy in the event of derailment or other calamity that would render an IRR segment inoperable. Similarly, IRR is almost exclusively an overhead carrier, and as an overhead carrier for most of its traffic, the destiny of the railroad would not be within its control. Moreover, IRR would be seeking capital based on construction cost estimates that include extremely low contingencies and engineering estimates for a venture of its size and scope and aggressive engineering schedule.

IPA's argument that the CAPM portion of the Board's cost of equity estimate is a better proxy for the SARR is flawed for another reason as well. IPA ignores the Board's reason for estimating the railroad industry's cost of equity using both the CAPM and MSDCF approaches. As the Board explained, use of an average of the two approaches, each of which looks at different economic factors, "will improve the reliability and stability of our cost-of-equity calculation."[10] The importance of that consideration is particularly apparent in the current economic circumstances, where the substantial drop in equity values in the latter part of 2008 produced a substantial downward movement in the CAPM-based cost of equity estimate. The Board's use of a combined MSDCF-CAPM approach to estimate the railroad industry's cost of equity is expressly intended to smooth out these short-term variations in cost of equity that would result from using only one or the other cost of capital approach. This is an additional reason why it makes no sense to claim that the railroad industry is a valid proxy to use in

[9] IPA claims in a footnote that "IRR should constitute a less risky enterprise" than other Class I railroads because IRR is "required to yield a sustainable return to enable it to achieve revenue adequacy." *Id.* at III-G-7 n.7. However, this argument makes no sense. IRR is not "required" to produce any specific return. The SAC test estimates the costs and revenues of a hypothetical railroad that serves a group of the UP's shippers that have the same revenue-generating prospects as the UP's real-world shippers. The SARR is thus subject to the same cost and revenue uncertainties that would apply to real-world railroads; it has no special guarantee of earning adequate revenues.

[10] *Use of a Multi-Stage Discounted Cash Flow Model*, slip op. at 14.

estimating IRR's cost of equity but then use something other than the Board's official estimate of the railroad industry's cost of equity.

IPA concludes its attack on MSDCF with the stunning assertion that complainants should nonetheless be entitled to choose the lower of a CAPM or MSDCF-based estimate.[11] This just confirms that IPA's approach is result-oriented and not deserving of serious consideration.

2. Equity Flotation Costs

Until 2007, the Board had rejected arguments by railroad defendants in SAC cases that the costs of raising the equity necessary to finance the construction of the SARR must be included in the SAC cost analysis. The Board's rationale was that there was not sufficient evidence of the "existence and size of equity flotation fees associated with equity issuances of a similar size."[12] In 2007, the Board changed its approach. In the SAC case involving AEP Texas, AEP Texas objected to the evidence submitted by BNSF Railway as to the size of an appropriate equity flotation fee and argued that the best evidence of the existence and size of an equity financing fee for a major railroad project was set forth in the ICC's railroad industry cost of capital determination for the year 1991, in which the ICC acknowledged that the Burlington Northern Railroad had incurred equity flotation costs of about 3.9% in 1991 in connection with the issuance of over 10 million shares of new common stock.[13] However, AEP Texas argued that the Board should treat that evidence of equity flotation fees in the SAC analysis the same way those fees were treated in the 1991 cost of capital determination, *i.e.*, by spreading the

[11] IPA Opening Nar. at III-G-10 at III-G-11.

[12] *Pub. Serv. Co. of Colo. D/B/A Xcel Energy v. Burlington Northern R.R.*, 7 S.T.B. 589, 659 (2004).

[13] *See* Rebuttal Evidence of Complainant AEP Texas North Co. in *AEP Tex. N. Co. v. BNSF Ry.*, STB Docket No. 41191 (Sub-No. 1), at III-G-4 (filed July 27, 2004).

impact of the equity flotation fees across the entire railroad industry.[14] The Board agreed with AEP Texas.[15]

IPA ignored the Board's decision in *AEP Texas North* and included in its SAC evidence no costs associated with the raising of the financing necessary to construct and operate the IRR. UP's reply evidence in this case reflects the Board's conclusion in *AEP Texas North* that the 3.9% equity flotation costs incurred by Burlington Northern in 1991 provide sufficient evidence of the costs that would be incurred by a new entrant into the railroad market. UP agrees that the 3.9% cost incurred by Burlington Northern in 1991 is a valid real-world estimate of the costs to a SARR to raise equity. However, UP believes that the Board incorrectly concluded in *AEP Texas North* that the cost of that flotation fee should be assessed to the SARR only to the extent the cost was reflected in a hypothetical change to the railroad industry cost of capital in the years in which the SARR needed to raise capital to finance construction of the SARR. For the reasons set out below, UP urges the Board to include the full 3.9% equity flotation fee in this case as a direct cost to the SARR.

The SARR's cost to raise equity is a cost that is borne directly by the SARR, just like other direct costs associated with construction of the SARR. The fee that must be paid to underwriters to raise the necessary financing is no different in kind from the fee that the SARR must pay to its engineers to design the SARR. It is a cost incurred by a new entrant to construct and operate a major railroad project, and it should be reflected in the SAC analysis.

The Board's approach effectively eliminates the impact of the equity flotation costs. In *AEP Tex. North*, the Board multiplied the flotation cost percentage by the percentage that the

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[14] *Id*.

[15] *See AEP Tex. N. Co. v. BNSF Ry.*, STB Docket No. 41191 (Sub-No. 1), slip op. at 108 (STB served Sept. 7, 2007).

SARR's market valuation was of the total railroad industry market value. The Board added this reduced cost to the weighted industry-average cost of equity capital. This approach implicitly assumes that an equity flotation cost is associated only with a small percentage of the railroad industry equity. That assumption is erroneous. Railroads have not recently raised equity but they incurred the flotation costs in the past when they did raise equity. The Board's approach assumes that the SARR can avoid all but a small percentage of the equity flotation costs that real world railroads have, a kind of reverse entry barrier. In 1991, the Burlington Northern incurred equity flotation costs when it raised equity. While the railroad industry cost of capital increased slightly in that year to account for the flotation costs, the Burlington Northern incurred the full extent of the costs itself. By recognizing the SARR's equity flotation costs only to the extent that those costs would be reflected in the railroad industry cost of capital for a year in which the SARR is the only firm that raises equity, the Board is allowing the SARR to avoid responsibility for a cost that real world railroads incur.

In *AEP Texas North*, the Board claimed that its approach to equity flotation costs is consistent with its treatment of debt flotation fees.[16] But that assertion is not correct. Debt flotation fees are in fact incurred by all railroads as they regularly raise debt. Therefore, the fees that a SARR would incur would be reflected in the debt component of the cost of capital for the railroad industry. In the context of the equity flotation fees, the SARR's costs are diluted because no other member of the industry raised equity in the year when the SARR raised the equity. In the area of debt, the SARR's costs would not be diluted because other railroads incur debt flotation fees in the year in which the SARR is assumed to incur those costs, and the costs are therefore reflected in the railroad industry cost of capital.

[16] *Id.*

3. Inflation Indices

IPA used actual AAR cost indices and Global Insight's June 2011 forecasts to calculate annual inflation forecasts.[17] UP does not dispute IPA's road property asset and operating expense DCF inflation indexes derived from these sources and, consistent with Board precedent, updates those indices in circumstances where new actual index values have become available. UP does, however, take issue with IPA's inflation index for land. IPA developed its average annual inflation for land of 4.63% from changes in farm real estate average values per acre between 2006 and 2010 as reported by the United States Department of Agriculture ("USDA") in its August 2010 Land Values and Cash Rents summary.[18] IPA did not provide any explanation of why the change in farm land prices between 2006 and 2010 is relevant to the IRR, which is assumed to acquire right of way in 2008 and 2009. Nor does the time frame comport with IPA's land appraisal, which estimates prices as of January 2011. UP accepts the use of the USDA as the source for inputs to calculate the IRR land value inflation index, but rejects IPA's selected time frame. Instead, UP develops its estimate based on changes in Utah farm land values between 2008 and 2011 as reported by the USDA in its August 2011 Land Values and Cash Rents summary.[19] Use of the more relevant time frame produces an annual land inflation value of -0.91%.[20]

4. Tax Liability

IPA's DCF incorporates three errors affecting the calculation of IRR income tax liability. First, as discussed in Section III.H.1.f, IPA misapplied the guidelines relative to bonus

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[17] IPA Opening Nar. at III-G-11.

[18] *Id.* at III-G-12; IPA Opening workpaper "IRR Land Appreciation.xlsx."

[19] UP Reply workpaper "IRR Land Appreciation Reply.xlsx."

[20] *Id.*

depreciation by assuming this temporary measure would apply to IRR assets at the time of their replacements. Second, as also as discussed in Section III.H.1.f, IPA used the wrong tax life for certain of the IRR road property assets. Third, as discussed in Section III.G.5, IPA improperly truncated the calculation of the present value of remaining interest and accelerated depreciation tax benefits beyond year 10 of the DCF. UP corrected these shortcomings as explained in the referenced Sections.

5. Capital Cost Recovery

IPA states that it calculated the capital recover cost of IRR's property using a 10-year DCF period in accordance with the Board's decision in *Major Issues in Rail Rate Cases*, Ex Parte No. 657 (Sub-No. 1) (STB served Oct. 30, 2006).[21] IPA's workpapers show that IPA performed its calculation by truncating its DCF analysis at 10 years and computing the terminal value as of year 10.[22] IPA's truncation of the DCF analysis at 10 years, rather than at the 20-year mark the Board has consistently used to compute the terminal value using its discounted cash flow model, emphasizes a flaw in the Board's model and produces a significant distorting effect on the DCF results. UP corrects the flaw in the Board's model, as discussed below.

The Board's DCF model contains a flaw that becomes less pronounced as the analysis period is lengthened. The Board's model is flawed in that it sums the amount of unused depreciation beyond the truncation year and allows the SARR to realize all of the remaining depreciation-related benefits in the truncation year.[23] In fact, depreciation benefits should extend

[21] IPA Opening Nar. at III-G-13.

[22] IPA Opening workpaper "Exhibit III-H-1.xls."

[23] The year-20 terminal value calculation in the Board's DCF model capitalizes the DCF quarter 80 pre-tax calculated revenue requirement by dividing by the real cost of capital. This, in effect, calculates the present value of the quarter 80 capital requirement assuming it had been indexed for inflation from the fourth quarter of year 20 into perpetuity, and is then discounted back to year 20 fourth quarter levels using the nominal cost of capital. From this capitalized revenue

to the 50th year of the DCF's perpetual calculations (because the longest IRS tax depreciation life for railroad assets is 50 years). Thus, when the DCF model is truncated at year 20, the correct approach for realizing the tax benefits generated by the depreciation deduction would be to compute the present value of the remaining depreciation benefit as of year 20 and deduct that amount from the capitalized revenue stream.

Under the Board's model, truncating the DCF calculation at year 20 produces some distortion to the DCF result by accelerating the availability of depreciation benefits that should only be available after year 20.[24] However, the problem becomes even more pronounced when the model is truncated at year 10. When the model is truncated at year 10, the flawed assumption results in both the remaining depreciation benefit and certain remaining tax deductible interest benefit being realized immediately after year 10.[25] Under IPA's calculations, both of these benefits are used to reduce IRR's tax liability at the end of year 10, instead of being spread over a longer period.[26]

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stream the model subtracts the unconsumed tax benefits from depreciation for those assets with lives in excess of 20 years before calculating Federal and state tax liability.

[24] The DCF model also computes a tax benefit for tax deductible interest payments related to the amortization of the SARR's debt. However, because the debt is amortized over 20 years, the benefit is completely exhausted when the terminal value is calculated after the 20th year.

[25] As explained in note 24 the SARR benefits from a tax deduction for interest payments on its debt that is amortized over 20 years. When the DCF model is truncated after 10 years, the SARR immediately realizes the benefit of the deductions that should have been spread across years 11 through 20.

[26] In its terminal value calculation in this case, IPA capitalizes the quarter 40 pre-tax revenue requirement and deducts the sum of the remaining years 11 through 20 debt amortization and the sum of the remaining years 11 through 50 accelerated depreciation, effectively assuming all of those benefits will be realized immediately after year 10, when in fact they will be spread over many years.

Rather than argue that the Board should revert back to the 20-year format previously used in SAC cases,[27] UP accepts IPA's proposal to compute the terminal value at the end of year 10, but also corrects the flaw in that calculation that fails to consider the timing of the remaining tax benefits and, as a result overstates the terminal value. The need for this correction can be demonstrated through a simplified example.

Assume a SARR with the following financial profile:

Initial Investment	$1,000,000
PV of Future Investment	50,000
Total To Be Recovered	$1,050,000
Inflation	3.0%
Cost of Debt	5.0%
Cost of Capital	11.0%
Federal Tax Rate	35.0%
State Tax Rate	5.0%
Debt %	25.0%
Debt Amortization	20
Depreciation:	
20-Year SL	50.0%
50-Year SL	50.0%

Table III.G.1 below shows the starting revenue requirement and the sum of the present value of the net terminal value calculation when the discounted cash flow model is run with

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[27] The Board could, consistent with use of a 10-year DCF period, continue to use its discounted cash flow model and truncate the calculation at year 20. The DCF period need not be the same as the time period covered by the discounted cash flow model. The period covered by the model, as the Board explained, is perpetuity (hence the need to calculate a "terminal value"). The DCF-period is simply the time period over which stand-alone costs are compared to stand-alone revenues to determine if the rates being evaluated are reasonable. *See Major Issues*, slip op. at 65 (explaining that "use of a shorter DCF period does not necessitate the adjustment of how debt is treated, i.e., amortization over the life of the asset versus amortization over the DCF period").

terminal values calculated in different years, but without any consideration of the tax benefits associated with interest or depreciation. The terminal value alternatives evaluated are:

1. Perpetuity – DCF model is run into perpetuity which for purposes of this demonstration is 2,000 quarters or 500 years.
2. 20 Year Post 20 PV – Board's standard 20 year discounted cash flow format, but with conceptual error corrected to account for actual timing of depreciation benefits.
3. 20 Year – Board's standard 20 year discounted cash flow format with no corrections.
4. IPA 10 – 10 year format used by IPA in this proceeding with conceptual error expanded to include unused interest and depreciation tax benefits for years 11 through 20.
5. 10 Year Post 10 PV – 10 year format used by IPA in this proceeding with the conceptual error corrected to match the timing of the tax benefits with the timing of the cash flows.

Table III.G.1

	Starting Revenue Requirement	Post Year 10 Including Terminal Value - Present Value
Perpetual	$31,799	$496,972
20 Year Post 20 PV	$31,799	$496,972
20 Year	$31,799	$496,972
IPA 10	$31,799	$496,972
10 Year Post 10 PV	$31,799	$496,972

Source: UP Reply workpaper "DCF Period Demonstration – quarterly no interest or depreciation.xlsx."

Table III.G.1 shows that without any consideration for tax benefits from interest or depreciation, the starting revenue requirement for each time format is identical, as is the present value of the net terminal value after year 10.

Table III.G.2 shows the results of running the exact same models, but this time recognizing the tax benefits of interest and depreciation.

Table III.G.2

	Starting Revenue Requirement	Post Year 10 Including Terminal Value - Present Value
Perpetual	$27,381	$465,591
20 Year Post 20 PV	$27,381	$465,591
20 Year	$27,076	$470,896
IPA 10	$25,661	$495,500
10 Year Post 10 PV	$27,381	$465,591

Source: UP Reply workpaper "DCF Period Demonstration – quarterly.xlsx."

Table III.G.2 shows that when tax benefits are considered, the starting revenue requirement for the perpetual model and for those variations that correctly match the timing of the tax benefits with the timing of the revenue stream by calculating the present value of the unused tax benefit stream is identical, as is the present value of terminal value after year 10. However the 20 Year and the IPA 10 scenario – which assume all of the tax benefits are consumed at the time of the terminal value calculation – have lower starting revenue requirements and correspondingly higher present value terminal values. This is the direct result of the incorrect overstatement of unused tax benefits and resulting overstatement of the terminal value.

The Santa Fe Railway noted this conceptual problem with the Board in *Arizona Public Service Company v. Atchison, Topeka & Santa Fe Railway Company*. At the time the Board rejected Santa Fe's proposed correction on the grounds that it would require a major change to its discounted cash flow model by creating the need to project and discount SARR earnings in the post analysis period.

> Santa Fe asserts that we erred by failing to calculate the present value of the unused tax benefits from depreciation that would be available in the

> post-analysis period. We disagree. If we were to separately discount the stream of annual depreciation allowances in the post-analysis period, which could be used to offset earnings generated after 2013, we would also have to separately project and discount earnings (and annual taxes due on those earnings) that the AGRR would realize in the post-analysis period. However, developing present values for various projected revenue requirements in the post-analysis period would convert our analysis to a perpetual model, which, as we have explained, would be inappropriate.[28]

However, the Board's concern in *APS II* was unjustified and its explanation of the supposed difficulties associated with Santa Fe's proposal was inconsistent with the way the discounted cash flow model actually works. As explained above, the terminal value formula in the Board's discounted cash flow model calculates the present value of the last quarter's capital requirement assuming it had been indexed for inflation into perpetuity, which is then discounted back to the last quarter's level using the nominal cost of capital. In other words, contrary to the Board's explanation in *APS*, the discounted cash flow model does project and discount earnings and taxes. It just fails to do so with the unused post terminal value tax benefits. To demonstrate that the truncated discounted cash flow models implicitly assume the projecting and discounting of earnings, UP replicated the terminal value calculation for each of the scenarios analyzed by projecting the revenue stream into perpetuity (assumed for these calculations as 500 years) and discounting it back to the last quarter's level. In each instance the calculation into perpetuity matched exactly the terminal value produced by the Board's formula. Table III.G.3 compares the results for each scenario based on the Board's truncated model and comparable calculations run into perpetuity.

[28] 3 S.T.B. 70, 82-83 (1998).

Table III.G.3

	Truncated Model		Perpetual Run Verification	
	Starting Revenue Requirement	Post Year 10 Including Terminal Value - Present Value	Starting Revenue Requirement	Post Year 10 Including Terminal Value - Present Value
Perpetual	N/A	N/A	$27,381	$465,591
20 Year Post 20 PV	$27,381	$465,591	$27,381	$465,591
20 Year	$27,076	$470,896	$27,076	$470,896
IPA 10	$25,661	$495,500	$25,661	$495,500
10 Year Post 10 PV	$27,381	$465,591	$27,381	$465,591

Source: UP Reply workpaper "DCF Period Demonstration – quarterly.xlsx."

In each case, the perpetual run verification matched exactly the results of the truncated model. In sum, UP's proposed correction to the Board's DCF model's treatment of remaining depreciation and tax deductible interest benefits in the model's terminal value calculation is consistent with the model's approach to the other issues and merely corrects an error in the model's treatment of unused post-terminal value tax benefits.

III.H: Results of SAC Analysis

III. H. RESULTS OF SAC DCF ANALYSIS

In this Section, UP discusses the results of its SAC DCF analysis and the application of the Board's Maximum Markup Methodology ("MMM") and cross-subsidy tests to the evidence in this case.

1. Results of SAC DCF Analysis

IPA used a variation of the Board's DCF model to develop the capital recovery and operating expense related revenue requirements. UP identified several problems with IPA's DCF model in Section III.G. There are other problems with IPA's DCF inputs and assumptions that UP could have discussed in Section III.G; however, because IPA discussed these other issues in Section III.H, UP addresses them in Section III.H as well. The DCF implementation problems discussed here include IPA's improper change to the Board's standard debt amortization pattern, extension of the benefits of bonus depreciation to the replacement cost of assets as they reach the end of their useful lives, and use of the wrong tax depreciation lives for certain of the IRR road property assets. UP's corrected DCF analyses are set out in Exhibit III.H-1.

a. Cost of Capital

As discussed above in Sections III.G.1 and III.G.2, IPA incorrectly used only the CAPM-derived component of the Board's 2008 through 2010 railroad cost of equity component and failed to include equity floatation costs in calculating the railroad cost of equity component. UP corrected both problems. The cost of capital figures used by UP in its reply are set forth in Table A of Exhibit III.H-1.

b. Road Property Investment Values

UP's calculations for road property investment values are detailed in Table C of Exhibit III.H-1. UP replaced IPA's road property investments with those specified in Section III.F. UP accepts IPA's IRR proposed construction schedule.

For land investments, IPA's land valuation witness estimated 2011 land values and discounted those values back to the IRR construction period using an index that does not reflect the correct time frame for the IRR's land acquisition. As explained in Section III.G.3, UP corrected the index to reflect properly the change in land values over the relevant time period.

c. Interest During Construction

UP calculated interest during construction ("IDC") on construction funds outstanding during 2008, 2009, and 2010 using the same methodology as IPA.

d. Amortization Schedule of Assets Purchased with Debt Capital

In its opening, IPA proposes to change the Board's long standing practice of amortizing SARR debt over 20 years. However, IPA's improperly assumes that IRR could be financed with a single debt instrument that has a 20-year term, while also assuming that the terms of the instrument would reflect the railroad industry cost of debt, which is calculated based in part on instruments with much shorter intervals to maturity, and thus corresponding low yields.

As justification for its proposed change, IPA asserts that a SARR's debt capital would mirror the type of debt instruments issued by US Class I railroads included in the Board's annual cost of capital determination, and it cites the Board decision in *West Texas Utilities Co. v. Burlington Northern Railroad* as supporting its claim.[1] IPA also suggests that nearly 90% of the

[1] IPA Opening Nar. at III-H-2 (citing *West Tex. Utils. Co. v. Burlington Northern R.R.*, 1 S.T.B. 638, 712 (1996)).

railroad industry debt consists of corporate bonds, notes, and debentures that incorporate coupon payments of interest, rather than periodic payments with principle and interest components.[2]

IPA's assertions are misleading in at least two respects. First, while the *WTU* decision supports the notion that a SARR's *cost* of debt should be based on the Board's cost of capital determinations, there is no hint in that decision that the SARR is required to adopt the composition of that debt and, in particular how the interest and principle is returned to debt holders, as IPA implies.

Second, and more importantly, IPA's emphasis on the type of debt instrument creates a disconnect with its assumption that IRR's cost of debt would reflect the railroad industry's cost of debt. When the Association of American Railroads ("AAR") calculates the railroad industry cost of debt for the Board's annual cost of capital determination, it calculates the average yield of the bonds, notes, and debentures that were traded during the year. These bonds, notes, and debentures include instruments with relatively short intervals to maturity and correspondingly low yields, and those with longer intervals to maturity and correspondingly higher yields. Table III.H.1 below segregates the 2010 traded debt instruments that the AAR used in its calculations between those with yields below the 2010 average yield of 4.56% and those with yields above the average.

[2] *Id.* at III-H-3.

Table III.H.1
Breakdown of AAR 2010 Cost of Debt
Between Those With Yields Below and Above the Average Yield
($ millions)

2010 Instruments	Count	Market Value	Weight	Avg. Yield	Maturity Range	Avg. Years to Maturity
Below Avg.	11	$3,831.4	33.56%	2.69%	2012-2017	3.6
Above Avg.	22	$7,585.3	66.44%	5.51%	2020-2105	26.0
Average	33	$11,416.7	100.00%	4.56%		18.5

Source: UP Reply Workpaper "AAR 2010 Cost of Capital Debt Details.xlsx."

Table III.H.1shows that eleven of the 33 debt instruments used by the AAR to determine the 2010 railroad industry average cost of debt have yields below the average, with an average yield of 2.69%, and that these instruments will mature and be paid in full in an average of 3.6 years. If, as IPA suggests, the IRR were financed with a single note with a 20-year term with a maturity date of 2031, then the interest rate would have to be recalculated to reflect the longer term nature of the financing. By contrast, the long-standing assumption in the DCF model that debt will be amortized over a 20-year period, rather than that the principle will be paid in full at maturity, incorporates the concept that the cost of debt will reflect a mix that includes some instruments with shorter terms until maturity. In other words, IPA's decision to use the railroad industry's average cost of debt and the accompanying mix of short and long term maturities is consistent with the long-standing assumption in the DCF model that debt will be amortized throughout the 20 year period, not with an assumption that IRR could be financed with a note under which no principle would not be paid for 20 years.

The current debt amortization schedule in the DCF was first introduced by the Interstate Commerce Commission in its 1990 decision in *Coal Trading Corp. v. Baltimore & Ohio*

Railroad.[3] That amortization assumption is consistent both with the AAR's calculation of the average debt yield and with the maturity schedules of the underlying instruments.

e. Present Value of Replacement Cost

UP accepts IPA's calculation of the replacement cost of IRR assets with the exception noted below regarding bonus depreciation.

f. Tax Depreciation Schedules

IPA's tax depreciation schedules contain two errors. The first is that IPA assumes that the bonus depreciation benefit, which is not applicable to assets placed in service after January 1, 2013, will be available into perpetuity.[4] Specifically, IPA modified the "Replacement" tab of the Board's DCF model to apply 50 percent bonus depreciation to assets replaced at the end of their projected useful lives. The shortest lived IRR road property asset – ties – has an average service life of 21 years. The DCF assumes that IRR will incur the investment required to replace ties in the year 2032, well after the bonus depreciation benefit is scheduled to expire. UP has removed the bonus depreciation benefit from the asset replacement tab of the DCF in its reply.

The second error is that IPA's tax depreciation schedules use the wrong tax depreciation lives for certain of the IRR's road property assets. Specifically, IPA assumed certain accounts to qualify for 15-year lives when, under IRS rules, they actually qualify as 20-year properties. Internal Revenue Code § 168(e) specifies the rules for the classification of property for purposes of computing the cost recovery allowance provided by the Modified Accelerated Cost Recovery System ("MACRS") – the tax depreciation system used in the United States. Property is classified according to class life as determined in Revenue Procedure 87-56 unless statutorily

[3] *Coal Trading Corp. v. Baltimore & Ohio R.R.*, 6 I.C.C.2d 361 (1990).

[4] UP Reply Workpaper "GPO_IRS_26_168_K_2.pdf."

classified otherwise in § 168.[5] There are no exceptions to this rule. The following assets are specifically listed under asset class 40.2, each carrying a 20-year tax life.

- Account 6 - Bridge & Trestles
- Account 13 - Fences & Roadway Signs
- Account 17 - Roadway Buildings
- Account 19 - Fuel Stations
- Account 20 - Shops & Enginehouses
- Account 39 - Public Improvements

For each of these asset categories, UP changed the depreciation period from 15 years to 20 years and updated the depreciation percentages to comply with the proper 20-year MACRS table.

g. <u>Average Annual Inflation in Asset Prices</u>

UP accepts IPA's inflation assumptions for assets other than land, as discussed above.

h. <u>Discounted Cash Flow</u>

As explained in detail above in Section III.G.4, UP accepts IPA proposal to calculate the terminal value after year 10, but corrects the calculation to capture properly the timing of the use of the tax benefits beyond year 10.

i. <u>Computation of Tax Liability – Taxable Income</u>

UP accepts IPA's assumed federal tax rate of 35% and Utah state income tax rate of 6%.

j. <u>Operating Expenses</u>

UP updated the base year operating expenses as detailed in Section III.D. For the annual adjustment of operating expenses, IPA used ton miles instead of the Board's standard use of tons to more accurately account for the mix of traffic on IRR. UP accepts IPA's use of ton miles and updates the calculations in the DCF using the updated and corrected ton miles from Section III.A.2. In a change from prior Board precedent, IPA applied its ton mile adjustment to

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[5] UP Reply workpaper "IRC 168.pdf."

maintenance of way expenses. Because maintenance of way expenses are developed on a normalized basis over the 10-year DCF period, they reflect the average personnel and maintenance expenditures over that time span. There is no need to index these costs.

k. Summary of SAC Analysis

UP's stand-alone costs and revenues for IRR are presented in Table L of Exhibit III.H-1 on a quarterly and annual basis and summarized in Table III.H.2 below.

Table III.H.2
Summary of DCF Results – 2011 to 2020
($ millions)

Year (1)	Annual Stand-Alone Requirement (2)	Stand-Alone Revenues (3)	Overpayments or Shortfalls (4)	PV Difference (5)	Cumulative PV Difference (6)
2011	$214.6	$101.5	-$113.1	-$107.4	-$107.4
2012	215.6	102.0	-113.6	-97.4	-204.8
2013	224.1	110.7	-113.3	-87.6	-292.4
2014	229.2	113.4	-115.8	-80.7	-373.1
2015	235.3	117.2	-118.2	-74.3	-447.4
2016	243.7	121.6	-122.0	-69.2	-516.6
2017	251.2	126.7	-124.5	-63.7	-580.3
2018	256.8	126.8	-130.0	-60.0	-640.3
2019	263.2	129.5	-133.7	-55.7	-696.0
2020	269.4	132.8	-136.6	-51.3	-747.3

Source: UP Reply Exhibit III.H-1.

The results in Table III.H.2 show that the revenues available to the SARR are not sufficient to cover the full SAC costs of the SARR over the 10-year analysis period. In fact, IRR would experience a cumulative revenue shortfall of nearly $750 million. Thus, IPA has not demonstrated that the challenged rates are unreasonably high.

Even if the Board were to conclude that SARR revenues exceeded SARR costs, it would still have to apply two types of cross-subsidy analyses before it could award any relief to IPA.

The Board's threshold internal cross-subsidy analysis is designed to ensure that a shipper does not prevail in a SAC case by relying on a SAC presentation that creates a cross-subsidy in favor of the issue traffic. As the Board has explained, a shipper cannot "prove an impermissible cross-subsidy by shifting 'responsibility for paying for facilities it uses to other shippers who do not benefit from those facilities.'"[6] Because the IRR line segment between Milford and Lynndyl serves IRR traffic that does not share any facilities with the IPA issue traffic moving on the IRR lines between Price and Lynndyl, UP administered the threshold internal cross-subsidy test to the IRR lines between Price and Lynndyl.

UP's workpapers illustrate how, in the event the Board were to find that IRR's revenues exceed its costs, the threshold internal cross-subsidy analysis should be performed. UP's cross-subsidy analysis applied the procedures and assumptions that the Board used in *Otter Tail* to the UP Reply IRR. UP first estimated the road-property investment that is attributable the Lynndyl to Price portion of the IRR system. UP then estimated the portion of each operating expense category that should be attributed to the Lynndyl to Price part, using a bottom-up approach to calculate direct operating expenses,[7] and an URCS-based approach to calculate indirect operating expenses,[8] just as the Board did in *Otter Tail* (without any further refinements to the Board's approach).[9] Finally, UP performed a DCF analysis for the Lynndyl to Price part, which shows that, as compared to the result for the full SARR, the revenue shortfall associated with the traffic using the Lynndyl to Price part is even greater as a percentage of the annual stand-alone revenues for each year from 2011 through 2020.[10] This shows that an improper cross-

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[6] *Otter Tail Power Co. v. BNSF Ry.*, STB Docket No. 42071, slip op. at 24 (STB served Jan. 25, 2006) (quoting *PPL Montana, LLC v. Burlington N. & Santa Fe Ry.*, 6 S.T.B. 752, 757-78 (2003)).

[7] UP Reply workpaper "IRR Operating Expense XSUB Reply SARR.xlsx."

[8] UP Reply workpaper "Reply Cross-Subsidy DCF.xlsx," Tab "Operating Expense."

[9] *See Otter Tail*, slip op. at 25-29.

[10] UP Reply workpaper "Reply Cross-Subsidy DCF.xlsx," Tab "Summary."

subsidization exists for the traffic on the Lynndyl to Price segment, which includes IPA's own traffic.

2. Maximum Rate Calculations

If the Board carries out a SAC analysis based on UP's reply evidence, it will have no reason to apply MMM. However, if the Board finds that IRR's SAC revenues exceed its SAC costs, it should apply MMM by developing the variable costs used to calculate the revenue-to-variable cost ("R/VC") ratio for the movements in the traffic group in accordance with the costing methodology that it ordered the parties to apply *Arizona Electric Power Cooperative, Inc. v. BNSF Railway and Union Pacific Railroad*.[11]

The Board developed MMM to "allocate the total SAC costs among all of the movements in the traffic group to determine if the challenged rate is unreasonably high, and if so by how much."[12] The allocation of SAC costs is based on each movement's "relative share of service provided, as measured by URCS variable costs."[13] MMM calculates a maximum revenue-to variable cost ratio that limits the contribution from any single movement to a prescribed ratio based on each movement's "share of service provided."

Logically, each movement's share of service provided should be based on the SARR's costs because MMM is allocating the costs of service provided by the SARR. However, because of IRR's relatively small size and a traffic base that consists primarily of trainload service, there is not likely to be a wide variance between costs distributed using a SARR specific URCS and those distributed with a proper implementation of UP system-average URCS.

[11] *Ariz. Elec. Power Coop., Inc. v. BNSF Ry. & Union Pac. R.R.*, STB Docket No. 42133, slip op. at 2 (STB served June 27, 2011).

[12] *Major Issues in Rail Rate Cases*, STB Ex Parte No. 657 (Sub-No. 1), slip op. at 9 (STB served Oct. 30, 2006).

[13] *Id.* at 14.

In *AEPCO*, the Board recognized that a "mismatch" would occur where, as occurred in that case, a complainant posits a SARR that would move traffic in trainload service, but calculates the variable costs for that traffic using defendant's costs as though the traffic was moved in carload and multi-car service.[14] The Board therefore ordered the parties to revise their variable cost calculations for carload and multi-car shipments to account for the efficient, low-cost characteristics of those movements over the portion of the through movement replicated by the SARR.[15]

Like the complainant in *AEPCO*, IPA designed its SARR so that carload and multi-car shipments would move in intact trainloads over the portion of the through movement replicated by the SARR. Accordingly, if the Board reaches the MMM portion of its rate reasonableness analysis, it should, at a minimum, apply MMM using the costing approach it identified in *AEPCO*.[16]

IPA's application of MMM in this case ignored the Board's decision in *AEPCO*. To illustrate the potential impact of this issue, UP reran IPA's MMM model following the Board's instructions to the parties in *AEPCO* to have MMM variable costs reflect the proposed operations on the SARR. Specifically, UP costed the IRR intermodal and merchandise shipments as unit train shipments, with a corresponding substitution of actual empty return ratios for the URCS unit train default assumption of two. Table III.H.3 below compares IPA's opening maximum R/VC ratios derived from its MMM model with the MMM R/VC ratios generated when the

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[14] *AEPCO*, slip op. at 2.

[15] *Id.*

[16] UP continues to believe that the correct means of applying the theory behind MMM is to use the SARR's costs.

merchandise and intermodal IRR shipments are costed consistent with the service provided by the IRR.

Table III.H.3
IPA MMM Results

Year	IPA Maximum R/VC	Reply R/VC
2011	250.2	254.2
2012	251.4	255.1
2013	244.4	247.8
2014	241.8	245.5
2015	238.8	242.8
2016	240.1	244.1
2017	236.2	240.5
2018	245.2	249.3
2019	246.6	250.7
2020	245.5	249.9

Source: UP Reply workpaper "IPA MMM with AEPCO Move Types.xlsm."

In addition to its failure to adhere to the Board's instructions in *AEPCO* regarding the matching of MMM costing assumptions with the service provided by IRR, IPA's MMM run suffers from a number of implementation errors. Even though UP's reply evidence demonstrates that IRR costs exceed revenues by a substantial margin over the 10-year DCF period, UP develop an MMM model template that corrects the IPA MMM model's errors described below.

First, IPA used the wrong index to adjust the MMM URCS costs for the years 2011 through 2020. Instead of using the RCAF-A as instructed by the Board in its 2009 decision in *AEP Texas North*,[17] IPA relies on a strained interpretation of the Board's decision in *OG&E*[18] and uses the Board's standard URCS indexing approach in it MMM runs.[19] The *OG&E* decision

[17] *AEP Tex. N. Co. v. BNSF Ry.*, STB Docket No. 41191 (Sub-No. 1), slip op. at 14 (STB served May 15, 2009).

[18] *Oklahoma Gas & Elec. Co. v. Union Pac. R.R.*, STB Docket No. 42111 (STB served July 24, 2009).

[19] IPA Opening Nar. at III-H-12.

involved short term indexing of URCS costs to inflate only for specific quarters within one year, and not across years. The IPA MMM model, on the other hand, is forecasting URCS costs 10 years into the future. UP followed the Board's *AEP Texas North* guidance and used a forecast of the RCAF-A as the basis for forecasts to forecast variable costs in the MMM model.

Second, even though IPA's IRR costs are influenced by the inclusion of BNSF trackage rights trains moving between Price and Provo, IPA failed to include cost for the BNSF trackage rights movements in its MMM model. Instead IPA added the revenues from the BNSF trackage rights shipments to the IRR revenues in the MMM model, effectively increasing the amount of SARR overpayments to be absorbed by the other SARR participants, including the IPA issue traffic. On reply, UP included the BNSF trackage rights shipments in the MMM model in a manner consistent with the development of the IRR costs. To calculate the variable cost attributable to these shipments, UP included only the below-the-wheel costs. UP used these costs to calculate an R/VC ratio for trackage rights shipments in each year and included them in the MMM maximum R/VC calculations.

Third, IPA incorrectly calculated the variable costs for intermodal shipments. As discussed in Section III.A.3.d, IPA used container weights rather than car weights as the URCS costing input when calculating the variable costs for intermodal traffic. This error developed costs for each intermodal shipment assuming a single container on each intermodal flat car instead of the UP system average of five. This error significantly increases the cost per ton as calculated in URCS. These artificially high costs result in very low R/VC ratios for intermodal movements, thus reducing the opportunity for any MMM revenue reductions on these moves, and thereby pushing more of the MMM reductions to other higher-rated traffic including the issue traffic. UP corrected IPA's error in its MMM template.

Fourth, IPA incorrectly assumed that revenue empty shipments moving over IRR with no lading weights incur no variable cost. Even though these shipments do not include any lading weight, URCS variable costs are applicable to the costs of moving the empty car itself. UP corrected this oversight in its MMM template.

Finally, beyond the technical issues surrounding MMM, UP addresses the issue raised by the Board in *Otter Tail* regarding the need to ensure that rates are not driven down below those that would be required to cover the costs of a cross-subsidy segment. As discussed above, the IRR system as configured by IPA includes a segment from Milford to Lynndyl that includes traffic that does not share any facilities with the issue traffic, which moves on IRR between Price and Lynndyl. If the Board finds that IRR's SAC revenues exceed its SAC costs and no obvious impermissible cross-subsidy is revealed by the threshold internal cross-subsidy test, the Board would still have to ensure that any rate reduction produced using MMM does not reduce rates to levels that are insufficient to cover the costs of the cross-subsidy segment. As the Board has explained, its "cross-subsidy analysis serves as both a threshold inquiry and a limit on potential relief."[20]

To ensure that rates are not driven down below the level that would be required to cover the costs of the Lynndyl to Price portion of the IRR system, the Board would simply apply MMM to allocate the costs of the Lynndyl to Price segment to users of that segment, including the issue traffic. In other words, the Board would apply MMM to the revenues and the costs developed for its threshold internal cross-subsidy analysis. This is a straightforward way to ensure that traffic using only the Milford to Lynndyl segment is being used only to share in the recovery of costs, and not to create a cross subsidy.

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[20] *Otter Tail*, slip op. at 11.

As the Board explained in *Otter Tail*, a SARR traffic group may include traffic from a shipper that uses only "secondary facilities," and not the "core facilities" needed to serve the issue traffic (Shipper A), as long as the traffic is being used to share costs with traffic from a shipper that uses both the "secondary facilities" and the "core facilities" (Shipper B).[21] By including Shipper A's traffic in the analysis, Shipper B can share more of the costs of the "core facilities" with the issue traffic, because Shipper B does not have to pay as much to support the "secondary facilities."[22]

However, if all Shipper B's revenues associated with the "secondary facilities" were made available to the SARR and the costs of the "secondary facilities" were eliminated, there would be no legitimate reason for the SARR traffic group to include Shipper A. An MMM analysis conducted in those circumstances would determine a revenue-to-variable cost ratio that included the full benefit of cost-sharing, but none of the impact of cross-subsidy from Shipper A. Indeed, any additional reduction to the revenue-to variable cost ratio as a result of an MMM analysis that included Shipper A's traffic and the "secondary facilities" would reflect an impermissible cross-subsidy from including Shipper A's traffic.

To illustrate the potential impact of such a cross-subsidy, UP performed an analysis of a potential cross subsidy created by the Milford to Lynndyl segment using IPA's opening evidence, without making any adjustments to revenues or costs (or any changes to MMM in accordance with the Board's decision in *AEPCO*). As shown below in Table III.H.4, the IPA SARR would not fail outright the threshold internal cross subsidy test.

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[21] *Id.* at 10.

[22] *Id.*

Table III.H.4
Summary of IPA Cross-Subsidy DCF Results – 2011 to 2020
($ millions)

Year (1)	Annual Stand-Alone Requirement (2)	Stand-Alone Revenues (3)	Overpayments or Shortfalls (4)	PV Difference (5)	Cumulative PV Difference (6)
2011	$71.5	$92.3	$20.8	$19.9	$19.9
2012	71.6	89.9	18.4	16.0	35.9
2013	75.1	97.6	22.5	17.9	53.8
2014	76.9	100.3	23.4	16.9	70.7
2015	79.3	103.8	24.5	16.2	86.9
2016	82.7	108.0	25.4	15.3	102.2
2017	85.6	113.4	27.8	15.3	117.5
2018	87.1	111.6	24.5	12.3	129.7
2019	89.3	113.9	24.7	11.3	141.0
2020	91.7	117.7	26.0	10.8	151.8

Source: UP Reply workpaper "IPA Cross-Subsidy DCF.xls."

However, the next step would be to apply MMM to the results of the first stage of its analysis to determine whether traffic using only the Milford to Lynndyl segment is responsible for reducing the prescribed MMM ratio. The results are summarized in Table III.H.5 below.

Table III.H.5
IPA Cross-Subsidy MMM Results

Year	**IPA Maximum R/VC**	**Reply R/VC**
2011	250.2	262.2
2012	251.4	270.5
2013	244.4	257.8
2014	241.8	259.9
2015	238.8	259.1
2016	240.1	260.4
2017	236.2	257.4
2018	245.2	271.3
2019	246.6	276.1
2020	245.5	277.1

Source: UP Reply workpaper "IPA Cross-Subsidy MMM.xlsm."

This analysis shows that the SARR traffic that uses only the Milford to Lynndyl segment is responsible for reducing the maximum R/VC levels produced by the application of MMM. It shows that, without cross-subsidization from traffic using only the Milford to Lynndyl segment, the R/VC ratio for the issue traffic would have to be 12 percentage points higher than the R/VC ratio that IPA claims would be the maximum R/VC ratio for the issue traffic in the first year of the analysis, and more than 30 percentage points higher by the final year of the analysis. The additional reduction to the revenue-to variable cost ratio as a result of traffic that uses only the Milford to Lynndyl segment reflects and impermissible cross-subsidy of the issue traffic.

IV: Witness Qualifications

MICHAEL R. BARANOWSKI

Mr. Baranowski is a Senior Managing Director at FTI Consulting, Inc., an economic and consulting firm with offices located at 1101 K Street, NW, Washington, DC 20005. Since 1980, Mr. Baranowski has been involved in various aspects of transportation analysis including operations, engineering, facility requirements, valuations and costing.

Mr. Baranowski holds a Bachelor of Science degree in accounting from Fairfield University in Fairfield, Connecticut. In 1980, he joined the consulting firm of Wyer, Dick and Company in Livingston, New Jersey as a consultant. He participated in a variety of studies for railroad, shipper and other clients including line abandonments, operations analysis, terminal switching studies, labor protection and rail facility and equipment valuation.

In late 1981, Mr. Baranowski became a consultant with Snavely, King and Associates with offices in Morristown, New Jersey and Washington, D.C. While at Snavely, King, he was involved in rail merger, traffic, switching, liquidation and valuation studies for a variety of rail and rail related clients. He was also responsible for engineering, operating and costing components in a number of Section 229 proceedings.

Mr. Baranowski joined Klick, Kent & Allen ("KK&A") in 1988 as a Senior Consultant. He became a principal of KK&A in 1989 and remained in that position until its acquisition by FTI in 1998.

Mr. Baranowski has presented testimony before the Interstate Commerce Commission, Surface Transportation Board, Federal Communications Commission, Federal Regulatory Commission and a variety of state regulatory agencies. Mr. Baranowski's curriculum vitae, which identifies representative engagements and cases in which he has sponsored expert testimony, is attached hereto.

Mr. Baranowski is sponsoring Sections III.G and III.H of defendants' Reply Evidence. Mr. Baranowski has signed a verification of the truth of the statements contained therein. A copy of that verification is attached hereto.

VERIFICATION

I declare under penalty of perjury that I have read the Reply Evidence in this proceeding that I have sponsored, as described in the foregoing Statement of Qualifications, and that the contents thereof are true and correct. Further, I certify that I am qualified and authorized to sponsor this testimony.

Michael R. Baranowski

Executed on November 9, 2011

IV-3

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Education
B.S. in Accounting, Fairfield University

Supplemental Finance Studies, Kean College

Mike Baranowski provides financial financial and economic consulting services to the telecommunications and transportation industries. He has special expertise in analyzing and developing complex computer costing models, operations analysis, and transportation engineering. Much of his work involves providing oral and written expert testimony before courts and regulatory bodies.

Some of Mr. Baranowski's representative accomplishments include:

- Overseeing the development of computer cost modeling tools designed to simulate the cost of competive entry into local telecommunications markets and directing the efforts of a nationwide team of testifying experts presenting the cost model results in multiple proceedings across the country.
- Directing the analysis, critique and restatement of a variety of complex cost models developed by major telecommunications companies designed to simulate the forward-looking cost of competitive entry into local telecommunications markets.
- Designing multiple PC-based spreadsheet models for use in calculating the stand-alone cost of competitive entry into the railroad and pipeline markets. These models have been used to assist clients in all three network industries in making internal pricing decisions that are in compliance with governing regulatory standards.
- Conducting detailed analyses of railroad operations and developing the associated capital requirements and operating expenses attributable to specific movements and the incremental capital and operating expense requirements attributable to major changes in anticipated traffic levels.
- Calculating marginal and incremental costs for a major petroleum products pipeline company, an approach that is now used regularly by the company in making internal day-to-day pricing decisions.

Mr. Baranowski holds a B.S. in Accounting from Fairfield University in Fairfield, Connecticut and has pursued supplemental finance studies at Kean College in Union, New Jersey.

TELECOMMUNICATIONS TESTIMONY

Federal Communications Commission

February 1998	File No. E-98-05. AT&T Corp. v. Bell Atlantic Corp. Affidavit of Michael R. Baranowski.
March 13, 1998	File No. E-98-05. AT&T Corp. v. Bell Atlantic Corp. Supplemental Affidavit of Michael R. Baranowski.
June 10, 1999	CC Docket No. 96-98. Implementation of the Local Competition Provisions of the Telecommunications Act of 1996. Reply Affidavit of Michael R. Baranowski, John C. Klick and Brian F. Pitkin.

July 25, 2001	CC Docket No. 00-251, 00-218. In the Matter of Petition of AT&T Communications of Virginia, Inc. and WorldCom, Inc., Pursuant to Section 252(e)(5) of the Communications Act, for Preemption of the Jurisdiction of the Virginia State Corporation Commission Regarding Interconnection Disputes with Verizon-Virginia, Inc. Panel
June 13, 2005	WC Docket No. 05-25;RM-10593. In the Matter of Special Access Rates for Price Cap Local Exchange Carriers; AT&T Corp. Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services, Joint Declaration on Behalf of SBC Communications, Inc.
July 29, 2005	WC Docket No. 05-25;RM-10593. In the Matter of Special Access Rates for Price Cap Local Exchange Carriers; AT&T Corp. Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services, Joint Reply Declaration on Behalf of SBC Communications, Inc.

Public Service Commission of Delaware

February 4, 1997	PSC Docket No. 96-324. In the Matter of Bell Atlantic - Delaware Statement of Terms and Conditions Under Section 252(F) of the Telecommunications Act of 1996. Testimony of Michael R. Baranowski.

Public Service Commission of the District of Columbia

March 24, 1997	Formal Case No. 962. In the Matter of the Implementation of the District of Columbia Telecommunications Competition Act of 1996. Testimony of Michael R. Baranowski.
May 2, 1997	Formal Case No. 962. In the Matter of the Implementation of the District of Columbia Telecommunications Competition Act of 1996. Rebuttal Testimony of Michael R. Baranowski.

Public Service Commission of the State of Maryland

March 7, 1997	Docket No. 8731, Phase II. In the Matter of the Petitions for Approval of Agreements and Arbitration of Unresolved Issues Arising Under Section 252 of the Telecommunications Act of 1996. Direct Testimony of Michael R. Baranowski.
April 4, 1997	Docket No. 8731, Phase II. In the Matter of the Petitions for Approval of Agreements and Arbitration of Unresolved Issues Arising Under Section 252 of the Telecommunications Act of 1996. Rebuttal Testimony of Michael R. Baranowski.
May 25, 2001	Case No. 8879. In the Matter of the Investigation into Rates for Unbundled Network Elements Pursuant to the Telecommunications Act of 1996. Panel Testimony on Recurring Cost Issues

Public Service Commission of the State of Michigan

January 20, 2004	Case No. U-13531. In the Matter, on the Commission's Own Motion to Review the Costs of Telecommunication Service Provided By SBC Michigan. Initial Testimony of Michael R. Baranowski and Julie A. Murphy.
May 10, 2004	Case No. U-13531. In the Matter, on the Commission's Own Motion to Review the Costs of Telecommunication Service Provided By SBC Michigan. Final Reply Testimony of Michael R. Baranowski and Julie A. Murphy.

New Jersey Board of Public Utilities

December 20, 1996	Docket No. TX 95120631. Notice of Investigation Local Exchange Competition for Telecommunications Services. Rebuttal Testimony of John C. Klick and Michael R. Baranowski.

North Carolina Utilities Commission

March 9, 1998	Docket No. P-100, Sub 133d. In the Matter of Establishment of Universal Support Mechanisms Pursuant to Section 254 of the Telecommunications Act of 1996. Rebuttal Testimony of Michael R. Baranowski.

Pennsylvania Public Utility Commission

January 13, 1997	Docket Nos. A-310203F0002 et al. MFS-III. Application of MFS Intelenet of Pennsylvania, Inc. et. Al. (Phase III). Rebuttal Testimony of Michael R. Baranowski.
February 21, 1997	Docket Nos. A-310203F0002 et al. MFS-III. Application of MFS Intelenet of Pennsylvania, Inc. et. Al. (Phase III). Surrebuttal Testimony of Michael R. Baranowski.
April 22, 1999	Docket Nos. P-00991648, P-00991649. Petition of Senators and CLECs for Adoption of Partial Settlement and Joint Petition for Global Resolution of Telecommunications Proceedings. Direct Testimony of Michael R. Baranowski.
January 11, 2002	Docket No. R-00016683. Generic Investigation of Verizon Pennsylvania, Inc.'s Unbundled Network Element Rates. Panel Testimony on Recurring Cost Issues

State Corporation Commission Commonwealth of Virginia

April 7, 1997	Case No. PUC970005. Ex Parte to Determine Prices Bell Atlantic - Virginia, Inc. Is Authorized To Charge Competing Local Exchange Carriers In Accordance With The Telecommunications Act of 1996 And Applicable State Law. Affidavit of Michael R. Baranowski.
April 23, 1997	Case No. PUC970005. Ex Parte to Determine Prices Bell Atlantic - Virginia, Inc. Is Authorized To Charge Competing Local Exchange Carriers In Accordance With The Telecommunications Act of 1996 And Applicable State Law. Direct Testimony of Michael R. Baranowski.

June 10, 1997	Case No. PUC970005. Ex Parte to Determine Prices Bell Atlantic - Virginia, Inc. Is Authorized To Charge Competing Local Exchange Carriers In Accordance With The Telecommunications Act of 1996 And Applicable State Law. Rebuttal Testimony of Michael R. Baranowski.

Washington State Utilities and Transportation Commission

December 22, 2003	Docket No. UT-033044. In the Matter of the Petition of Qwest Corporation To Initiate a Mass-Market Switching and Dedicated Transport Case Pursuant to the Triennial Review Order. Direct Testimony of Michael R. Baranowski.
February 2, 2004	Docket No. UT-033044. In the Matter of the Petition of Qwest Corporation To Initiate a Mass-Market Switching and Dedicated Transport Case Pursuant to the Triennial Review Order. Response Testimony of Michael R. Baranowski.

Public Service Commission of West Virginia

February 13, 1997	Case Nos. 96-1516-T-PC, 96-1561-T-PC, 96-1009-T-PC, 96-1533-T-T. Petition to establish a proceeding to review the Statement of Generally Available Terms and Conditions offered by Bell Atlantic in accordance with Sections 251, 252, and 271 of the Telecommunications Act of 1996. Testimony of Michael R. Baranowski.
February 27, 1997	Case Nos. 96-1516-T-PC, 96-1561-T-PC, 96-1009-T-PC, 96-1533-T-T. Petition to establish a proceeding to review the Statement of Generally Available Terms and Conditions offered by Bell Atlantic in accordance with Sections 251, 252, and 271 of the Telecommunications Act of 1996. Rebuttal Testimony of Michael R. Baranowski.
June 3, 2002	Case No. 01-1696-T-PC, Verizon West Virginia, Inc. Petition For Declaratory Ruling That Pricing of Certain Additional Unbundled Network Elements (UNEs) Complies With Total Element Long-Run Incremental Cost (TELRIC) Principles. Direct Testimony of Michael R. Baranowski
July 1, 2002	Case No. 01-1696-T-PC, Verizon West Virginia, Inc. Petition For Declaratory Ruling That Pricing of Certain Additional Unbundled Network Elements (UNEs) Complies With Total Element Long-Run Incremental Cost (TELRIC) Principles. Supplemental Direct Testimony of Michael R. Baranowski

RAILROAD TESTIMONY

Interstate Commerce Commission

March 9, 1995	Finance Docket No. 32467. National Railroad Passenger Corporation and Consolidated Rail Corporation -- Application Under Section 402(a) of the Rail Passenger Service Act for an Order Fixing Just Compensation.
October 30, 1995	Docket No. 41185. Arizona Public Service Company and Pacificorp v. The Atchison, Topeka and Santa Fe Railway Company.

Surface Transportation Board

July 11, 1997	Docket No. 41989. Potomac Electric Power Company v. CSX Transportation, Inc. Reply Statement and Evidence of Defendant CSX Transportation, Inc.
August 14, 2000	Docket No. 42051. Wisconsin Power and Light Company v. Union Pacific Railroad Company, Reply Verified Statement of Christopher D. Kent and Michael R. Baranowski.
September 20, 2002	STB Docket No. 42070. Duke Energy Corporation v. CSX Transportation, Inc., Reply Evidence and Argument of CSX Transportation, Inc.
September 30, 2002	STB Docket No. 42069. Duke Energy Corporation v. Norfolk Southern Railway Company, Reply Evidence and Argument of Norfolk Southern Railway Company.
October 11, 2002	STB Docket No. 42072. Carolina Power & Light v. Norfolk Southern Railway Company, Reply Evidence and Argument of Norfolk Southern Railway Company.
November 12, 2002	Docket No. 42070 Duke Energy Corporation v. CSX Transportation, Rebuttal Evidence and Argument of CSX Transportation
November 19, 2002	Docket No. 42069 Duke Energy Corporation v. Norfolk Southern Railway Company, Rebuttal Evidence and Argument of Norfolk Southern Railway Company
November 27, 2002	Docket No. 42072 Carolina Power & Light Company v. Norfolk Southern Railway Company, Rebuttal Evidence and Argument of Norfolk Southern Railway Company
January 10, 2003	STB Docket No. 41185. Arizona Public Service Co. And Pacificorp v. The Atchison, Topeka and Santa Fe Railway Company, Petition of the Burlington Northern and Santa Fe Railway Company to Reopen and Vacate Rate Prescription.
February 19, 2003	STB Docket No. 42077, Arizona Public Service Co. And Pacificorp v. The Burlington Northern and Santa Fe Railway Company, and STB Docket No. 41185, Arizona Public Service Co. And Pacificorp v. The Burlington Northern and Santa Fe Railway Company, Reply of the Burlington Northern Santa Fe Railway Company in Opposition to Petition for Consolidation.
April 4, 2003	Docket No. 42057 Public Service Company of Colorado D/B/A Xcel Energy v. The Burlington Northern and Santa Fe Railway Company, Reply Evidence and Argument of The Burlington Northern and Santa Fe Railway Company
October 8, 2003	Docket No. 42071 Otter Tail Power Company v. The Burlington Northern and Santa Fe Railway Company, Reply Evidence of The Burlington Northern and Santa Fe Railway Company
October 24, 2003	Docket No. 42069 Duke Energy Corporation v. Norfolk Southern Railway Company, Supplemental Evidence of Norfolk Southern Railway Company

October 31, 2003	Docket No. 42069 Duke Energy Corporation v. Norfolk Southern Railway Company, Reply of Norfolk Southern Railway Company to Duke Energy Company's Supplemental Evidence
November 24, 2003	Docket No. 42072 Carolina Power & Light Company v. Norfolk Southern Railway Company, Supplemental Evidence of Norfolk Southern Railway Company
December 2, 2003	Docket No. 42072 Carolina Power & Light Company v. Norfolk Southern Railway Company, Reply of Norfolk Southern Railway Company to Carolina Power & Light Company's Supplemental Evidence
December 12, 2003	Docket No. 42069 Reply of Norfolk Southern Railway Company to Duke Energy Corporation's Petition to Correct Technical Error and Affidavit of Michael R. Baranowski
January 5, 2004	Docket No. 42070 Duke Energy Corporation v. CSX Transportation, Inc., Supplemental Evidence of CSX Transportation, Inc.
January 26, 2004	Docket No. 42058 Arizona Electric Power Cooperative, Inc. v. The Burlington Northern and Santa Fe Railway Company and Union Pacific Railroad Company, Joint Supplemental Reply Evidence and Argument of The Burlington Northern and Santa Fe Railway Company and Union Pacific Railroad Company
March 22, 2004	Docket No. 42071 Otter Tail Power Company v. The Burlington Northern and Santa Fe Railway Company, Supplemental Reply Evidence of The Burlington Northern and Santa Fe Railway Company
April 9, 2004	Docket No. 41185 Arizona Public Service Company and Pacificorp v. The Burlington Northern and Santa Fe Railway Company, The Burlington Northern and Santa Fe Railway Company's Reply Evidence on Reopening
May 24, 2004	Docket No. 41191 (Sub-No. 1) AEP Texas North Company v. The Burlington Northern and Santa Fe Railway Company, Reply Evidence of The Burlington Northern and Santa Fe Railway Company
June 23, 2004	Docket No. 42057 Public Service Company of Colorado d/b/a Xcel Energy v. The Burlington Northern and Santa Fe Railway Company, Petition to Correct Technical and Computational Errors
March 1, 2005	Docket No. 42071 Otter Tail Power Company v BNSF Railway Company, Supplemental Evidence of BNSF Railway Company
April 4, 2005	Docket No. 42071 Otter Tail Power Company v BNSF Railway Company, Reply of BNSF Railway Company to Supplemental Evidence
July 20, 2005	Docket No. 42088 Western Fuels Association, Inc. and Basin Electric Power Cooperative, Inc. v. BNSF Railway Company, Reply Evidence of BNSF Railway Company
May 1, 2006	Docket No. Ex Parte 657 (Sub-No. 1) Major Issues in Rail Rate Cases, Verified Statement Supporting Comments of BNSF Railway Company

May 31, 2006	Ex Parte 657 (Sub-No. 1) Major Issues in Rail Rate Cases; Verified Statement Supporting Reply Comments of BNSF Railway Company
June 15, 2006	Docket No. 42088 Western Fuels Association, Inc. and Basin Electric Power Cooperative, Inc. v. BNSF Railway Company, Reply Supplemental Evidence of BNSF Railway Company
June 15, 2006	Docket No. 41191 (Sub 1) AEP Texas North Company v. BNSF Railway Company, Reply Supplemental Evidence of BNSF Railway Company
June 30, 2006	Docket No. Ex Parte 657 (Sub-No. 1) Major Issues in Rail Rate Cases; Verified Statement Supporting Rebuttal Comments of BNSF Railway Company
February 4, 2008	Docket No. 42099 E.I. DuPont De Nemours and Company v. CSX Transportation, Inc., Opening Evidence of CSX Transportation, Inc.
February 4, 2008	Docket No. 42100 E.I. DuPont De Nemours and Company v. CSX Transportation, Inc., Opening Evidence of CSX Transportation, Inc.
February 4, 2008	Docket No. 42101 E.I. DuPont De Nemours and Company v. CSX Transportation, Inc., Opening Evidence of CSX Transportation, Inc.
May 1, 2008	Docket No. Ex Parte 679 Petition of the AAR to Institute a Rulemaking Proceeding to Adopt a Replacement Cost Methodology to Determine Railroad Revenue Adequacy, Verified Statement of Michael R. Baranowski
July 14, 2008	Docket No. 42088 Western Fuels Association, Inc. and Basin Electric Power Cooperative, Inc. v. BNSF Railway Company, Third Supplemental Reply Evidence of BNSF Railway Company
July 14, 2008	Docket No. AB-515 (Sub-No. 2) Central Oregon & Pacific Railroad, Inc. -- Abandonment and Discontinuance of Service -- in Coos, Douglas, and Lane Counties, Oregon (Coos Bay Rail Line)
August 8, 2008	Docket No. 41191 (Sub-No. 1) AEP Texas North Company v. BNSF Railway Company, Fourth Supplemental Evidence of BNSF Railway Company
August 11, 2008	Docket No. 42014 Entergy Arkansas, Inc. and Entergy Services, Inc. v Union Pacific Railroad Company and Missouri & Northern Arkansas Railroad Company, Inc.; Finance Docket No. 32187 Missouri & Northern Arkansas Railroad Company, Inc. – Lease, Acquisition and Operations Exemption – Missouri Pacific Railroad Company and Burlington Northern Railroad Company, Reply Evidence and Argument of Union Pacific
September 5, 2008	Docket No. 41191 (Sub-No. 1) AEP Texas North Company v. BNSF Railway Company, Fourth Supplemental Reply Evidence of BNSF Railway Company
September 12, 2008	Docket No. AB-515 (Sub-No. 2) Central Oregon & Pacific Railroad, Inc. -- Abandonment and Discontinuance of Service -- in Coos, Douglas, and Lane Counties, Oregon (Coos Bay Rail Line); Rebuttal to Protests
August 24, 2009	Docket No. 42114 US Magnesium, L.L.C. v. Union Pacific Railroad Company, Opening Evidence of Union Pacific Railroad Company
October 22, 2009	Docket No. 42114 US Magnesium, L.L.C. v. Union Pacific Railroad Company, Rebuttal Evidence of Union Pacific Railroad Company

January 19, 2010	Docket No. 42110 Seminole Electric Cooperative, Inc. v. CSX Transportation, Inc., Reply Evidence of CSX Transportation, Inc.
May 7, 2010	Docket No. 42113 Arizona Electric Power Cooperative, Inc. v. BNSF Railway Company and Union Pacific Railroad Company, Joint Reply Evidence of BNSF Railway Company and Union Pacific Railroad Company
November 22, 2010	Docket No. 42088 Western Fuels Association, Inc. and Basin Electric Power Cooperative, Inc. v. BNSF Railway Company, BNSF Comments on Remand, Joint Verified Statement of Michael R. Baranowski and Benton V. Fisher
January 6, 2011	Docket No. 42056 Texas Municipal Power Agency v. BNSF Railway Company, BNSF Reply to TMPA Petition for Enforcement of Decision, Joint Verified Statement of Michael R. Baranowski and Benton V. Fisher
October 28, 2011	Docket No. FD 35506 Western Coal Traffic League - Petition for Declaratory Order, Opening Evidence of BNSF Railway Company, Joint Verified Statement of Michael R. Baranowski and Benton V. Fisher

US District Court for Northern District of Oklahoma

January 2, 2007	Case No. 06-CV-33 TCK-SAJ, Grand River Dam Authority v. BNSF Railway Company; Report of Michael R. Baranowski
February 2, 2007	Case No. 06-CV-33 TCK-SAJ, Grand River Dam Authority v. BNSF Railway Company; Reply Report of Michael R. Baranowski

Circuit Court of Pulaski County, Arkansas

August 17, 2007	Case No. CV 2006-2711, Union Pacific Railroad v. Entergy Arkansas, Inc. and Entergy Services, Inc., Expert Witness Report of Michael R. Baranowski
December 14, 2007	Case No. CV 2006-2711, Union Pacific Railroad v. Entergy Arkansas, Inc. and Entergy Services, Inc., Reply Expert Witness Report of Michael R. Baranowski

U.S. District Court for the Eastern District of Wisconsin

February 15, 2008	Case No. 06-C-0515, Wisconsin Electric Power Company v. Union Pacific Railroad Company, Expert Reply Report of Michael R. Baranowski

Arbitrations and Mediations

March 7, 2005	Arbitration Case #181 Y 00490 04 BNSF Railway Company and J.B. Hunt Transport, Inc., Expert Report on behalf of BNSF Railway Company
March 28, 2005	Arbitration Case #181 Y 00490 04 BNSF Railway Company and J.B. Hunt Transport, Inc., Rebuttal Expert Report on behalf of BNSF Railway Company
April 12, 2005	Arbitration Case #181 Y 00490 04 BNSF Railway Company and J.B. Hunt Transport, Inc., Supplemental Expert Report on behalf of BNSF Railway Company
April 19, 2005	Arbitration Case #181 Y 00490 04 BNSF Railway Company and J.B. Hunt Transport, Inc., Supplemental Rebuttal Expert Report on behalf of BNSF Railway Company

April/May 2005	Arbitration Case #181 Y 00490 04 BNSF Railway Company and J.B. Hunt Transport, Inc., Hearings before Arbitration Panel
February 20, 2007	In the Matter of the Arbitration between the Detroit Edison Company, et al, and BNSF Railway Company, Expert Report of Michael R. Baranowski
March 19, 2007	In the Matter of the Arbitration between the Detroit Edison Company, et al, and BNSF Railway Company, Supplemental Expert Report of Michael R. Baranowski
February 12, 2009	In the Matter of the Arbitration between Wisconsin Public Service Corporation and Union Pacific Railroad Company, Rebuttal Expert Report of Michael R. Baranowski
October 16, 2009	In the Matter of Arbitration Between Norfolk Southern Railway Company and Drummond Coal Sales, Inc., Expert Report of Michael R. Baranowski
July 25, 2011	American Arbitration Association Case No. 58 147 Y 0031809, BNSF Railway Company and Kansas City Southern Railway Company, Expert Report of Michael R. Baranowski

PAUL BOBBY

Paul Bobby is an Associate and serves as the Director of Railroad Engineering for the Midwest Region at STV Incorporated, an Engineering Consulting Firm with offices located at 200 West Monroe Street, Suite 1650, Chicago, IL 60067. Since 1997, Mr. Bobby has been involved in all aspects of design and construction for transportation facilities and has specialized in the railroad industry.

Mr. Bobby has a Bachelor of Science in Civil Engineering from the University of Wisconsin – Platteville, and holds Professional Engineering Licenses in the States of Illinois, Indiana, Wisconsin, and Georgia. In 1997, he worked for the Wisconsin Central, LTD as a construction laborer assigned to special capacity projects. In 2000, Mr. Bobby joined the Consoer Townsend Envirodyne (CTE) Engineers as a Civil Engineer in their rail group where he was involved in a variety of railroad project across the Midwest.

Mr. Bobby joined STV Incorporated in mid-2004 as the Midwest Manager of Track, and recently was promoted to his current position as Associate and the Director of Railroad Engineering for the Midwest Region.

Mr. Bobby's resume is attached hereto.

Mr. Bobby is sponsoring Section III.F.2 of UP's Reply Evidence relating to roadbed preparation. Mr. Bobby has signed a verification of the truth of the statements contained therein. A copy of that verification is attached hereto.

VERIFICATION

I declare under penalty of perjury that I have read the Reply Evidence in this proceeding that I have sponsored, as described in the foregoing Statement of Qualifications, and that the contents thereof are true and correct. Further, I certify that I am qualified and authorized to sponsor this testimony.

Paul E Bobby

Paul Bobby

Executed on November 8, 2011

Paul E. Bobby, P.E.

Director of Railroad Engineering

Mr. Bobby is a civil engineer and project manager with extensive experience in the design and construction of railroad and highway improvements, including Federal Transit Administration (FTA) New Starts projects and rail clearance and grade separation programs. He is adept at the design of roadway and track alignment, geometry, and right-of-way (ROW) and utility conflict identification. Mr. Bobby has experience with feasibility studies, cost estimating, and the development of construction staging plans to maintain traffic and operations. He has also managed a variety of successful track capacity expansion and rail improvement project, for Metra, freight railroads, and as part of the Chicago Region Environmental and Transportation Efficiency Program (CREATE) program, which was established to identify key bottlenecks and conflicts within existing Chicagoland transportation infrastructure.

Firm
STV

Education
Bachelor of Science, Civil Engineering; University of Wisconsin/Platteville

Professional Registration
Professional Engineer: Georgia, Illinois, Indiana, and Wisconsin

Memberships
American Railway Engineering and Maintenance-of-Way Association (AREMA)

Maintenance-of-Way Club of Chicago

Project Experience

RAIL

CSX CREATE Third Main B12 Project - Project Manager

Overseeing Task 1, Project B12, of STV's CREATE general engineering consultant (GEC) contract for CSX, the first task included in this blanket contract. The firm has been selected to provide full-service design as well as resident engineering and inspection services to B&OCT/CSX for projects involved in the CREATE program. Mr. Bobby is providing overall guidance for task Project B12, which includes the construction of a third mainline along the Beltway Corridor from 123rd Street to CP San Francisco in Alsip and Blue Island, IL. This additional mainline will increase freight rail capacity and decrease travel times within the area. STV is overseeing construction, which includes new track as well as upgrades to existing track. A new rail bridge over 127th Street will also be constructed and includes associated signal work. In addition to managing this task, Mr. Bobby is serving as the client's point of contact for this project. (4/10 - Present)

CSX CREATE WA-2 CM - Project Manager

Overseeing STV's construction management (CM) services during the 4-phase signal installation and construction of interlocking improvements at seven locations on the Western Avenue Corridor in Chicago, from Ogden Junction to 75th Street, where a new centralized traffic control (CTC) signaling system will be installed. CTC signaling and interlocking improvements will increase train speeds and traffic capacity through better track utilization.

IV-15

CSX CREATE B-16 Thornton Junction Connection Design Services - Project Manager
Developing a project report and design approval documents for a new track and associated switches to connect the CN Elsdon Sub and Union Pacific Villa Grove Sub in South Holland, IL. This will reestablish a former connection between the Beltway and Western Avenue corridors. (10/10 - Present)

CSX CREATE Project WA-10 - Project Manager
Managing the final design of the rail interlocking to allow the interchange between the Canadian National (CN) and CSX railroads. The Chicago Region Environmental and Transportation Efficiency Program (CREATE) was established to identify key bottlenecks and conflicts within the existing Chicagoland transportation infrastructure. As a component of this program, Project WA-10 in Blue Island, IL, involves reconfiguring the CSX Vermont Street interlocking to provide a universal connection to the CN main line. Expanding this interlocking between these two main lines will increase rail traffic capacity and improve train movement through Chicago. Mr. Bobby is responsible for the coordination of all work between the signal designers and each railroad and their respective labor forces. As part of the CREATE project, Mr. Bobby is also responsible for the preparation of plans, specifications, and estimate submittals to Illinois Department of Transportation. (6/08 - Present)

CHSRA Los Angeles-to-Anaheim Project EIR/EIS - QA/QC Review
Conducting a quality assurance/quality control (QA/QC) review, including track and alignments, of a portion of the new high-speed rail line that will provide service between major metropolitan areas of California. STV has been commissioned by the California High-Speed Rail Authority (CHSRA) to lead the environmental and engineering services for the Los Angeles-to-Anaheim segment of the rail. The proposed corridor runs adjacent to existing passenger and freight lines and will travel at speeds up to 220 miles per hour. This segment of the proposed route requires the development of solutions for overlaying a new set of track infrastructure into a physically constrained rail corridor, which includes local and regional passenger service as well as local and transcontinental rail freight operating on a limited right-of-way in a dense urban environment. Mr. Bobby is providing a QA/QC review of the plan and profile drawings, as well as the inclusion of alternatives for at-grade, tunnel, and aerial portions during the evaluation process. (12/09 - Present)

City of Joliet Regional Multimodal Transportation Center - Engineering Lead
Providing railroad coordination and overseeing the required infrastructure improvements as part of the development of a multimodal transportation center in Joliet, IL. Several modes of transportation will be relocated into a central facility that will connect to the historic Joliet Union Station. This venture could eventually be a stop on the future high-speed passenger rail line, linking Chicago with St. Louis. The proposed transportation center is located within the Joliet Union Depot (UD) Interlocking, which includes Union Pacific,

Burlington Northern Santa Fe, Amtrak, and the Metra Rock Island District and Heritage Corridor rail lines. Mr. Bobby is coordinating with the various rail agencies, keeping them informed of the project plans and mitigating potential impacts the project may have on the railroads. STV, as a subconsultant, is providing professional services for the planning and engineering of the transportation center, which will meet local, interstate, and national transportation needs. The firm is also developing an implementation plan identifying possible funding sources and phasing of project elements over a multi-year timeframe. In addition to rail coordination, Mr. Bobby is developing the required infrastructure improvements related to track realignments, platform configurations, interlocking modifications, bridge rehabilitations, and construction staging as part of the development of this multimodal transportation center. (2009 - Present)

IDOT IL 15 over ICG Railroad and IL 13 Reconstruction - Rail Coordinator

Performing railroad coordination services for the $14.4 million replacement of dual structures on IL 15 that span IL 13 and the Illinois Central Gulf (ICG) railroad right-of-way in St. Clair County, IL. An Illinois Department of Transportation (IDOT) inspection found the dual bridges to be in poor condition. The agency, therefore, recommended both structures be replaced. STV is providing Phase I and Phase II design engineering services for the structural replacements. Phase I services include the preparation of a crash analysis, geometric studies, environmental coordination, public involvement, and all other work necessary to prepare a Project Report for design approval. After design approval, Phase II will include the complete design of the new structures. Mr. Bobby is communicating closely with the various rail agencies to keep them informed of the project plans and mitigate potential impacts the project may have on the railroads. (11/08 - Present)

IDOT Elgin O'Hare Western Bypass - Railroad Coordinator

Responsible for rail coordination with the Union Pacific, Canadian Pacific, and the Canadian National freight railroads, as well as the project team, for the proposed extension of the Elgin O'Hare Western Bypass in Cook County, IL. This project began with an Environmental Impact Statement (EIS) and feasibility study analyzing alternatives to improve transportation and ease congestion within the study area. Proposed improvements include widening existing roadways and extending the Elgin O'Hare Expressway east into O'Hare International Airport to provide western airport access. The initial study was completed and presented to the Illinois Department of Transportation (IDOT), who is moving forward with the design of the recommended improvements that have the least impact on the surrounding neighborhoods. Mr. Bobby is overseeing the evaluation of the impacts of the proposed Elgin O'Hare Western Bypass on the freight and passenger rail services located within the project area. The primary objectives of his coordination efforts are to keep the railroads informed of the progress of the study and to resolve any potential conflicts at an early stage. Mr. Bobby also has been working with the planning team during the alternative design process and advising them of potential rail impacts. (2007 - Present)

NICTD West Lake Corridor New Starts Studies - Engineering Task Leader
Leading the engineering design of a commuter rail system for the Northern Indiana Commuter Transit District (NICTD) extending from Valparaiso to Lowell, IN, to Chicago. Mr. Bobby is preparing travel-demand modeling, alternatives development, plan and profile development, and a public outreach campaign. (2005 - Present)

Metra Civil/Structural Blanket Engineering Services - Project Manager
Oversaw rail engineering services for STV's civil/structural blanket project for Metra, in which the firm provided systemwide services on an as-needed basis. STV's project scope varied by task order, and services included field verification of conditions, design of buildings and trackwork, rehabilitation of buildings and retaining walls, construction inspection and plan preparation, environmental assessments, traffic studies, roadway geometry, and property surveys. Mr. Bobby oversaw all 12 tasks associated with this contract, one of which involved conducting a thorough condition inspection, preparing a condition report, and developing the necessary rehabilitation activities for repair of the Rock Island District Turntable in Blue Island, IL. (10/08 - 12/10)

St. Louis Metro East Riverfront Interlocking - Project Engineer
Oversaw the track design for a new diamond interlocking located between St. Louis Metro's existing East Riverfront light-rail station and the Eads Bridge spanning the Mississippi River. The Eads Bridge is a 2-level structure carrying two sets of tracks for the MetroRail transit system on its lower level and a 4-lane highway on the upper level. The new interlocking is located in an area east of the bridge known as the East Arcade. Mr. Bobby and his team designed the new interlocking on a tight schedule and within a restricted area, which made design work challenging. The project required the installation of an asymmetrical double crossover using a combination of No. 6 and No. 8 turnouts on concrete ties to allow single-track operation over the Eads Bridge with minimal disruption to the passenger rail service while the bridge is rehabilitated. This project has an aggressive completion schedule, which required STV to develop an independent material procurement package in advance of the construction contract. Mr. Bobby directed the track design for the new interlocking and reviewed the final plans, successfully meeting the aggressive schedule. (11/09 - 6/10)

Metra Computerized Maintenance Management System Program - Project Manager
Oversaw the selection and implementation of a computerized maintenance management system (CMMS) for Metra's fixed facilities, including passenger train stations, locomotive and car shops, maintenance-of-way facilities, train control centers, and offices throughout Chicago and its surrounding suburbs. Mr. Bobby and his team collaborated with the agency to develop and implement a 2-phase plan to standardize and automate preventive maintenance work orders for Metra's fixed assets. As part of the project, STV evaluated and customized an off-the-shelf Web-based CMMS application that would replace Metra's paper-based legacy system. Mr.

Bobby led site inventories to survey and document Metra's facilities equipment and assets, which were then loaded into the CMMS asset database. During the second phase of the plan, he successfully managed the staggered implementation of the CMMS. Under Mr. Bobby's direction, the CMMS has been fully implemented and is utilized across all of Metra's districts. (11/07 - 11/09)

Norfolk Southern Corporation Lakeside Dam Rehabilitation - Rail Engineer
Provided design services for rail alignment and related earthwork as part of the construction of a 1.5-mile realignment for the Norfolk Southern (NS) Corporation in Macon, GA. The proposed alignment was partially over a 60-foot-high earthen dam. The project, which required coordination among many stakeholders, involved a complex intersection of the railroad, a major state route, and the dam. (8/08 - 12/08)

WisDOT Wisconsin Central Railroad Bridge over U.S. 41 - Project Manager
Managed the replacement of the Wisconsin Central Bridge over U.S. 41 in Fond du Lac, WI. Mr. Bobby prepared the project work plan, budget, amendments, and schedule; made staff assignments; quality assurance; and managed all coordination with the client. The project encompassed five alternative studies for the new structure, which replaces the existing single-track bridge. The Wisconsin Department of Transportation (WisDOT) and STV determined that two new bridges would best replace the existing single-track bridge over U.S. 41. The design provides a new industrial spur railroad track off of the main line to the City of Fond du Lac Southwest Industrial Park. The firm also assisted in executing public information meetings and utilities coordination. Mr. Bobby coordinated the evaluation of alternatives with WisDOT. (2002 - 2004)

Metra Blanket Project Administration/Management Services - Project Manager
Oversaw the administration of projects for Metra to be designed by outside consultants. Mr. Bobby managed project controls and monitored compliance with approved budgets and schedules. Specific tasks under this blanket included administration and management of parking lot design, construction inspection services, and Standard Cost Category Analysis for New Starts projects. Mr. Bobby was also responsible for making sure Metra's standards and guidelines were adhered to by the project teams and documented according to Metra project management guidelines. (2005 - 6/09)

Metra Project Administration Blanket, Standard Cost Category Analysis for New Starts Projects - Project Manager
Managed this project to assist Metra in standardizing the capital cost methodology and estimates for four Chicagoland projects according to Federal Transit Administration (FTA) guidelines on Standard Cost Categories. These guidelines were required as part of the application process to enter the New Starts program for federal funding. Projects included new

service to the STAR Line and Southeast Line; the Union Pacific Railroad (UPRR) Northwest Line track and signal improvement, as well as extension of service; and the UPRR West Line track and signal improvements. (12/05 - 5/07)

CSX Goldsboro Passing Siding - Lead Rail Engineer
Oversaw rail engineering for the design of a 2-mile passing siding on the W&W subdivision of the Atlantic Coast Line in Goldsboro, NC. Work for this project was performed on an accelerated schedule, allowing only four weeks from the start of engineering until the bid documents needed to be complete. Mr. Bobby prepared complete documents, including plans, special provisions, and cost estimates. The project was completed on time and within budget. (2007)

KCS Meridian Rail Siding - Lead Rail Engineer
Led the design team for a proposed rail alignment and related earthwork as part of the construction of a 3-mile double-track extension on the Meridian Speedway in Meridian, MS. The project had an aggressive schedule, and the line remained operational with staged construction. The project was part of a master agreement with Kansas City Southern (KCS) to provide professional services on an on-call basis for the main rail lines. (3/07 - 5/07)

KCS Meridian Connection - Lead Rail Engineer
Served as technical lead and managed the design team responsible for the design of the rail alignment and related earthwork as part of the construction of a 4-mile realignment and connection of the Norfolk Southern (NS) Corporation and the Kansas City Southern (KCS) railway on the Meridian Speedway in Meridian, MS. The project required extensive coordination between the KCS and NS railroads, resulting in an operational staging plan suitable for both parties. The project was part of a master agreement with KCS to provide professional services on an on-call basis for the main rail lines. (3/07 - 5/07)

CSX Bridge 45 - Rail Engineer
Responsible for the rail alignment design and construction staging plans for a new single-track railroad bridge over the Hudson River in Iona, NY. Mr. Bobby prepared staging plans to maintain rail operations during the bridge construction. The bridge was designed with environmental sensitivity to the Hudson River ecosystem. (2006 - 2007)

CTA Block 37 Station and Tunnel Connector - Project Engineer/Lead Rail Engineer
Designed the rail alignment for a mined tunnel in water-bearing soft clay that connects the Chicago Transit Authority (CTA)'s Blue and Red transit lines in Chicago. Located at Block 37 between State and Dearborn streets, this tunnel links the two subways to a new underground station. Work for this project was performed on an extremely complex and tight schedule, and had to be completed with minimal disruptions to the subway service. Mr. Bobby

prepared all special trackwork and details, and established the horizontal geometry for the trackwork and alignment for the entire project. (8/04 - 6/07)

Norfolk Southern Corporation Heartland Corridor Clearance Improvements - Rail Engineer
Provided design services for modifications to the Norfolk Southern (NS) Corporation rail alignment in order to meet clearance requirements, and developed an undercutting plan to be executed by the railroad for clearance improvements to 29 tunnels in Virginia, West Virginia, Kentucky, and Ohio known as the "Heartland Corridor." Mr. Bobby contributed to the design of overhead bridge-jacking plans to obtain vertical clearances. He modified slide fences, provided utility coordination, and reviewed track design. Mr. Bobby also created railroad bridge-lowering plans and stormwater pollution prevention plans (SWPPPs) at tunnel portals. (7/06 - 8/06)

Michigan State University Rail Feasibility Study - Rail Advisor
Provided technical advisement to Michigan State University (MSU) for a feasibility study to expand its existing coal storage yard to allow for bulk unit trains. The study investigated the possibility of increasing both operational flexibility and capacity to allow MSU to store unit trains and perform switching operations. Mr. Bobby utilized his extensive rail experience to advise the client on geometric and operational solutions, and performed quality assurance for the study. (11/05 - 2/06)

CTA Circle Line Alternatives Analysis - Task Manager
Served as civil task manager for the alternatives analysis of the new Chicago Transit Authority (CTA) Circle Line, which would connect the existing CTA transit lines and several Metra commuter lines by an outer loop track approximately two miles outside of downtown Chicago. Mr. Bobby performed project data collection, horizontal/vertical alignment development and analysis, and right-of-way and utility-conflict identification. The study focused on a series of elevated structures and underground tunnels required to make the connections. (4/04 - 8/04)

Metra Southwest Service Expansion - Project Engineer
Led the rail design for this $97 million mainline expansion of Metra's Southwest Service Line in Chicago, a Federal Transit Administration (FTA) New Starts project to support Metra's growing ridership needs. The scope of work included upgrading 3.2 miles of an existing single-track to a double-track to increase the frequency of Metra's service to its existing areas and expand service to Manhattan, IL. The project also included four maintenance-of-way sidings, three interlockings, two new station layouts, and one new yard that included a maintenance facility. Mr. Bobby coordinated with the various project disciplines to develop the rail design according to the project plan. He also produced bid documents. (3/01 - 11/02)

City of Ottawa Illinois Valley Commuter Rail Feasibility Study - Project Engineer
Provided conceptual engineering for the analysis of the physical, operational, and financial feasibility of providing commuter rail service on an existing active railroad right-of-way and trackage between Joliet and LaSalle/Peru, IL. (4/02)

Riverview Trenton Rail Road Intermodal Facility - Design Engineer
Prepared plans for conceptual grade crossings, new yard layout, container storage, and trackwork for this intermodal facility in Detroit. (6/01)

Amtrak Detroit Station - Design Engineer
Designed a parking lot, site drainage, and grading plans for the development of this rail station in Detroit. Mr. Bobby was also responsible for utility and rail coordination. (1/01 - 6/01)

City of Lisle Commuter Rail Station - Resident Engineer
Completed inspection, material testing, and construction documentation for a commuter rail station rehabilitation in Lisle, IL. The project included construction of new precast platforms on grade beams, handicap ramps, hand railings, drainage, retaining walls, and stairways. (6/01)

Jefferson Terminal Railroad Auto Mixing Facility - Design Engineer
Provided the conceptual design of an auto mixing facility in Detroit, MI, which incorporated over-the-road auto haulers with a rail yard and staging facility that included plans for conceptual grade crossings, new yard layout, container storage, and trackwork. (5/01)

CSX Piqua Yard - Design Engineer
Provided cost-estimating and design services for a new yard located in Fort Wayne, IN, to accommodate a new steel manufacturer in the area that needed rail service. (6/00 - 12/00)

Metra 47th Street Trainwasher - Project Engineer
Provided on-site project-engineering services during construction for the layout of the yard lead track and new approach to the trainwasher. (5/00 - 7/00)

MWRDGC Stickney Facility Centrifuge - Track Engineer
Designed the layout for additional yard track for the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC) centrifuge in Stickney, IL. Mr. Bobby also incorporated a new car-mover with the existing facility. (5/98 - 8/98)

CONSTRUCTION MANAGEMENT

NICTD Kensington Interlocking Improvements CM Services - Construction Manager

Managing STV's construction management (CM) services for improvements at the Kensington Interlocking on Chicago's south side, including the addition of a second Northern Indiana Commuter Transportation District (NICTD) route across the Canadian National (CN) railroad to the Metra Electric Mains. STV is overseeing all aspects of the contractor's construction methods, as well as providing a precondition survey to identify existing conditions of the rail and right-of-way in the area of the Kensington Interlocking Improvement Project limits, including the existing signal system, structures, and track appurtenances. Mr. Bobby is managing field inspections, contract administration, project controls, quality assurance, safety monitoring, and procurement assistance. (12/08 - Present)

CTA Brown Line Tie Renewal - Project Rail/Civil Engineer
Provided engineering and track inspection services for this $18 million project, which included the renewal of dense, composite ties with Pandrol plates, as well as the replacement of timber guards, rail greasers, and contact rail chairs for the Chicago Transit Authority (CTA)'s Brown Line in Chicago. This project included the complete replacement of timber cross ties and outer guard with plastic composite cross ties and outer guards, all new tie plates, and OTM. Live train testing was performed on the 50-foot-high elevated track, which spans three miles and encompasses eight stations. Mr. Bobby assisted with constructability reviews, project planning, inspection services, and emergency services. (4/08 - 9/08)

ISTHA Open Road Tolling Plaza CM - Project Controls
Provided project controls for STV's Phase III engineering services for all plaza/roadway improvements for the Open Road Tolling conversions at four mainline plazas on the Tri-State Tollway for the Illinois State Toll Highway Authority (ISTHA). The conversions included the Tri-State Tollway; M.P. 19.5 (83rd Street- Plaza 39); M.P. 19.8 (82nd Street - Plaza 36); M.P. 30 (Cermak - Plaza 35); and M.P. 39 (Irving Park- Plaza 33) in DuPage and Lake Counties in Illinois. Mr. Bobby assisted in cost analysis, construction revisions, quantity changes, and change order requests. (2005 - 2006)

DRAINAGE/UTILITIES

MWRDGC MUPPS for the North Side Water Reclamation Plant - Project Engineer
Provided overall engineering services to prepare a Master Underground Process Piping Survey (MUPPS)—a comprehensive Geographical Interface System (GIS) database that identifies and locates all underground utilities, process piping, topographic features, and permanent structures—at the North Side Water Reclamation in Skokie, IL, for the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC). The GIS system comprises AutoCAD Civil Map 3D graphical objects with links to a customized Microsoft Access relational database, and facilitates an inventory and information retrieval on all site utilities. Mr. Bobby was responsible for the development and implementation of the GIS database system, as well as

researched and digitized existing district drawings and associated databases. (2007 - 2008)

Forest City Enterprises Illinois Science and Technology Park Redevelopment - Project Manager
Oversaw the development of the master utility and drainage plan and the Phase I construction documents for this $500 million, 23-acre redevelopment project in Skokie, IL. The scope of work included the demolition of multiple buildings, site utilities disconnection and demolition, partial utility tunnel demolition, site backfill, and temporary site and landscape improvements in preparation for new buildings, structures, and permanent landscape. Mr. Bobby managed the pre-design services, the development of site utility and drainage master plans, and limited interim site engineering for a master plan, all of which addressed current and future buildings, as well as phased development. He oversaw the integration of existing systems with new systems, and attended meetings with the client, utility companies, surveyors, public agencies, construction and demolition contractors, architects, and electrical/mechanical consultants. (2005 - 2007)

ROADWAY

IDOT Dan Ryan Expressway Reconstruction - Project Engineer
Provided interdisciplinary coordination, road grading, and intersection grading design of the frontage road reconstruction from 63rd Street to 47th Street on the Dan Ryan Expressway in Chicago for the Illinois Department of Transportation (IDOT). Mr. Bobby's responsibilities included ramp relocations, writing special provisions, and horizontal and vertical design layout. He also designed 25 cast-in-place retaining walls, which line the frontage roads and ramps. (2/03 - 4/04)

Village of Elwood Drummond Road Relocation - Project Engineer
Completed horizontal and vertical design, earthwork, storm sewer layout, and erosion control for the roadway design for the relocation of Drummond Road in Elwood, IL. (11/02 - 4/03)

Publications and Presentations

Published and presented "Metra - Southwest Service Expansion" at the American Railway Engineering and Maintenance-of-Way Association (AREMA) International Conference in Chicago. (2003)

RICHARD W. BROWN

Richard W. Brown is a Director at FTI Consulting, Inc., an economic and consulting firm with offices located at 1101 K Street, NW, Washington, DC 20005. With 28 years of experience in the railroad industry, Mr. Brown specializes in providing financial, economic and analytical consulting services to North America's largest railroads.

Mr. Brown received a BA in Economics from Syracuse University in 1963, and an MBA from Northwestern University in 1971. Prior to joining FTI, Mr. Brown spent 28 years with The Burlington Northern & Santa Fe Railway (BNSF), and its predecessor The Atchison, Topeka and Santa Fe Railway (ATSF). While at BNSF, Mr. Brown focused on strategic issues including the negotiation and implementation of the agreements between UP and BNSF that were effected to facilitate the UP-SP merger. Additionally, he took a lead role in the analysis of the potential impact of regulatory changes on railroad marketing strategy.

Mr. Brown held numerous positions in Strategic Planning and Marketing at ATSF. He was involved in merger analysis and planning and played a key role in the attempted merger between ATSF and Southern Pacific. Mr. Brown headed ATSF's Bulk Commodity Marketing which included Chemicals and Coal. In this role, he re-engineered a field sales organization with regional directors responsible for coaching and mentoring account managers. He also led ATSF's rail-truck retail efforts and negotiated several joint venture and business partnerships. While in this capacity, he developed a program for using rail truck transfer to increase car utilization. He implemented a joint venture with a major bulk truck line to bring intermodal rail service to dry bulk shippers.

Mr. Brown has provided expert testimony in merger proceedings before the Interstate Commerce Commission and The Surface Transportation Board.

Mr. Brown is sponsoring portions of Sections III.D of defendants Reply Evidence. Mr. Brown has signed a verification of the truth of the statements contained therein. A copy of that verification is attached hereto.

VERIFICATION

I declare under penalty of perjury that I have read the Reply Evidence in this proceeding that I have sponsored, as described in the foregoing Statement of Qualifications, and that the contents thereof are true and correct. Further, I certify that I am qualified and authorized to sponsor this testimony.

Richard W. Brown

Executed on November 8, 2011

Richard W. Brown

Director – Economic Consulting

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Tel: (202) 312-9100
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Education

MBA from Northwestern University Graduate School of Management

BS in Economics from Syracuse University

Richard W. Brown is a Director in the Network Industries Strategies ("NIS") group of the economic division of FTI Consulting, Inc. Mr. Brown is assigned to the DC office located at 1101 K Street NW; Washington DC 20005, however he works from his home office at 100 Windwood Circle; Breckenridge, Colorado 80424.

Mr. Brown joined FTI Consulting in 1999. Much of the NIS group's work focuses on the economic and financial analysis of network industries, in particular different aspects of transportation. While at FTI, Mr. Brown has been involved in the analysis of rates, costs, and service in the railroad industry. Mr. Brown worked extensively to develop expert testimony before the Surface Transportation Board ("STB") examining the reasonableness of railroad rates, railroads' applications for mergers and acquisitions. He has also supported railroad internal strategic planning needs with respect to mergers & acquisitions and the impact of potential regulatory changes.

Prior to joining FTI, Mr. Brown spent 28 years with The Burlington Northern & Santa Fe Railway (BNSF), and its predecessor The Atchison, Topeka and Santa Fe Railway (ATSF). While at BNSF, he focused on strategic issues including the negotiation and implementation of the agreements between UP and BNSF that were effected to facilitate the UP-SP merger. Additionally, he took a lead role in the analysis of the potential impact of regulatory changes on railroad marketing strategy.

Mr. Brown held numerous positions in Strategic Planning and Marketing at ATSF. He was involved in merger analysis and planning and played a key role in the attempted merger between ATSF and Southern Pacific. Mr. Brown headed ATSF's Bulk Commodity Marketing which included Chemicals and Coal. In this role, he re-engineered a field sales organization with regional directors responsible for coaching and mentoring account managers; started a subsidiary company to handle tank containers as a retail intermodal option; and expanded on that with a joint venture with Bulkmatic, a major dry bulk truck line, to initiate a retail intermodal option for bulk containers.

Mr. Brown holds a Bachelors Degree in Economics from Syracuse University and an MBA degree from Northwestern University Graduate School of Management.

TESTIMONY

Surface Transportation Board

September 20, 2002	Docket No. 42070. Duke Energy Corporation v. CSX Transportation, Inc., Written Reply Evidence and Argument of CSX Transportation, Inc.
September 30, 2002	Docket No. 42069. Duke Energy Corporation v. Norfolk Southern Railway Company, Written Reply Evidence and Argument of Norfolk Southern Railway Company.
October 11, 2002	Docket No. 42072. Carolina Power & Light v. Norfolk Southern Railway Company, Written Reply Evidence and Argument of Norfolk Southern Railway Company.
January 19, 2010	Docket No. 42110. Seminole Electric Cooperative, Inc. v. CSX Transportation, Inc., Written Reply Evidence of CSX Transportation, Inc.
May 7, 2010	Docket No. 42113 Arizona Electric Power Cooperative, Inc. v. BNSF Railway Company and Union Pacific Railroad Company, Joint Reply Evidence of BNSF Railway Company and Union Pacific Railroad Company

United States District Court for The District of Oregon

February 5, 2010	Docket No. CV No.: 3:08-CV-415-BR BNSF Railway Company, vs. Albany and Eastern Railroad Company, et al, Expert Witness Statement.

PATRICK J. BRYANT

Patrick J. Bryant is sponsoring Section III.F.2 of UP's Reply Evidence relating to roadbed preparation. Mr. Bryant has signed a verification of the truth of the statements contained therein. A copy of that verification, as well as Mr. Bryant's resume, is attached hereto.

VERIFICATION

Patrick J. Bryant

Mr. Bryant is a Civil Engineer employed by STV Incorporated, an Engineering Consulting Firm with offices located at 200 West Monroe Street, Suite 1650, Chicago, IL 60067. Since 1994, Mr. Bryant has been involved in all aspects of design and construction for transportation facilities and has specialized in the highway and railroad industry.

Mr. Bryant has a Bachelor of Science in Civil Engineering from the University of Illinois at Chicago and holds a Professional Engineering License in the State of Illinois. In 1994, Mr. Bryant joined Christian-Roge and Associates and worked solely in highway design and construction. In 2005, Mr. Bryant joined Jacob & Hefner, Associates and worked in site design and railroad design.

Mr. Bryant joined STV Incorporated in 2008 and has worked solely in Railroad design and construction.

I declare under penalty of perjury that I have read the Reply Evidence in this proceeding that I have sponsored, as described in the foregoing Statement of Qualifications, and that the contents thereof are true and correct. Further, I certify that I am qualified and authorized to sponsor this testimony.

Patrick J. Bryant, P.E.

Executed on November 9, 2011

Patrick J. Bryant, P.E.

Civil Engineer

Mr. Bryant is a civil engineer with more than 15 years of experience in roadway, highway, and rail, as well as bridge design and construction. His work on residential and commercial development projects showcases his knowledge of site/civil and environmental engineering. He has provided services as a project engineer, construction engineer, construction technician, and quality assurance/quality control (QA/QC) specialist for a variety of projects in Illinois, including the Illinois Department of Transportation (IDOT) Elgin O'Hare Western Bypass where he is providing conceptual track design for potential alignments and impacts to the Union Pacific Railroad, Canadian Pacific Railway, and Canadian National Railway. Mr. Bryant's experience includes the design of roadway geometry, grading, drainage, and utilities. He has been responsible for the design of roadway plans, including profiles, horizontal alignments, and cross-sections. Mr. Bryant is also experienced in track design for commuter rail agencies and freight railroads.

Firm

Education

Bachelor of Science, Civil Engineering; University of Illinois, Chicago (1994)

Professional Registrations

Professional Engineer: Illinois (2004/#062057106/ exp 11/30/11)

Computer Skills

AutoCAD, Civil3D, MicroStation, GeoPak, HydroFlow, TR20, Paydirt, Visual Basic, AutoLisp, Eaglepoint

Project Experience

CIVIL/SITE

CSX CREATE B-2 Project - Project Engineer

Providing site design engineering services for the reconstruction of the Metra Union Pacific Railroad (UPRR) West Line's passenger stations in Berkeley and Bellwood, IL, as part of STV's CREATE general engineering consultant contract for CSX. Mr. Bryant is providing site design, including grading, drainage, signage, and construction staging. (3/11 - Present)

Kane County DOT Fabyan Parkway at Van Nortwick Avenue Phase II Intersection Improvements - QA/QC

Performed quality assurance/quality control (QA/QC) for STV's Phase II engineering services for the Fabyan Parkway and Van Nortwick Avenue intersection in Batavia, IL. The scope of work included road widening and the addition of a left-turn lane, as well as data collection, geotechnical services, and drainage design. The firm also extended lateral pipes in the widened area, replacing inlets along curb lines and a culvert to correct a drainage problem. STV prepared construction documents in accordance with the IDOT Bureau of Local Roads manual and Kane County design standards. Mr. Bryant performed QA/QC of the final Phase II engineering plans STV submitted. (6/09 - 2/10)

CDOT Montrose Harbor Bridges and Underpasses - Project Engineer

Provided engineering services for the reconstruction of four concrete arch bridges, originally constructed in the 1930s, in Montrose Harbor Park in

Chicago. STV evaluated rehabilitation and reconstruction alternatives for each of the structures. Because the existing structures are located in a historic park setting, STV coordinated with the project architect to develop a structural system that maintains the existing architectural features while meeting current highway bridge standards. Mr. Bryant designed maintenance of traffic plans, which included assessing current traffic volume and developing a plan would have minimal impact to commuters during construction. Because the project area was located within a park setting, there was a heavy amount of pedestrian traffic. Mr. Bryant also assisted with the drainage design plans. (4/08 - 1/09)

IDOT U.S. 150 Phase I Study - Civil Engineer
Provided civil design for STV's Phase I engineering services in the preparation of a Categorical Exclusion Group II report for the widening of U.S. 150 in Tazewell County, IL, to three lanes. Mr. Bryant provided roadway design, including grading, geometric alignments, and easements. (7/08 - 8/08)

Dr. Rao Commercial Subdivision - Project Engineer
Responsible for developing site plans for a 40-acre commercial development project in Joliet, IL. This commercial development contains medical and professional offices, a store, gas station, and a bank. Mr. Bryant was responsible for parking lot design, road and grading designs, geometric alignments, easement coordination, storm water management, and utility design and coordination. (7/06 - 8/07)

Taking Care of Business, Inc. Crete Marketplace - Project Engineer
Developed site plans for a 100-acre commercial development project in Crete, IL. This commercial development contains two major department stores, a fast-food restaurant, two gas stations, and 12 other useable lots. Mr. Bryant was responsible for parking lot, road, and grading designs; geometric alignments; easement coordination; storm water management; as well as utility design and coordination. (3/07 - 4/08)

Bridge Street Mall, O&S Holdings - Project Engineer
Responsible for developing site plans for a 320-acre mall development project in Joliet, IL. This proposed mall would contain numerous stores, restaurants, as well as medical and professional offices. Mr. Bryant was responsible for parking lot, road, and grading design; geometric alignments; easement coordination; storm water management; and utility design and coordination. (10/07 - 4/08)

IDI Rock Run Industrial Park - Project Engineer
Generated road and grading designs, geometric alignments, easement coordination, and utility design and coordination for this 60-acre commercial development in Joliet, IL. (4/07 - 9/07)

KB Homes Streams of Plainfield Residential Subdivision - Project Engineer

Prepared road design, grading design, geometric alignments, easement coordination, and utility design and coordination for this 80-acre residential subdivision in Plainfield, IL. (6/06 - 4/07)

Chovan Commercial Subdivision - Project Engineer
Responsible for developing site plans for a 20-acre commercial development project in Joliet, IL, that contains medical and professional offices. Mr. Bryant was responsible for parking lot, road, and grading design; geometric alignments; easement coordination; storm water management; as well as utility design and coordination. (2/06 - 9/07)

Gallagher and Henry Parker Road Residential Subdivision - Project Engineer
Developed road and grading designs, geometric alignments, easement coordination, and utility design and coordination for this 120-acre residential subdivision in Homer Glen, IL. (2/06 - 1/07)

Sharp Homes Horton Farms Residential Subdivision - Project Engineer
Prepared road and grading design, geometric alignments, easement coordination, storm water management, and utility design and coordination for this 80-acre residential subdivision in Joliet, IL. (1/06 - 8/06)

Sharp Homes Commercial Development Projects - Project Engineer
Developed site plans for various commercial development projects in Joliet, IL. Mr. Bryant oversaw spur track design, road design, grading design, geometric alignments, storm water management, easement coordination, and utility design and coordination for the new Sharp Industrial Park, as well as three commercial lots and a railroad distribution center at the Mound Road Commercial Park. (5/05 - 5/08)

Kendall County Highway Department/Sharp Homes Hunter's Ridge Road Widening - Project Engineer
Designed roadway plans, including profiles, horizontal alignments, cross sections, and drainage systems, for the widening of a 2-lane rural road to a 4-lane arterial with multiple intersections, to support new residential developments in Joliet, IL. The project included widening a 1.5-mile stretch of roadway to accommodate the 130-acre Hunter's Ridge and 90-acre Jones Road subdivisions developed by Sharp Homes. Mr. Bryant was also responsible for developing site plans for these subdivision projects. (5/05 - 3/06)

Kendall County Highway Department/Lakewood Homes Ridge Road Widening - Project Engineer
Supervised design roadway plans, including profiles, horizontal alignments, cross sections, and drainage systems for 2 miles of a major 4-lane arterial in Joliet, IL. Mr. Bryant was also responsible for developing the roadway improvements that were funded by Lakewood Homes. Plans were submitted to the Kendall County Highway Department for review and approval. (10/04 - 3/05)

ISTHA I-294 Reconstruction - Project Engineer
Managed the design of roadway plans, including profiles, horizontal alignments, cross sections, and drainage systems, for the reconstruction of 6 miles of I-294 in Illinois. Mr. Bryant was also responsible for developing special provisions and preparing project cost estimates. (6/03 - 4/05)

CDWM Sewer Improvement Projects - Project Engineer
Responsible for the design of sewer plans, including profiles, horizontal alignments, and grading plans, for numerous sewer improvements in Chicago. These projects ranged from spot repair to total reconstruction of road and sewers. (6/01 - 3/05)

CDWM CHA Redevelopment Projects - Project Engineer
Designed sewer plans, including sewer profiles, sewer horizontal alignments, and grading plans associated with improvements to Chicago Housing Authority (CHA) public housing including Stateway Gardens, Henry Horner, Ida B. Wells, and Lakeview Crescent developments. (2/02 - 6/04)

CDOT Racine Avenue Improvements - Project Engineer
Facilitated the design of roadway plans, including profiles, horizontal alignments, cross sections, and drainage systems associated with the improvement of a 0.8-mile segment of Racine Avenue in Chicago. Mr. Bryant was also responsible for developing special provisions and preparing project cost estimates. (7/03 - 1/04)

CDOT 37th Street Improvements - Project Engineer
Developed the design of roadway plans, including profiles, horizontal alignments, cross sections, and drainage systems for improvements to a 0.5-mile stretch of 37th Street in Chicago. Mr. Bryant also developed special provisions and prepared project cost estimates for the project. (7/03 - 1/04)

IDOT Higgins Road Rehabilitation - Project Engineer
Responsible for the design of roadway plans, including profiles, horizontal alignments, cross sections, and drainage systems for the rehabilitation of 4 miles of Higgins Road in Schaumburg, IL. Mr. Bryant was also responsible for developing special provisions and preparing project cost estimates. (12/00 - 1/03)

IDOT Golf Road Rehabilitation - Project Engineer
Designed roadway plans, including profiles, horizontal alignments, cross sections, and drainage systems for the rehabilitation of 4 miles of Golf Road in Schaumburg, IL. Mr. Bryant was also responsible for developing special provisions and preparing project cost estimates for this project. (10/00 - 1/03)

ISTHA I-90 Improvements - Project Engineer
Responsible for the design of roadway plans, including profiles, horizontal alignments, cross-sections, and drainage systems, for improvements to I-90 in Illinois. Mr. Bryant was also responsible for developing special provisions and preparing project cost estimates. (11/97 - 4/98)

ISTHA Randall Road/I-90 Interchange - Project Engineer
Designed roadway plans, including profiles, horizontal alignments, cross-sections, and drainage systems for the Randall Road/I-90 Interchange in Elgin, IL. Mr. Bryant was also responsible for developing special provisions and preparing project cost estimates. (10/96 - 4/97)

IDOT Route 59 - Project Engineer
Prepared roadway plans, including profiles, horizontal alignments, cross sections, and drainage systems, as part of the design of five miles of Route 59, in Naperville, IL. Mr. Bryant was also responsible for developing special provisions and preparing project cost estimates. (9/94 - 4/95)

RAIL

CSX/Chicago/Gary Regional Airport Authority CSX Fort Wayne Line and NS Gary Branch Relocation - Design Engineer
Preparing track and civil plans for the reconfiguration of CSX's Fort Wayne Line onto Norfolk Southern (NS)'s Gary Branch in Gary, IN. The work is being performed as a component of the Chicago/Gary Regional Airport Authority's airport runway extension project and includes the addition of a new connection from CSX's Barr Subdivision to Canadian National (CN)'s reconfigured Elgin, Joliet & Eastern (EJ&E) Railway Line. A new industrial connection from the CSX Porter Subdivision to the Indiana Sugars manufacturing facility will also be added. In addition, the scope of work includes reconfiguring the Clarke Junction Interlocking between the Barr Subdivision, adding a new connection to the NS Chicago Line, and removing the Pine Junction Interlocking on the Barr Subdivision and improving design speed from 40 mph to 60 mph. This work will increase rail traffic capacity and improve train movement into and out of Chicago. Mr. Bryant is also coordinating the design plans with the various railroads and transportation agencies. (2/11 - Present)

CSX CREATE Third Main B12 Project - Field Inspector
Performing field inspections for Task 1, Project B12, of STV's CREATE general engineering consultant (GEC) contract for CSX. The Chicago Region Environmental and Transportation Efficiency Program (CREATE) was established to identify key bottlenecks and conflicts within the existing Chicagoland transportation infrastructure. Mr. Bryant is providing inspections for the construction of a third mainline along the Beltway Corridor from 123rd Street to CP San Francisco in Alsip and Blue Island, IL, which includes new track and upgrades to existing track. This additional mainline will increase freight rail capacity and decrease travel times within the area. A new rail bridge over 127th Street will also be constructed and includes associated signal work. Mr. Bryant is providing inspections to make sure the work is being performed according to the project plans and specifications. (2011 - Present)

CSX CREATE Project WA-10 - Design Engineer
Preparing track and civil plans for the final design of the rail interlocking to allow the interchange between the Canadian National (CN) and CSX

railroads in Blue Island, IL. As a component of the CREATE program, Project WA-10 involves reconfiguring the CSX Vermont Street interlocking to provide a universal connection to the CN main line. Expanding this interlocking between these two main lines will increase rail traffic capacity and improve train movement through Chicago. Mr. Bryant is also coordinating the design plans with the various railroads and transportation agencies. (2011 - Present)

City of Joliet Regional Multimodal Transportation Center - Track Engineer
Providing railroad coordination and designs for infrastructure improvements as part of the development of a multimodal transportation center in Joliet, IL. Several modes of transportation will be relocated into a central facility that will connect to the historic Joliet Union Station. This venture could eventually be a stop on the future high-speed passenger rail line, linking Chicago with St. Louis. The proposed transportation center is located within the Joliet UD Interlocking, which includes Union Pacific, Burlington Northern Santa Fe, Amtrak, and the Metra Rock Island District and Heritage Corridor rail lines. Mr. Bryant is developing designs for the infrastructure improvements related to track realignments, platform configurations, interlocking modifications, bridge rehabilitations, and construction staging. (9/09 - Present)

IDOT Elgin O'Hare Western Bypass - Track Engineer
Coordinating design plans with various railroads and transportation agencies and preparing staging plans as part of STV's freight rail coordination for the $3.9 billion Elgin O'Hare Western Bypass in Cook County, IL. Mr. Bryant developed conceptual track engineering plans and cost estimates for potential track alignments and impacts to the railroads during Phase I of this project. He also developed staging plans, cross-sections, plan profiles, and drainage plans. The project has now moved into Phase II, and STV is coordinating the approved plans among the Union Pacific, Canadian Pacific, and Canadian National freight railroads and the project team. The primary objective of the coordination is to keep the railroads informed of progress with this Illinois Department of Transportation (IDOT) project and to resolve any potential conflicts at an early stage. Mr. Bryant is coordinating work with the planning team during the alternative design process and is advising them of potential rail impacts. He is also coordinating plans with signals and highway improvement work being performed simultaneously. (10/08 - Present)

TTC Transit City LRT Program PM - Track Design QC
Provided quality control for track and civil plans, as part of the Toronto Transit Commission (TTC)'s proposed underground light rail commuter line and new Sheppard's Street station in Toronto, Canada. Mr. Bryant verified that the project was designed according to the agency's design criteria and that it is constructible. He checked clearances, materials, profile grades, and drainage design. (4/10 - 2/11)

St. Louis Metro East Riverfront Interlocking - Track Engineer
Prepared track and civil plans for the design of a new interlocking between the East Riverfront MetroRail station and the historic Eads Bridge, which

connects St. Louis with East St. Louis, IL, over the Mississippi River. The Eads Bridge is a 2-level structure carrying two sets of tracks for the MetroRail light-rail transit system on its lower level and a 4-lane highway on the upper level. STV designed a new asymmetrical diamond cross-over interlocking within the East Arcade located east of the bridge. To construct the new interlocking, approximately 206 feet of the roadway deck and superstructure was removed. The firm designed the new interlocking on a tight schedule and within a restricted area, making the design work challenging. The interlocking is 185 feet long and the cross-over is confined within an 18-foot-wide area. Mr. Bryant performed track calculations and geometry to develop multiple track alignment options. The plans were then presented to the client, which chose an option most suitable to its needs. Mr. Bryant prepared track and civil design plans using AutoCAD. He also coordinated with other project disciplines to develop conduit plans for multiple systems including electrical, communications, overhead catenary systems, and signals, all of which are located within the restricted area. (11/09 - 6/10)

CSX Manville Bridge Reconstruction - Track Engineer
Prepared track designs to address construction staging for CSX's reconstruction of a railroad bridge over a waterway in Manville, NJ. The new structure increases CSX's capacity from one track to two tracks in the Reading subdivision. Mr. Bryant designed track geometry, plan and profiles, and temporary shoofly alignments for the staging plans and final rail alignment. (2009)

Norfolk Southern Corporation PennDOT S.R. 28 Improvement - Track Engineer
Facilitated track design to address Norfolk Southern Corporation (NS) capacity issues during PennDOT's improvement of S.R. 28. To allow for single-tracking during roadway improvements, NS Control Point (CP) Herr will be eliminated. For NS to have capacity for this interlocking removal and single-tracking, STV relocated two approaching interlockings—one at CP Etna, and one at CP Sharp. Mr. Bryant designed track geometry, plan and profile for relocation of the interlockings, as well as extension of the westward main track No. 2 and controlled siding. The total project will increase block capacity by 2,700 feet. (8/08 - 5/09)

Kansas City Southern Meridian Connection - Rail Engineer
Performed design for the rail alignment and related earthwork as part of the construction of a 4-mile realignment and connection of the Norfolk Southern Corporation (NS) and the Kansas City Southern (KCS) on the Meridian Speedway in Meridian, MS. The project required extensive coordination between the KCS and NS, resulting in an operational staging plan suitable for both parties. (10/08 - 7/09)

Norfolk Southern Corporation Lakeside Dam Rehabilitation - Rail Engineer
Responsible for the design of the rail alignment and related earthwork as part of the construction of a 1.5-mile realignment for the Norfolk Southern

Corporation (NS) in Macon, GA. The proposed alignment was partially over a 60-foot-high earthen dam. The project, which required coordination among many stakeholders, was a complex intersection of the railroad, a major state route, and the dam. (8/08 - 12/08)

CONSTRUCTION MANAGEMENT

NICTD Kensington Interlocking Improvement CM Services - Track Engineer

Developing track engineering for construction management (CM) services for improvements at the Kensington Interlocking, including the addition of a second Northern Indiana Commuter Transportation District (NICTD) route across the connect to the Metra Electric Mains. Mr. Bryant made recommendations for alterations to the original track design that is being incorporated into the final design and construction. He is also performing office engineering tasks, as well as performing field inspections. STV is overseeing all aspects of the contractor's construction methods, as well as providing a precondition survey to identify existing conditions of the rail and right-of-way in the area of the Kensington Interlocking limits, including the existing signal system, structures, and track appurtenances. (6/09 - Present)

DuPage County Highway Department Road Improvement Projects - Construction Engineer

Inspected the resurfacing and repair of numerous county roads in DuPage County, IL, including Bloomingdale Road, Gary Avenue, Glen Ellyn Road, Naperville Road, 75^{th} Street, and 63^{rd} Street. Mr. Bryant provided quality assurance and quality control of contractors' work on these road construction projects. (4/95 - 9/99)

Cook County Highway Department Ashland Avenue - Construction Engineer

Inspected the construction of 1.5 miles of Ashland Avenue in Chicago. Mr. Bryant provided quality assurance and quality control of contractors' work on highway and bridge construction projects. (4/97 - 11/97)

Cook County Highway Department Lehigh Avenue - Construction Engineer

Responsible for the construction of 1.5 miles of Lehigh Avenue in Morton Grove, IL. Mr. Bryant provided quality assurance and quality control of contractors' work on highway and bridge construction projects. (3/96 - 12/96)

ISTHA I-294 Improvements - Construction Engineer

Responsible for construction inspection during the repair and resurfacing of 6 miles of I-294 in Rosemont, IL. Mr. Bryant provided quality assurance and quality control of contractors' work on highway and bridge construction projects. (4/94 - 9/94)

BENTON V. FISHER

Mr. Fisher is a Senior Managing Director at FTI Consulting, Inc., an economic and consulting firm with offices located at 1101 K Street, NW, Washington, DC 20005. Since 1991, Mr. Fisher has been involved in various aspects of transportation consulting including economic studies involving costs and revenues, traffic and operating analyses, and work with performance measurement and financial reporting systems.

Mr. Fisher holds a Bachelor of Science degree in Engineering and Management Systems from Princeton University. In 1990, he served as the Deputy Controller for the Bill Bradley for U.S. Senate Campaign. In 1991, he joined Klick, Kent & Allen, Inc., which was acquired by FTI Consulting, Inc. in 1998. While with the firm Mr. Fisher has performed numerous analyses for and assisted in the preparation of expert testimony related to merger applications, rate reasonableness proceedings, contract disputes, and other regulatory costing issues before the Interstate Commerce Commission, Surface Transportation Board, Federal Energy Regulatory Commission, Postal Rate Commission, Federal Courts, and State Utility Commissions. He has previously sponsored evidence in numerous railroad rate reasonableness proceedings, including evidence regarding the topics identified above.

Mr. Fisher's curriculum vitae, which identifies representative engagements and cases in which he has sponsored expert testimony, is attached hereto.

Mr. Fisher is sponsoring portions of Sections III.C and III.D of defendants' Reply Evidence relating to calculation of equipment counts and operating costs other than MOW and G&A. Mr. Fisher has signed a verification of the truth of the statements contained therein. A copy of that verification is attached hereto.

VERIFICATION

I declare under penalty of perjury that I have read the Reply Evidence in this proceeding that I have sponsored, as described in the foregoing Statement of Qualifications, and that the contents thereof are true and correct. Further, I certify that I am qualified and authorized to sponsor this testimony.

Benton V. Fisher

Executed on November 9, 2011

IV-41

Benton V. Fisher

Senior Managing Director – Economic Consulting

benton.fisher@fticonsulting.com

FTI Consulting
11101 K Street, NW
Suite B100
Washington, DC 20005
Tel: (202) 312-9100
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Education
B.S. in Engineering and Management Systems, Princeton University

Benton V. Fisher is a Senior Managing Director of FTI's Economic Consulting group, located in Washington, D.C. Mr. Fisher has more than 20 years of experience in providing financial, economic and analytical consulting services to corporate clients dealing with transportation, telecommunications, and postal subjects.

North America's largest railroads have retained FTI both to assist them in making strategic and tactical decisions and to provide expert testimony in litigation. FTI's ability to present a thorough understanding of myriad competitive and regulatory factors has given its clients the necessary tools to implement and advance their business. Mr. Fisher has worked extensively to develop these clients' applications for mergers and acquisitions and expert testimony justifying the reasonableness of their rates before the Surface Transportation Board. In addition to analyzing extensive financial and operating data, Mr. Fisher has worked closely with people within many departments at the railroad as well as outside counsel to ensure that the railroads' presentations are accurate and defensible. Additionally, Mr. Fisher reviews the expert testimony of the railroads' opponents in these proceedings, and advises counsel on the necessary course of action to respond.

AT&T and MCI retained FTI to advance its efforts to implement the Telecommunications Act of 1996 in local exchange markets. Mr. Fisher was primarily responsible for reviewing the incumbent local exchange carriers' (ILEC) cost studies, which significantly impacted the ability of FTI's clients to access local markets. Mr. Fisher analyzed the sensitivity of multiple economic components and incorporated this information into various models being relied upon by the parties and regulators to determine the pricing of services. Mr. Fisher was also responsible for preparing testimony that critiqued alternative presentations.

Mr. Fisher assisted in reviewing the U.S. Postal Service's evidence and preparing expert testimony on behalf of interveners in Postal Rate and Fee Changes cases. He has also been retained by a large international consulting firm to provide statistical and econometric support in their preparation of a long-range implementation plan for improving telecommunications infrastructure in a European country.

Mr. Fisher has sponsored expert testimony in rate reasonableness proceedings before the Surface Transportation Board and in contract disputes in Federal Court and arbitration proceedings.

Mr. Fisher holds a B.S. in Engineering and Management Systems from Princeton University.

TESTIMONY

Surface Transportation Board

January 15, 1999	Docket No. 42022 FMC Corporation and FMC Wyoming Corporation v. Union Pacific Railroad Company, Opening Verified Statement of Christopher D. Kent and Benton V. Fisher
March 31, 1999	Docket No. 42022 FMC Corporation and FMC Wyoming Corporation v. Union Pacific Railroad Company, Reply Verified Statement of Christopher D. Kent and Benton V. Fisher
April 30, 1999	Docket No. 42022 FMC Corporation and FMC Wyoming Corporation v. Union Pacific Railroad Company, Rebuttal Verified Statement of Christopher D. Kent and Benton V. Fisher
July 15, 1999	Docket No. 42038 Minnesota Power, Inc. v. Duluth, Missabe and Iron Range Railway Company, Opening Verified Statement of Christopher D. Kent and Benton V. Fisher
August 30, 1999	Docket No. 42038 Minnesota Power, Inc. v. Duluth, Missabe and Iron Range Railway Company, Reply Verified Statement of Christopher D. Kent and Benton V. Fisher
September 28, 1999	Docket No. 42038 Minnesota Power, Inc. v. Duluth, Missabe and Iron Range Railway Company, Rebuttal Verified Statement of Christopher D. Kent and Benton V. Fisher
June 15, 2000	Docket No. 42051 Wisconsin Power and Light Company v. Union Pacific Railroad Company, Opening Verified Statement of Christopher D. Kent and Benton V. Fisher
August 14, 2000	Docket No. 42051 Wisconsin Power and Light Company v. Union Pacific Railroad Company, Reply Verified Statement of Christopher D. Kent and Benton V. Fisher
September 28, 2000	Docket No. 42051 Wisconsin Power and Light Company v. Union Pacific Railroad Company, Rebuttal Verified Statement of Christopher D. Kent and Benton V. Fisher
December 14, 2000	Docket No. 42054 PPL Montana, LLC v. The Burlington Northern Santa Fe Railway Company, Opening Verified Statement of Christopher D. Kent and Benton V. Fisher
March 13, 2001	Docket No. 42054 PPL Montana, LLC v. The Burlington Northern Santa Fe Railway Company, Reply Verified Statement of Christopher D. Kent and Benton V. Fisher
May 7, 2001	Docket No. 42054 PPL Montana, LLC v. The Burlington Northern Santa Fe Railway Company, Rebuttal Verified Statement of Christopher D. Kent and Benton V. Fisher

October 15, 2001	Docket No. 42056 Texas Municipal Power Agency v. The Burlington Northern Santa Fe Railway Company, Opening Verified Statement of Benton V. Fisher
January 15, 2002	Docket No. 42056 Texas Municipal Power Agency v. The Burlington Northern Santa Fe Railway Company, Reply Verified Statement of Benton V. Fisher
February 25, 2002	Docket No. 42056 Texas Municipal Power Agency v. The Burlington Northern Santa Fe Railway Company, Rebuttal Verified Statement of Benton V. Fisher
May 24, 2002	Docket No. 42069 Duke Energy Corporation v. Norfolk Southern Railway Company, Opening Evidence and Argument of Norfolk Southern Railway Company
June 10, 2002	Docket No. 42072 Carolina Power & Light Company v. Norfolk Southern Railway Company, Opening Evidence and Argument of Norfolk Southern Railway Company
July 19, 2002	Northern States Power Company Minnesota v. Union Pacific Railroad Company, Union Pacific's Opening Evidence
September 30, 2002	Docket No. 42069 Duke Energy Corporation v. Norfolk Southern Railway Company, Reply Evidence and Argument of Norfolk Southern Railway Company
October 4, 2002	Northern States Power Company Minnesota v. Union Pacific Railroad Company, Union Pacific's Reply Evidence
October 11, 2002	Docket No. 42072 Carolina Power & Light Company v. Norfolk Southern Railway Company, Reply Evidence and Argument of Norfolk Southern Railway Company
November 1, 2002	Northern States Power Company Minnesota v. Union Pacific Railroad Company, Union Pacific's Rebuttal Evidence
November 19, 2002	Docket No. 42069 Duke Energy Corporation v. Norfolk Southern Railway Company, Rebuttal Evidence and Argument of Norfolk Southern Railway Company
November 27, 2002	Docket No. 42072 Carolina Power & Light Company v. Norfolk Southern Railway Company, Rebuttal Evidence and Argument of Norfolk Southern Railway Company
January 10, 2003	Docket No. 42057 Public Service Company of Colorado D/B/A Xcel Energy v. The Burlington Northern and Santa Fe Railway Company, Opening Evidence and Argument of The Burlington Northern and Santa Fe Railway Company
February 7, 2003	Docket No. 42058 Arizona Electric Power Cooperative, Inc. v. The Burlington Northern and Santa Fe Railway Company and Union Pacific Railroad, Opening Evidence of The Burlington Northern and Santa Fe Railway Company and Union Pacific Railroad

April 4, 2003	Docket No. 42057 Public Service Company of Colorado D/B/A Xcel Energy v. The Burlington Northern and Santa Fe Railway Company, Reply Evidence and Argument of The Burlington Northern and Santa Fe Railway Company
May 19, 2003	Docket No. 42057 Public Service Company of Colorado D/B/A Xcel Energy v. The Burlington Northern and Santa Fe Railway Company, Rebuttal Evidence and Argument of The Burlington Northern and Santa Fe Railway Company
May 27, 2003	Docket No. 42058 Arizona Electric Power Cooperative, Inc. v. The Burlington Northern and Santa Fe Railway Company and Union Pacific Railroad, Joint Variable Cost Reply Evidence of The Burlington Northern and Santa Fe Railway Company and Union Pacific Railroad
May 27, 2003	Docket No. 42058 Arizona Electric Power Cooperative, Inc. v. The Burlington Northern and Santa Fe Railway Company and Union Pacific Railroad, Reply Evidence of The Burlington Northern and Santa Fe Railway Company
June 13, 2003	Docket No. 42071 Otter Tail Power Company v. The Burlington Northern and Santa Fe Railway Company, Opening Evidence of The Burlington Northern and Santa Fe Railway Company
July 3, 2003	Docket No. 42058 Arizona Electric Power Cooperative, Inc. v. The Burlington Northern and Santa Fe Railway Company and Union Pacific Railroad, Joint Variable Cost Rebuttal Evidence of The Burlington Northern and Santa Fe Railway Company and Union Pacific Railroad
October 8, 2003	Docket No. 42071 Otter Tail Power Company v. The Burlington Northern and Santa Fe Railway Company, Reply Evidence of The Burlington Northern and Santa Fe Railway Company
October 24, 2003	Docket No. 42069 Duke Energy Corporation v. Norfolk Southern Railway Company Supplemental Evidence of Norfolk Southern Railway Company
October 31, 2003	STB Docket No. 42069 Duke Energy Corporation v. Norfolk Southern Railway Company, Reply of Norfolk Southern Railway Company to Duke Energy Company's Supplemental Evidence
November 24, 2003	STB Docket No. 42072 Carolina Power & Light Company v. Norfolk Southern Railway Company, Supplemental Evidence of Norfolk Southern Railway Company
December 2, 2003	STB Docket No. 42072 Carolina Power & Light Company v. Norfolk Southern Railway Company, Reply of Norfolk Southern Railway Company to Carolina Power & Light Company's Supplemental Evidence
January 26, 2004	STB Docket No. 42058 Arizona Electric Power Cooperative, Inc. v. The Burlington Northern and Santa Fe Railway Company and Union Pacific Railroad Company, Joint Supplemental Reply Evidence and Argument of The Burlington Northern and Santa Fe Railway Company and Union Pacific Railroad Company

March 1, 2004	STB Docket No. 41191 (Sub-No. 1) AEP Texas North Company v. The Burlington Northern and Santa Fe Railway Company, Opening Evidence and Argument of The Burlington Northern and Santa Fe Railway Company
March 22, 2004	STB Docket No. 42071 Otter Tail Power Company v. The Burlington Northern and Santa Fe Railway Company, Supplemental Reply Evidence of The Burlington Northern and Santa Fe Railway Company
April 29, 2004	STB Docket No. 42071 Otter Tail Power Company v. The Burlington Northern and Santa Fe Railway Company, Rebuttal Evidence of The Burlington Northern and Santa Fe Railway Company
May 24, 2004	STB Docket No. 41191 (Sub-No. 1) AEP Texas North Company v. The Burlington Northern and Santa Fe Railway Company, Reply Evidence of The Burlington Northern and Santa Fe Railway Company
March 1, 2005	Docket No. 42071 Otter Tail Power Company v. BNSF Railway Company, Supplemental Evidence of BNSF Railway Company
April 4, 2005	Docket No. 42071 Otter Tail Power Company v BNSF Railway Company, Reply of BNSF Railway Company to Supplemental Evidence
April 19, 2005	Docket No. 42088 Western Fuels Association, Inc. and Basin Electric Power Cooperative, Inc. v. BNSF Railway Company, Opening Evidence of BNSF Railway Company
July 20, 2005	Docket No. 42088 Western Fuels Association, Inc. and Basin Electric Power Cooperative, Inc. v. BNSF Railway Company, Reply Evidence of BNSF Railway Company
July 27, 2004	STB Docket No. 41191 (Sub-No. 1) AEP Texas North Company v. The Burlington Northern and Santa Fe Railway Company, Rebuttal Evidence of The Burlington Northern and Santa Fe Railway Company
September 30, 2005	Docket No. 42088 Western Fuels Association, Inc. and Basin Electric Power Cooperative, Inc. v. BNSF Railway Company, Rebuttal Evidence of BNSF Railway Company
October 20, 2005	Docket No. 42088 Western Fuels Association, Inc. and Basin Electric Power Cooperative, Inc. v. BNSF Railway Company, Surrebuttal Evidence of BNSF Railway Company
June 15, 2006	Docket No. 42088 Western Fuels Association, Inc. and Basin Electric Power Cooperative, Inc. v. BNSF Railway Company, Reply Supplemental Evidence of BNSF Railway Company
June 15, 2006	Docket No. 41191 (Sub-No. 1) AEP Texas North Company v. BNSF Railway Company, Reply Supplemental Evidence of BNSF Railway Company
March 19, 2007	Docket No. 41191 (Sub-No. 1) AEP Texas North Company v. BNSF Railway Company, Reply Third Supplemental Evidence of BNSF Railway Company

March 26, 2007	Docket No. 42088 Western Fuels Association, Inc. and Basin Electric Power Cooperative, Inc. v. BNSF Railway Company, Reply Second Supplemental Evidence of BNSF Railway Company
July 30, 2007	Docket No. 42095 Kansas City Power & Light v. Union Pacific Railroad Company, Union Pacific's Opening Evidence
August 20, 2007	Docket No. 42095 Kansas City Power & Light v. Union Pacific Railroad Company, Union Pacific's Reply Evidence
February 4, 2008	Docket No. 42099 E.I. DuPont De Nemours and Company v. CSX Transportation, Inc., Opening Evidence of CSXT
February 4, 2008	Docket No. 42100 E.I. DuPont De Nemours and Company v. CSX Transportation, Inc., Opening Evidence of CSXT
February 4, 2008	Docket No. 42101 E.I. DuPont De Nemours and Company v. CSX Transportation, Inc., Opening Evidence of CSXT
March 5, 2008	Docket No. 42099 E.I. DuPont De Nemours and Company v. CSX Transportation, Inc., Reply Evidence of CSXT
March 5, 2008	Docket No. 42100 E.I. DuPont De Nemours and Company v. CSX Transportation, Inc., Reply Evidence of CSXT
March 5, 2008	Docket No. 42101 E.I. DuPont De Nemours and Company v. CSX Transportation, Inc., Reply Evidence of CSXT
April 4, 2008	Docket No. 42099 E.I. DuPont De Nemours and Company v. CSX Transportation, Inc., Rebuttal Evidence of CSXT
April 4, 2008	Docket No. 42100 E.I. DuPont De Nemours and Company v. CSX Transportation, Inc., Rebuttal Evidence of CSXT
April 4, 2008	Docket No. 42101 E.I. DuPont De Nemours and Company v. CSX Transportation, Inc., Rebuttal Evidence of CSXT
July 14, 2008	Docket No. 42088 Western Fuels Association, Inc. and Basin Electric Power Cooperative, Inc. v. BNSF Railway Company, Third Supplemental Reply Evidence of BNSF Railway Company
August 8, 2008	Docket No. 41191 (Sub-No. 1) AEP Texas North Company v. BNSF Railway Company, Fourth Supplemental Evidence of BNSF Railway Company
September 5, 2008	Docket No. 41191 (Sub-No. 1) AEP Texas North Company v. BNSF Railway Company, Fourth Supplemental Reply Evidence of BNSF Railway Company
October 17, 2008	Docket No. 42110 Seminole Electric Cooperative, Inc. v. CSX Transportation, Inc., CSX Transportation, Inc.'s Reply to Petition for Injunctive Relief, Verified Statement of Benton V. Fisher
August 24, 2009	Docket No. 42114 US Magnesium, L.L.C. v. Union Pacific Railroad Company, Opening Evidence of Union Pacific Railroad Company

September 22, 2009	Docket No. 42114 US Magnesium, L.L.C. v. Union Pacific Railroad Company, Reply Evidence of Union Pacific Railroad Company
October 22, 2009	Docket No. 42114 US Magnesium, L.L.C. v. Union Pacific Railroad Company, Rebuttal Evidence of Union Pacific Railroad Company
January 19, 2010	Docket No. 42110 Seminole Electric Cooperative, Inc. v. CSX Transportation, Inc., Reply Evidence of CSX Transportation, Inc.
May 7, 2010	Docket No. 42113 Arizona Electric Power Cooperative, Inc. v. BNSF Railway Company and Union Pacific Railroad Company, Joint Reply Evidence of BNSF Railway Company and Union Pacific Railroad Company
October 1, 2010	Docket No. 42121 Total Petrochemicals USA, Inc. v. CSX Transportation, Inc., Motion for Expedited Determination of Jurisdiction Over Challenged Rates, Verified Statement of Benton V. Fisher
November 22, 2010	Docket No. 42088 Western Fuels Association, Inc. and Basin Electric Power Cooperative, Inc. v. BNSF Railway Company, Comments of BNSF Railway Company on Remand, Joint Verified Statement of Michael R. Baranowski and Benton V. Fisher
January 6, 2011	Docket No. 42056 Texas Municipal Power Agency v. BNSF Railway Company, BNSF Reply to TMPA Petition for Enforcement of Decision, Joint Verified Statement of Michael R. Baranowski and Benton V. Fisher
July 5, 2011	Docket No. 42123 M&G Polymers USA, LLC v. CSX Transportation, Inc., Reply Market Dominance Evidence of CSX Transportation, Inc.
August 1, 2011	Docket No. 42125 E.I. DuPont De Nemours and Company v. Norfolk Southern Railway Company, Norfolk Southern Railway's Reply to Second Motion to Compel, Joint Verified Statement of Benton V. Fisher and Michael Matelis
August 5, 2011	Docket No. 42121 Total Petrochemicals USA, Inc. v. CSX Transportation, Inc. , Reply Market Dominance Evidence of CSX Transportation, Inc.
August 15, 2011	Docket No. 42124 State of Montana v. BNSF Railway Company, BNSF Railway Company's Reply Evidence and Argument, Verified Statement of Benton V. Fisher
October 24, 2011	Docket No. 42120 Cargill, Inc. v. BNSF Railway Company, BNSF Railway Company's Reply Evidence and Argument, Verified Statement of Benton V. Fisher
October 28, 2011	Docket No. FD 35506 Western Coal Traffic League - Petition for Declaratory Order, Opening Evidence of BNSF Railway Company, Joint Verified Statement of Michael R. Baranowski and Benton V. Fisher

U.S. District Court for the Eastern District of North Carolina

March 17, 2006	Civil Action No. 4:05-CV-55-D, PCS Phosphate Company v. Norfolk Southern Corporation and Norfolk Southern Railway Company, Report by Benton V. Fisher

U.S. District Court for the Eastern District of California

January 18, 2010	E.D. Cal. Case No. 08-CV-1086-AWI, BNSF Railway Company v. San Joaquin Valley Railroad Co., et al.

Arbitrations and Mediations

July 10, 2009	JAMS Ref. # 1220039135; In the Matter of the Arbitration Between Pacer International, Inc., d/b/a/ Pacer Stacktrain (f/k/a/ APL Land Transport Services, Inc.), American President Lines, Ltd. And APL Co. Pte. Ltd. And Union Pacific Railroad Company; Rebuttal Expert Report of Benton V. Fisher

ROBERT FISHER

Rob Fisher is a Director in the Network Industries Strategies group of the FTI Economic Consulting practice and is based in Washington, D.C. Mr. Fisher provides financial and economic consulting services to the transportation, energy and telecommunications industries.

Mr. Fisher holds an M.B.A. (with distinction) from the University of Michigan and a B.S. from the School of Foreign Service at Georgetown University. Prior to joining FTI, Mr. Fisher worked for two technology companies, most recently as Vice President of Strategic Marketing, where he held P&L responsibility for the company's largest product. Before that, he spent 10 years as a strategy consultant, working with dozens of telecom clients on financial analysis, marketing strategy and operational improvement.

Mr. Fisher has developed expert testimony for railroad clients in litigation disputes involving the delivery of large coal shipments to energy customers. He has directed financial analysis to demonstrate the reasonableness of railroad rates before the Surface Transportation Board, including leading the analysis of traffic and revenues in prior stand alone cases.

Mr. Fisher's curriculum vitae, which identifies representative engagements and cases in which he has sponsored expert testimony, is attached hereto.

Mr. Fisher sponsors evidence relating to traffic and revenue set forth in Section III.A. Mr. Fisher has signed a verification of the truth of the statements contained therein. A copy of that verification is attached hereto.

VERIFICATION

I declare under penalty of perjury that I have read the Reply Evidence in this proceeding that I have sponsored, as described in the foregoing Statement of Qualifications, and that the contents thereof are true and correct. Further, I certify that I am qualified and authorized to sponsor this testimony.

Robert Fisher

Robert Fisher

Executed on November 9, 2011

IV-51

Rob Fisher

Director – Economic Consulting

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11101 K Street, NW
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Tel: (202) 312-9100
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Education
MBA (with distinction) from University of Michigan

BS from School of Foreign Service at Georgetown University

Rob Fisher is a director in the Network Industries Strategies group of the FTI Economic Consulting practice and is based in Washington, D.C. Mr. Fisher provides financial and economic consulting services to the transportation, energy and telecommunications industries.

Mr. Fisher has developed expert testimony for railroad clients in litigation disputes involving the delivery of large coal shipments to energy customers. He also has directed financial analysis to demonstrate the reasonableness of railroad rates before the Surface Transportation Board, including leading the analysis of traffic and revenues in prior stand alone cases.

In addition, Mr. Fisher has supported a consortium of manufacturers to gain anti-leakage provisions in the pending greenhouse gas legislation. His report, which measured the energy and trade intensity and the emissions of each industry, has been entered into Congressional testimony.

Prior to joining FTI, Mr. Fisher worked for two technology companies, most recently as Vice President of Strategic Marketing, where he held P&L responsibility for the company's largest product. Before that, he spent 10 years as a strategy consultant, working with dozens of telecom clients on financial analysis, marketing strategy and operational improvement.

Mr. Fisher holds an M.B.A. (with distinction) from the University of Michigan and a B.S. from the School of Foreign Service at Georgetown University.

TESTIMONY

Surface Transportation Board

May 7, 2010	Docket No. 42113 Arizona Electric Power Cooperative, Inc. v. BNSF Railway Company and Union Pacific Railroad Company, Joint Reply Evidence of BNSF Railway Company and Union Pacific Railroad Company

RANDALL G. FREDERICK

Randall G. Frederick the office manager for STV's office at 9428 Baymeadows Road, Suite 630, Jacksonville, FL 32256, has more than 30 years of experience as a project manager providing construction engineering and inspection (CE&I) services for highway and railway bridges and tunnels.

As a former CSX Principal Engineer, he was responsible for management and administration of publicly funded projects in Ohio, Pennsylvania, West Virginia, Virginia, Maryland, and Washington, DC. Mr. Frederick functioned as the primary representative in the mediation of legal proceedings, public safety issues, and other politically-sensitive railroad-related matters. He managed the system and network of the company's Computer Aided Dispatching System (CADS), Rail-Highway Grade Crossing Warning Systems, and Incremental Train Control Signaling (ITCS). Mr. Frederick has a Bachelor of Arts degree in Business Administration from Cedarville University.

Mr. Frederick's resume is attached hereto.

Mr. Frederick is sponsoring Section III.F.8 of UP's Reply Evidence relating to public improvements. Mr. Frederick has signed a verification of the truth of the statements contained therein. A copy of that verification is attached hereto.

I declare under penalty of perjury that I have read the Reply Evidence that I have sponsored, as described in the foregoing Statement of Qualifications, and that the contents thereof are true and correct. Further, I certify that I am qualified and authorized to sponsor this testimony.

Randall S. Frederick

Executed on November 7, 2011

Randall G. Frederick

Project Manager/Senior Engineer
Associate

Mr. Frederick, the office manager for STV's office in Jacksonville, FL, has more than 30 years of experience as a project manager providing construction engineering and inspection (CE&I) services for highway and railway bridges and tunnels. As a former CSX Principal Engineer, he was responsible for management and administration of publicly funded projects in Ohio, Pennsylvania, West Virginia, Virginia, Maryland, and Washington, D.C. Mr. Frederick functioned as the primary representative in the mediation of legal proceedings, public safety issues, and other politically-sensitive railroad-related matters. He managed the system and network of the company's Computer Aided Dispatching System (CADS), Rail-Highway Grade Crossing Warning Systems, and Incremental Train Control Signaling (ITCS).

Employee No.
91665

Department No.
53

Office Location
Jacksonville, FL

Date joined firm
9/12/05

Years with other firms
30

Education
Bachelor of Arts, Business Administration; Cedarville University (1987)

Training/Certifications
FRA Roadway Worker

Environmental and Industrial Safety Course

AREMA Highway Crossing Interconnection

Memberships
NCUTCD Railroad & Light Rail Transit Highway Grade Crossings Technical Committee

Computer Skills
MS PowerPoint, Project, Access

Project Experience

CSX Siding Capacity Project - Project Manager/Senior Engineer
Managing the design and construction of a 7,200-foot passing siding in Goldsboro, NC. Mr. Frederick is responsible for the site survey, environmental permitting, development of design documents, and the supervision of construction. (2007 - Present)

CSX Montgomery Sanitary Sewer Installation - Project Manager
Managing CE&I services for the micro-tunneling and installation of a 96-foot sanitary sewer beneath the CSX main line tracks in Montgomery, AL. Mr. Frederick is preparing estimates, coordinating with CSX personnel, and managing the budget. (2007 - Present)

CSX Railroad Bridge over Asbury Road Rehabilitation - Project Manager
Managing preliminary engineering reviews and development of railroad force account estimates and contract management for the rehabilitation of a single-span railroad bridge over Asbury Road at Erie International Airport in Erie, PA. Mr. Frederick is coordinating with CSX personnel and managing the budget. (2006 - Present)

CSX I-370 Bridge Widenings - Construction Manager
Managing CE&I services for the widening of dual highway bridges on I-370 over the CSX right-of-way in Derwood, MD. Mr. Frederick is preparing estimates, coordinating with CSX personnel, and managing the budget. (2006 - Present)

CSX Wireline and Pipeline Installations - Construction Manager
Managing more than 35 underground wireline and pipeline utility installations across CSX property in 23 states, some of which go under and

others parallel to the CSX right-of-way. Mr. Frederick is preparing estimates, coordinating with CSX personnel, and managing the budget. (2005 - Present)

Republic of China Ministry of Rail ITCS Signal System - Designer
Served as a member of the design management team for a state-of-the-art, GPS-based, Incremental Train Control Signaling (ITCS) system on 1,400 km of rail line between Beijing and Tibet for the Republic of China's Ministry of Rail. Mr. Frederick led a team of engineers and CAD operators in the application engineering department of GE Transportation Systems in Jacksonville, FL, to ensure on-time project completion within pre-established budgetary constraints. (2004 - 2005)

GE Transportation Systems - Former Signal Engineer
Responsible for oversight and management of the grade crossing warning system and as-in-service train control projects. This position required solid knowledge and experience in railroad signal design, inspection and installation, FRA, FHWA, and MUTCD standards, as well as a thorough understanding of the federal (ISTEA/TEA-21/SAFETEA-LU) funding programs. (2000 - 2005)

CSX Public Projects - Former Principal Engineer, Public Projects
Responsible for project management and administration of publicly funded projects, within a 11-state area including Ohio, Michigan, Indiana, Illinois, Pennsylvania, Kentucky, Tennessee, West Virginia, Virginia, Maryland, Washington, D.C., and Ontario, Canada. Mr. Frederick monitored, scheduled, and coordinated key project milestones necessary for successful implementation. His responsibilities necessitated close interaction, communication, and negotiation with state and local government authorities for review and execution of contractual agreements. The position required detailed knowledge and application of state and federal laws and regulations, as they relate to railroad operations, permitting, and associated issues. He periodically appeared as the railroad's expert witness for grade crossing accident and Public Utility Commission hearings and litigation. Mr. Frederick also functioned as the railroad's primary representative in the mediation of legal proceedings, public safety issues, and other politically-sensitive railroad-related matters. (1994 - 2000)

CSX Technology - Former Software Engineer
Managed the system and network of the company's Computer Aided Dispatching System (CADS) in Jacksonville, FL. Duties included system monitoring, performance tuning, supervision, implementation and management of software/hardware upgrades, and disaster recovery planning within a high-volume, mission-critical operation. (1992 - 1994)

CSX Technology - Former Electronic Signal Technician
Responsible for coordination and implementation of new software installations necessary to update the Computer Aided Dispatching System (CADS) in Jacksonville, FL. Duties included managing and directing field

personnel in the identification, analysis, and resolution of signal code system problems. (1988 - 1992)

CSX Technology - Former Division Signal Maintainer

Performed signal design, installation, maintenance, and electronic trouble shooting of automatic signal and grade crossing warning systems in Newark, OH. (1974 - 1988)

ROBERTO GUARDIA, P.E.

Roberto Guardia is a geotechnical engineer with Shannon & Wilson, Inc. He has 25 years of experience including the last 18 years in tunneling, microtunneling and horizontal directional drilling projects. Mr. Guardia has been involved in the construction and rehabilitation of over 150 tunnels in the US and overseas. Other areas of expertise include tunnel support, grouting, and shotcrete. He has been Resident Engineer for the enlargement of approximately 25 railroad tunnels. Mr. Guardia has served as Project Manager for the design and plans and specifications for construction, enlargement and rehabilitation of railroad, highway and conveyance tunnels. Mr. Guardia has a Master of Science Degree in Civil Engineering from the University of Illinois.

Mr. Guardia's resume is attached hereto.

Mr. Guardia is sponsoring Section III.F.4 of UP's Reply Evidence relating to geotechnical issues and tunnels. Mr. Guardia has signed a verification of the truth of the statements contained therein. A copy of that verification is attached hereto.

I declare under penalty of perjury that I have read the Reply Evidence that I have sponsored, as described in the foregoing Statement of Qualifications, and that the contents thereof are true and correct. Further, I certify that I am qualified and authorized to sponsor this testimony.

Executed on November 07, 2011

Roberto J. Guardia

Roberto J. Guardia, PE | Vice President

GEOTECHNICAL ENGINEER

EDUCATION

MS, (Geotechnical) Civil Engineering, University of Illinois, 1978
BS, Civil Engineering, University of Illinois, 1976

REGISTRATION

Professional Engineer, Washington, 26086, 1989
Professional Engineer, Oregon, 66833PE, 2001
Professional Engineer, California, C63333, 2002
Professional Engineer, Florida, 63761, 2006
Professional Engineer, Georgia, PE032289, 2007
Professional Engineer, Alabama, 30515
Professional Engineer, South Carolina, 27552
Professional Engineer, Panama, 81-006-053, 1981
Approved Examiner and Trainer for American Concrete Institute Shotcrete Nozzlemen Certification

Roberto Guardia is a geotechnical engineer with 25 years of experience including the last 18 years in tunneling, microtunneling and horizontal directional drilling projects. Roberto has been involved in the construction and rehabilitation of over 150 tunnels in the US and overseas. Other areas of expertise include tunnel support, grouting, and shotcrete. He has been Resident Engineer for the enlargement of approximately 25 railroad tunnels. Mr. Guardia has served as Project Manager for the design and plans and specifications for construction, enlargement and rehabilitation of railroad, highway and conveyance tunnels including the Elk Creek, Cape Creek and Edwards Tunnels for ODOT.

Microtunneling

1 ***King County, Henderson Combined Sewer Overflow (CSO), Seattle, Washington.*** A 1,000-foot segment of the project consisted of a 72-inch-diameter concrete pipe that was installed by microtunneling under an eight-lane section of Interstate-5 and the BNSF and Union Pacific Railroad corridor into Seattle. Three-dimensional tomography methods were utilized to identify potential obstructions. Horizontal directional drilling was used to install three 4 ½-inch high-density polyethylene (HDPE) pipes around the future tunnel to run the tomography probes. Roberto managed the exploration program, prepared a geotechnical baseline report, and plans and specifications related to the 72-inch crossing. Obstructions found during tunneling confirmed the anticipated obstructions identified by the three-dimensional tomography.

2 ***King County, Henderson Combined Sewer Overflow (CSO), Seattle, Washington.*** Roberto was Project Manager assisting Construction Management Team in reviewing geotechnical related submittals, weekly progress meetings, assessing construction methods, special inspections for shotcrete supported circular shafts and monitoring and analyzing ground behavior while tunneling under two important water mains. The 3,500-foot-long, 15-foot diameter storage tunnel was excavated with an earth pressure balance machine and supported with gasketed segmental liner. Compaction grouting was utilized for an area of excessive ground settlement and as a

precautionary measure under the main waterlines. Five microtunnels ranging from 48- to 78-inch-diameter and up to 750 feet long were part of the project connecting between shafts.

3 ***Bonneville Power Administration, Pipe Jacking, Vancouver, Washington.*** As Project Engineer, Roberto provided design and plans and specifications for the construction of a 48-inch pipe jack to replace an existing distressed concrete pipe at the Cold Creek diversion pipeline of the Bonneville Power Administration in Vancouver. The design-construct contract was structured to allow concrete, fiberglass, and steel pipe as alternates. A Data Report and a Baseline Report were provided as part of the project documents. Lateral loads were provided for the design of three shafts up to 80 feet deep connecting the three segments of the 2,250 feet long pipeline. Provided Engineer's cost estimate, submittal review, and overseeing construction activities with participation in progress meetings as required. A slurry excavation microtunneling machine and a closed shield machine were used simultaneously in different segments.

4 ***Burns & McDonnell, Lake Ft. Smith Water Supply Intake Works, Fort Smith, Arkansas.*** The water supply intake structures consisted of an intake tower built in a shaft on the shore of Lake Ft. Smith, a 1,300 feet long multi-use tunnel and outlet portal structure. The shaft and tunnel were excavated by drill and blast methods and supported by steel fiber reinforced shotcrete and rock dowels. The tunnel was lined with cast-in-place concrete and will be used for flood control discharge. There are two water supply pipes below the invert of the tunnel. Two lake taps of 72-inch-diameter and 300 feet aggregate length were excavated from the intake shaft below lake level utilizing microtunneling methods. Roberto served as Project Manager/Designer for this project preparing plans and specifications.

5 ***Cascade Water Alliance, Waterline Central Segment, Seattle, Washington*** The Cascade Water Alliance, composed by several utilities and cities of eastern Seattle are building a new 42-inch diameter waterline to meet the needs of the growing east side communities. The 10-mile long Central segment has four undercrossings that will be excavated by microtunneling methods installing 48 to 56-inch diameter casings. Obstacles include a BNSF railroad line/ Jenkins Creek, four-lane with median SR-18, Little Soos Creek and a major avenue Kent-Kangley Road. Roberto was Project Manager for the exploration consisting of eight borings and Geotechnical recommendations for the new crossings with lengths between 135 to 355 feet utilizing microtunneling methods. Slug tests in cased boreholes were conducted to estimate the groundwater inflow during dewatering of the alluvial deposits at Jenkins Creek. Both slurry pressure balanced and auger microtunneling methods were recommended. Recommendations were provided for shafts, thrust blocks and construction dewatering.

6 ***City of Seattle Duwamish River Crossing, Seattle, Washington.*** As Project Engineer, Roberto provided submittal reviews for two 80-foot-deep frozen ground shafts and 10-foot-diameter concrete pipes installed by pipe-jacking with a slurry-circulation microtunneling machine. The 540-foot-long crossing traversed saturated silts and fine sands. Participated in construction monitoring during the difficult shaft construction due to freeze-pipe complications and evaluated instrumentation including inclinometer/magnetic switch extensometers, piezometers, and thermistor strings.

7 ***City of Everett, I-5 Crossing, Everett, Washington.*** Roberto was Project Engineer for a 60-inch steel pipe jacked under I-5 near Everett. Provided construction monitoring during chemical grouting of the heading material consisting of soft organic soils and hydraulically placed fill. Performed cube compression test on grouted sand samples. The pipe was jacked with an open face shield and spoils removed with an auger.

8 ***City of Kennewick, Kennewick Treatment Plant, Kennewick, Washington.*** Roberto was Project Engineer for the design, plans, and specifications for 10-foot-diameter jacked steel pipe crossing a BNSF mainline embankment. Also provided the engineer's cost estimate and lateral pressures for the design of the reaction shoring. The 160 feet long pipe jack will be used to convey a 2-foot-diameter treated sewer line and pedestrian traffic.

9 ***BNSF, Pipe Jacking, Tacoma, Washington.*** As Project Engineer, Roberto reviewed submittals and provided partial construction monitoring for a 540-foot-long, 68-inch-diameter steel pipe jacked under a BNSF railyard in Tacoma. The tunnel was driven with a slurry microtunneling machine excavating through consolidated silts, sands, and clays with the ground water located 3 feet below the ground surface. Logs were encountered in the course of the excavation, which were crushed by the slurry machine. The project was completed without significantly disturbing the railyard tracks as verified by survey settlement points.

Tunnels

10 ***Health Ministry/ Nippon Koei, Panama, Sewer Collection Tunnel, Panama City, Panama.*** As Project Geotechnical Manager, Roberto provided Geotechnical services for the 8-kilometer 3.0-meter diameter sewer collector tunnel. The first phase of exploration included 22 deep borings up to 40 meters deep in soil and rock and a preliminary engineering report of conditions encountered and recommendations for design and tunneling machine selection. The rock samples were characterized by performing unconfined compressive strength tests, tri-axial tests, point load tests and slake durability tests. In-place permeability tests were performed at the bottom of the boreholes utilizing packer tests. The second phase included 42 deep borings to further explore difficult areas and included the preparation of tunneling specifications and a Geotechnical Baseline Report for the Design-Build project. Tunneling machine is an earth pressure balance tunneling machine and support provided with a segmental concrete lining.

11 ***Oregon Department of Transportation, In-Depth Tunnel Inspections, Oregon.*** As Project Manager, Roberto performed in-depth tunnel inspections of nine highway tunnels in Oregon and provided tunnel inspection training to their engineering and maintenance personnel. The inspection reports had detailed information regarding tunnel design and detailed tunnel maps. Tunnel portals, adjacent slopes, and tunnel drainage systems were also evaluated during the tunnel inspections. Recommendations were provided for immediate, short-term and long-term maintenance and the scope and budget of the anticipated repairs. A tunnel inspection training manual was prepared with basic tunnel design concepts, descriptions of tunnel liners, and specific tunnel inspection procedures adapted to each kind of tunnel liner. One-day and half-day long training seminars were developed for engineering and maintenance personnel respectively. The seminars included examples of liner distress for various kinds of liners, as identified during the tunnel inspections, and discussion of tunnel maintenance and rehabilitation recommendations for each tunnel.

12 ***Washington State Department of Transportation, Interstate 90 Tunnel Feasibility, Hyak, Washington.*** Roberto was Project Manager for the feasibility study and preliminary cost estimate for the 3,000-feet long, 36-foot wide roadway twin tunnels through volcanic and sedimentary rocks. Geologic reconnaissance of the portals and terrain over the tunnel alignment provided basic geologic information that was used in the preliminary rock support design. The preliminary design of the 190 foot high west portal rock cut was developed based on existing topography and existing highway constraints. An engineer's cost estimate was developed for construction of the tunnel and portals based on unit costs and estimated quantities. A geotechnical exploration

program for final design including core drilling along the alignment and portals and the use of the boring optical televiewer and a pilot bore along the tunnel alignment was developed.

13 ***Oregon Department of Transportation, Cape Creek Tunnel Rehabilitation, Florence, Oregon.*** Roberto was Project Manager for the geotechnical investigation, testing, design, plans, specifications, and construction observation for Cape Creek Tunnel Rehabilitation. The 714-foot-long tunnel built in 1933 has approximately 450 feet of timber lining that was later covered with a reinforced concrete lining. The rest of the tunnel was left unlined. Geotechnical investigations included drill probes through the concrete lining and six coreholes drilled through the arch form within the tunnel to a depth of 25 feet. The concrete linings were also tested with ground penetration radar and sonic testing to determine the strength and thickness of the lining, and to get an indication of loose rock and voids above the lining. The investigation found that a segment of the concrete lining had areas of thinner concrete and signs of distress and corrosion with high rock loading. The lining near the south portal was designed for replacement with lattice girders and shotcrete and cement grouting in the tunnel arch. The rest of the concrete linings will be backfilled with lightweight grout to fill the existing voids. The unlined areas will be supported with rock bolts and shotcrete.

14 ***Union Pacific, Clearance Improvements for Double-Stack Cars of Coos Bay Tunnels, Oregon.*** Roberto is Project Manager for the ongoing evaluation of 9 tunnels in the Coos Bay area to determine preliminary feasibility and construction costs for providing double-stack container car clearance. The condition of the tunnels was assessed and surveyed cross-sections were evaluated to determine the depth of tunnel clearance required by location. Concrete notching, complete timber set removal with new tunnel support and track lowering are under consideration to obtain the clearance improvements.

15 ***RailAmerica, Tunnel 13, Siskiyou, Oregon.*** Tunnel 13 had extensive damage due to a fire and after rehabilitation there were two segments of the tunnel that did not meet State requirements for vertical and side clearance. Roberto was Project Manager for determining the impediments by laser survey and developing the design and specifications for the tunnel clearance improvements. Existing steel sets had to be removed and replaced with new steel sets located in a new centerline. The work involved the use of steel fiber reinforced shotcrete, steel dowels and new steel sets. We also participated during construction with submittal review and construction observation on a full-time basis.

16 ***Union Pacific Railroad, Tunnel No. 2, Keddie, California.*** Roberto served as resident engineer for the mining of a collapsed tunnel in foliated schist providing additional support with spilling, grouting and shotcrete as required for the Union Pacific Railroad. A top heading excavation method was utilized in a portion of the tunnel that collapsed up to the ground surface. Liner consisted of steel sets and channel lagging backfilled with concrete.

17 ***Union Pacific Tunnel Clearance Improvements, Feather River and Fremont, California.*** Roberto served as resident engineer for notching railroad tunnels to improve clearance. Notching was performed with a roadheader mounted on a rail car. Resin encapsulated rock bolts were installed through the existing concrete liners to provide additional liner support or to replace existing rock bolts located in the notched area. Responsible for measuring air flows and toxic gases during the operation. Notching was performed in 10 tunnels located in the Feather River Canyon and one tunnel in Fremont.

18 ***Southern Pacific, Tehachapi Tunnel Clearance Improvement Project, Caliente and Tehachapi, California.*** Roberto served as resident engineer for this project. Twelve tunnels between Caliente and Tehachapi were enlarged to accommodate double-stack container trains. The work consisted of installing crown rock bolts and sidewall tiebacks, pumping cement grout behind the concrete liner to fill voids, and notching with a roadheader.

19 ***Conrail, Tunnel Enlargement, Gallitzin, Pennsylvania.*** The brick liner of the 3,600-foot-long tunnel was removed and the tunnel enlarged from a single-track to a double-track configuration. Coal mines were present over the tunnel and caused several collapses. Support consisted of rock dowels and pre-stressed rock bolts with steel-fiber-reinforced wet mix shotcrete. Provided construction management services and supervised six engineers and technicians on three shifts per day. Roberto served as Resident Engineer.

20 ***ICF-Kaiser, Berry Street Tunnel Rehabilitation and Enlargement Project, Pittsburgh, Pennsylvania.*** The project involved enlargement of a 100-year-old brick railroad tunnel and conversion to a bus tunnel, excavation of shale and sandstone, lattice girder, shotcrete and rock dowel support, and new drainage systems. Roberto collaborated in the design approach, plans and specifications, engineer's cost estimate, and Geotechnical Design Summary Report. He also reviewed contractor's value engineering proposal.

21 ***La Nacional, Loma Larga Tunnels, Monterrey, Mexico.*** Project Manager for alternate design and blasting recommendations for the construction of the tunnels. The 2,350 feet long twin highway tunnels have a semi-circular shape with a horizontal diameter of 58 feet making it a large underground cavern. Reviewed available borings and site geology and provided design for various support categories based on the RMR and Q methods. Proposed liner was of fiber-reinforced shotcrete and rock bolts in lieu of the original design of wire mesh and plain shotcrete. Further analysis of the benefits of utilizing rock bolt was conducted by numerical methods (FLAC). Provided tunnel blasting recommendations for optimizing drillhole diameter, spacing and blast sequence of the benched heading. The perimeter of the tunnel was blasted by innovative smooth blasting methods.

22 ***Wheeling & Lake Erie, Robertsville Tunnel Rehabilitation, Robertsville, Ohio.*** The 550-foot-long railroad tunnel supported by timber sets has erodible shales, which weaken the sidewalls and requires continuous ditch maintenance. Roberto served as Project Manager and provided field investigation and alternative recommendations with cost estimates followed by plans and specifications for shotcreting the sidewalls and providing shotcrete and rock bolt support to one portal and a new portal excavation.

23 ***Oregon Department of Transportation (DOT), Elk Creek Highway Tunnel, Elkton, Oregon.*** Roberto was Project Manager for the rehabilitation of the 1,150 feet long Elk Creek highway tunnel. Performed tunnel exploration by probes through wood liner and ground penetration radar methods. Accomplished geological mapping and rock mass classification of the tunnel including Schmidt rebound hammer and point load testing of the rock. Developed design of tunnel ground support for the new clearance envelope, consisting of fiber-reinforced shotcrete, rock bolts, lattice girders, and steel sets. Prepared plans and specifications for Oregon DOT for the ground support and portal structures. Included engineer's cost estimate, which was within 10 percent of successful bidder's proposal.

24 ***BNSF, Tunnel Enlargement, Martinez, California.*** As Project Manager, Roberto provided preliminary design and cost estimate for the enlargement of three tunnels in Martinez. The

concrete-lined tunnels were enlarged in 1989 for double stack clearance by performing notches that exceeded 2 feet and undercutting. The proposed notching is to achieve Chrysler car clearance. The work will involve notching with a road header and installing new resin-grouted rock bolts above and below the new notch.

25 ***Union Pacific, Clearance Improvement Program of the Donner Pass Tunnels, Sacramento, California to Reno, Nevada.*** As Project Manager, Roberto prepared plans and specifications for enlarging 25 tunnels for double stack and Chrysler car clearance. Several of the tunnels will require remining or undercutting. Prior to notching with a road header the tunnels will be grouted and reinforced with rock bolts. Construction costs were estimated in the order of $12 million.

26 ***BNSF, Ostrander Tunnel Rehabilitation, Kelso, Washington.*** The timber set and lagging supported tunnel was burned to ashes after a forest fire. The 430-foot-long tunnel built in vesicular basalt was literally cooked by the fire and had to be scaled by mechanical methods. Final support was achieved with the installation of resin-grouted rock bolts and steel fiber-reinforced shotcrete. Bidding documents were prepared in an accelerated schedule and the work was completed in 28 working days. Roberto was Project Manager.

27 ***Puget Sound Energy, Lower Baker Tunnel In-Depth Inspection, Concrete, Washington.*** The Lower Baker Tunnel has had a long history of water flows on the downstream abutment partially originating from the concrete lined tunnel. When the 22-foot-diameter tunnel is dewatered inflows are in the order of 800 gallons per minute originating in cracks and previously installed grout pipes. The tunnel was mapped indicating existing cracks, construction joints, and areas of seepage and leaks. Nondestructive testing consisting of ground penetration radar and sonic/ultrasonic methods were utilized to determine the extent of poor concrete and the location of voids in the concrete and between the concrete and rock. Probe holes drilled through the concrete liner verified and calibrated the ground penetration radar and sonic measurements. Roberto served as Project Manager for this project.

28 ***Puget Sound Energy, Lower Baker Tunnel Rehabilitation, Concrete, Washington.*** Roberto served as Project Manager for this project. Based on the results of the Lower Baker Tunnel In-Depth Inspection, a rehabilitation program was implemented consisting of cement and chemical grouting of voids behind the concrete liner and within the concrete liner. A valve attached to a steel plate anchored to the concrete was used to seal one grout pipe that was leaking approximately 300 gallons per minute. Once the flow was stopped, polyurethane grout was injected into the grout pipe successfully stopping the flow. Significant cracks were grouted through holes drilled into the liner. Other work consisted of surface repairs of cavitation areas and sealing cracks on the surface.

PUBLICATIONS

Lake Ft. Smith Microtunneling Lake Tap, Guardia, R., Winkler, K., Rasmussen, P., and Lewtas, T. Proceedings Rapid Excavation and Tunneling Conference, Seattle, June 2005.

Rehabilitation of the Cape Creek Highway Tunnel Under Traffic, Robinson, R. A., Shell, T., Guardia, R., Rodolf, S., Proceedings Rapid Excavation and Tunneling Conference, Seattle, June 2005.

Predicted versus Actual Obstructions for Two Pipe-jacked Tunnels of The Henderson CSO, Seattle, Washington, Cowles, B., Guardia, R., Robinson, R., Andrews, R., Molvik, D., Proceedings Rapid Excavation and Tunneling Conference, Seattle, June 2005.

"Conceptual Design for a Deep Underground Science and Engineering Laboratory," by H.C. Haxton, J.F. Wilkerson, R. Robinson, and R. J. Guardia, Proceedings of the Rapid Excavation and Tunneling Conference, June 2005.

Godlewski, P.M., and Guardia, R.J., 2003, Transportation Tunnel Rehabilitation *in* Rapid Excavation and Tunneling Conference, New Orleans, La., June 2003, Proceedings, New Orleans, La..

Neil, D.M., and Guardia, R.J., 2002, Tomographic Ground Imaging for the Henderson CSO Treated Tunnel Alignment, King County, Washington, Proceedings North American Tunneling, Seattle, May.

Guardia, R.J., Robinson, R.A., Godlewski, P.M., and Hultman, W.A., 2002, Reconditioning of Transportation Tunnels in the Pacific Northwest, Proceedings North American Tunneling, Seattle, May.

Parker, H.W., Godlewski, P.M., and Guardia, R.J., 2002, The Art of Tunnel Rehabilitation with Shotcrete, Shotcrete Magazine, American Shotcrete Association, Fall.

Fisk, P.S., Guardia, R.J., and Porter, W.D., 2002, Lower Baker Tunnel Investigation and Repairs, Proceedings North American Tunneling, Seattle, May.

Robertson, C.A., Guardia, R.J., Robinson, R.A., and Rustvold, J.W., 2001, Bonneville Power Administration Cold Creek Pipeline Replacement, Proceedings Rapid Excavation and Tunneling Conference, San Diego, June.

Parker, H.W., Robinson, R.A., Godlewski, P.M., Hultman, W.A., and Guardia, R.J., 2001, Tunnel Rehabilitation in North America, Proceedings International Tunneling Association World Tunnel Congress, Milan, June.

Guardia, R.J., Robertson, R.A., and Laird, J.R., 2000, Tunnel Inspection Manual, prepared for Oregon Department of Transportation, June, 96 p.

PROFESSIONAL ASSOCIATIONS

American Society of Civil Engineers
American Shotcrete Association; Individual Member
American Railway Engineering and Maintenance of Way Association; Associate Member

DAVID J. HUGHES

David J. Hughes has over 30 years of experience as a professional engineer in the fields of railroad engineering, railroad operations, and maintenance supervision. He has substantial experience with small regional freight railroads, as well as larger railroads, and is especially well qualified to assess the MOW workload and resource requirements of IRR.

Mr. Hughes has experience with a broad range of railroads. From 1967 to 1975, he held numerous positions in the Engineering Department of Southern Pacific Railroad, including as a General Track Foreman in Utah. In this position, he inspected track for defects and either personally made repairs or scheduled the repairs by a maintenance gang. He also supervised the work of section gangs, smoothing gangs, and welders. In addition, Mr. Hughes served as Bridge and Building Supervisor in Houston, Texas. In that position, he was personally responsible for performing annual bridge inspections and prioritizing bridge maintenance. He was also responsible for equipment maintenance facilities and other railroad facilities in the Houston Terminal. Both of these positions provided Mr. Hughes with hands on knowledge of what is required to maintain track and structures in the field.

From 1975 through 1980, Mr. Hughes was Vice President of Engineering for the Boston and Maine Railroad ("B&M"), where he was responsible for all track structures and signal systems maintenance, and for planning the reconfiguration and reconstruction of 155 route miles of mainline. B&M's size and traffic density were similar to those of IRR.[1] As B&M was in bankruptcy reorganization when Mr. Hughes was chief engineer, he gained valuable experience in effectively maintaining track and structures at the lowest possible cost.

[1] B&M was sold to Guilford Transportation Industries in 1981.

From 1980 through 1985, Mr. Hughes was President of Pandrol, Inc. (a manufacturer of track fastening systems) and Speno Rail Services (a railroad track maintenance contractor), where he assisted railroads in developing high-performance track components and mechanized rail and ballast maintenance practices. In those positions, he spent extensive time in the field observing maintenance problems first hand and devising solutions to those problems.

From 1985 through 1991, Mr. Hughes was President of the Bangor & Aroostook Railroad, a 430-mile regional railroad in the northeastern United States. From 2001 to 2005, he was Chief Engineer for the National Railway Passenger Corporation ("Amtrak"), where he was responsible for maintenance and construction of track, structures, signal and electrical systems on one of the most complex railroad infrastructures in the Americas. This position gave him a deep understanding of the most sophisticated railroad track, signal, and electrical technologies. From 2005 through 2006, Mr. Hughes was Acting President and Chief Executive Officer of Amtrak.

As co-founder and first chairman of Regional Railroads of America, Mr. Hughes testified before Congress on several occasions about the capital and maintenance requirements of small railroads. He has had frequent discussions with leaders of the small railroad industry about their techniques for operating railroads profitably. Furthermore, as a consultant, Mr. Hughes has performed due diligence reviews of dozens of MOW plans for lines being spun off by Class I railroads or of lines being bought or sold by private parties. These due diligence studies generally involved hi-rail inspection trips over lines and interviews with MOW officials regarding their MOW maintenance organizations and plans for maintaining the lines. Through the due diligence reviews, Mr. Hughes gained extensive familiarity with the MOW practices of non-union railroads. These reviews, performed for financial institutions and borrowers, are an ongoing part of his practice, allowing him to keep up to date with the most recent MOW practices. Mr. Hughes' consulting work has allowed him to understand how MOW practices have evolved over the past 30 years and has placed him in an excellent position to contrast the MOW practices of different railroads.

Mr. Hughes has a long history of participation in professional engineering organizations and keeps those contacts current. He has been a director and member of the board of governors of the American Railway Engineering and Maintenance Association, a director of the Engineering Division of the Association of American Railroads ("AAR"), and president of the Transportation Research Forum of New England. He has served on the AAR committee prioritizing new research investments and has attended several annual meetings of the International Heavy Haul Association. He has been a frequent visitor to the Facility for Accelerated Service Testing in Pueblo, Colorado, where he followed the performance of various track components under heavy haul conditions.

During his career, Mr. Hughes has worked with more than 35 railroads in 25 countries – including short line railroads in the United States – to improve operating efficiency, evaluate operations and maintenance costs, and optimize capital spending. His knowledge of MOW practices is fresh, broad, and deep, and he is well-acquainted with maintenance activities on lines with size and traffic density similar to what IPA proposes for IRR. Thus, Mr. Hughes is well-positioned and highly qualified to evaluate IPA's MOW evidence and the maintenance requirements for the IRR lines. His testimony addresses the reasonableness of IPA's MOW assumptions and the need to consider real-world evidence in evaluating IPA's MOW plan.

Mr. Hughes sponsors evidence relating to MOW costs set forth in Section III.D.4. Mr. Hughes has signed a verification of the truth of the statements contained herein. A copy of that verification is attached hereto.

VERIFICATION

I declare under penalty of perjury that I have read the Reply Evidence in this proceeding that I have sponsored, as described in the foregoing Statement of Qualifications, and that the contents thereof are true and correct. Further, I certify that I am qualified and authorized to sponsor this testimony.

David J. Hughes

Executed on November 8, 2011

DAVID A. MAGISTRO, P.E.

David A. Magistro is a Senior Engineer/Project Manager for STV Incorporated at 6405 Metcalf, Suite 516, Overland Park, KS 66202. He has more than ten years of experience focused on movable bridge construction and rehabilitation for numerous private railroad and public transportation agency clients. He is knowledgeable about all components of railroad bridges, including superstructure design, substructure design and bridge construction.

Mr. Magistro was the bridge design team leader for BNSF's double tracking project through Abo Canyon in New Mexico, which included design for 9 major bridges, T-Wall retaining walls and several culverts. He has also provided strategic planning on more long-term projects, such as the delicate conversion of a historic swing-span bridge in Swanton, VT, from manual to mechanical operation. Mr. Magistro's project team successfully incorporated an electric-powered system for New England Central Railroad without altering the appearance or function of the bridge.

Mr. Magistro has a Bachelor of Science degree in Civil Engineering from Kansas State University.

Mr. Magistro's resume is attached hereto.

Mr. Magistro is sponsoring Section III.F.5 of UP's Reply Evidence relating to bridges. Mr. Magistro has signed a verification of the truth of the statements contained therein. A copy of that verification is attached hereto.

I declare under penalty of perjury that I have read the Reply Evidence that I have sponsored, as described in the foregoing Statement of Qualifications, and that the contents thereof are true and correct. Further, I certify that I am qualified and authorized to sponsor this testimony.

Executed on November 07, 2011

David A. Magistro, P.E.

Senior Engineer/Project Manager

Mr. Magistro has more than 10 years of experience focused on movable bridge construction and rehabilitation for numerous private railroad and public transportation agency clients. Regarded as a versatile and responsive professional, he is knowledgeable about all components of movable bridges, including the structural steel, drive systems, motors, shafts, and bearings. Mr. Magistro's design of emergency repairs to the structural and mechanical systems on the 3,750-foot, double swing-span Coleman Bridge between Yorktown and Gloucester Point, VA, helped the Virginia Department of Transportation (VDOT) quickly restore service to this important toll crossing after a tug boat collision. He has also provided strategic planning on more long-term projects, such as the delicate conversion of a historic swing-span bridge in Swanton, VT, from manual to mechanical operation. Mr. Magistro's project team successfully incorporated an electric-powered system for New England Central Railroad without altering the appearance or function of the bridge.

Employee No.
04910

Department No.
53

Office Location
Overland Park, KS

Date joined firm
3/30/09

Years with other firms
11

Education
Bachelor of Science, Civil Engineering; Kansas State University (1998)

Professional Registrations
Professional Engineer: Missouri (2003/#2003001064/exp. 12/31/11), Kansas (2009/# 20754/exp. 4/30/13), Oklahoma (2009/#24155/exp. 8/31/12)

Memberships
American Railway Engineering and Maintenance-of-Way Association (AREMA) (2005 - Present)

Heavy Movable Structures (HMS) Registrar (2001 - 2010), Treasurer (2010-Present)

Project Experience

ODOT Robinson Street Grade Crossing - Project Manager
Managing the construction of a detour for rail and vehicular traffic that will be used during construction of a permanent Burlington Northern Santa Fe (BNSF) Railroad grade separation at Robinson Street in Norman, OK. This railroad corridor receives heavy freight traffic and is also an Amtrak corridor. STV's shoofly design will permit rail and roadway traffic to continue during construction. In addition, the firm is assisting the contractor with the design of shoring for the permanent bridge structure. (3/10 - Present)

UPRR Oklahoma City I-40 - Project Engineer
Reviewed project plans for the realignment of train tracks along this highway corridor in Oklahoma City. Mr. Magistro reviewed the overhead structures and foundation configuration at each grade separation to determine if the arrangements, clearances, and structural designs met American Railway Engineering and Maintenance-of-Way Association (AREMA) and Union Pacific Railroad (UPRR) requirements. He provided reviews through the duration of the project and interacted with UPRR, the Oklahoma Department of Transportation, utility owners, and construction contractors. (6/09 - 9/10)

New England Central Railroad Bridge 15.21 Modification - Project Engineer
Provided mechanical and structural design services for the conversion of a swing-span bridge from manual to mechanical operation in Swanton, VT. The bridge, which had been operated manually using a capstan, is protected as a state historic resource. The project team successfully incorporated the electric-powered system without altering the appearance or function of the bridge. (5/09 - 10/10)

VDOT Coleman Bridge Cable Replacement - Project Engineer
Designed emergency repairs to the structural and mechanical systems on this 3,750-foot, double swing-span bridge that crosses the York River between Yorktown and Gloucester Point, VA. A tug boat struck the bridge and damaged several cables. Mr. Magistro's work enabled VDOT to restore service to this important toll crossing, which carries the 4-lane U.S. 117 and connects the Peninsula and Middle Peninsula areas of Virginia's Tidewater region. (10/09 - 6/10)

South Central Florida Express Moore Haven Bridge Rehabilitation - Project Engineer
Prepared design plans for new mechanical equipment on this swing-span railroad bridge in Moore Haven, FL, which remained in operation during construction. Engineers completed the transition between the old and new system in a week without causing interruptions to train service. (5/10 - 9/10)

BNSF Bridge 231.4 Structural Inspection, Load Rating, and Structural Repairs - Project Manager/Field Inspector/Design Engineer
Responsible for the comprehensive structural inspection and load rating of the floor system for the roadway portions of this double-deck structure over the Mississippi River in Fort Madison, IA, for the Burlington Northern Santa Fe (BNSF) Railroad. The inspection and load rating was followed by a phase of structural repairs. Mr. Magistro was responsible for the design and construction sequencing of the structural steel repairs for an approach span through plate girders and floor system components, including stringers and floorbeams. (6/08 - 3/09)

Norfolk Southern Bridge 6.66 Rehabilitation - Design Engineer
Managed the structural design for the replacement of curved segments on the rolling girders of this double-track rolling bascule span over the South Branch Elizabeth River in Gilmerton, VA. The project included structural design and detailing, plan production, construction specifications, construction sequencing and contractor coordination. (5/07 - 1/09)

BNSF Bridges 5.8, 6.2, and 6.7 Structural Inspection, Load Rating and Structural Repairs - Project Manager/Field Inspector
Directed the comprehensive inspection and load rating analysis of these three structures over north Willamette Boulevard, north Lombard Street, and north Fessenden Street in Portland, OR. All three structures consist of a combination of deck plate girder spans and deck truss spans resting on either structural steel towers or concrete piers. Mr. Magistro also managed the follow-up project to design structural retrofits to increase the load capacity of these structures. (1/08 - 12/08)

BNSF Bridge 117.35 Electrical/Mechanical Rehabilitation - Project Manager

Responsible for the replacement of the drive system on this span drive vertical lift bridge over the Illinois River in Beardstown, IL. The project included replacing the existing central reducer, drive motors, auxiliary drive system, shafts, bearings, and couplings. (9/07 - 11/08)

Canadian Pacific Rail Bridge 283.27 Bearing Repair and Truss Jacking - Project Manager/Design Engineer
Responsible for design and detailing of jacking frames used to longitudinally jack two approach spans through trusses adjacent to this 360-foot swing span over the Mississippi River in La Crosse, WI. The project included construction sequencing and field assistance during construction. (5/07 - 12/07)

VDOT I-264 Berkley Bridge Rehabilitation - Design Engineer
Participated in the rehabilitation of a 4-leaf bascule bridge over the New Elizabeth River in Norfolk, VA, for VDOT. The project consisted of design and integration of a new drive system and machinery on top of an existing system of equipment and machinery. The design includes two complete designs to accommodate the original 2-leaf bascule built in 1950 and the second bascule pair built in 1992. Mr. Magistro's responsibilities included design of the new mechanical equipment, as well as structural retrofits required for installation of the new equipment. (6/06 - 9/07)

BNSF Abo Canyon Double Track Capacity Design Project - Lead Bridge Engineer
Responsible for bridge layouts, design, quantity calculations and cost estimates for nine bridge structures along a 5-mile stretch of second mainline track for the Burlington Northern Santa Fe (BNSF) Railroad through Abo Canyon, NM. (10/04 - 3/06)

BNSF Bridge 0.80 Emergency Stringer Replacement - Project Manager/Design Engineer
Supervised the emergency replacement of eight stringers in the movable span floor system of this 450-foot swing span over the Missouri River in Kansas City, MO. The scope of the project also included shop inspection during fabrication of the fracture critical stringers. (8/04 - 10/04)

Canadian Pacific Rail Bridge 283.27 Span Alignment Lock Design - Project Manager
Led the design and detailing of a new span alignment and span locking device for this 360-foot swing span over the Mississippi River in La Crosse, WI. The project included structural modifications to the approach span where the new device was located. (12/03 - 10/04)

BNSF Bridge 37.0 Fender Replacement - Project Manager/Design Engineer
Oversaw design and detailing of a new fender system for the 260-foot swing span over the Snohomish River in Everett, WA. (5/03 - 4/04)

BNSF Bridge 14.2 Pier Rehabilitation - Project Engineer

Assisted in development and design of rehabilitation details for the rest pier, bridge bearings, lift tower structural support steel, and end floorbeam top flange replacement for this bridge located near Steilacoom, WA. The rest pier was rehabilitated and the live load bearing was replaced while maintaining both rail and navigation traffic. (3/02 - 11/03)

BNSF Richmond Turntable Rehabilitation - Project Engineer
Responsible for design of the new mechanical components in the rehabilitation of this 110-foot turntable structure in Richmond, CA. The project included design and details for new end trucks, new enclosed gear reducer to replace open gear set, new shafts and bearings, and new structural supports. (8/02 - 5/03)

EJE Railway Bridge 728 Rehabilitation - Design Engineer
Responsible for the mechanical rehabilitation of this Scherzer single-leaf rolling bascule span over the East Chicago Canal in Gary, IN, for Elgin, Joliet and Eastern (EJE) Railway. The project included replacement of the drive motor and central reducer, and all associated shafts, bearings, and couplings; installation of a new auxiliary motor and clutch; and upgrade of the control system. Mr. Magistro was also responsible for the design of the structural support system rehabilitation for new mechanical components, and construction sequencing and field assistance during construction. (4/01 - 5/03)

CSX Transportation Bridge L653.4 Span Replacement - Project Engineer
Participated in the inspection to evaluate the existing condition of the movable span for purposes of the United States Coast Guard Cost Apportionment. Mr. Magistro was responsible for the new bridge deck details, including timber ties, steel ties, and rail joints for this on-line swing span replacement with a new 360-foot vertical lift span over the Mobile River near Hurricane, AL. (5/00 - 2/03)

Elgin, Joliet and Eastern Railway Bridge 198 Inspection and Rehabilitation - Design Engineer
Led the mechanical rehabilitation of this skewed 306-foot-long tower drive vertical lift bridge over the Des Plaines River in Joliet, IL. This Elgin, Joliet and Eastern (EJE) Railway project included the replacement of an open gear set with an enclosed gear reducer, as well as the replacement of all impacted shafts, pinions, bearings, and couplings. Mr. Magistro was also responsible for the design of new mechanical system components, construction sequence, and field assistance during construction. (5/01 - 11/02)

BNSF Bridge 1136.3 Rail Joint Replacement - Design Engineer
Responsible for the replacement of the rail joints on this Abbott Style single-leaf bascule bridge over the Old River in Orwood, CA. The project also involved installation of steel ties under the new joints, replacement of one approach span, and rehabilitation of the span lock. Mr. Magistro's responsibilities also included engineering design, plan production, and field assistance during construction. (5/00 - 4/01)

THOMAS MURPHY

Thomas Murphy is a rail transportation consultant with 44 years of experience in rail industry operations. He began his career with the Milwaukee Railroad in 1967. In 1975, he was promoted to trainmaster. In 1979, Mr. Murphy joined the Chicago & North Western Railway Company ("CNW"), where he held various positions, including General Manager of the Transportation Center in Chicago. In that position, he was responsible for the safe and efficient dispatching of trains, locomotives, and crews for the CNW system, served as the point of contact for all interchange railroads on the system, and directed activities on CNW's line into the Powder River Basin.

Following the 1996 merger of CNW with UP, Mr. Murphy worked with the merger team to combine the CNW dispatching center into the Harriman Dispatch Center in Omaha, Nebraska. In 1996, he became General Superintendent of UP's Central Region, with responsibility for safety, transportation, and budget for the UP territories from St. Louis, Missouri, to Texarkana, Texas, and Kansas City, Missouri, to Yuma, California. In 1998, Mr. Murphy was promoted to General Manager of the Harriman Dispatch Center. In addition to managing the Harriman Center, his responsibilities in this position included the acquisition of locomotives, short-term lease of locomotives, and balancing of horsepower hours between UP and other Class I railroads.

In 1999, Mr. Murphy was promoted to Assistant Vice President of Operations for UP's Western Region, with responsibility for safety, transportation, dispatching, and budget for the region. The Western Region covered nine states, from Kansas to California, and to Idaho and Nevada. Mr. Murphy retired from UP in 2009.

Based on his experience described above, Mr. Murphy is familiar with the configuration and operating characteristics of the UP lines replicated for purposes of IPA's SARR, as well as with rail operations more generally. Mr. Murphy sponsors evidence relating to the IRR system and rail operations set forth in Sections III.B and III.C of the Reply Evidence above. Mr. Murphy has signed a verification of the truth of the statements contained herein. A copy of that verification is attached hereto.

VERIFICATION

I declare under penalty of perjury that I have read the Reply Evidence in this proceeding that I have sponsored, as described in the foregoing Statement of Qualifications, and that the contents thereof are true and correct. Further, I certify that I am qualified and authorized to sponsor this testimony.

Thomas Murphy

Executed on November 7, 2011

MARK PETERSON

Mark Peterson is a Vice President with STV Incorporated at 1055 West Seventh Street, Suite 3150, Los Angeles, CA 90017. He brings over 25 years of extensive experience in the design and construction management of transportation architecture. He brings a high degree of knowledge and experience in the resolution of challenging design and construction processes within operational facilities and structures. Most recently Mr. Peterson has functioned as the project architect on numerous highly technical projects for light rail, commuter rail, and passenger rail as well as Class I railroads. Mr. Peterson is sensitive to the specific needs of his clients, working closely with them to set appropriate project direction in order to achieve design goals. Mr. Peterson has a Bachelor of Arts Degree in Architecture from Washington University.

Mr. Peterson's resume is attached.

Mr. Peterson is sponsoring Section III.F.7 of UP's Reply Evidence relating to buildings and facilities. Mr. Peterson has signed a verification of the truth of the statements contained therein. A copy of that verification is attached hereto.

I declare under penalty of perjury that I have read the Reply Evidence that I have sponsored, as described in the foregoing Statement of Qualifications, and that the contents thereof are true and correct. Further, I certify that I am qualified and authorized to sponsor this testimony.

Executed on November 7, 2011 ____________________________

Mark A. Peterson, AIA

Vice President

Mark Peterson brings over 25 years of extensive experience in the design and construction management of transportation architecture. He brings a high degree of knowledge and experience in the resolution of challenging design and construction processes within operational facilities and structures. Most recently Mr. Peterson has functioned as the project architect on numerous highly technical projects for light rail, commuter rail, and passenger rail as well as Class I railroads. A Vice President of the firm, Mr. Peterson is sensitive to the specific needs of his clients, working closely with them to set appropriate project direction in order to achieve design goals.

Firm
STV

Education
Bachelor of Arts, Architecture; Washington University

Professional Registrations
Architect: California (1994/#C25229/exp. 5/31/11)

Memberships
American Institute of Architects (AIA), Los Angeles Chapter

Project Experience

MULTIMODAL

Downtown Ottawa Light Rail Transit System – Facilities Lead
Leading the design and specification effort for the vehicle maintenance facility and yard and back-up dispatch center for the initial build out of 12.5 kilometers of new light rail serving the City of Ottawa, Ontario, Canada. Mr. Peterson is directing a diverse team of consultants to develop a 10 acre campus for the maintenance and dispatch of the initial fleet of 120 LRVs. In addition to maintaining the vehicles for the initial build out the facility will ultimate expand to serve the heavy repair needs of up to 200 LRVs. The site development includes a Maintenance of Equipment building serving the progressive, warrantee, unscheduled and heavy maintenance requirements, as well as daily service and inspection requirements. Also included are an enclosed LRT storage yard, maintenance of way facilities and dispatching of operating crews. This component of he project will be constructed to LEED® "Certified" standards. System valuation is $2.1 billion Canadian, the maintenance facilities are estimated to cost approximately $70 million.

IV-83

BNSF Railway Intermodal Facility Expansions – Project Manager
Led design for numerous rail and building projects associated with a $150 million expansion of the world's largest intermodal facility in Los Angeles. One project was the complete redesign of secure parking facilities, which included security systems; gate reconfiguration; and supporting administrative, repair, and mechanical structures. Mr. Peterson helped develop a complete master plan corresponding to the rolling 5-year goals of the Burlington Northern Santa Fe (BNSF) Railway. He was responsible for the programming and design of a new 2,800 m^2 operations and administrative command center serving the nearly 500 employees and contractors at the Los Angeles facility as well as a new, secure communications hub built to emergency services standards in Stockton, CA, to provide connectivity between operations centers

in Los Angeles, Fort Worth, TX, and Northern California. Mr. Peterson assumed a similar design role for the BNSF Memphis Intermodal Yard Expansion, which is one of the first in the nation to employ European wide-span crane technology.

BNSF Memphis Intermodal Facility – Project Manager
Project Architect responsible for the administration and direction of facilities planning and design, including initial programming gate traffic analysis, and site development plans. Facilities included Hostler Maintenance and Crew Facilities, BNSF Operations Center, Electric Crane Repair building, Gate Administration Building and AGS, communications center, and other ancillary support structures. This facility was one of two intermodal yards that were the first on the BNSF system to employee wide-span cranes.

BNSF Commerce Intermodal Facility – Project Manager
Project manager and architect in charge of design of the conversion of an automotive transfer yard to an intermodal facility in Commerce , California. Project challenges included pavement rehabilitation, site circulation, and phasing of construction.

BNSF Southern California Logistics Intermodal Yard – Project Manager
Project architect and planner for preliminary design of BNSF Southern California Logistics Intermodal Yard, Victorville, California. Facility is proposed to reduce trucking from the Ports of Long Beach and Los Angeles by providing an inland option for intermodal train make up and load centering operations The yard would serve as a key component of an intermodal center that serves the BNSF, Southern California Logistics Airport, and truck distribution to the High Desert region of Southern California.

UPRR Salt Lake City Intermodal Facility – Project Manager
Project architect for the design of and contract administration for the facilities of this new intermodal yard completed in 2007. Facilities included UPRR Crew Facility, Hostler Maintenance and Crew Facilities, UPRR Operations Center, Crane Repair building, Gate Administration Building and AGS, communications center, and other ancillary support structures. Although the yard is located on a green field site, a series of privately owned irrigation canals created design challenges not the least of which was addressing yard security.

UPRR LATC Operations & Crew Facility – Project Manager
Project architect for the design of and contract administration for a new welfare facility at the UPRR's container yard near downtown Los Angeles. The 800 square meter structure serves as the yard office and provides welfare facilities for yard personnel and security agents. The project scope also include the demolition of a large warehouse and the replacement of site lighting and new pavement. Brownfield site conditions required specialize pretreatment of rain water.

POLA/BNSF Railway SCIG – Facilities Design Manager
Worked with the Port of Los Angeles (POLA) and the Burlington Northern Santa Fe (BNSF) Railway as Project manager, architect, and planner to design a new intermodal facility, the Southern California International Gateway (SCIG), on a sustainable design basis in Los Angeles. The SCIG will provide much-needed near-dock capacity with direct access to the Alameda Corridor, a 32 km grade-separated rail line between the ports and downtown Los Angeles. The design, which progressed to the Environmental Impact Report (EIR) process and is presently awaiting approval, is based upon minimizing the environmental footprint and employs highly efficient wide-span cranes capable of serving up to eight intermodal tracks. The cranes are electric and use cogeneration of power in their operation. All hostling equipment will utilize either compressed natural gas (CNG) or liquefied natural gas (LNG) to reduce emissions. All yard lighting is designed to virtually eliminate light trespass and utilizes highly efficient lamps. Yard operations are designed to provide the utmost in efficiency and further reduce hostling operations and third-party truck dwell time. This efficiency also reduced the overall area of impact for stormwater management.

City of Galveston Intermodal Yard Planning – Design Consultant
Provided consulting services for independent review of a proposed intermodal rail yard and big box distribution development for the City of Galveston Texas. Mr. Peterson provided alternate facility layouts that improved the interface with Port operations, addressed community concerns related to noise and light trespass, impacts to future development, and traffic impacts. The studies also provided track layouts that mitigated impacts to roadways at grade crossings.

LACSD Trash-to-Train Master Planning Intermodal Yard, Mesquite & Puente Hills, California – Project Manager
Architect in charge of initial planning of terminal facilities for LA County Sanitation Districts' trash to train operations slated for start-up in 2010. Design is presently approaching 90% completion level. Planning included brown-field development on Puente Hills site and a revised yard concept to meet reduced budget constraints for the Mesquite yard. Effort included programming for operations, personnel, and equipment.

TRANSPORTATION FACILITIES

POLA PHL Office & Maintenance Facilities - Project Manager
Managing the design of a 730 m^2 office building and an 760 m^2 maintenance facility to accommodate the Pacific Harbor Line (PHL) for the Port of Los Angeles (POLA). The office building is registered under the Leadership in Energy and Environmental Design (LEED®) Green Building Rating System and is pursuing Gold certification. Design features draw from a broad range of LEED concepts and project-specific design innovations such as recycling and reusing industrial water from locomotive maintenance and other processes on the site. The office building design incorporates natural

ventilation; controlled daylighting; locally sourced, high-recycled-content materials; and photovoltaic panels. Mr. Peterson is working with POLA to analyze a cogeneration process using natural gas captured from the site (a former oil field). While both buildings promote environmental stewardship, they employ practical solutions with durability and maintainability as a central tenant for design. Due to uncertainty in the economy, the project has been put on-hold several times, after which Mr. Peterson has successfully regrouped the project team and gotten them back up to speed. As a result, the team has met all submittal deadlines in a timely and material fashion.

KCS Locomotive Service Facility, Jackson, MS - Project Manager
Architect in charge of preliminary design of two bay locomotive service facility for Kansas City Southern Railway. Facility will service four Dash 9 locomotives on the primary track and up to three more on a third track which is dedicated to wheel truing and drop table operations.

SCRRA On-Call Engineering Design Services - Project Manager
Directed the consolidation of several Southern California Regional Rail Authority (SCRRA)/Metrolink properties into a single campus in Pomona, CA. The campus is comprised of a 6,000 m^2 maintenance support facility and a 2,600 m^2 train control center, which houses a modified Metrolink operations center that remained online during the project as a back-up to the new facility. The train control center (TCC) required a conditional use permit (CUP) as the site was surrounded by medical offices, senior housing, and a railroad right-of-way. Upon approval at a public hearing, the project was praised by the City of Pomona Planning Commission as a "very attractive" building that will be an asset to the community. The TCC was constructed according to the strict standards of California's essential services building regulations and includes a dispatch center and a significant data center. The TCC provided several modes of wireless communications including a microwave array and two cellular towers. The design team secured environmental clearances for the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). This project includes positive train control systems, which are mandated to be installed on all railroads in California by 2015.

SJRRC Equipment Storage & Maintenance Facility - Project Manager
Oversaw the design of a new service and inspection facility in Stockton, CA, for the San Joaquin Regional Rail Commission (SJRRC) Altamont Commuter Express commuter rail service. Mr. Peterson managed a team of approximately 100 people, including various subconsultants. The project is the first vehicle maintenance shop of its type pursuing Leadership in Energy and Environmental Design (LEED®) certification and includes a 10,000 m^2 shop with areas for maintenance, wheel truing, fueling, service, and inspection; 1,200 m^2 of office and welfare areas; and a 170 m^2 trainwasher. The project site is bordered to the north by a residential community. STV worked though out the development of the project to mitigate the massiveness of the facility through design, working closely with the City of Stockton and the neighboring community. The industrial nature of the facility, which services diesel locomotives, made it an unusual LEED

candidate, and many sustainable design techniques being considered conflicted with building codes. Despite these challenges, Mr. Peterson proposed several sustainable techniques including water reclamation from industrial processes for reuse in pressure washers and as grey water in toilets, and strategies that use automatic processes to minimize energy consumption. One such process uses air quality monitors to control exhaust fans to run as-needed. Other sustainable strategies include photovoltaic panels, rainwater harvesting for irrigation, and drought tolerant plants. Mr. Peterson suggested significant design changes to the client that would have netted cost savings, had they been adopted. This LEED-registered project is pursuing Silver certification.

UPRR Roseville Warehouse Expansion - Project Manager
Project architect for the design of and contract administration for the expansion of UPRR's Roseville Yard warehouse. Project expanded the warehouse and provided a truck dock. Project challenges included location of existing utilities, poor stormwater drainage, soils contamination and buried/abandoned roundhouse pits and foundations.

UPRR Oxnard MOW Facility - Project Manager
Project architect for the design of a replacement maintenance of way facility that was required to replace an existing facility that was given to the City for development of a transit intermodal center in Oxnard California. Mr. Peterson worked closely with the UPRR's engineer and the City of Oxnard to develop a facility that was in keeping with the municipal design requirements and approval process.

UPRR Martinez Yard Office - Project Manager
Project architect for the design of and contract administration for a modular yard office for the UPRR yard in Martinez, California. The office and yard are located in a FEMA flood plain which required specialized foundations and wetlands approvals due to its proximity to a wildlife reserve.

IV-87

Amtrak Seattle Interim Improvement - Project Manager
Managed the modification of track configurations in a Seattle rail maintenance facility in response to a mainline shift by the Burlington Northern Santa Fe (BNSF) Railway Company and to improve storage. This shift also required modifications to the existing drop table and drop table building. Mr. Peterson faced challenges including stormwater management in commingled systems and phasing of work to complement the larger build-out anticipated in future phases. The project was constructed using a highly successful design-build team approach.

Amtrak Southampton Drop Table Study - Project Manager
Oversaw the design of several studies to add a new drop table and progressive maintenance track as an addition to a maintenance facility serving the northern terminus of Amtrak's Acela service in Boston. The project posed several challenges, including a severely constrained site, a high water table, and differential settlement issues. Mr. Peterson helped develop innovative foundation concepts to minimize construction impacts to yard operations and

capacity. To address the storage shortage on the site, the team developed a design scheme for storing full locomotive truck sets on a mezzanine level created in the drop pit. The project also required a comprehensive fire response and suppression system plan with the Boston Fire Department. There was no existing fire plan prior to the study and the department initially wanted a fire access road constructed adjacent to the facility. Through Mr. Peterson's coordination efforts and the assistance of a property risk management consultant, the fire department agreed to a standpipe system. The standpipe was a much safer solution, considering the extensive catenary system, and created minimal impact to yard operations compared to the fire access road originally requested.

Amtrak Passenger Platform Expansion - Project Manager
Worked with Amtrak, the Burlington Northern Santa Fe (BNSF) Railway, and the City of Hanford to develop an 245 m second passenger platform to support a second mainline in Hanford, CA. Platform and shelter designs reflected the historic context of the Hanford Depot and interfaced with the city's adjacent intermodal transit facilities. The 7^{th} Street at-grade crossing and pedestrian safety were major forces in the design solution.

NCTD Fallbrook Junction MOW Facility - Project Manager
Oversaw preliminary design and pricing for the replacement of the North County Transit District (NCTD) maintenance-of-way (MOW) building and yard north of Oceanside, CA. The study looked at several sites to satisfy environmental impact requirements and ultimately was developed to conform to a specific site. The facility included four vehicle bays, welfare facilities for business operations and employees, a partially covered spur track, and parking and material laydown areas.

Caltrans/Amtrak National City Car Service Facility & Passenger Platform - Project Manager
Oversaw the design of a new service and inspection facility for Amtrak trains at a layover storage yard in National City, CA. The facility includes a 2-track inspection service and fueling facility designed for joint use with Burlington Northern Santa Fe (BNSF) Railway. On-site improvements also included storage for six trainsets and a train wash, administrative shop, and storage building. The project also entailed the design of a new passenger platform and trans-load dock, as well as tem kilometers of track improvements through downtown San Diego. Complexities of this project included the number of rail lines servicing the area as well as working with the City of National City to get the facility to conform with their vision of growth for the community.

ROBERT C. PHILLIPS, P.E.

Robert C. Phillips serves as Vice President of the Rail Division at STV Incorporated, an Engineering Consulting Firm with offices located at 1000 West Morehead, Suite 200, Charlotte, NC 28208. He is responsible for overseeing and directing STV's commuter and freight rail planning and engineering projects. He has more than 30 years of experience with track design and maintenance, grade crossings, bridge construction, signal and communication systems, maintenance and protection of traffic, and the installation of fiber-optic cable within railroad rights-of-way. Mr. Phillips worked for Norfolk Southern Railway in various capacities for 12 years, during which he gained operating experience in engineering, track maintenance, and train operations. His responsibilities included supervising and training train crews, ensuring operating rules compliance, and investigating accidents and injuries.

Mr. Phillips led a team of project managers, senior engineers, and other railroad consultants in assembling the planning, engineering, and construction costs to build a hypothetical contemporary operating railroad in Charlotte, NC, as part of a cost assessment for a several coal rate cases. Cost assessments included major earthwork, bridge and culvert construction, track, communications and signalization, engineering design, construction management, material costs and logistics, mobilization, and contingencies. Cases included *Duke/CSXT*, *CP&L*, *Seminole v. CSXT*, *AEPCO*, *Otter Tail*, and *AEP Texas North*.

Mr. Phillips holds a Master of Business Administration from Averett College and a Bachelor of Science degree in civil engineering from Virginia Polytechnic Institute. He joined STV in 1994.

Mr. Phillips' resume is attached hereto.

Mr. Phillips is sponsoring Section III.F.2 through III.F.12 of UP's Reply Evidence. Mr.

Phillips has signed a verification of the truth of the statements contained therein. A copy of that verification is attached hereto.

I declare under penalty of perjury that I have read the Reply Evidence that I have sponsored, as described in the foregoing Statement of Qualifications, and that the contents thereof are true and correct. Further, I certify that I am qualified and authorized to sponsor this testimony.

Executed on November 7th, 2011

[signature]

Robert C. Phillips, P.E.

Vice President/Project Manager

Mr. Phillips, Vice President of the Rail Division, is responsible for overseeing and directing STV's commuter and freight rail planning and engineering projects. He has more than 30 years of experience with track design and maintenance, grade crossings, bridge construction, signal and communication systems, maintenance and protection of traffic, and the installation of fiber-optic cable within railroad rights-of-way. Mr. Phillips worked for Norfolk Southern Railway in various capacities for 12 years, during which he gained operating experience in engineering, track maintenance, and train operations. His responsibilities included supervising and training train crews, ensuring operating rules compliance, and investigating accidents and injuries.

Employee No.
91356

Department No.
53

Office Location
Charlotte, NC

Date joined firm
6/2/94

Years with other firms
19

Education
Master of Business Administration; Averett College (1992)

Bachelor of Science, Civil Engineering; Virginia Polytechnic Institute (1975)

Professional Registration
Professional Engineer: Pennsylvania (2000/#PE056524-E/exp. 9/30/13) and Virginia (1997/#030702/exp. 2/28/13)

Project Experience

BRIDGES

NCDOT Norfolk Southern over US 220 Bridge Replacement - Field Engineer
Provided construction field coordination between Norfolk Southern and the North Carolina Department of Transportation (NCDOT) for the replacement of a Norfolk Southern single-track, single-span railroad bridge with a double-track, 4-span railway bridge over U.S. Route 220 (US 220) in Price, NC. (1996 - 1997)

Norfolk Southern over US 401 Bridge Replacement - Field Engineer
Handled the construction field coordination between Norfolk Southern and the North Carolina Department of Transportation for replacement of the Norfolk Southern Bridge over U.S. Route 401 (US 401) in Fuquay-Varina, NC. (1995 - 1996)

Norfolk Southern Merritt Drive Improvements - Field Engineer
Responsible for construction observation for a detour bridge and replacement of the Norfolk Southern railroad bridge on Merritt Drive in Greensboro, NC. (1995 - 1996)

Norfolk Southern US 250 Bridge Replacement - Project Manager
Provided construction field coordination between Norfolk Southern and the Virginia Department of Transportation for the construction of a temporary detour bridge and a new through-plate girder replacement railroad bridge in Waynesboro, VA. (1994 - 1995)

RAIL

Norfolk Southern Railway On-Call Services Contract - Principal-in-Charge

Responsible for plan review and construction engineering and inspection services on an on-call, as-needed basis for more than 700 projects involving proposed roadway, bridge, and retaining wall construction affecting railway facilities throughout the 22-state Norfolk Southern system. Projects to date have included overseeing construction of overhead bridges, underpasses, floodwalls, utility crossings, parallel construction of utilities, roadways, bikeways, and grade crossings. (2/04 - Present)

Norfolk Southern Heartland Corridor Clearance Improvements CM - Senior Project Manager

Oversaw this $191 million project to provide clearance improvements to 28 railroad tunnels and seven bridges on the 530-mile-long Heartland Corridor, which extends from Norfolk, VA, to Columbus, OH. Mr. Phillips' services included creating overhead bridge jacking plans to obtain vertical clearances, modifying slide fences, providing utility coordination, creating Stormwater Pollution Prevention Plans for tunnel portals, creating railroad bridge lowering plans, and reviewing track designs. His construction management (CM) responsibilities also included conducting preconstruction meetings with contractors as well as weekly progress meetings, reviewing construction schedules, monitoring and documenting contractor work, reviewing monthly contractor pay estimates, and coordinating between the contractor and railroad forces. The project constituted an innovative public-private partnership venture between the Norfolk Southern, various participating states, and the Federal Highway Administration. (4/07 - 12/10)

CSX Post-Hurricane Katrina/Rita Emergency Rail Reconstruction Project - Principal-in-Charge

Oversaw design and construction inspection for this $100 million emergency rail reconstruction project. Mr. Phillips was in charge of assessing damage to six major rail bridges ranging to more than 10,000 feet in length, developing repair or replacement plans, providing project management and construction management, and providing on-site inspection during the reconstruction period. In total, morethan 75 miles of track was severely damaged and in need of emergency repair. (8/05 - 9/07)

STB Railroad Coal Rate Case Litigation Cost Assessments - Project Manager

Led a team of project managers, senior engineers, and other railroad consultants in assembling the planning, engineering, and construction costs to build a hypothetical contemporary operating railroad in Charlotte, NC, as part of a cost assessment for a several coal rate cases. Cost assessments included major earthwork, bridge and culvert construction, track, communications and signalization, engineering design, construction management, material costs and logistics, mobilization, and contingencies. Cases included Norfolk Southern (NS) vs. Duke Energy, NS vs. CP&L, CSX vs. Duke Energy, AEPCO vs. Burlington Northern Santa Fe (BNSF) and

Union Pacific, Otter Tail vs. BNSF, Seminole vs. CSXT, AEP Texas North vs. BNSF. (2002 - 2004)

Norfolk Southern Fiber-Optic Cable Installation - Project Manager
Responsible for the construction management of the installation of the fiber backbone along Norfolk Southern right-of-way along several routes: Cleveland, OH, to Boyce, VA, via Pittsburgh and Harrisburg, PA; Kalamazoo to Dearborn, MI; Dearborn, MI, to Toledo, OH; Toledo to Cleveland, OH; Cleveland, OH, to Buffalo, NY; and Cleveland, OH, to Pittsburgh, PA. Mr. Phillips oversaw staffing, permitting, inspection, safety operations, and final route approval. More than 100 managers and inspectors were involved in this major trunk line installation. Mr. Phillips also provided safety training, led Norfolk Southern operations meetings, attended weekly scheduling meetings, coordinated work trains and flagmen, and provided engineering reviews, change orders, and construction administration. (1999 - 2002)

Norfolk Southern Fiber-Optic Cable Installation in North and South Carolina - Project Manager
Coordinated with Norfolk Southern personnel and monitored the installation of fiber-optic cables belonging to Qwest Communications along several hundred miles of Norfolk Southern right-of-way in North Carolina and South Carolina. All phases of installation were involved, including plow train operations, long directional bores, and bridge attachments. Mr. Phillips provided periodic progress reports to Norfolk Southern and authorized minor changes from the approved construction plans to meet local conditions. He was also responsible for monitoring the railroad safety aspects of the installations. (1998 - 1999)

CSX System-Wide Grade Crossing Sign Project - Team Leader
Led one of seven teams for this project which required the installation of standard identification signs at every roadway grade crossing on the CSX Transportation system. During this process, STV completely updated the CSX grade crossing inventory list. (1997 - 1998)

CSX Systemwide Grade Crossing Inventory - Project Manager
Managed multiple teams to perform a grade crossing inventory encompassing more than 35,000 grade crossings on the CSX Transportation system in 21 states to meet a Federal Railroad Administration deadline. The project included deployment of multiple teams to inventory crossings, installing standard identification signs at every crossing to enhance safety and reporting, and updating CSX's inventory, including digital imagery of each crossing. All work was performed under a tight deadline of 180 days and completed a month ahead of schedule. (10/97 - 6/98)

Norfolk Southern Automobile Mixing Facility - Field Engineer
Responsible for shop inspection of structural steel at the fabrication plant in Colfax, NC, to be utilized in construction of this new automobile mixing facility in Shelbyville, KY. STV/RWA provided preliminary and final

hydraulic/hydrologic design as well as railway, roadway, highway bridge, and railway bridge design. (1996)

Norfolk Southern - Former Trainmaster

Supervised train crews and yard personnel, ensured operating rules compliance, investigated all accidents and injuries, scheduled local train and yard engine operations, and trained employees on Federal Railroad Administration and Norfolk Southern operating rules through annual operating rule classes for track and transportation employees in Manassas and Danville, VA. (1981 - 1987)

Norfolk Southern - Former Track Supervisor

Supervised track maintenance crews and production gangs, responsible for track inspection program, and ensured Federal Railroad Administration (FRA) Track Safety Standards for Class of track were in compliance. Mr. Phillips maintained the Norfolk Southern Safety Program over assigned territory and investigated all accidents and injuries, scheduled track maintenance operations, and trained employees on FRA Track Safety Standards and Norfolk Southern track maintenance policy. (1975 - 1980)

RICHARD H. RAY

Richard H. Ray is Director of Projects for RR Rail Highway Crossing Consultants, Inc., a consulting company with expertise in rail/highway crossings design and requirements, train signal systems and communications, with an office at 506 Fontaine Road, Mableton, GA 30126. Mr. Ray is recently retired from Norfolk Southern Corporation ("NS").

Since 1972, Mr. Ray has been involved in the various aspects of the rail industry primarily in the Signals and Communications Department, which included maintenance, construction, and engineering while employed by NS.

After graduation from High School Mr. Ray joined the Naval Air Reserve and served as an Avionic Technician, operating and repairing aircraft electronic equipment at various locations throughout the world including a tour of duty in Vietnam. Upon an honorable discharge from the Navy and employment by NS, Mr. Ray attended West Georgia College for two years while working in the engineering section of NS.

In 1972, Mr. Ray began his employment with NS on the Central of Georgia Railroad as an Assistant Signalman in a construction gang installing crossing signals and signal equipment. Later he was assigned to an Assistant Signal Maintainer position in East Point, Georgia with responsibilities of supporting the Signal Maintainer in his duties to maintain and troubleshoot signal systems and crossing signals. Later in 1972, Mr. Ray was promoted to Signal Maintainer in Dalton, Georgia, on the Southern Railway System with the responsibilities of maintaining, troubleshooting, testing and reporting pursuant to FRA regulations on signal systems and crossing signal equipment.

Mr. Ray was promoted to C&S Supervisor, Southern Railway in 1974. His duties included supervision of five mainline signal maintainers, one communications maintainer, one electrician and one floating signalman. Responsibilities included troubleshooting ordering equipment; scheduling of jobs for signal and communications systems and maintenance of two hot box detectors, and ensuring compliance with FRA regulations and railroad operating rules and procedures.

In 1978, Mr. Ray was promoted into the Signal Engineering Section of the Southern Railway as an Applications Engineer with responsibilities of design for signal systems, with an area of concentration centered on design of highway grade crossing warning devices. Duties included design of signal equipment, ordering of materials and detailed estimates for grade crossing signal projects. He was instrumental in the transition to computer aided drafting by designing the typicals used to engineer crossing signal equipment and computerizing grade crossing signal programs. This position required interaction with State DOT officials and serving on Committee D of the AAR.

After several years as an Applications Engineer, Mr. Ray accepted a position in 1988 as a Signal Engineer in the Engineering Section of NS. Duties for this position involved design of train signal systems and job estimation for installation and removal of track structures and signal systems. This position required interaction with the various railway departments.

While still in the Engineering Section, Mr. Ray was promoted in 1993 to Senior Systems Engineer, responsible for review and coordination with other departments concerning capital improvement projects and providing estimates and extent of Communication and Signal involvement. His duties in this position also involved State, local and private industry projects.

In 1995, Mr. Ray was promoted to his last position with NS as their Administrator Highway Grade. He was responsible for administering the railroad's portion of the federal highway grade crossing safety program and other grade crossing safety requests. This was accomplished by directing control systems activities, working closely with the signal design engineers to provide engineering and estimates, and coordinating activities between the railroads, state and other departments concerning projects for installation, up-grade or modification of grade crossing warning devices. It was essential in his duties to maintain a close working relationship and contact with the necessary local, state and federal agencies and authorities to ensure the success of all programs and projects. His duties required working closely with company safety, claims and legal personnel which included giving deposition testimony and testimony at hearings concerning all aspects of the grade crossing program.

Mr. Ray's resume is attached hereto.

Mr. Ray is sponsoring Section III.F.6 of UP's Reply Evidence relating to signals and communications. Mr. Ray has signed a verification of the truth of the statements contained therein. A copy of that verification is attached hereto.

I declare under penalty of perjury that I have read the Reply Evidence that I have sponsored, as described in the foregoing statement of Qualifications, and that the contents thereof are true and correct. Further, I certify that I am qualified and authorized to sponsor this testimony.

Executed on November 7, 2011

Richard H. Ray

Richard H. Ray
506 Fontaine Road
Mableton, GA 30126
Residence Phone 678-945-5442
Business Phone 404-529-1234

EDUCATION

1965-1969 Graduated Pebblebrook High School
1978-1980 West Georgia, College - Business Administration Curriculum
1985 Southern Technical Institute – Computer Science Curriculum

MILITARY SERVICE

1969-1971 United States Naval Air
Primary training in aviation electronics and operation of electronic countermeasures.
Honorable Discharge, Combat Veteran

EMPLOYMENT

1972 Assistant Signal Maintainer, Central of Georgia Railroad
Assisted Signal Maintainer in maintenance and troubleshooting of signal systems and highway grade crossing warning devices.

1972 Signal Maintainer, Southern Railway
Provided maintenance and troubleshooting of signal systems and highway grade crossing warning devices. Responsibilities included testing and reports pursuant to FRA regulations.

1974-1978 C&S Supervisor, Southern Railway
Supervision of five mainline signal maintainers, one communications maintainer , one electrician and one floating signalman. Responsibilities included troubleshooting, ordering equipment, scheduling of jobs and maintenance of two hot box detectors. Ensure compliance with FRA regulations and railroad operating procedures.

1978-1988 Applications Engineer, Norfolk Southern Railway
Design of signal systems, area of concentration centered on design of highway grade crossing warning devices. Including ordering of materials and estimates for grade crossing signal projects. Instrumental in transition to computer aided drafting design and computerizing grade crossing signal program. Required interaction with state DOT officials within fourteen state territory. Served on Committee D of the AAR.

1988-1993 Signal Engineer, Norfolk Southern Railway
Primarily involved in design of train signal systems and job estimation for installation and removal of track structures. Required interaction with various railway departments.

EMPLOYMENT - CONTINUED

1993-1995 Senior Systems Engineer, Norfolk Southern Railway
Primary responsibilities included review and coordination with other departments of capital improvement projects providing estimates and extent of C&S involvement. Also involved with state and private industry projects.

1995 -
Mar 2011 Administrator Highway Grade Crossing, Norfolk Southern Railway
Administer the railroad's portion of the federal highway grade crossing safety program and other grade crossing safety requests. This is accomplished by directing control systems activities and coordinating activities between the railroad, state and other departments concerning projects for installation, up-grade or modification of grade crossing warning devices. Maintain close working relationship and contacts with necessary local, state and federal agencies and authorities to ensure success of programs and projects. Work closely with company claims and legal personnel including giving deposition testimony and testimony at hearings concerning all aspects of the grade crossing program.

DAVID R. WHEELER

David R. Wheeler is the founder and President of Rail Network Analytics. His business address is 9222 Nottingham Way, Mason, OH 45040. Mr. Wheeler received a Bachelor of Science degree in engineering and computer science from Merrimack College in 1985. He also received a Masters of Business Administration degree in finance and operations management from Miami University in 1992.

Throughout his career, Mr. Wheeler has focused on advanced analytical techniques for operational improvement and strategic planning. He has more than fifteen years experience in areas including rail operations analysis, capacity analysis, simulation, stand-alone rate case litigation, structured problem solving and mergers & acquisitions. Mr. Wheeler has experience not only in the simulation and analysis of railroads, but also in other high technology industries including cockpit simulation work on the F-16 and F-22 fighter aircraft.

Mr. Wheeler held a number of leadership positions within the Union Pacific Railroad Company (UP). During his tenure with UP, Mr. Wheeler led teams within Finance, Capacity Planning, Network & Capital Planning and Network Design & Integration. He has submitted testimony in previous stand-alone cost cases and presented research in a variety of forums. As General Director, Capacity Planning & Analysis, Mr. Wheeler was responsible for and led the capital planning function for UP's annual capital development and implementation. In this capacity, Mr. Wheeler analyzed and directed spending of more than $300 million for Powder River Basin coal traffic. Mr. Wheeler uses simulation tools on a regular basis and has conducted a number of simulation benchmarking studies to determine and lead vendors toward simulation improvements.

Mr. Wheeler has worked on a variety of projects in the railroad industry. Mr. Wheeler developed UP's Colorado/Utah coal capacity plan and guided the Intermodal growth capacity initiative from Chicago to Los Angeles across UP's Sunset and Tucumcari routes. He has led multiple projects for the BNSF, NS, CSX, CP and CN, as well as the many short lines that connect with the UP. Mr. Wheeler has also led teams working on proposals for new passenger service for Amtrak, various commuter agencies, and UP's Joint Facilities, Finance, Operations and Engineering groups.

Mr. Wheeler is sponsoring evidence relating to the SARR capacity requirements and cycle times. His evidence is contained in Sections III.A, III.B and III.C of defendants' Reply Evidence. Mr. Wheeler has signed a verification of the truth of the statements contained therein. A copy of that verification is attached hereto.

VERIFICATION

I declare under penalty of perjury that I have read the Reply Evidence in this proceeding that I have sponsored, as described in the foregoing Statement of Qualifications, and that the contents thereof are true and correct. Further, I certify that I am qualified and authorized to sponsor this testimony.

David Wheeler

Executed on November 7, 2011

IV-104

GEORGE T. ZIMMERMAN

George T. Zimmerman is a railway engineer and project manager for STV Incorporated at 3505 Koger Boulevard, Suite 205, Duluth, GA 30096. He has more than 30 years of experience on roadway and bridge projects and particular expertise in freight planning, design, and construction management. His resident engineering and inspection experience includes grade crossings and roadway, railway, and highway bridges. Mr. Zimmerman manages STV's relationship with Norfolk Southern ("NS"), working with the railroad on a regular basis and assisting in the preparation of proposals and contracts. In addition, he provides structural designs and plan reviews for railway and bridge projects.

Mr. Zimmerman manages plan review and construction engineering and inspection services on an on-call, as-needed basis for more than 750 proposed roadway, bridge, and retaining wall construction projects affecting railway facilities throughout the 22-state NS system. Mr. Zimmerman has overseen construction of overhead bridges, underpasses, floodwalls, and utility crossings, and parallel construction of utilities, roadways, bikeways, and grade crossings since 1992. Mr. Zimmerman has a Bachelor of Science degree in civil engineering from West Virginia University.

Mr. Zimmerman's resume with additional project experience is attached hereto.

Mr. Zimmerman is sponsoring Section III.F.4 of UP's Reply Evidence relating to track construction. Mr. Zimmerman has signed a verification of the truth of the statements contained therein. A copy of that verification is attached hereto.

I declare under penalty of perjury that I have read the Reply Evidence that I have sponsored, as described in the foregoing Statement of Qualifications, and that the contents thereof are true and correct. Further, I certify that I am qualified and authorized to sponsor this testimony.

Executed on November 7, 2011

George T. Zimmerman, P.E.

Project Manager/Senior Engineer

Mr. Zimmerman is a railway engineer and project manager with more than 30 years of experience on roadway and bridge projects and particular expertise in freight planning, design, and construction management. His resident engineering and inspection experience includes grade crossings and roadway, railway, and highway bridges. Mr. Zimmerman manages STV's relationship with Norfolk Southern, working with the railroad on a regular basis and assisting in the preparation of proposals and contracts. In addition, he provides structural designs and plan reviews for railway and bridge projects.

Employee No.
91137

Department No.
53

Office Location
Duluth, GA

Date joined firm
5/16/79

Years with other firms
0

Education
Bachelor of Science, Civil Engineering; West Virginia University (1979)

Professional Registrations
Professional Engineer: Georgia (1992/#019811/exp. 12/31/12), Kansas (2002/ #17069/exp. 4/30/13), Missouri (2003/ #2003000042/exp. 12/31/11), Ohio (2001/#65833/exp. 12/31/11), South Carolina (1989/#12625/exp. 6/30/12)

Memberships
Roadway and Ballast Committee Member, American Railway Engineering and Maintenance of Way Association (AREMA)

American Society of Civil Engineers (ASCE)

Project Experience

BRIDGES

Norfolk Southern Jeffersonville Road Widening - Project Manager
Managed the preliminary layout and design of a four-span, 93.5-meter-long steel deck plate girder railroad bridge in Macon, GA. The single-track bridge will carry Norfolk Southern over Jeffersonville Road, which was widened from two to five lanes. The project included track realignment to allow off-line construction. (2002 - 2007)

GDOT Railroad Bridges over Butler Street and Piedmont Avenue - Senior Engineer
Provided bridge design for the widening of two CSX Railroad bridges over Butler Street and Piedmont Avenue in Fulton County, GA, and two retaining walls for the Georgia Department of Transportation (GDOT). (2002 - 2006)

GDOT SR 3 Connector - Senior Engineer
Designed a replacement bridge and adjoining roadway over Interstate 75 on the State Route 3 (SR 3) connector in Whitfield County, GA. The 8-lane bridge replaced a 2-lane structure of insufficient capacity. Work included horizontal and vertical design, construction plans, right-of-way plans, and construction staging plans, as well as pavement marking and signing plans. All design work for this Georgia Department of Transportation (GDOT) project was done in metric. (1995)

CSX Railroad over Monroe Road - Resident Engineer
Provided construction management and coordination with the railroad for this through-girder, single-track railroad structure in Charlotte, NC. The project included a temporary detour trestle, track realignment, staged construction, and coordination with the highway portion of the project. The underpass is located in what was one of the emerging growth corridors of the Charlotte area. (6/87 - 12/88)

COMMERCIAL

Private Developer Silas Creek Crossing Shopping Center - Resident Inspector
Provided construction observation for a 200,000-sf retail shopping center, highway bridge, and concrete box culvert in Winston Salem, NC. (7/88 - 3/89)

RAIL: COMMUTER RAIL

FTA PMO Denver RTD/CDOT Capital Program - Senior Engineer
Identified locations along proposed alignments where changes would be made to the Burlington Northern Santa Fe and Union Pacific Railroad tracks as part of project management oversight (PMO) services to the Federal Transit Administration (FTA) for the Denver Regional Transportation District (RTD)/Colorado Department of Transportation (CDOT) commuter rail system in Denver. Mr. Zimmerman also determined if the work could be considered a required railroad change or betterment for the railroad involved. To determine this, the trackwork and civil improvements to the rail system and track roadbed were evaluated as individual projects, but with a larger area view if there were track changes or replacements involved. (8/10 - 1/11)

CSX Ronald Reagan Parkway - Project Manager/Resident Engineer
Managed the construction engineering inspection of the CSX Railroad bridge over Ronald Reagan Parkway near Lawrenceville in Gwinnett County, GA. (2/92 - 12/93)

Norfolk Southern I-64 over Norfolk Southern - Resident Engineer
Observed construction field activities and represented the Norfolk Southern Railroad for two bridges over the railway, one at milepost 4.43 VB, and one at milepost 5.04 NS in Norfolk, VA. (1/90 - 2/92)

City of Virginia Beach Pungo Ferry Bridge - Resident Engineer
Provided construction management and inspection services and represented the City of Virginia Beach for the construction of the replacement of this obsolete swing span with a 3,400-foot-long highway bridge over the Intracoastal Waterway in Virginia Beach, VA. The project included roadway approaches and the placement of a geosynthetic stabilized embankment over adjacent wetlands. (1989 - 1992)

Norfolk Southern over Harris Boulevard - Resident Engineer
Provided construction management for a double-track Norfolk Southern underpass built using a temporary detour alignment in Newell, NC. (7/88 - 6/89)

City of Charlotte Tyvola Road Extension - Resident Structural Inspector
Inspected this 3.6-mile, 5-lane roadway extension in Charlotte, NC, including a new interchange with a 7-lane bridge over Billy Graham Parkway, eight

reinforced concrete box culverts, and a 6-lane bridge over Sugar Creek. (6/87 - 6/89)

HIGHWAYS/ROADWAYS

Piper Glen Development Corporation Rea Road Extension - Engineer
Provided construction coordination and management for 1.65-mile roadway extension to serve as the main thoroughfare for Piper Glen Development in Mecklenburg County, NC. The $2.5 million roadway and highway bridge project were built to be taken into the North Carolina Department of Transportation system and connected to the Charlotte Outer Beltway. (6/87 - 6/89)

INDUSTRIAL

IBM Research and Manufacturing Facility University Research Park - Engineer
Provided staging and design, earthwork, and site plan staging for balancing of cuts and fills for recreational facilities during construction of the building site and railway in Charlotte, NC. (5/79 - 11/79)

RAIL: FREIGHT RAIL

R. J. Corman Railroad On-Call Services Contract - Project Manager
Managing plan review and construction engineering and inspection services on an on-call, as-needed basis for proposed roadway, bridge, and miscellaneous projects affecting railway facilities throughout various R. J. Corman Railroad lines in the eastern United States. Mr. Zimmerman has overseen construction of overhead bridges, underpasses, utility crossings, parallel construction of utilities, roadways, and grade crossings since 2007. (2007 - Present)

Norfolk Southern On-Call Services Contract - Project Manager
Managing plan review and construction engineering and inspection services on an on-call, as-needed basis for more than 750 proposed roadway, bridge, and retaining wall construction projects affecting railway facilities throughout the 22-state Norfolk Southern system. Mr. Zimmerman has overseen construction of overhead bridges, underpasses, floodwalls, and utility crossings, and parallel construction of utilities, roadways, bikeways, and grade crossings since 1992. (1992 - Present)

Norfolk Southern Heartland Corridor Clearance Improvements CM - Project Manager
Coordinated various teams providing construction management (CM) services for portions of the Heartland Corridor Clearance Project, an award-winning, $191 million initiative to improve 28 tunnels and seven through-truss bridges and remove 24 overhead obstacles to provide a direct double-

stacked container train route from the ports of Virginia through West Virginia and eastern Kentucky and into central Ohio. Mr. Zimmerman oversaw the raising of a bridge at Harding Street in Bluefield, WV; stormwater and erosion control plans at various tunnel sites; and numerous bridge lowering and slide fence clearance tasks. (1/07 - 8/10)

LAMTPO Rail Relocation and Intermodal Facility Feasibility Study - Senior Engineer

Provided design engineering services for the proposed relocation of the Norfolk Southern Railroad mainline through Morristown, White Pine, and Jefferson City, TN, as part of a study for the Lakeway Area Metropolitan Transportation Planning Organization (LAMTPO) to determine the feasibility of relocating the Norfolk Southern A Line and installing an intermodal facility in Morristown. Mr. Zimmerman assisted in gathering information and determining railroad design and operation requirements. The A Line, which runs through downtown Morristown, will be eliminated and either a new line will be built or an existing line will be improved in the county. The intermodal facility will facilitate connections between freight lines along Interstate 81 and the Norfolk Southern Crescent. (3/08 - 4/09)

Rochester & Southern Railroad Silver Springs Connection Track - Project Manager

Reviewed rail design for a Rochester & Southern Railroad connection track in Silver Springs, NY. The connecting track will allow unit coal train movement from Norfolk Southern Railroad to the Rochester & Southern Railroad. Mr. Zimmerman's responsibilities included coordination with Norfolk Southern. (2007 - 2009)

Vulcan Materials Company Skippers Quarry Loop Track - Project Manager

Provided project administration and coordinated staff in multiple offices for the preliminary and final design of a 0.75-mile loop track, including a 100-foot-long open deck railroad trestle, for Vulcan Materials Company at Skippers Quarry in Skippers, VA. The track is used for loading unit rail trains with railroad ballast and other crushed aggregate materials. (1/07 - 1/09)

STB Railroad Coal Rate Case Litigation Cost Assessments - Project Manager

Responsible for determining values for track work items and construction staging of the work plan for this Surface Transportation Board (STB) project, which included assembling the planning, engineering, and construction costs to build a hypothetical contemporary operating railroad in Charlotte, NC, as part of a cost assessment for a several coal rate cases. Cost assessments included major earthwork, bridge and culvert construction, track, communications and signalization, engineering design, construction management, material costs and logistics, mobilization, and contingencies. Cases included Norfolk Southern versus Duke Energy, Norfolk Southern versus Carolina Power & Light, CSX versus Duke Energy, Burlington

Northern Santa Fe (BNSF) and Union Pacific versus AEC, BNSF versus Otter Tail, and AEP Texas North versus BNSF. (2000)

Norfolk Southern Automobile Mixing Facility - Project Manager
Provided preliminary and final hydraulic/hydrologic, railway, roadway, highway, and railway bridge design for this Ford automobile mixing facility in Shelbyville, KY. The project included 2.5 million cubic yards of earthwork, 18 miles of track installation, a 45-acre paved vehicle storage yard, three bridges, and two access roads. (8/96 - 12/97)

CSX Double-Track Program - Project Manager
Designed 7 miles of track parallel to the CSX Railroad main line in Marietta, GA. The project included a study of several grade-crossing eliminations and retaining wall structures. (1995)

Norfolk Southern Third Mainline Track - Project Manager
Managed engineering services for the design and construction of a 2.9-mile third main track from adjacent to CSX's Queensgate Yard to Mitchell Avenue in Cincinnati. Mr. Zimmerman provided project management as well as the design of all earthwork, track work, and retaining structures. (6/94 - 7/95)

USACE Omaha District Wharf Track Military Ocean Terminal - Senior Engineer
Provided engineering services for track material research for the rehabilitation of 3.5 miles of railroad track on concrete wharfs in Sunny Point, NC, for the U.S. Army Corps of Engineers (USACE). (1994)

CSX Railroad Relocation, Consolidation, and Grade Crossing Elimination - Contract A Resident Engineer, Contract B Assistant Resident Engineer
Supervised the $16.7 million construction of a railway roadbed, including 7,600 linear feet of grading, in Columbia, SC. The project included drainage, dewatering, utilities, and retaining walls. (4/83 - 4/87)

Graham County Development Corporation Graham County Railroad - Resident Engineer
Provided construction management and testing services for the $1.65 million rehabilitation of 12.65 miles of track and 13 small railroad bridges, including drainage improvements and 1.25 miles of track relayed with heavier rails on a steep mountainous grade, for this railroad between the re-established connection to the Southern Railway at Totpon, NC, to the Bemis Lumber Company yard in Robbinsville, NC. (1/81 - 4/83)

RAIL: LIGHT RAIL

CATS LYNX Blue Line Extension Light Rail Project - Senior Engineer
Responsible for the coordination and resolution of issues generated by the preliminary design in areas along the corridor that involve Norfolk Southern,

North Carolina and the Aberdeen, Carolina, and Western Railroads as part of the a new 9.3-mile light rail transit line extension in Charlotte, NC. Mr. Zimmerman is working with the Charlotte Area Transit System (CATS) to successfully integrate transit and land use, and to solve challenges associated with crossing and running along existing freight railroad right-of-way. The plans must satisfy the requirements of four different railroads so the city can secure necessary agreements. (2008 - Present)

SITE DEVELOPMENT

Statesville Redevelopment Authority Newtonville Subdivision - Resident Engineer

Provided construction management, inspection, and field testing services for the redevelopment of the $500,000 Newtonville Subdivision for the City of Statesville, NC. This project included the total removal of all existing facilities and the construction of all new infrastructure including excavation, drainage, utility installation, and street construction. (11/79 - 7/80)

Teaching Experience

Instructor, Introduction to Construction Inspection, Module 13: General Structural Steel Inspection; North Carolina American Public Works Association. (1999 - Present)

Instructor, STV/RWA Railroad Inspector's Workshops on various subjects including safety, project management, project reporting, and the development of a Field Inspectors Handbook for third-party projects on railroad property. (1995 - Present)

V: Unreasonable Practices Claim

V. UNREASONABLE PRACTICE

In Section I.D of its Counsel's Argument and Summary of Evidence, UP shows that there is no merit to IPA's claim that UP failed to provide IPA with common carrier rates in a timely manner.

CERTIFICATE OF SERVICE

I hereby certify that on this 10th day of November, 2011, I have caused both Highly Confidential and Public versions of the Reply Evidence and Argument of Defendant Union Pacific Railroad Company to be served by hand delivery upon:

C. Michael Loftus
Christopher A. Mills
Andrew B. Kolesar III
Daniel M. Jaffe
SLOVER & LOFTUS LLP
1224 Seventeenth Street, N.W.
Washington, D.C. 20036

Spencer F. Walters

REDACTED – TO BE PLACED ON PUBLIC FILE

BEFORE THE
SURFACE TRANSPORTATION BOARD

INTERMOUNTAIN POWER AGENCY	)	
Complainant,	)	Docket No. 42127
v.	)	
UNION PACIFIC RAILROAD COMPANY,	)	
Defendant.	)	

REPLY EVIDENCE AND ARGUMENT OF DEFENDANT
UNION PACIFIC RAILROAD COMPANY

EXHIBITS

J. MICHAEL HEMMER
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Omaha, NE 68179
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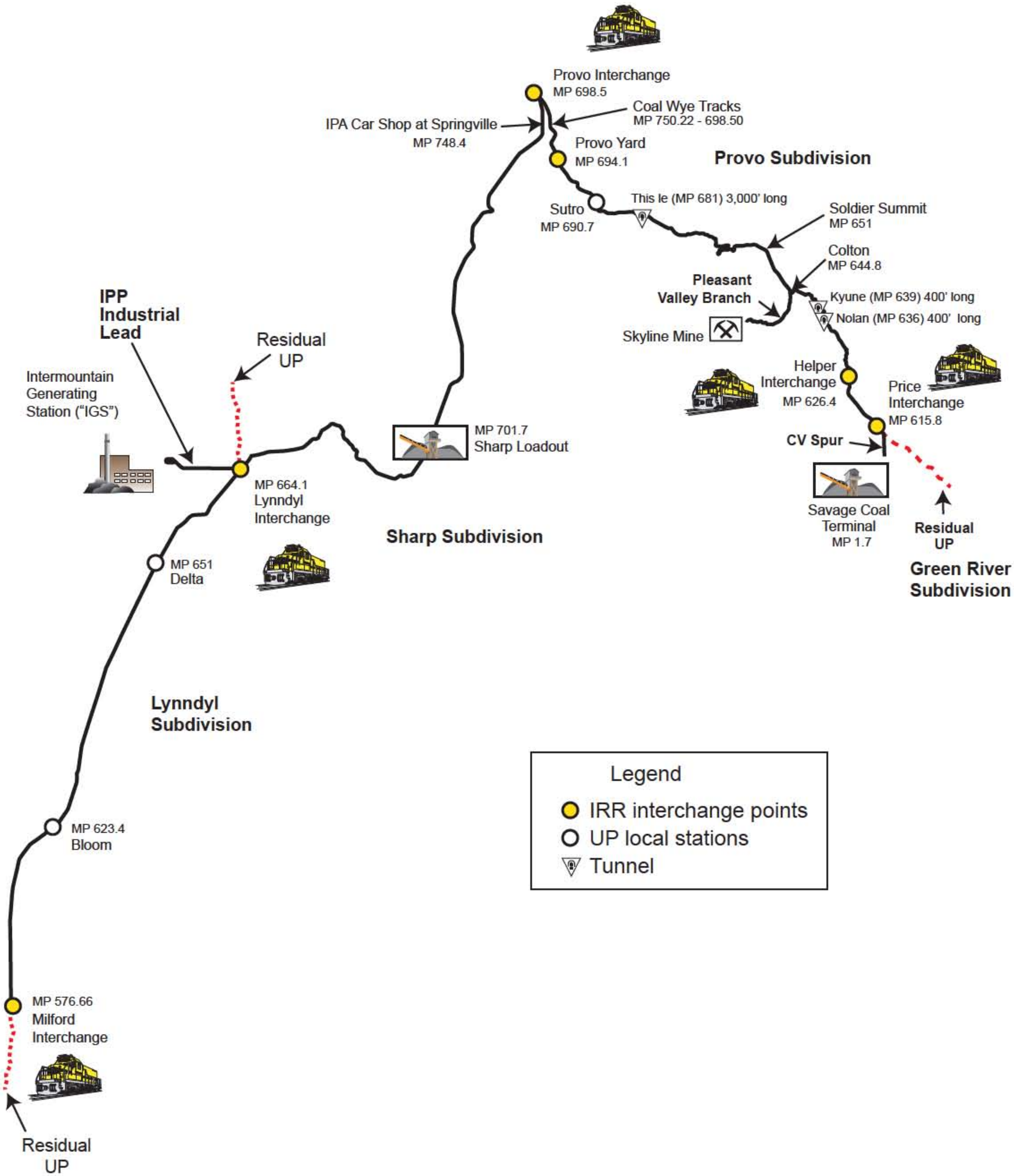
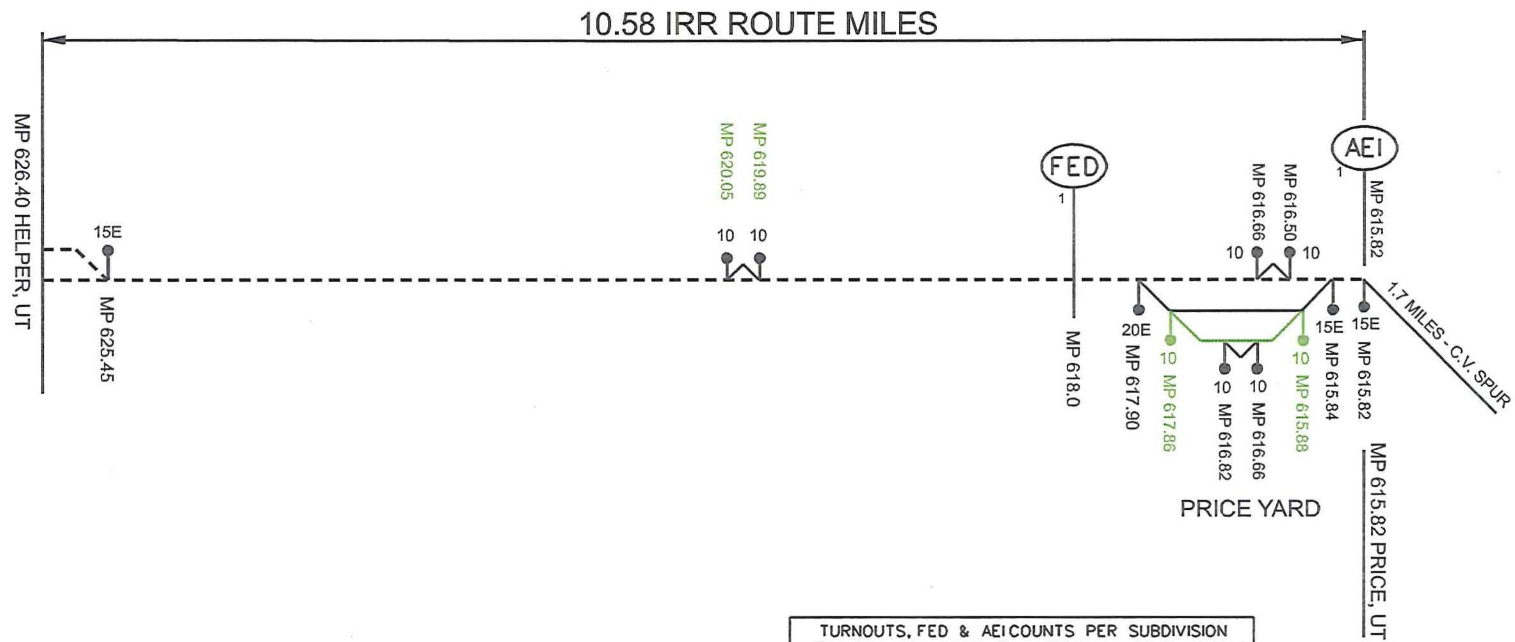
Attorneys for Union Pacific Railroad Company

November 10, 2011

Intermountain Stand-Alone Railroad ("IRR")





TURNOUTS, FED & AEI COUNTS PER SUBDIVISION	
DESCRIPTION	COUNT
▪10 TURNOUTS	8
▪15 TURNOUTS	3
▪20 TURNOUTS	1
FED	1
AEI	1

SUBDIVISION: **GREEN RIVER**

FROM: **HELPER** MP: **626.40** DATE: **11/10/11**

TO: **C.V. SPUR** MP: **615.82** NOT TO SCALE

LEGEND:

- - - - - - 136▪ STANDARD CWR

——— - 136▪ CWR CLASS 1 RELAY

(FED) 1 FAILED EQUIPMENT DETECTOR WITH NUMBER OF TRACKS COVERED

HB - HOT BEARING DETECTOR
DE OR DED - DRAGGING EQUIPMENT DETECTOR
HW - HOT WHEEL DETECTOR

(AEI) 1 AUTOMATIC EQUIPMENT IDENTIFICATION SCANNER WITH NUMBER OF TRACKS COVERED

20 - TURNOUT TYPE*

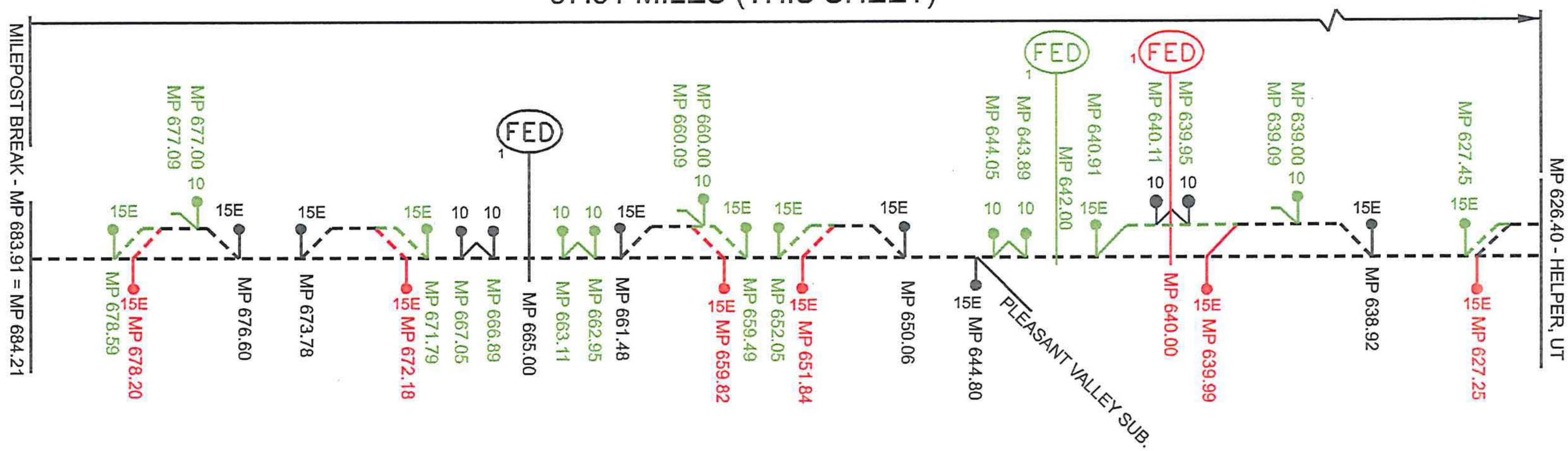
*TURNOUT TYPES
20-▪20 ELECTRIC
15E-▪15 ELECTRIC
15-▪15 HAND-THROWN
10S-▪10 SPRING
10-▪10 HAND-THROWN
10E-▪10 ELECTRIC

UP REPLY EXHIBIT:

III.B-1

73.05 IRR ROUTE MILES (CONTINUES ON SHEET 3 OF 8)

57.51 MILES (THIS SHEET)



TURNOUTS, FED & AEI COUNTS PER SUBDIVISION	
DESCRIPTION	COUNT
•10 TURNOUTS	23
•15 TURNOUTS	17
•20 TURNOUTS	0
FED	3
AEI	1

SUBDIVISION: **PROVO**

FROM: **HELPER** MP: **626.40** DATE: **11/10/11**

TO: **MILEPOST BREAK** MP: **683.91** NOT TO SCALE

LEGEND:

- - - - - - 136# STANDARD CWR

——— - 136# CWR CLASS 1 RELAY

FED 1 — FAILED EQUIPMENT DETECTOR WITH NUMBER OF TRACKS COVERED

HB - HOT BEARING DETECTOR
DE OR DED - DRAGGING EQUIPMENT DETECTOR
HW - HOT WHEEL DETECTOR

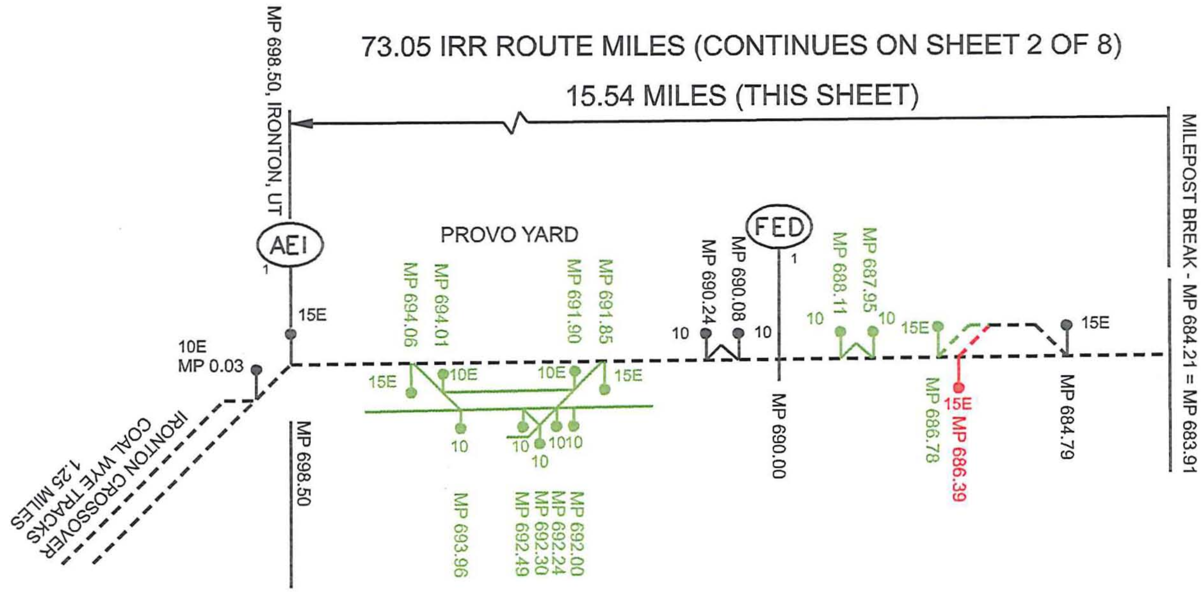
AEI 1 — AUTOMATIC EQUIPMENT IDENTIFICATION SCANNER WITH NUMBER OF TRACKS COVERED

20 - TURNOUT TYPE*

*TURNOUT TYPES
20-#20 ELECTRIC
15E-#15 ELECTRIC
15-#15 HAND-THROWN
10S-#10 SPRING
10-#10 HAND-THROWN
10E-#10 ELECTRIC

UP REPLY EXHIBIT:

III.B-1



TURNOUTS, FED & AEI COUNTS PER SUBDIVISION	
DESCRIPTION	COUNT
#10 TURNOUTS	23
#15 TURNOUTS	17
#20 TURNOUTS	0
FED	3
AEI	1

SUBDIVISION: **PROVO**

FROM: **MILEPOST BREAK** MP: **684.21** DATE: **11/10/11**

TO: **PROVO** MP: **698.50** NOT TO SCALE

LEGEND:

- - - - - - 136# STANDARD CWR
——— - 136# CWR CLASS 1 RELAY

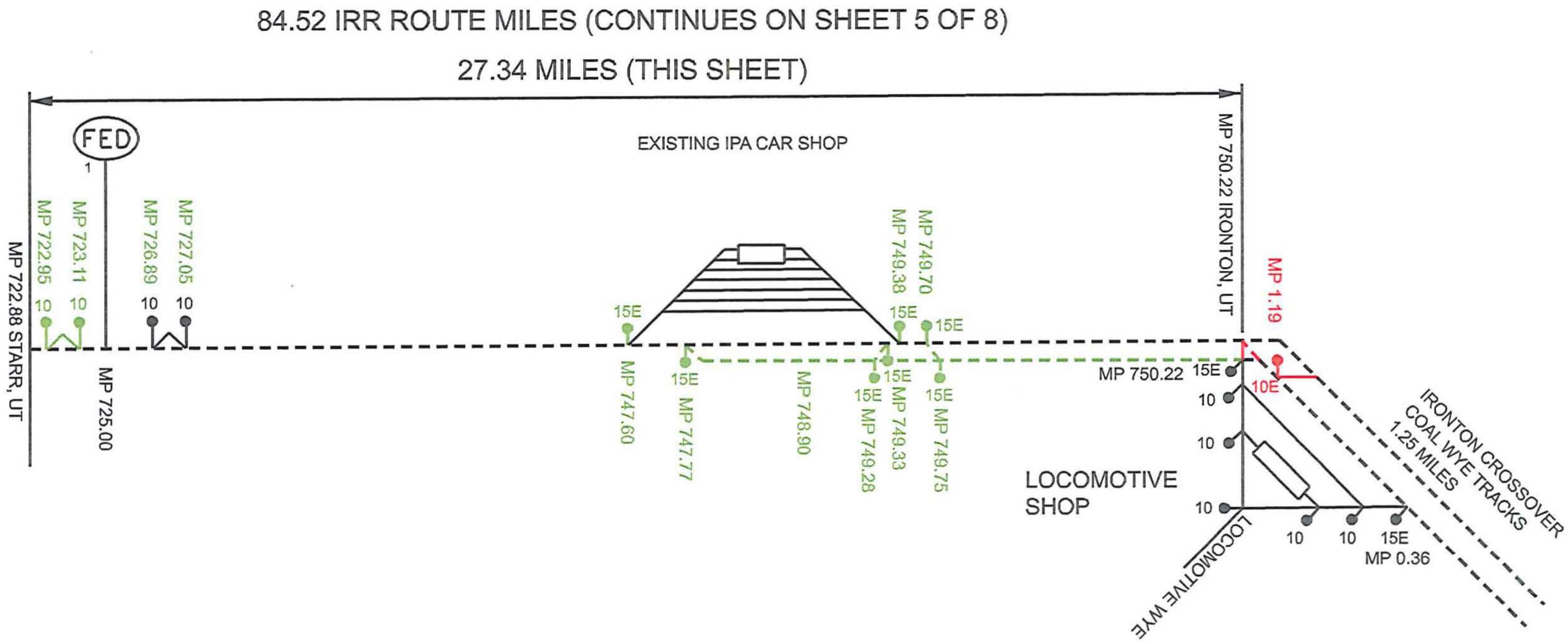
20 - TURNOUT TYPE*

*TURNOUT TYPES
20-#20 ELECTRIC
15E-#15 ELECTRIC
15-#15 HAND-THROWN
10S-#10 SPRING
10-#10 HAND-THROWN
10E-#10 ELECTRIC

FED 1 FAILED EQUIPMENT DETECTOR WITH NUMBER OF TRACKS COVERED
HB - HOT BEARING DETECTOR
DE OR DED - DRAGGING EQUIPMENT DETECTOR
HW - HOT WHEEL DETECTOR

AEI 1 AUTOMATIC EQUIPMENT IDENTIFICATION SCANNER WITH NUMBER OF TRACKS COVERED

UP REPLY EXHIBIT: III.B-1



TURNOUTS, FED & AEI COUNTS PER SUBDIVISION	
DESCRIPTION	**COUNT**
#10 TURNOUTS	17
#15 TURNOUTS	13
#20 TURNOUTS	0
FED	3
AEI	1

SUBDIVISION: **SHARP**

FROM: **STARR** MP: **722.88** DATE: **11/10/11**

TO: **IRONTON** MP: **750.22** NOT TO SCALE

LEGEND:

- - - - - - 136# STANDARD CWR
——— - 136# CWR CLASS 1 RELAY

FED 1 FAILED EQUIPMENT DETECTOR WITH NUMBER OF TRACKS COVERED
HB - HOT BEARING DETECTOR
DE OR DED - DRAGGING EQIUPMENT DETECTOR
HW - HOT WHEEL DETECTOR

AEI 1 AUTOMATIC EQUIPMENT IDENTIFICATION SCANNER WITH NUMBER OF TRACKS COVERED

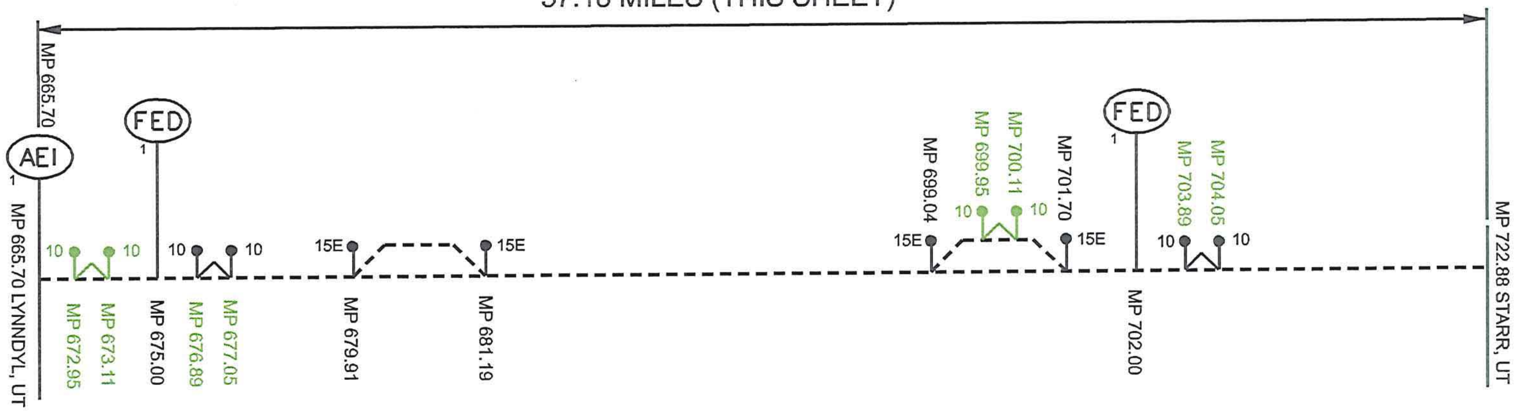
20 - TURNOUT TYPE*

*TURNOUT TYPES
20-#20 ELECTRIC
15E-#15 ELECTRIC
15-#15 HAND-THROWN
10S-#10 SPRING
10-#10 HAND-THROWN
10E-#10 ELECTRIC

UP REPLY EXHIBIT:
III.B-1

84.52 IRR ROUTE MILES (CONTINUES ON SHEET 4 OF 8)

57.18 MILES (THIS SHEET)



TURNOUTS, FED & AEI COUNTS PER SUBDIVISION	
DESCRIPTION	COUNT
•10 TURNOUTS	17
•15 TURNOUTS	13
•20 TURNOUTS	0
FED	3
AEI	1

SUBDIVISION: **SHARP**

FROM: **LYNNDYL** MP: **665.70** DATE: **11/10/11**

TO: **STARR** MP: **722.88** NOT TO SCALE

LEGEND:

- - - - - 136• STANDARD CWR

——— - 136• CWR CLASS 1 RELAY

20 • TURNOUT TYPE*

*TURNOUT TYPES
20-•20 ELECTRIC
15E-•15 ELECTRIC
15-•15 HAND-THROWN
10S-•10 SPRING
10-•10 HAND-THROWN
10E-•10 ELECTRIC

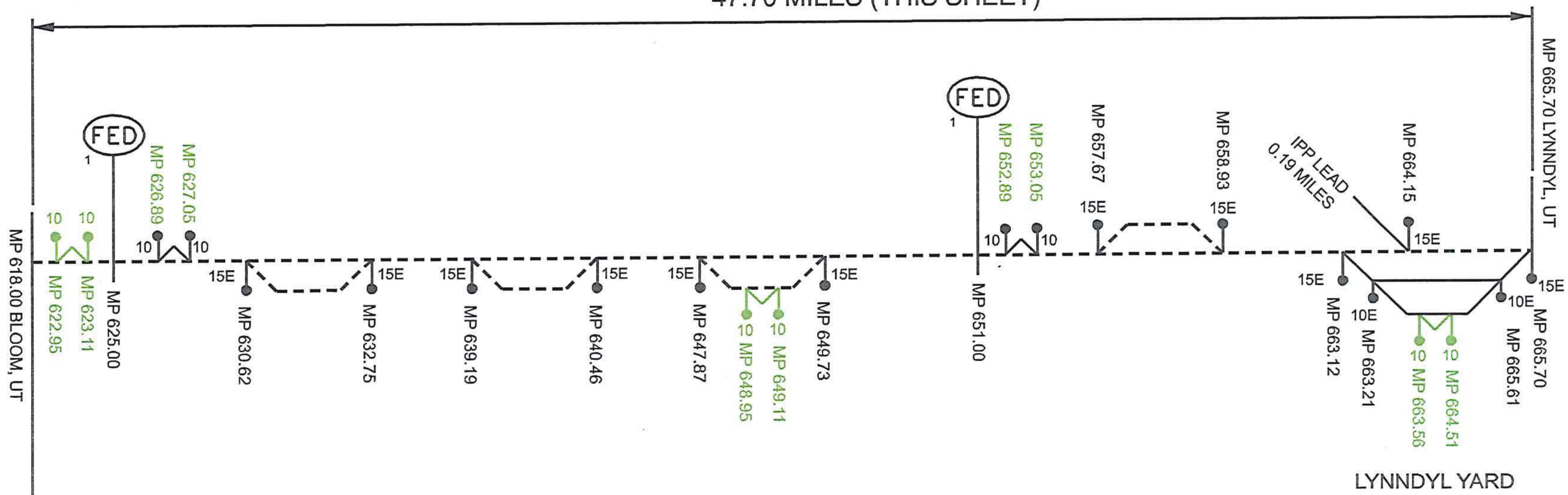
FED 1 FAILED EQUIPMENT DETECTOR WITH NUMBER OF TRACKS COVERED
HB • HOT BEARING DETECTOR
DE OR DED • DRAGGING EQUIPMENT DETECTOR
HW • HOT WHEEL DETECTOR

AEI 1 AUTOMATIC EQUIPMENT IDENTIFICATION SCANNER WITH NUMBER OF TRACKS COVERED

UP REPLY EXHIBIT:
III.B-1

89.0 IRR ROUTE MILES (CONTINUES ON SHEET 7 OF 8)

47.70 MILES (THIS SHEET)



TURNOUTS, FED & AEI COUNTS PER SUBDIVISION	
DESCRIPTION	COUNT
#10 TURNOUTS	18
#15 TURNOUTS	24
#20 TURNOUTS	0
FED	4
AEI	1

SUBDIVISION: **LYNNDYL**

FROM: **BLOOM** MP: **618.00** DATE: **11/10/11**

TO: **LYNNDYL** MP: **665.70** NOT TO SCALE

LEGEND:

- - - - - - 136# STANDARD CWR
——— - 136# CWR CLASS 1 RELAY

FED 1 FAILED EQUIPMENT DETECTOR WITH NUMBER OF TRACKS COVERED

HB - HOT BEARING DETECTOR
DE OR DED - DRAGGING EQUIPMENT DETECTOR
HW - HOT WHEEL DETECTOR

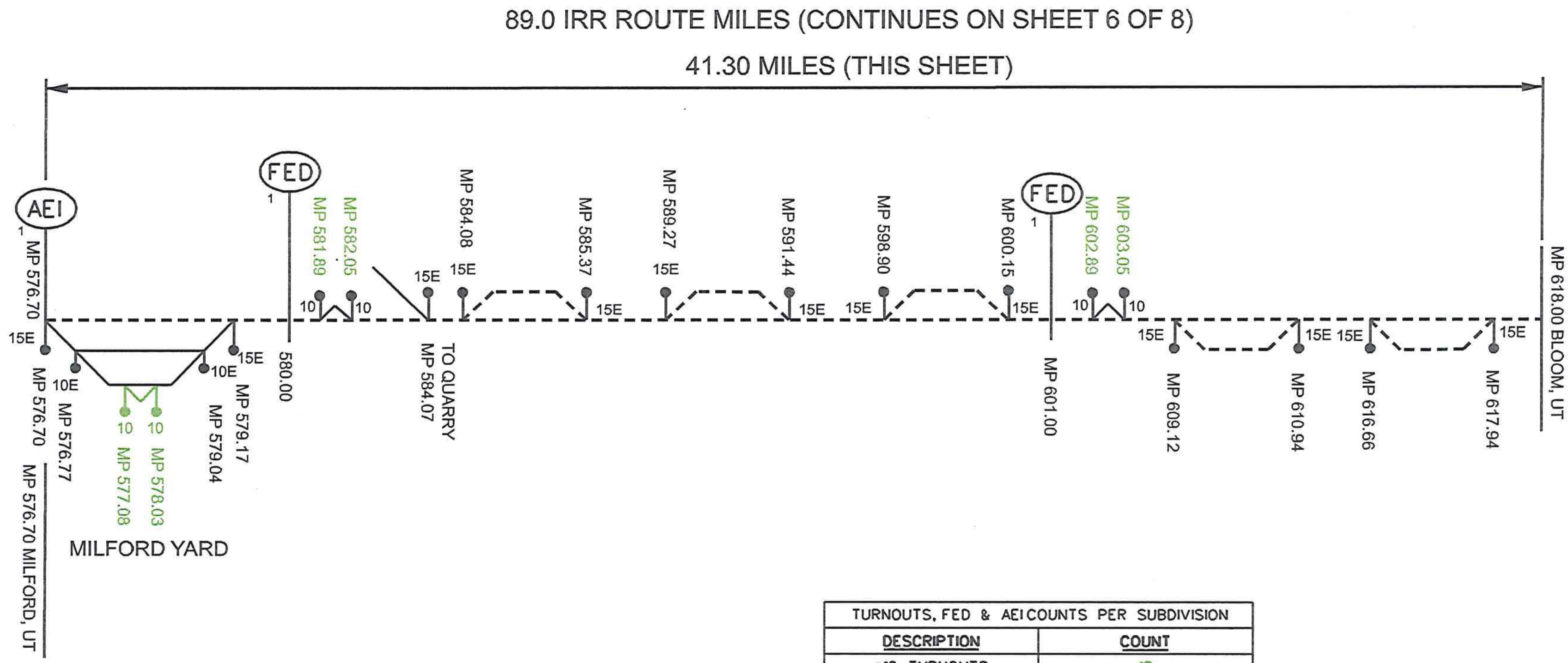
AEI 1 AUTOMATIC EQUIPMENT IDENTIFICATION SCANNER WITH NUMBER OF TRACKS COVERED

20 - TURNOUT TYPE*

*TURNOUT TYPES
20-#20 ELECTRIC
15E-#15 ELECTRIC
15-#15 HAND-THROWN
10S-#10 SPRING
10-#10 HAND-THROWN
10E-#10 ELECTRIC

UP REPLY EXHIBIT:

III.B-1



TURNOUTS, FED & AEI COUNTS PER SUBDIVISION	
DESCRIPTION	COUNT
#10 TURNOUTS	18
#15 TURNOUTS	24
#20 TURNOUTS	0
FED	4
AEI	1

PAGE 7 OF 8

SUBDIVISION: **LYNNDYL**

FROM: **MILFORD** MP: **576.70** DATE: **11/10/11**

TO: **BLOOM** MP: **618.00** NOT TO SCALE

LEGEND:

- - - - - 136# STANDARD CWR
——— - 136# CWR CLASS 1 RELAY

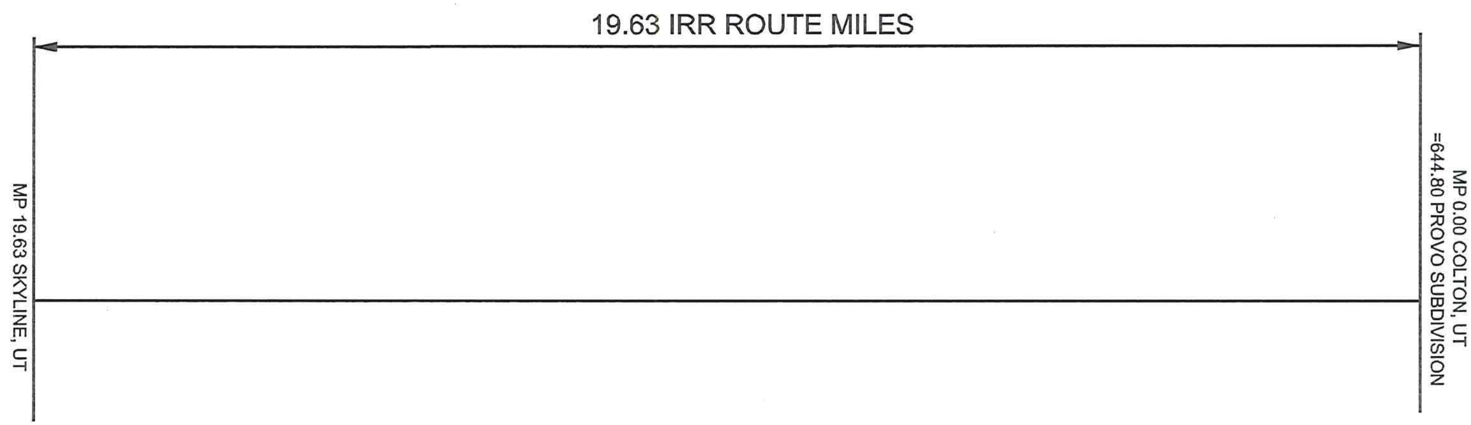
FED 1 FAILED EQUIPMENT DETECTOR WITH NUMBER OF TRACKS COVERED
HB - HOT BEARING DETECTOR
DE OR DED - DRAGGING EQUIPMENT DETECTOR
HW - HOT WHEEL DETECTOR

AEI 1 AUTOMATIC EQUIPMENT IDENTIFICATION SCANNER WITH NUMBER OF TRACKS COVERED

20 - TURNOUT TYPE*

*TURNOUT TYPES
20-#20 ELECTRIC
15E-#15 ELECTRIC
15-#15 HAND-THROWN
10S-#10 SPRING
10-#10 HAND-THROWN
10E-#10 ELECTRIC

UP REPLY EXHIBIT:
III.B-1



TURNOUTS, FED & AEI COUNTS PER SUBDIVISION	
DESCRIPTION	**COUNT**
•10 TURNOUTS	0
•15 TURNOUTS	0
•20 TURNOUTS	0
FED	0
AEI	0

SUBDIVISION: **PLEASANT VALLEY**

FROM: **COLTON** MP: **0.00** DATE: **11/10/11**

TO: **SKYLINE** MP: **19.63** NOT TO SCALE

LEGEND:

- - - - - - 136• STANDARD CWR
——— - 136• CWR CLASS 1 RELAY

20 • TURNOUT TYPE*

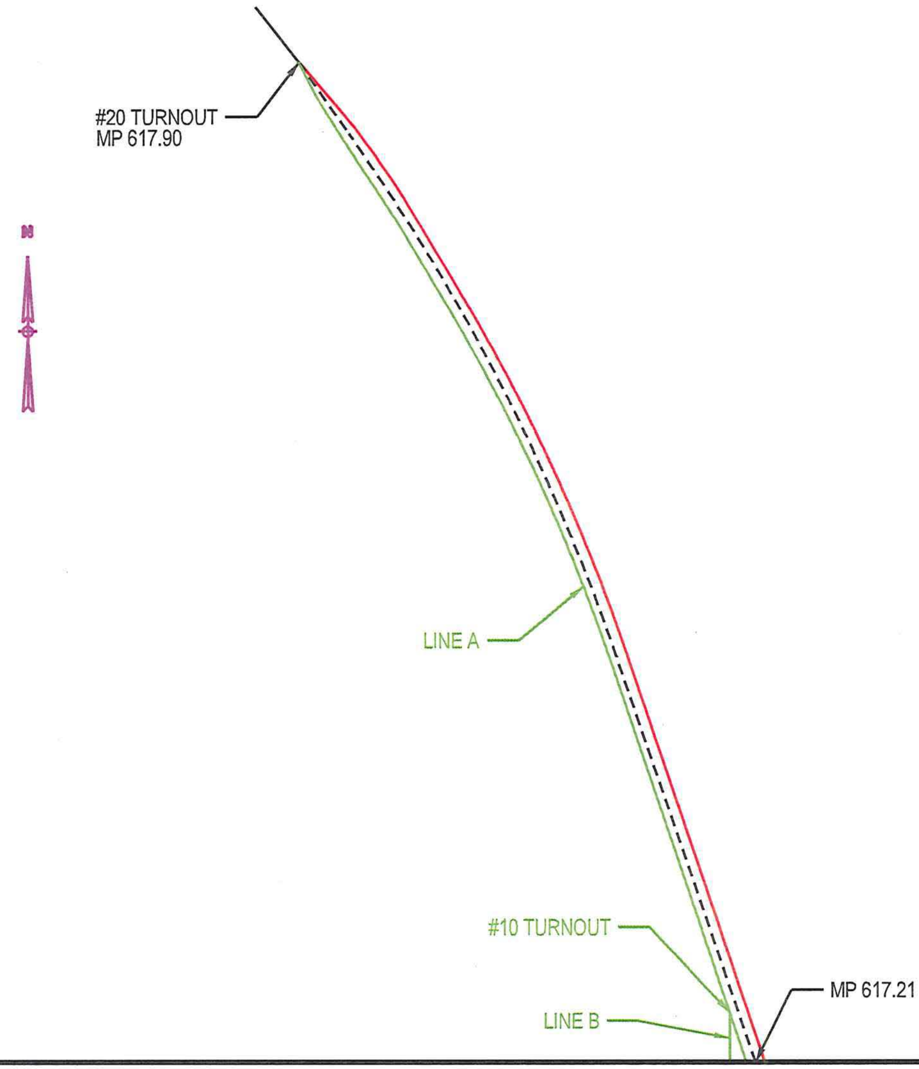
*TURNOUT TYPES
20-•20 ELECTRIC
15E-•15 ELECTRIC
15-•15 HAND-THROWN
10S-•10 SPRING
10-•10 HAND-THROWN
10E-•10 ELECTRIC

FED 1 FAILED EQUIPMENT DETECTOR WITH NUMBER OF TRACKS COVERED

HB • HOT BEARING DETECTOR
DE OR DED • DRAGGING EQUIPMENT DETECTOR
HW • HOT WHEEL DETECTOR

AEI 1 AUTOMATIC EQUIPMENT IDENTIFICATION SCANNER WITH NUMBER OF TRACKS COVERED

UP REPLY EXHIBIT:
III.B-1



PRICE YARD				
	LENGTH AFTER 13' TRACK CLEARANCE AREA		LENGTH FROM TURNOUT TO TURNOUT	
LINE	LF	MILES	LF	MILES
A	10,422	1.97	10,877	2.06
B	10,194	1.93	10,454	1.98
SETOUT	585	0.11	845	0.16

SUBDIVISION: **GREEN RIVER PRICE YARD**

MP 617.90 TO 617.21

DATE: 11/10/11

SCALE: NOT TO SCALE

LEGEND:

- - - - - 136# STANDARD CWR
——— - 136# CWR CLASS 1 RELAY

FED 1 FAILED EQUIPMENT DETECTOR WITH NUMBER OF TRACKS COVERED
HB - HOT BEARING DETECTOR
DE OR DED - DRAGGING EQUIPMENT DETECTOR
HW - HOT WHEEL DETECTOR

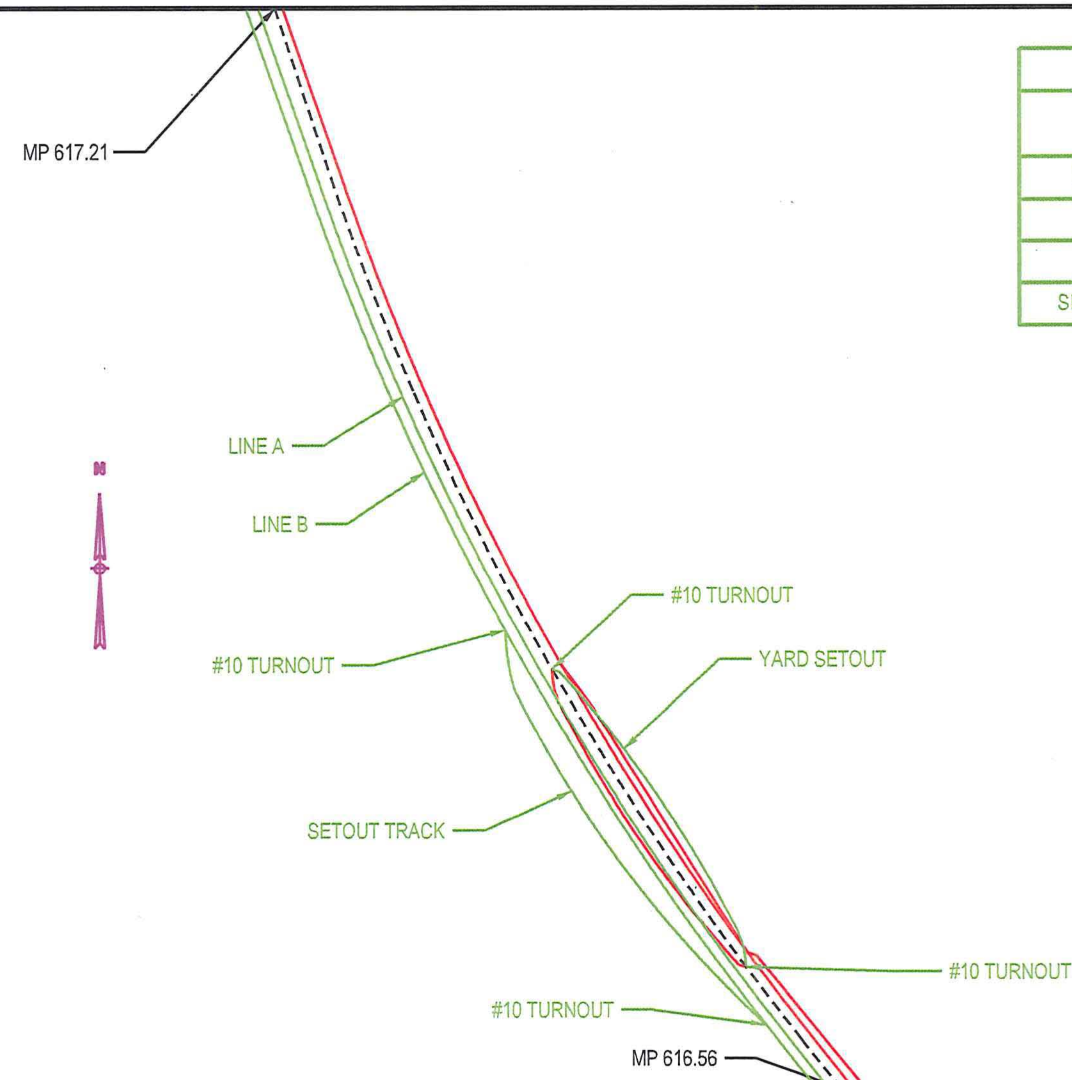
AEI 1 AUTOMATIC EQUIPMENT IDENTIFICATION SCANNER WITH NUMBER OF TRACKS COVERED

● 20 - TURNOUT TYPE*

*TURNOUT TYPES
20-#20 ELECTRIC
15E-#15 ELECTRIC
15-#15 HAND-THROWN
10S-#10 SPRING
10-#10 HAND-THROWN
10E-#10 ELECTRIC

UP REPLY EXHIBIT: **III.B-2**

PRICE YARD				
	LENGTH AFTER 13' TRACK CLEARANCE AREA		LENGTH FROM TURNOUT TO TURNOUT	
LINE	LF	MILES	LF	MILES
A	10,422	1.97	10,877	2.06
B	10,194	1.93	10,454	1.98
SETOUT	585	0.11	845	0.16



SUBDIVISION: **GREEN RIVER PRICE YARD**

MP 617.21 TO 616.56

DATE: 11/10/11

SCALE: NOT TO SCALE

LEGEND:

- - - - - 136# STANDARD CWR
——— - 136# CWR CLASS 1 RELAY

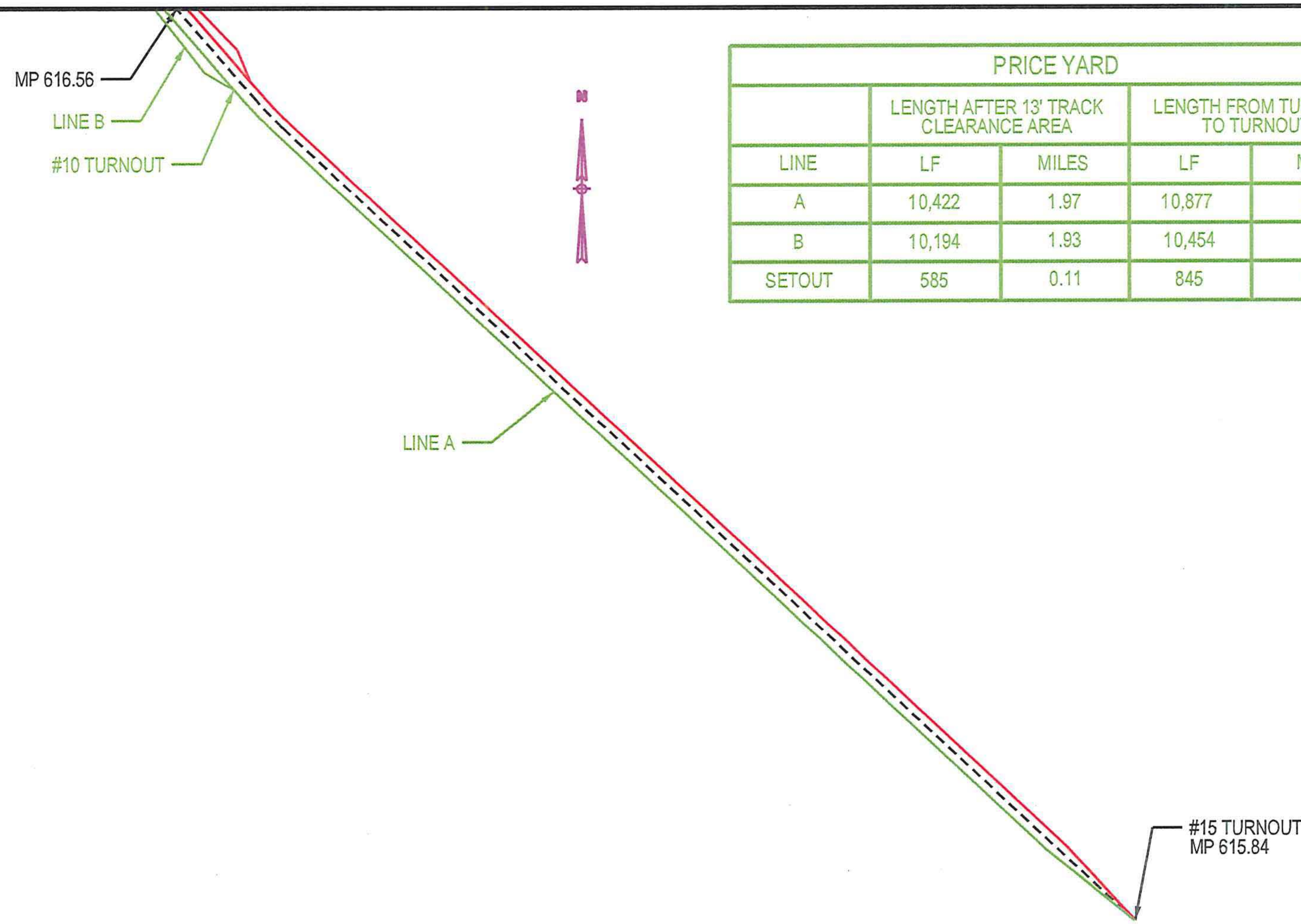
FED 1 FAILED EQUIPMENT DETECTOR WITH NUMBER OF TRACKS COVERED
HB - HOT BEARING DETECTOR
DE OR DED - DRAGGING EQUIPMENT DETECTOR
HW - HOT WHEEL DETECTOR

AEI 1 AUTOMATIC EQUIPMENT IDENTIFICATION SCANNER WITH NUMBER OF TRACKS COVERED

● 20 - TURNOUT TYPE*

*TURNOUT TYPES
20-#20 ELECTRIC
15E-#15 ELECTRIC
15-#15 HAND-THROWN
10S-#10 SPRING
10-#10 HAND-THROWN
10E-#10 ELECTRIC

UP REPLY EXHIBIT:
III.B-2



PRICE YARD				
	LENGTH AFTER 13' TRACK CLEARANCE AREA		LENGTH FROM TURNOUT TO TURNOUT	
LINE	LF	MILES	LF	MILES
A	10,422	1.97	10,877	2.06
B	10,194	1.93	10,454	1.98
SETOUT	585	0.11	845	0.16

SUBDIVISION: **GREEN RIVER**
PRICE YARD

MP 616.56 TO 615.84

DATE: 11/10/11

SCALE: NOT TO SCALE

LEGEND:

- - - - - 136# STANDARD CWR
——— - 136# CWR CLASS 1 RELAY

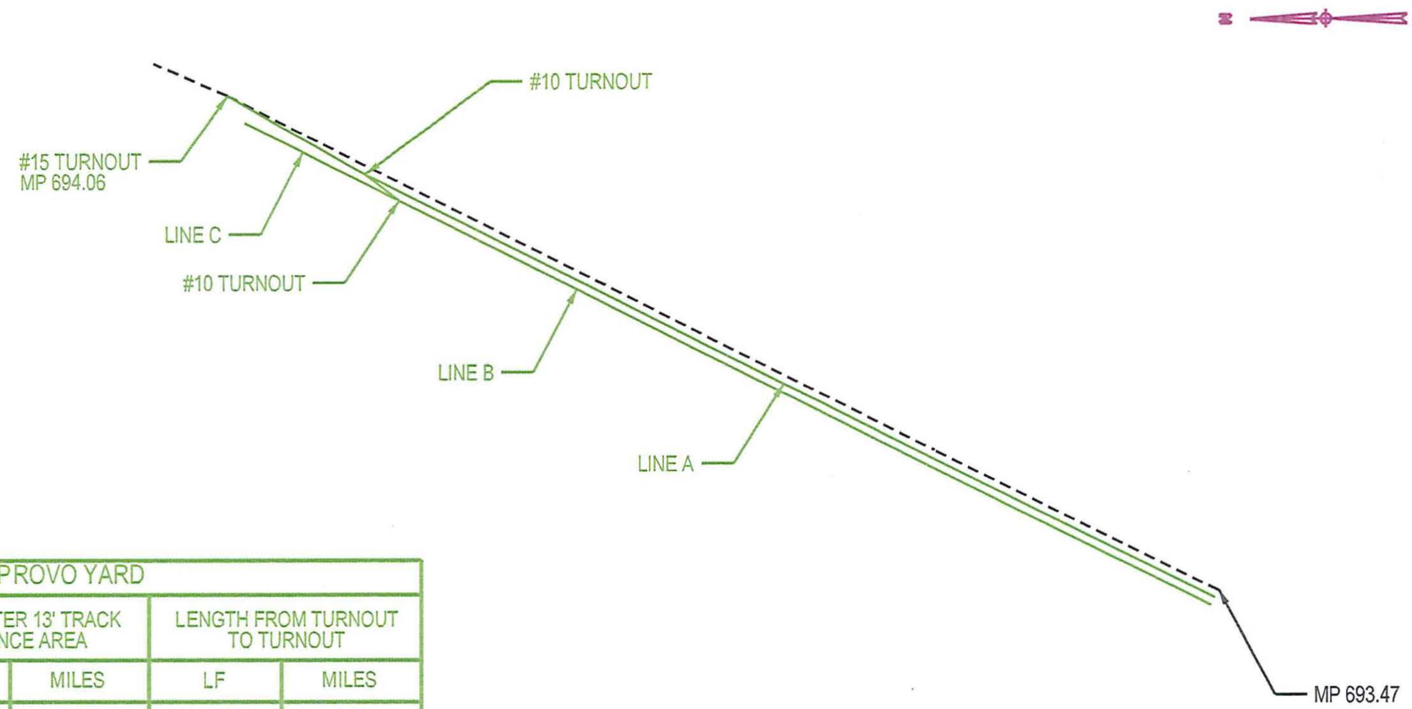
(FED) 1 FAILED EQUIPMENT DETECTOR WITH NUMBER OF TRACKS COVERED
HB - HOT BEARING DETECTOR
DE OR DED - DRAGGING EQUIPMENT DETECTOR
HW - HOT WHEEL DETECTOR

(AEI) 1 AUTOMATIC EQUIPMENT IDENTIFICATION SCANNER WITH NUMBER OF TRACKS COVERED

● 20 - TURNOUT TYPE*

*TURNOUT TYPES
20-#20 ELECTRIC
15E-#15 ELECTRIC
15-#15 HAND-THROWN
10S-#10 SPRING
10-#10 HAND-THROWN
10E-#10 ELECTRIC

UP REPLY EXHIBIT: **III.B-2**



PROVO YARD				
	LENGTH AFTER 13' TRACK CLEARANCE AREA		LENGTH FROM TURNOUT TO TURNOUT	
LINE	LF	MILES	LF	MILES
A	11,279	2.14	11,669	2.21
B	10,881	2.06	11,141	2.11
C	4,870	0.92	5,000	0.95
D	4,870	0.92	5,000	0.95
SETOUT	600	0.11	860	0.16
M.O.W. STORAGE	1,000	0.19	1,130	0.21

SUBDIVISION: **PROVO**
PROVO YARD
MP 694.06 TO 693.47

DATE: 11/10/11
SCALE: NOT TO SCALE

LEGEND:
- - - - - 136# STANDARD CWR
——— - 136# CWR CLASS 1 RELAY

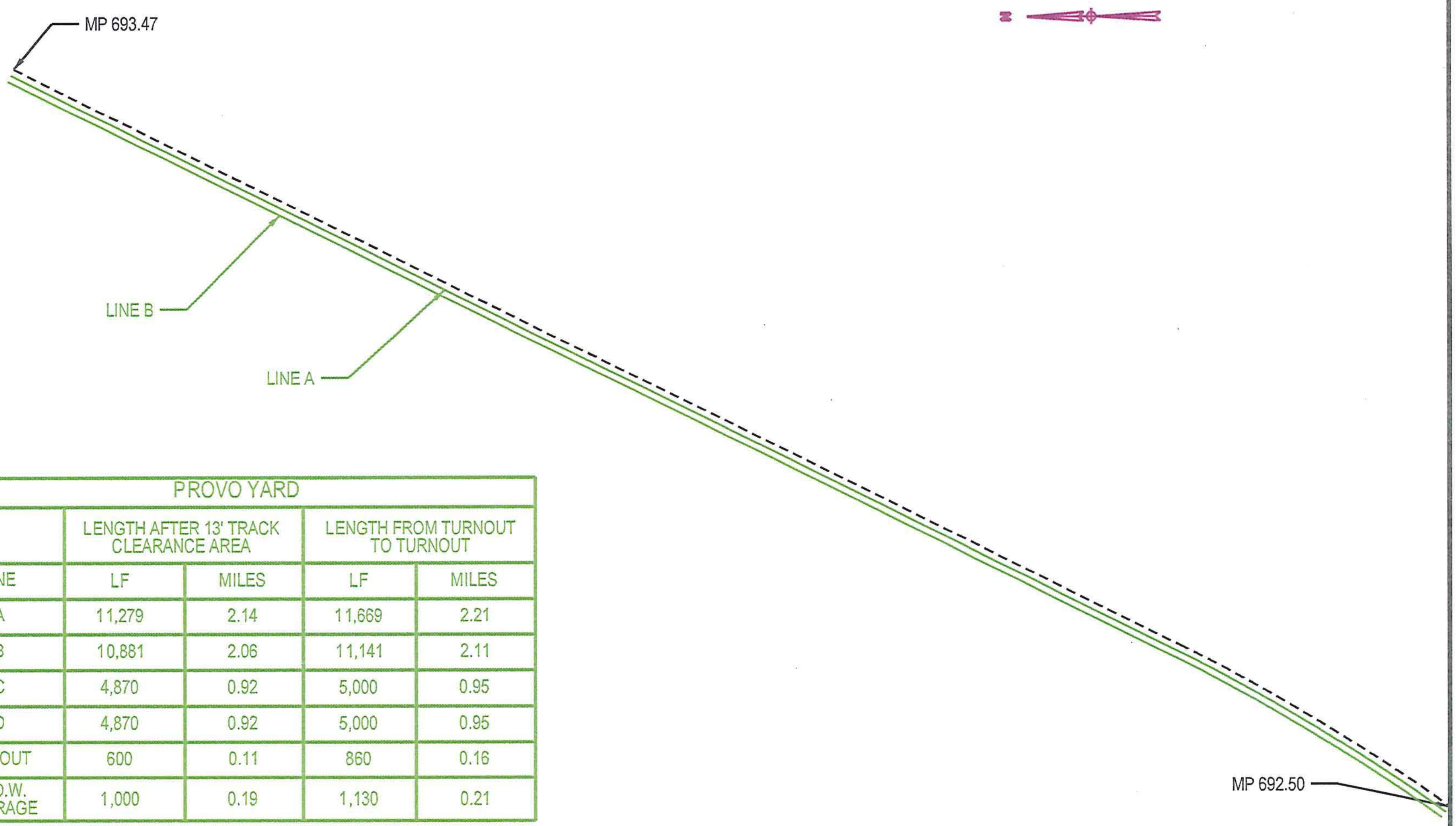
(FED 1) FAILED EQUIPMENT DETECTOR WITH NUMBER OF TRACKS COVERED
HB - HOT BEARING DETECTOR
DE OR DED - DRAGGING EQUIPMENT DETECTOR
HW - HOT WHEEL DETECTOR

(AEI 1) AUTOMATIC EQUIPMENT IDENTIFICATION SCANNER WITH NUMBER OF TRACKS COVERED

● 20 - TURNOUT TYPE*

*TURNOUT TYPES
20-#20 ELECTRIC
15E-#15 ELECTRIC
15-#15 HAND-THROWN
10S-#10 SPRING
10-#10 HAND-THROWN
10E-#10 ELECTRIC

UP REPLY EXHIBIT: **III.B-2**



PROVO YARD				
	LENGTH AFTER 13' TRACK CLEARANCE AREA		LENGTH FROM TURNOUT TO TURNOUT	
LINE	LF	MILES	LF	MILES
A	11,279	2.14	11,669	2.21
B	10,881	2.06	11,141	2.11
C	4,870	0.92	5,000	0.95
D	4,870	0.92	5,000	0.95
SETOUT	600	0.11	860	0.16
M.O.W. STORAGE	1,000	0.19	1,130	0.21

SUBDIVISION: **PROVO**

PROVO YARD

MP 693.47 TO 692.50

DATE: 11/10/11

SCALE: NOT TO SCALE

LEGEND:

- - - - - 136# STANDARD CWR
——— - 136# CWR CLASS 1 RELAY

FED 1 FAILED EQUIPMENT DETECTOR WITH NUMBER OF TRACKS COVERED

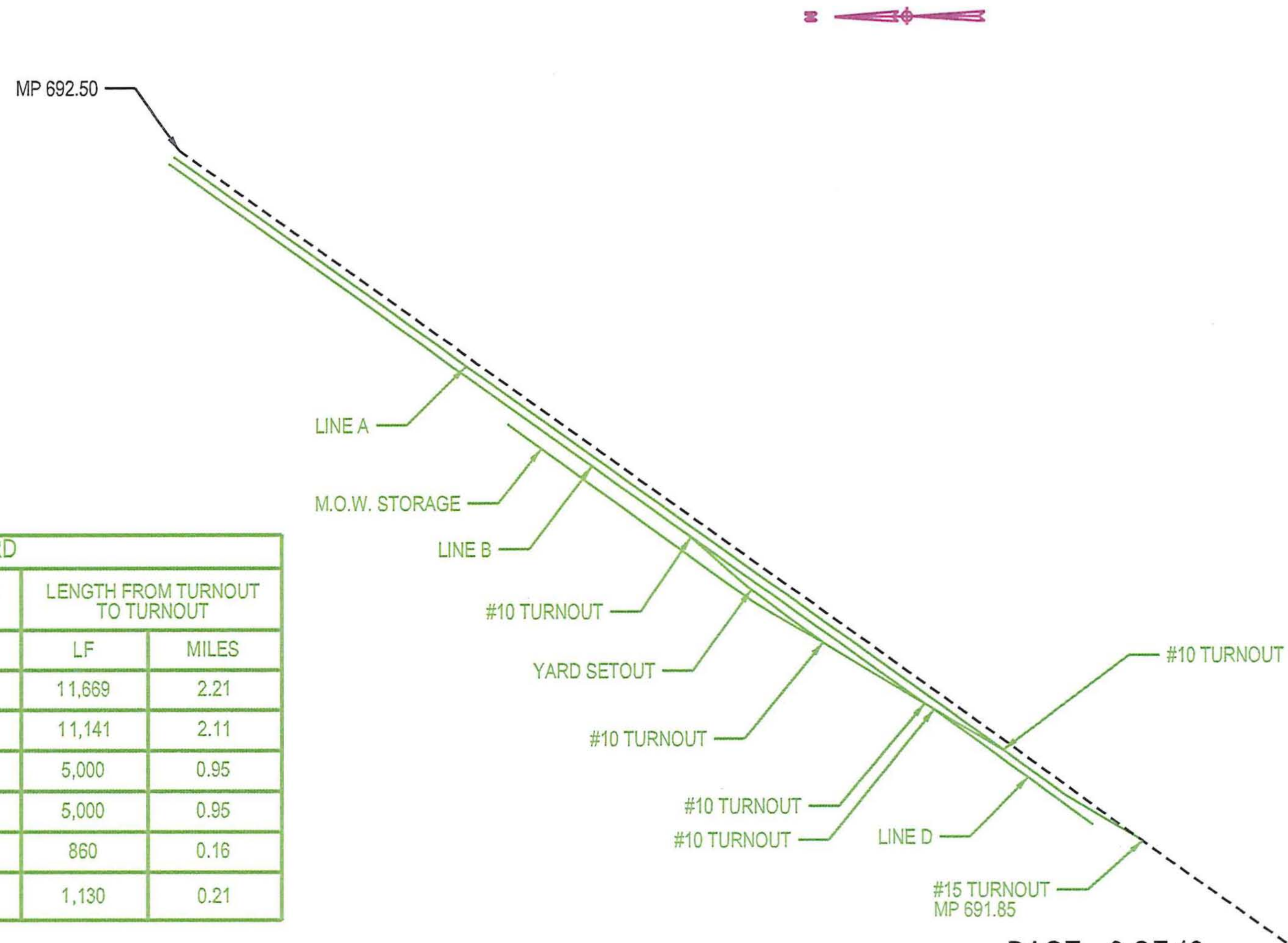
HB - HOT BEARING DETECTOR
DE OR DED - DRAGGING EQUIPMENT DETECTOR
HW - HOT WHEEL DETECTOR

AEI 1 AUTOMATIC EQUIPMENT IDENTIFICATION SCANNER WITH NUMBER OF TRACKS COVERED

● 20 - TURNOUT TYPE*

*TURNOUT TYPES
20-#20 ELECTRIC
15E-#15 ELECTRIC
15-#15 HAND-THROWN
10S-#10 SPRING
10-#10 HAND-THROWN
10E-#10 ELECTRIC

UP REPLY EXHIBIT: **III.B-2**



PROVO YARD				
	LENGTH AFTER 13' TRACK CLEARANCE AREA		LENGTH FROM TURNOUT TO TURNOUT	
LINE	LF	MILES	LF	MILES
A	11,279	2.14	11,669	2.21
B	10,881	2.06	11,141	2.11
C	4,870	0.92	5,000	0.95
D	4,870	0.92	5,000	0.95
SETOUT	600	0.11	860	0.16
M.O.W. STORAGE	1,000	0.19	1,130	0.21

SUBDIVISION: **PROVO**

PROVO YARD

MP 692.50 TO 691.85

DATE: 11/10/11

SCALE: NOT TO SCALE

LEGEND:

- - - - - 136# STANDARD CWR
——— - 136# CWR CLASS 1 RELAY

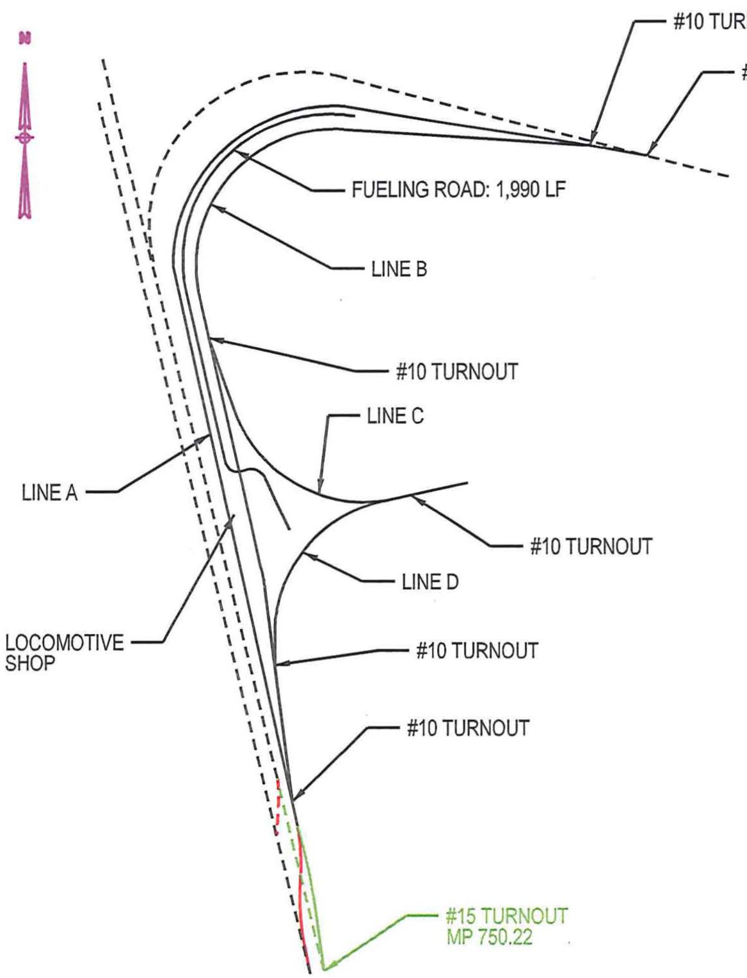
● 20 - TURNOUT TYPE*

*TURNOUT TYPES
20-#20 ELECTRIC
15E-#15 ELECTRIC
15-#15 HAND-THROWN
10S-#10 SPRING
10-#10 HAND-THROWN
10E-#10 ELECTRIC

FED 1 FAILED EQUIPMENT DETECTOR WITH NUMBER OF TRACKS COVERED
HB - HOT BEARING DETECTOR
DE OR DED - DRAGGING EQUIPMENT DETECTOR
HW - HOT WHEEL DETECTOR

AEI 1 AUTOMATIC EQUIPMENT IDENTIFICATION SCANNER WITH NUMBER OF TRACKS COVERED

UP REPLY EXHIBIT: **III.B-2**



LOCOMOTIVE SHOP				
	LENGTH AFTER 13' TRACK CLEARANCE AREA		LENGTH FROM TURNOUT TO TURNOUT	
LINE	LF	MILES	LF	MILES
A	3,911	0.74	4,450	0.86
B	3,027	0.57	3,516	0.67
C	815	0.15	1,016	0.19
D	875	0.17	1,059	0.20

SUBDIVISION: **SHARP LOCOMOTIVE SHOP**

DATE: 11/10/11

SCALE: NOT TO SCALE

LEGEND:
- - - - - 136# STANDARD CWR
——— - 136# CWR CLASS 1 RELAY

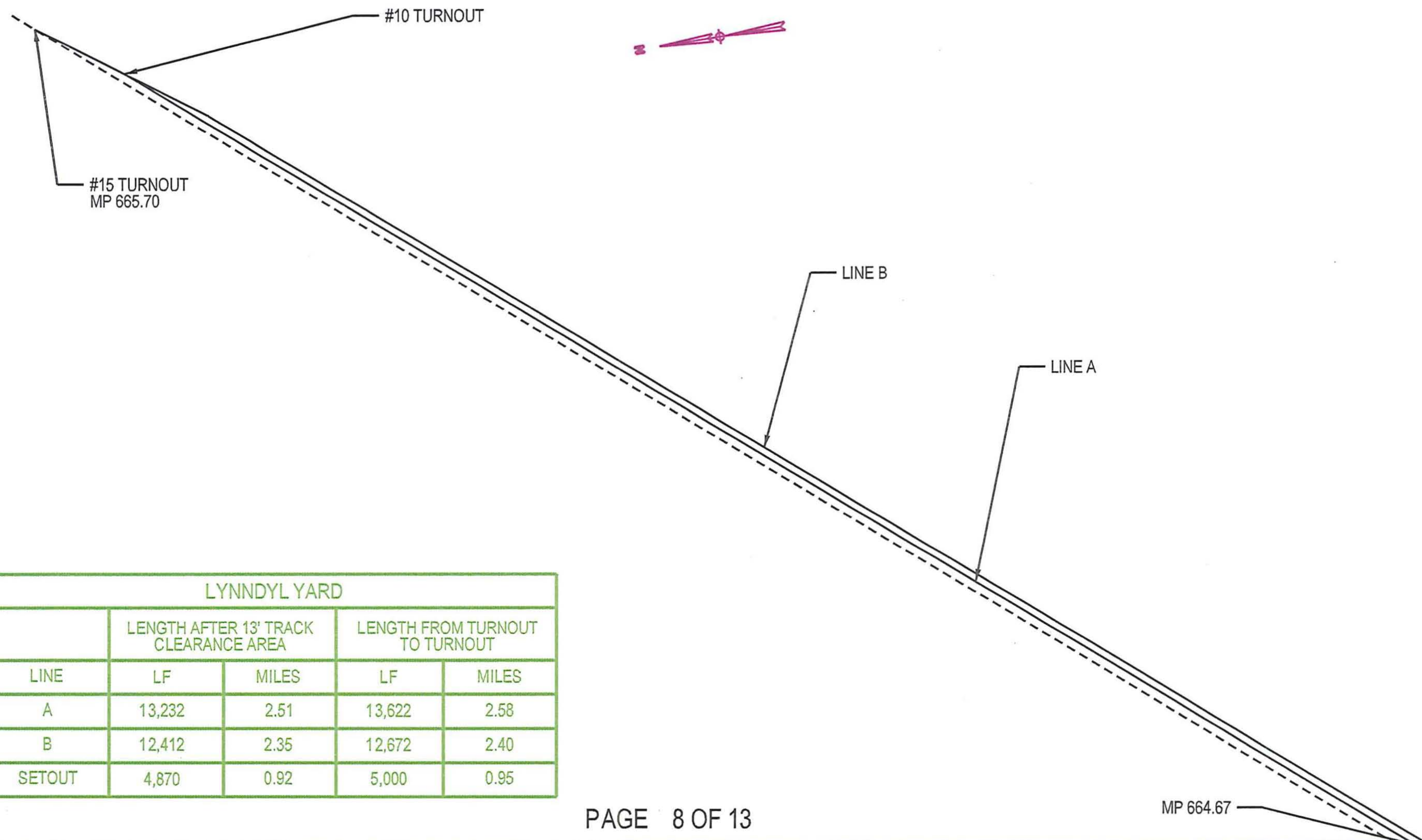
(FED) 1 FAILED EQUIPMENT DETECTOR WITH NUMBER OF TRACKS COVERED
HB - HOT BEARING DETECTOR
DE OR DED - DRAGGING EQUIPMENT DETECTOR
HW - HOT WHEEL DETECTOR

(AEI) 1 AUTOMATIC EQUIPMENT IDENTIFICATION SCANNER WITH NUMBER OF TRACKS COVERED

● 20 - TURNOUT TYPE*

*TURNOUT TYPES
20-#20 ELECTRIC
15E-#15 ELECTRIC
15-#15 HAND-THROWN
10S-#10 SPRING
10-#10 HAND-THROWN
10E-#10 ELECTRIC

UP REPLY EXHIBIT: **III.B-2**



LYNNDYL YARD				
	LENGTH AFTER 13' TRACK CLEARANCE AREA		LENGTH FROM TURNOUT TO TURNOUT	
LINE	LF	MILES	LF	MILES
A	13,232	2.51	13,622	2.58
B	12,412	2.35	12,672	2.40
SETOUT	4,870	0.92	5,000	0.95

SUBDIVISION: **LYNNDYL**
LYNNDYL YARD

MP 665.70 TO 664.67

DATE: 11/10/11

SCALE: NOT TO SCALE

LEGEND:

- - - - - 136# STANDARD CWR
——— - 136# CWR CLASS 1 RELAY

FED 1 FAILED EQUIPMENT DETECTOR WITH NUMBER OF TRACKS COVERED
HB - HOT BEARING DETECTOR
DE OR DED - DRAGGING EQUIPMENT DETECTOR
HW - HOT WHEEL DETECTOR

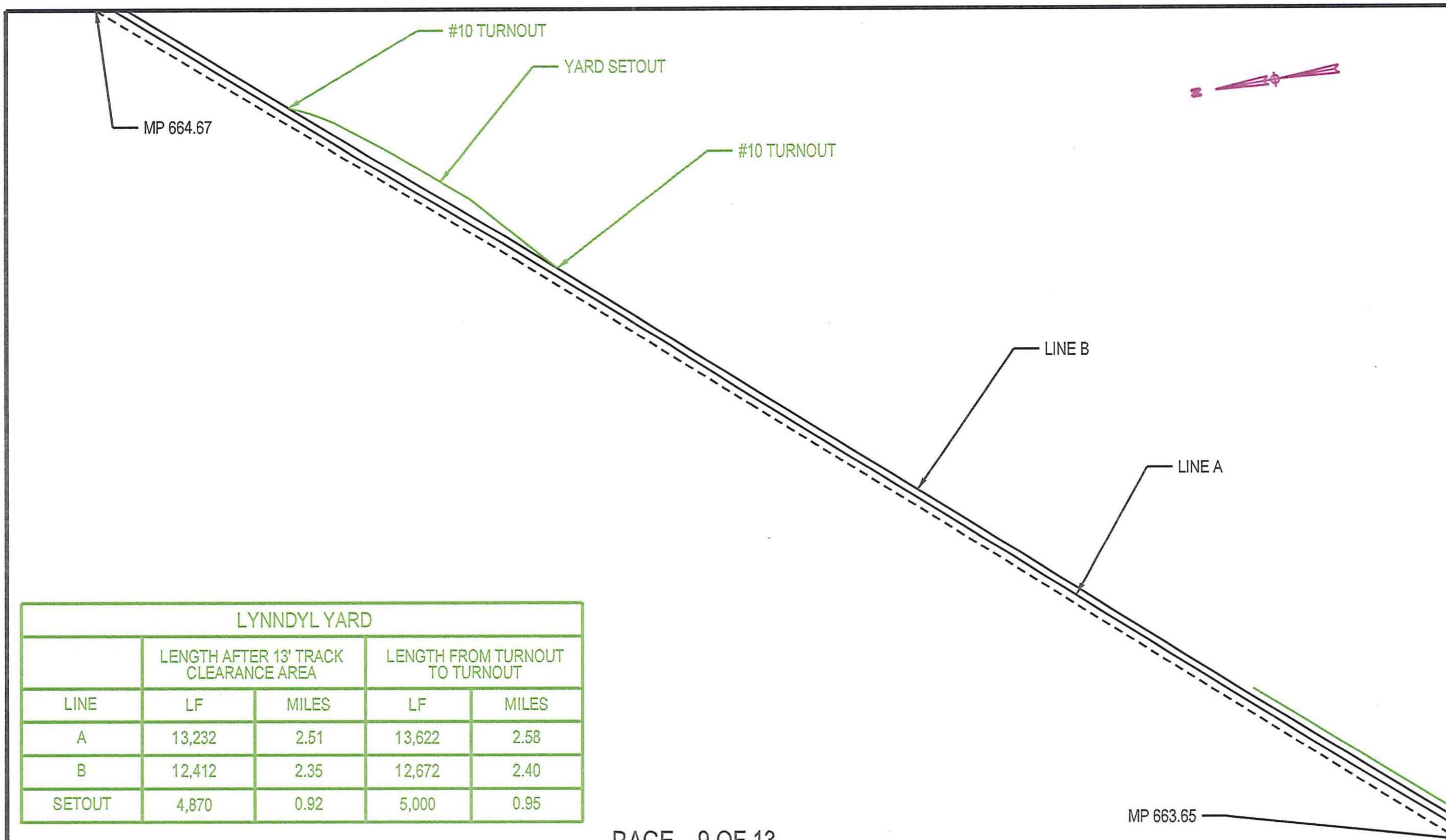
AEI 1 AUTOMATIC EQUIPMENT IDENTIFICATION SCANNER WITH NUMBER OF TRACKS COVERED

● 20 - TURNOUT TYPE*

*TURNOUT TYPES
20-#20 ELECTRIC
15E-#15 ELECTRIC
15-#15 HAND-THROWN
10S-#10 SPRING
10-#10 HAND-THROWN
10E-#10 ELECTRIC

III.B-2

UP REPLY EXHIBIT:



LYNNDYL YARD				
	LENGTH AFTER 13' TRACK CLEARANCE AREA		LENGTH FROM TURNOUT TO TURNOUT	
LINE	LF	MILES	LF	MILES
A	13,232	2.51	13,622	2.58
B	12,412	2.35	12,672	2.40
SETOUT	4,870	0.92	5,000	0.95

SUBDIVISION: **LYNNDYL**
LYNNDYL YARD

MP 664.67 TO 663.65

DATE: 11/10/11

SCALE: NOT TO SCALE

LEGEND:

- - - - - 136# STANDARD CWR
——— - 136# CWR CLASS 1 RELAY

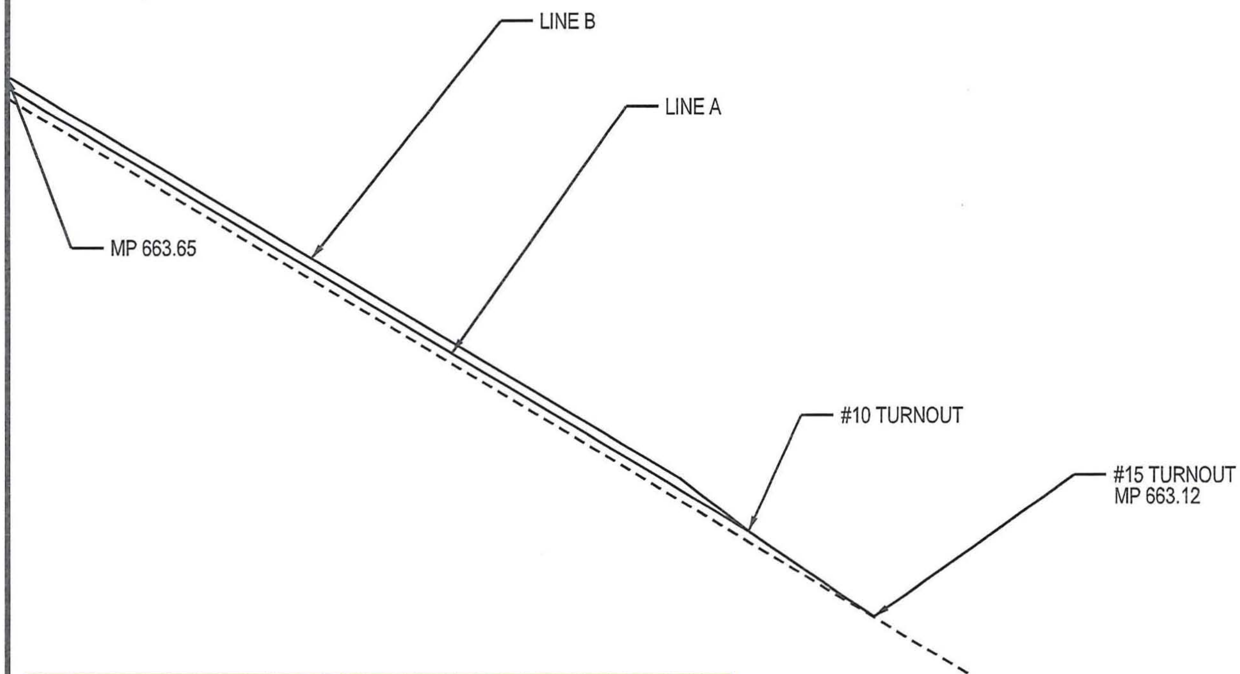
(FED) 1 FAILED EQUIPMENT DETECTOR WITH NUMBER OF TRACKS COVERED
HB - HOT BEARING DETECTOR
DE OR DED - DRAGGING EQUIPMENT DETECTOR
HW - HOT WHEEL DETECTOR

(AEI) 1 AUTOMATIC EQUIPMENT IDENTIFICATION SCANNER WITH NUMBER OF TRACKS COVERED

● 20 - TURNOUT TYPE*

*TURNOUT TYPES
20-#20 ELECTRIC
15E-#15 ELECTRIC
15-#15 HAND-THROWN
10S-#10 SPRING
10-#10 HAND-THROWN
10E-#10 ELECTRIC

UP REPLY EXHIBIT: **III.B-2**



LYNNDYL YARD				
	LENGTH AFTER 13' TRACK CLEARANCE AREA		LENGTH FROM TURNOUT TO TURNOUT	
LINE	LF	MILES	LF	MILES
A	13,232	2.51	13,622	2.58
B	12,412	2.35	12,672	2.40
SETOUT	4,870	0.92	5,000	0.95

SUBDIVISION: **LYNNDYL**
LYNNDYL YARD
MP 663.65 TO 663.12

DATE: 11/10/11

SCALE: NOT TO SCALE

LEGEND:

- - - - - 136# STANDARD CWR
——— - 136# CWR CLASS 1 RELAY

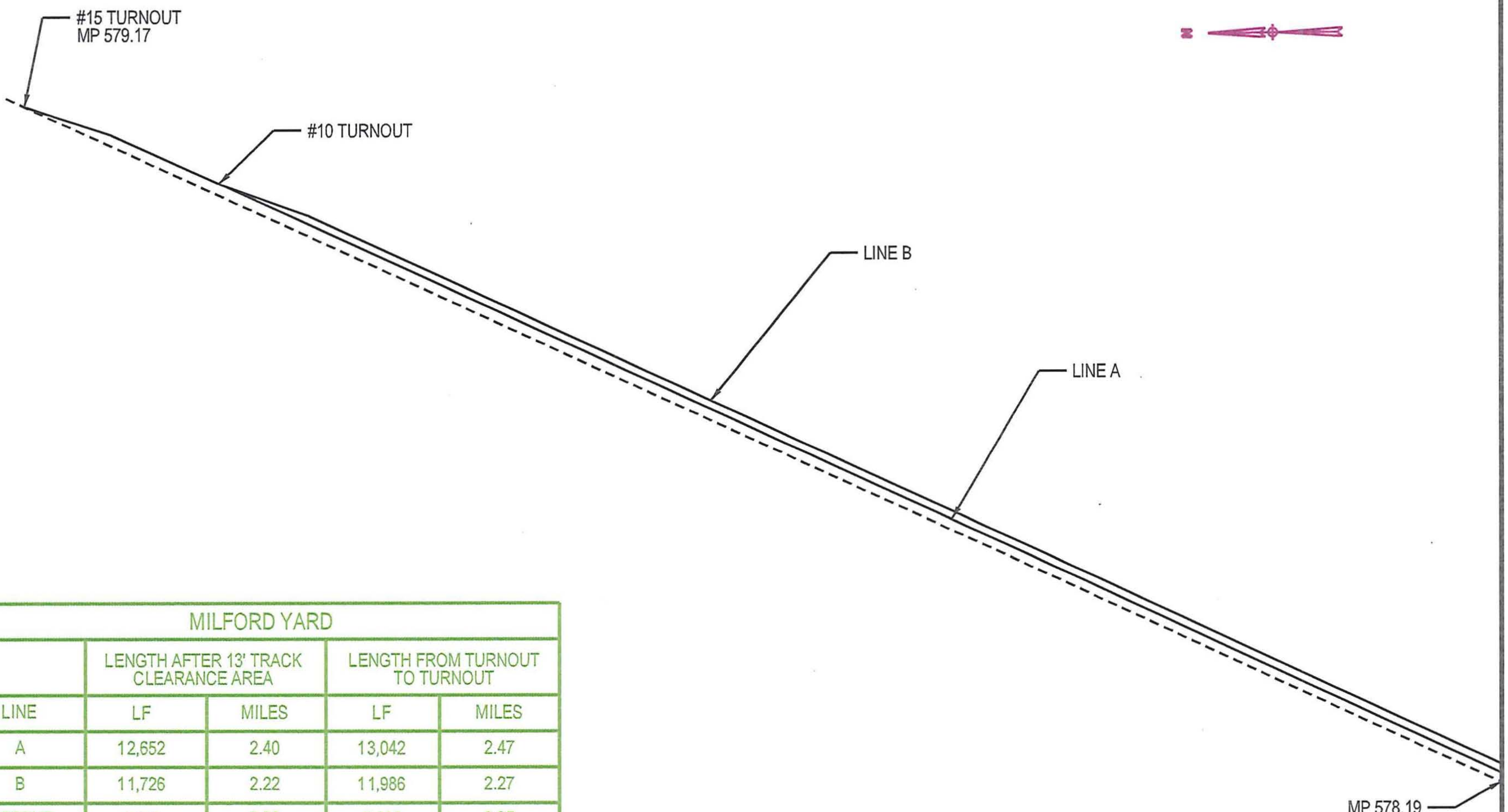
● 20 - TURNOUT TYPE*

*TURNOUT TYPES
20-#20 ELECTRIC
15E-#15 ELECTRIC
15-#15 HAND-THROWN
10S-#10 SPRING
10-#10 HAND-THROWN
10E-#10 ELECTRIC

FED 1 FAILED EQUIPMENT DETECTOR WITH NUMBER OF TRACKS COVERED
HB - HOT BEARING DETECTOR
DE OR DED - DRAGGING EQUIPMENT DETECTOR
HW - HOT WHEEL DETECTOR

AEI 1 AUTOMATIC EQUIPMENT IDENTIFICATION SCANNER WITH NUMBER OF TRACKS COVERED

UP REPLY EXHIBIT: **III.B-2**



MILFORD YARD				
	LENGTH AFTER 13' TRACK CLEARANCE AREA		LENGTH FROM TURNOUT TO TURNOUT	
LINE	LF	MILES	LF	MILES
A	12,652	2.40	13,042	2.47
B	11,726	2.22	11,986	2.27
SETOUT	4,870	0.92	5,000	0.95

SUBDIVISION: **LYNNDYL**
MILFORD YARD

MP 579.17 TO 578.19

DATE: 11/10/11

SCALE: NOT TO SCALE

LEGEND:

- - - - - 136# STANDARD CWR
——— - 136# CWR CLASS 1 RELAY

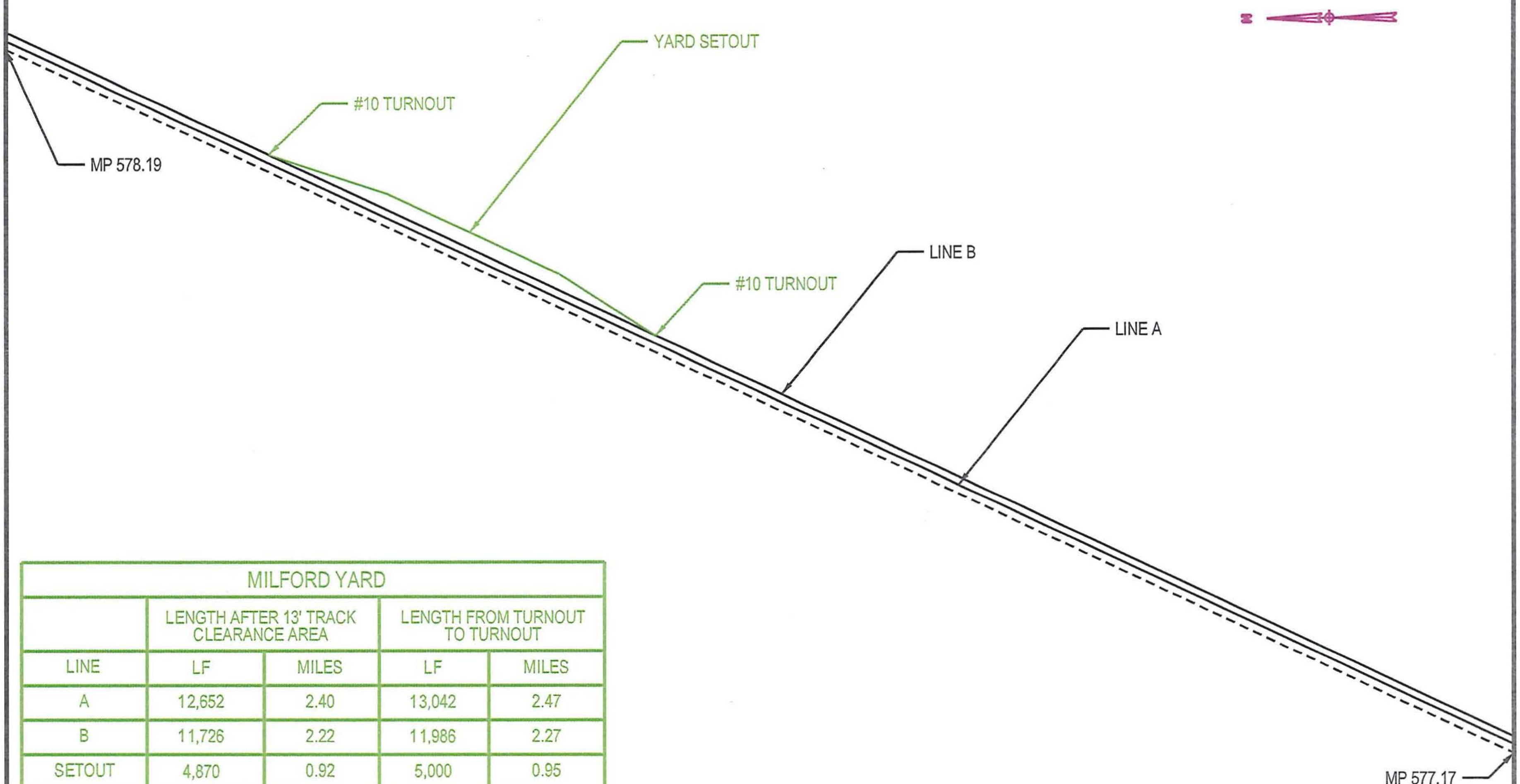
(FED 1) FAILED EQUIPMENT DETECTOR WITH NUMBER OF TRACKS COVERED
HB - HOT BEARING DETECTOR
DE OR DED - DRAGGING EQUIPMENT DETECTOR
HW - HOT WHEEL DETECTOR

(AEI 1) AUTOMATIC EQUIPMENT IDENTIFICATION SCANNER WITH NUMBER OF TRACKS COVERED

● 20 - TURNOUT TYPE*

*TURNOUT TYPES
20-#20 ELECTRIC
15E-#15 ELECTRIC
15-#15 HAND-THROWN
10S-#10 SPRING
10-#10 HAND-THROWN
10E-#10 ELECTRIC

UP REPLY EXHIBIT:
III.B-2



MILFORD YARD				
	LENGTH AFTER 13' TRACK CLEARANCE AREA		LENGTH FROM TURNOUT TO TURNOUT	
LINE	LF	MILES	LF	MILES
A	12,652	2.40	13,042	2.47
B	11,726	2.22	11,986	2.27
SETOUT	4,870	0.92	5,000	0.95

SUBDIVISION: **LYNNDYL**
MILFORD YARD

MP 578.19 TO 577.17

DATE: 11/10/11

SCALE: NOT TO SCALE

LEGEND:

- - - - - 136# STANDARD CWR
——— - 136# CWR CLASS 1 RELAY

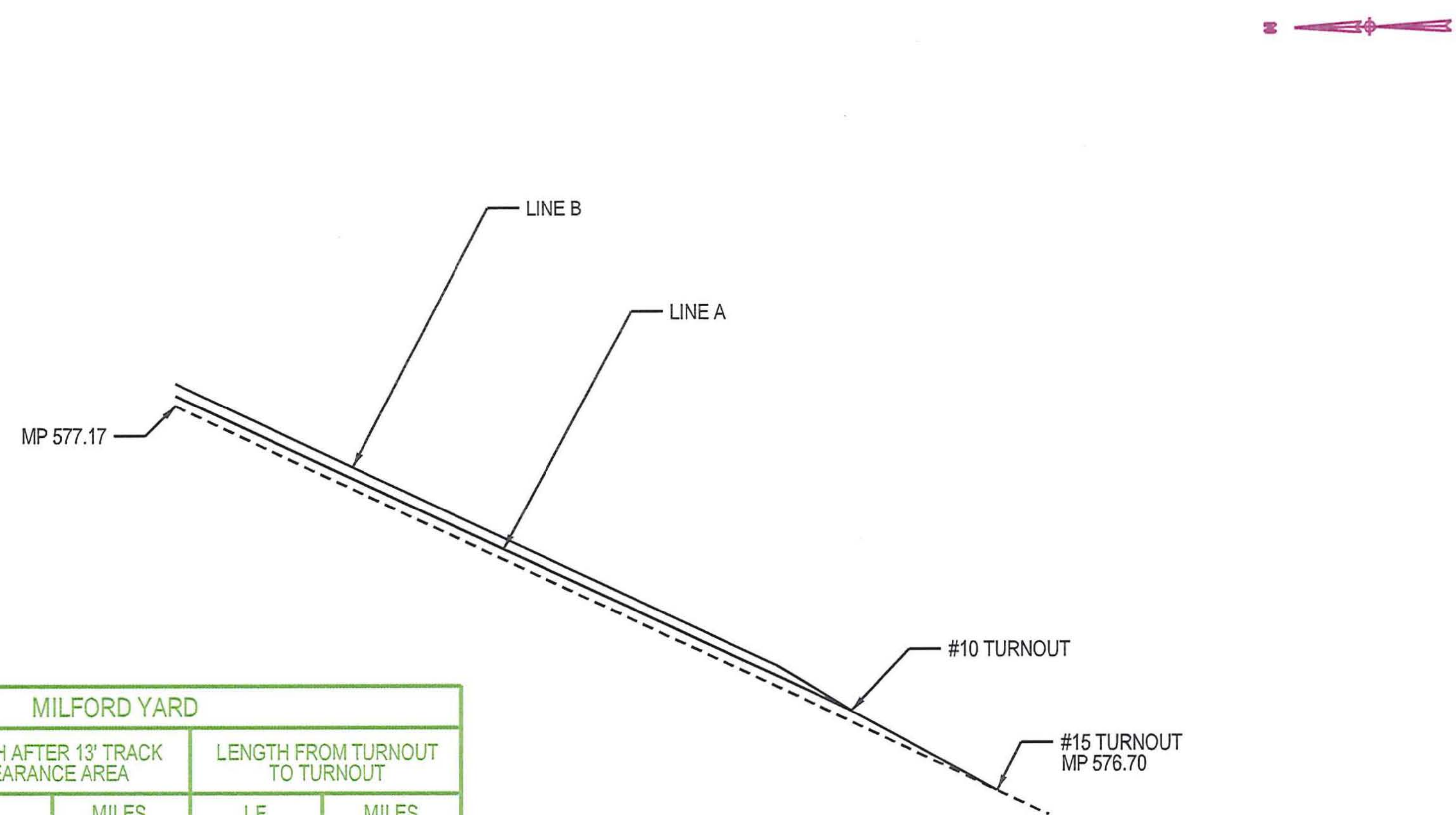
(FED) 1 FAILED EQUIPMENT DETECTOR WITH NUMBER OF TRACKS COVERED
HB - HOT BEARING DETECTOR
DE OR DED - DRAGGING EQUIPMENT DETECTOR
HW - HOT WHEEL DETECTOR

(AEI) 1 AUTOMATIC EQUIPMENT IDENTIFICATION SCANNER WITH NUMBER OF TRACKS COVERED

● 20 - TURNOUT TYPE*

*TURNOUT TYPES
20-#20 ELECTRIC
15E-#15 ELECTRIC
15-#15 HAND-THROWN
10S-#10 SPRING
10-#10 HAND-THROWN
10E-#10 ELECTRIC

UP REPLY EXHIBIT:
III.B-2



MILFORD YARD				
	LENGTH AFTER 13' TRACK CLEARANCE AREA		LENGTH FROM TURNOUT TO TURNOUT	
LINE	LF	MILES	LF	MILES
A	12,652	2.40	13,042	2.47
B	11,726	2.22	11,986	2.27
SETOUT	4,870	0.92	5,000	0.95

SUBDIVISION: **LYNNDYL**
MILFORD YARD

MP 577.17 TO 576.70

DATE: 11/10/11

SCALE: NOT TO SCALE

LEGEND:

- - - - - 136# STANDARD CWR
———— - 136# CWR CLASS 1 RELAY

(FED) 1 FAILED EQUIPMENT DETECTOR WITH NUMBER OF TRACKS COVERED
HB - HOT BEARING DETECTOR
DE OR DED - DRAGGING EQUIPMENT DETECTOR
HW - HOT WHEEL DETECTOR

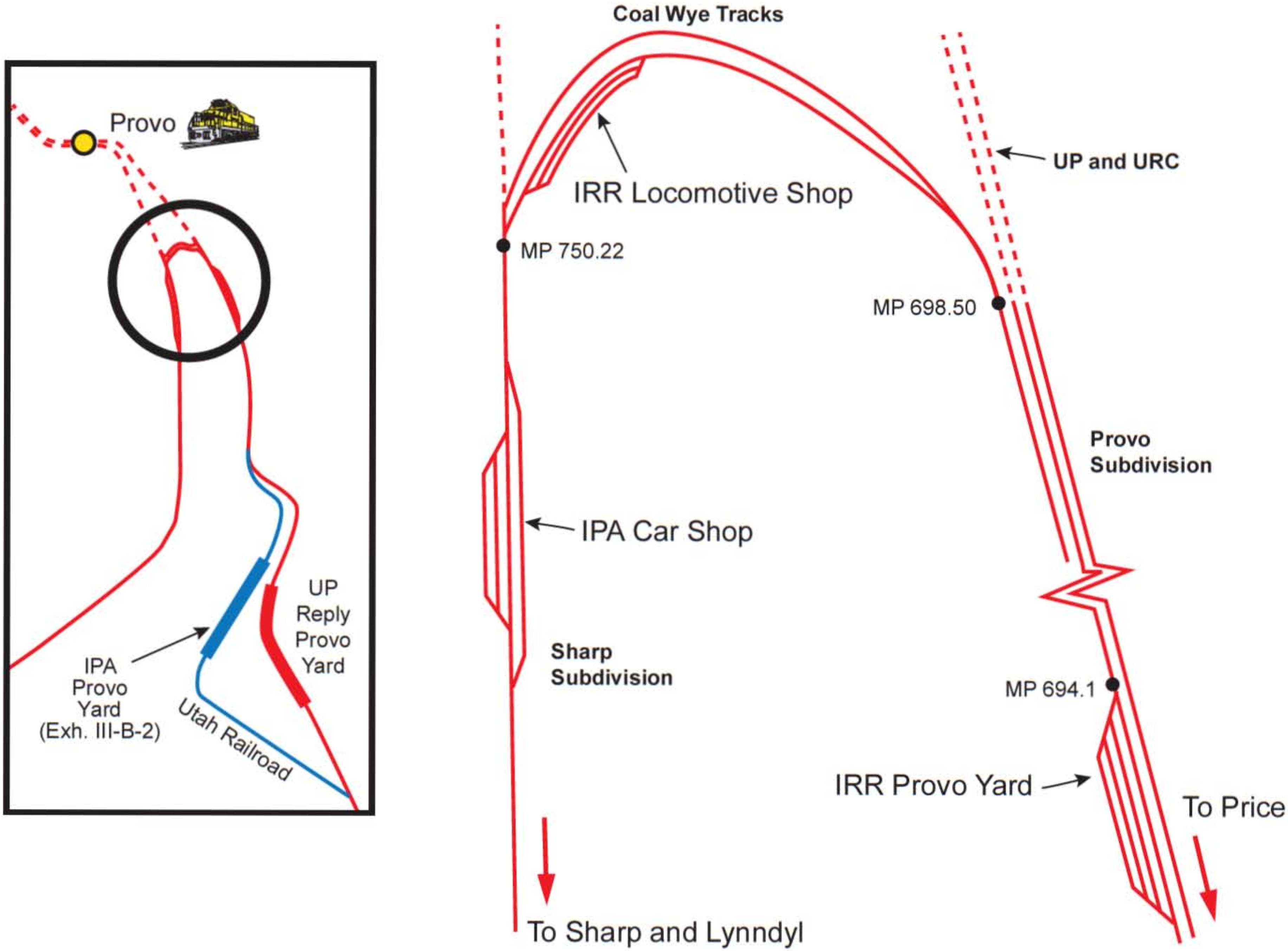
(AEI) 1 AUTOMATIC EQUIPMENT IDENTIFICATION SCANNER WITH NUMBER OF TRACKS COVERED

● 20 - TURNOUT TYPE*

*TURNOUT TYPES
20-#20 ELECTRIC
15E-#15 ELECTRIC
15-#15 HAND-THROWN
10S-#10 SPRING
10-#10 HAND-THROWN
10E-#10 ELECTRIC

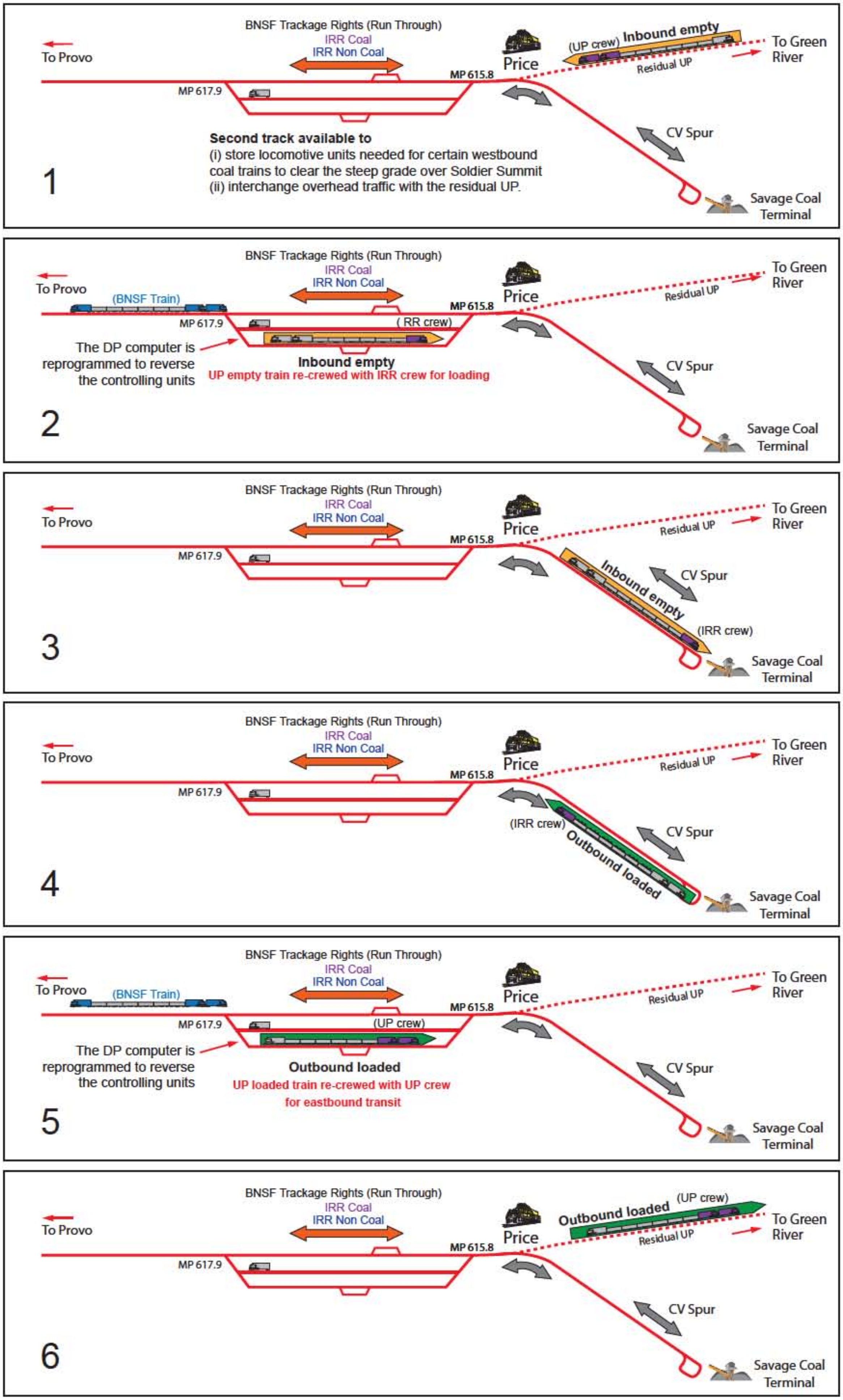
UP REPLY EXHIBIT:
III.B-2

Coal Wye Tracks Between Sharp and Provo Subdivisions

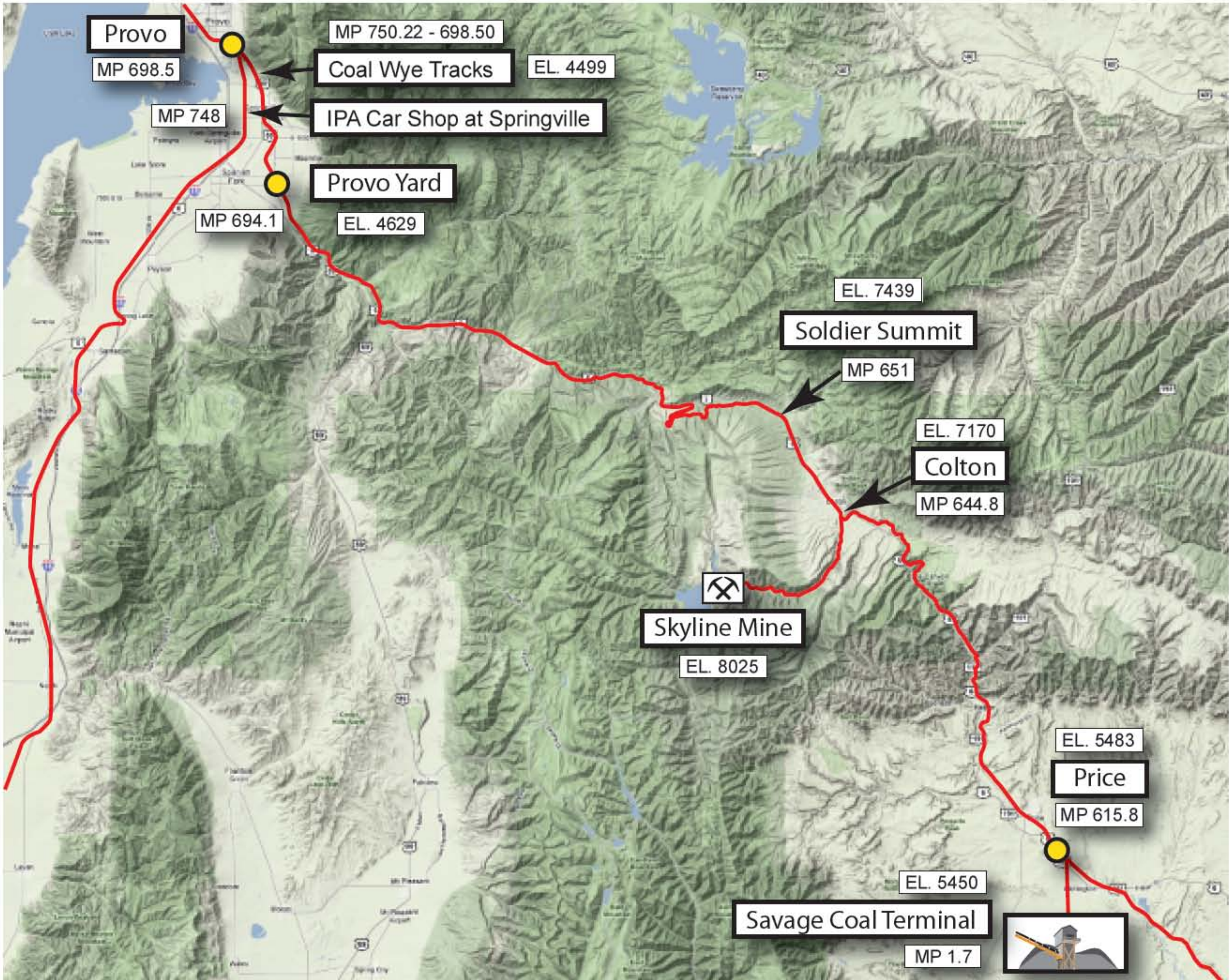


UP Reply Exhibit III.B-3
Page 1 of 1

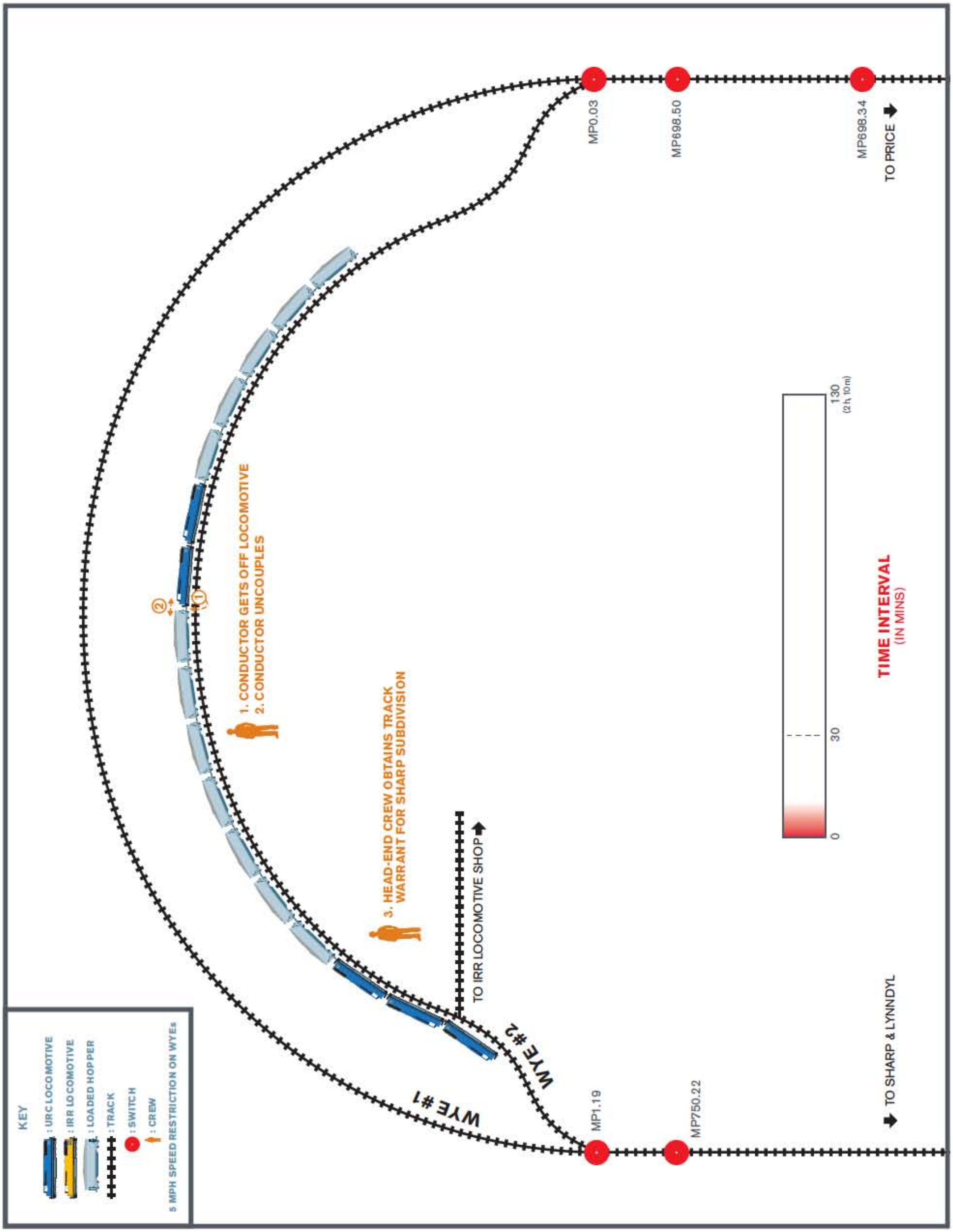
Reversing Direction of Coal Trains at Price Yard

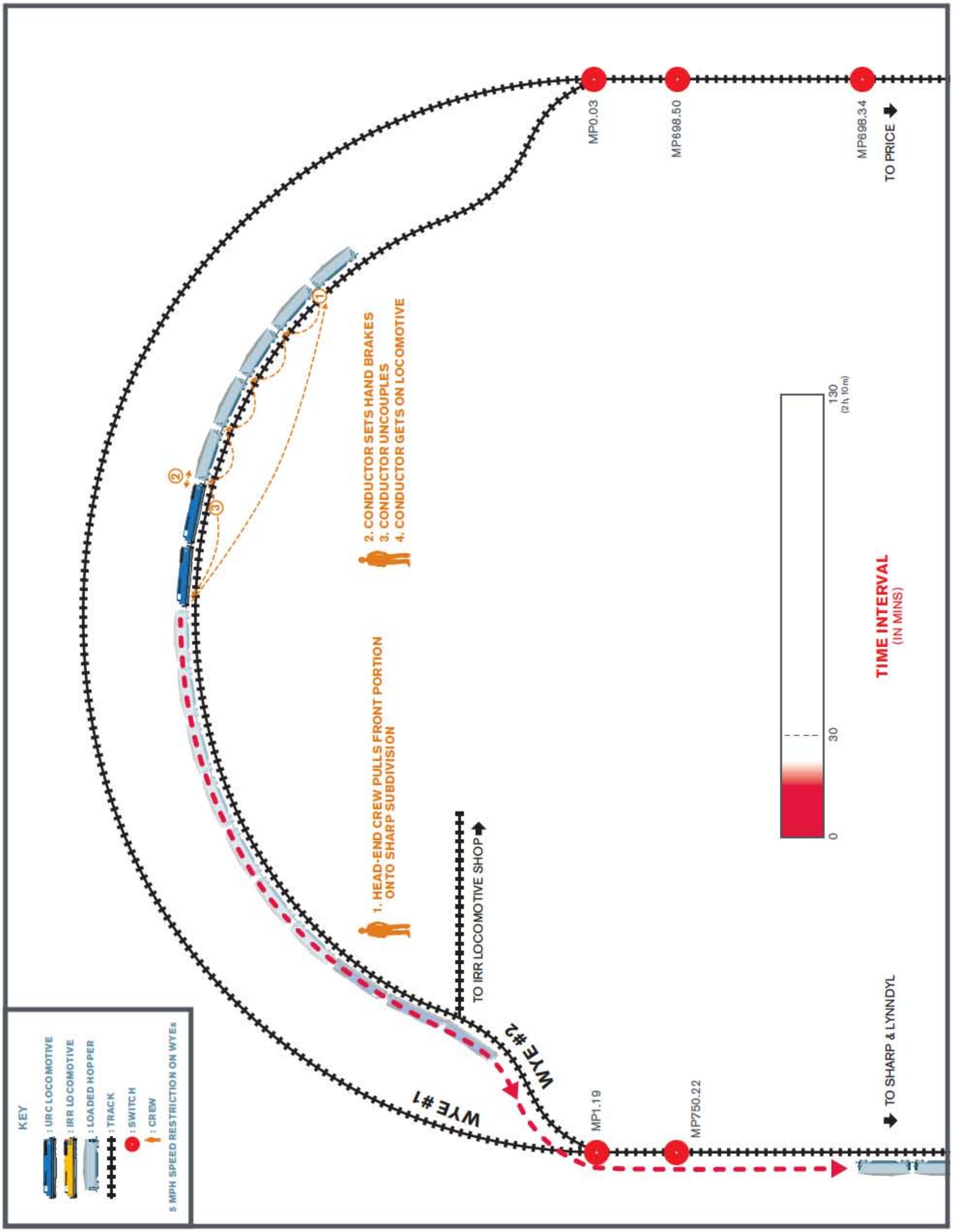


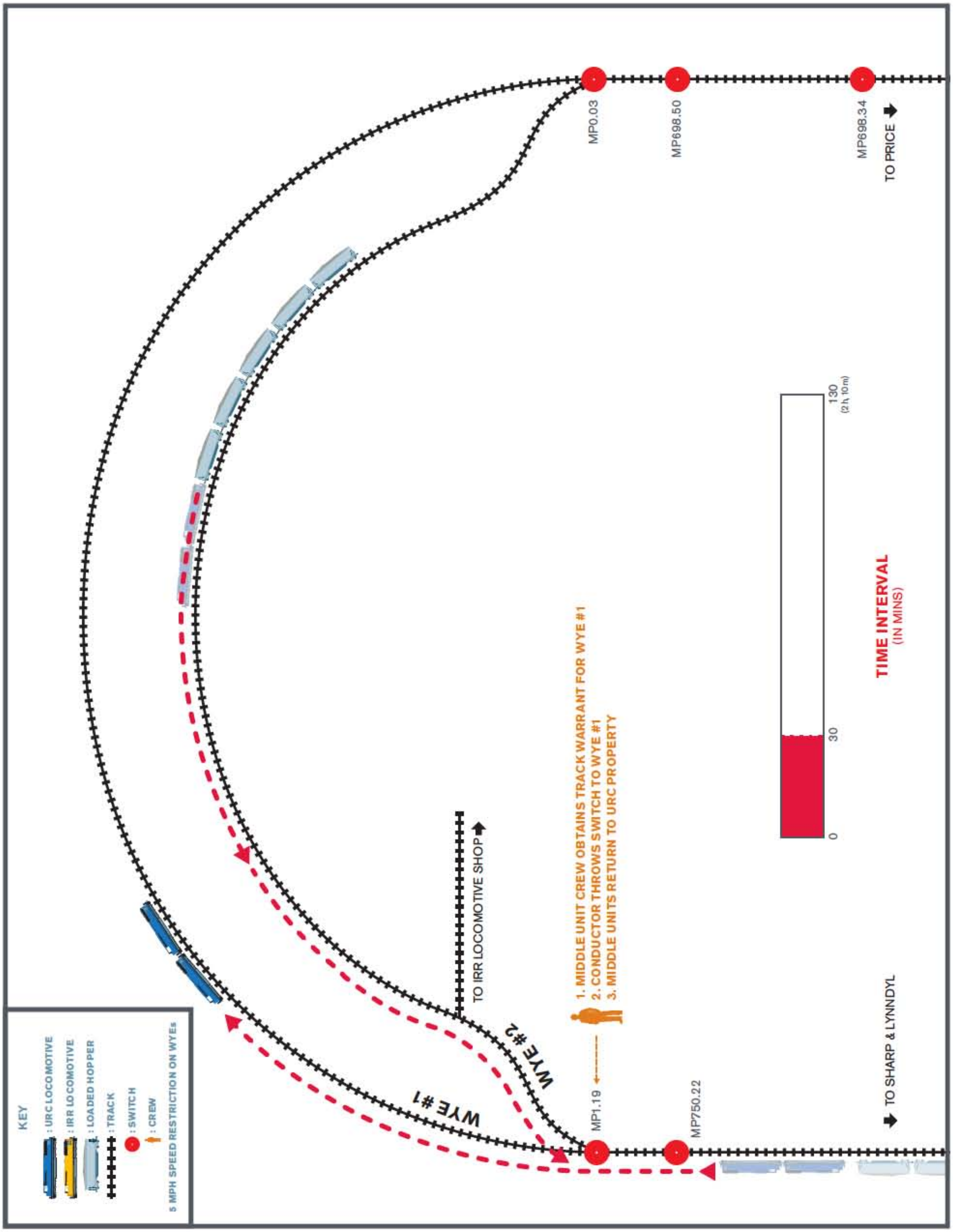
Topographical Map
Provo to Price

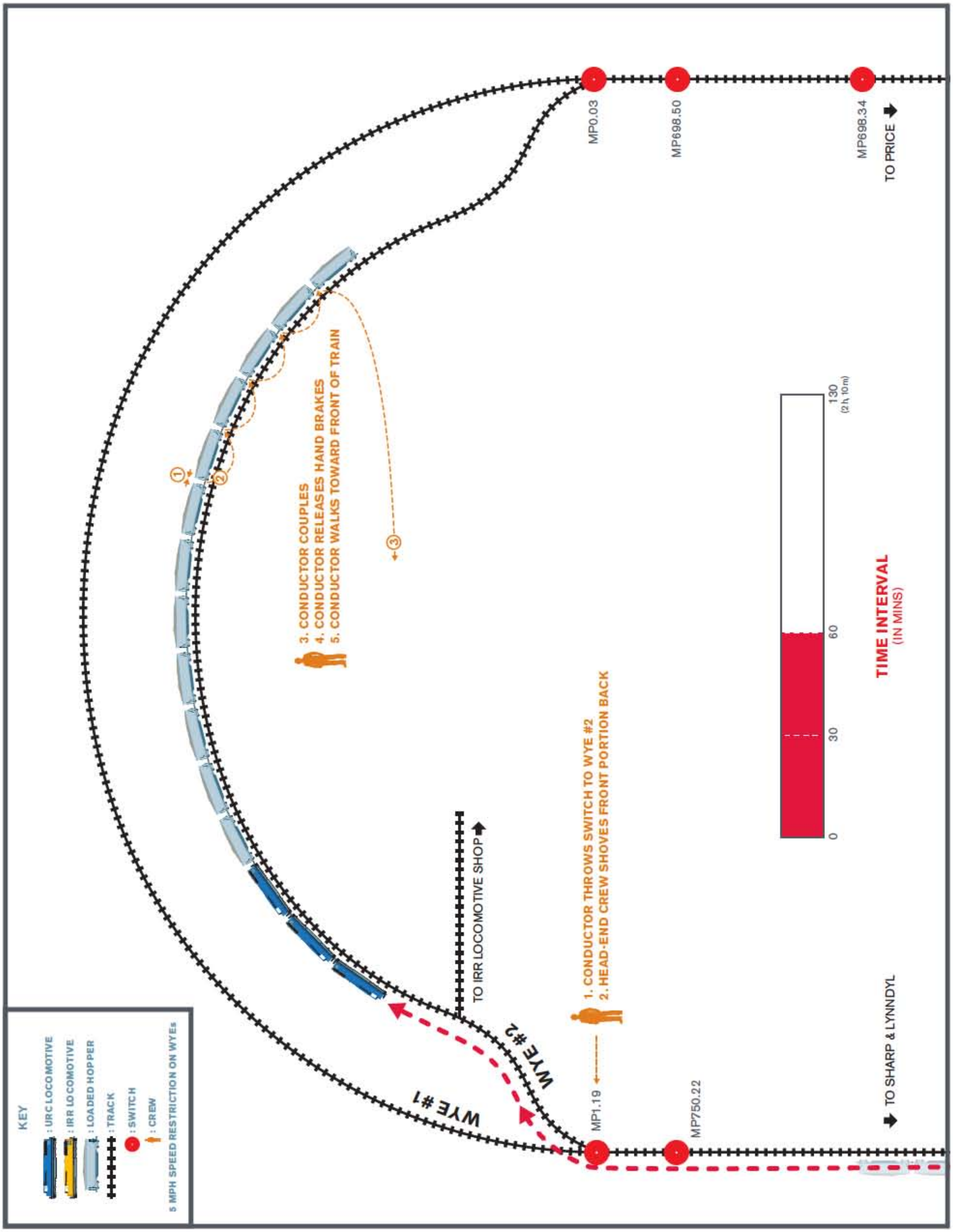


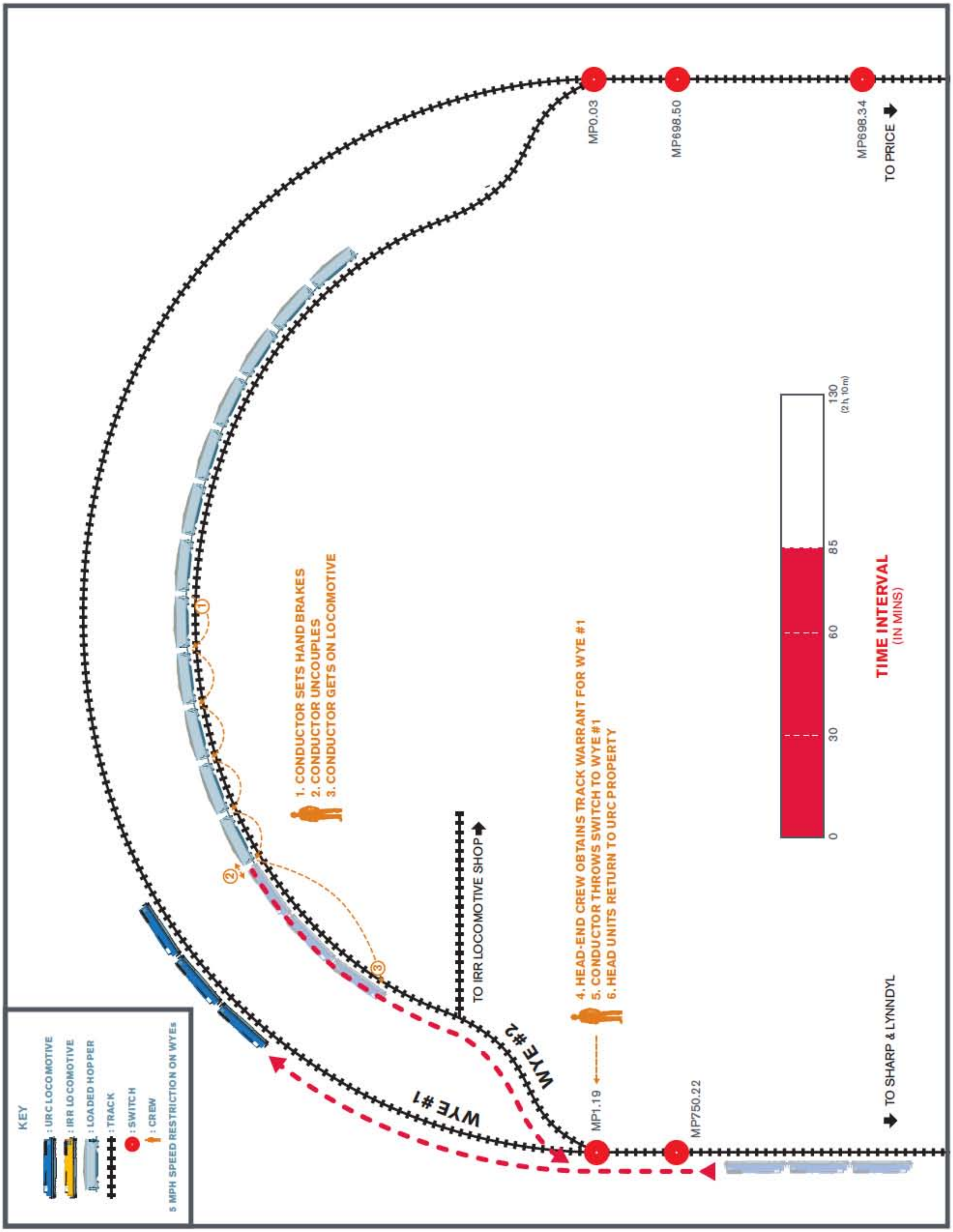
THIS EXHIBIT IS A HIGHLY CONFIDENTIAL DOCUMENT

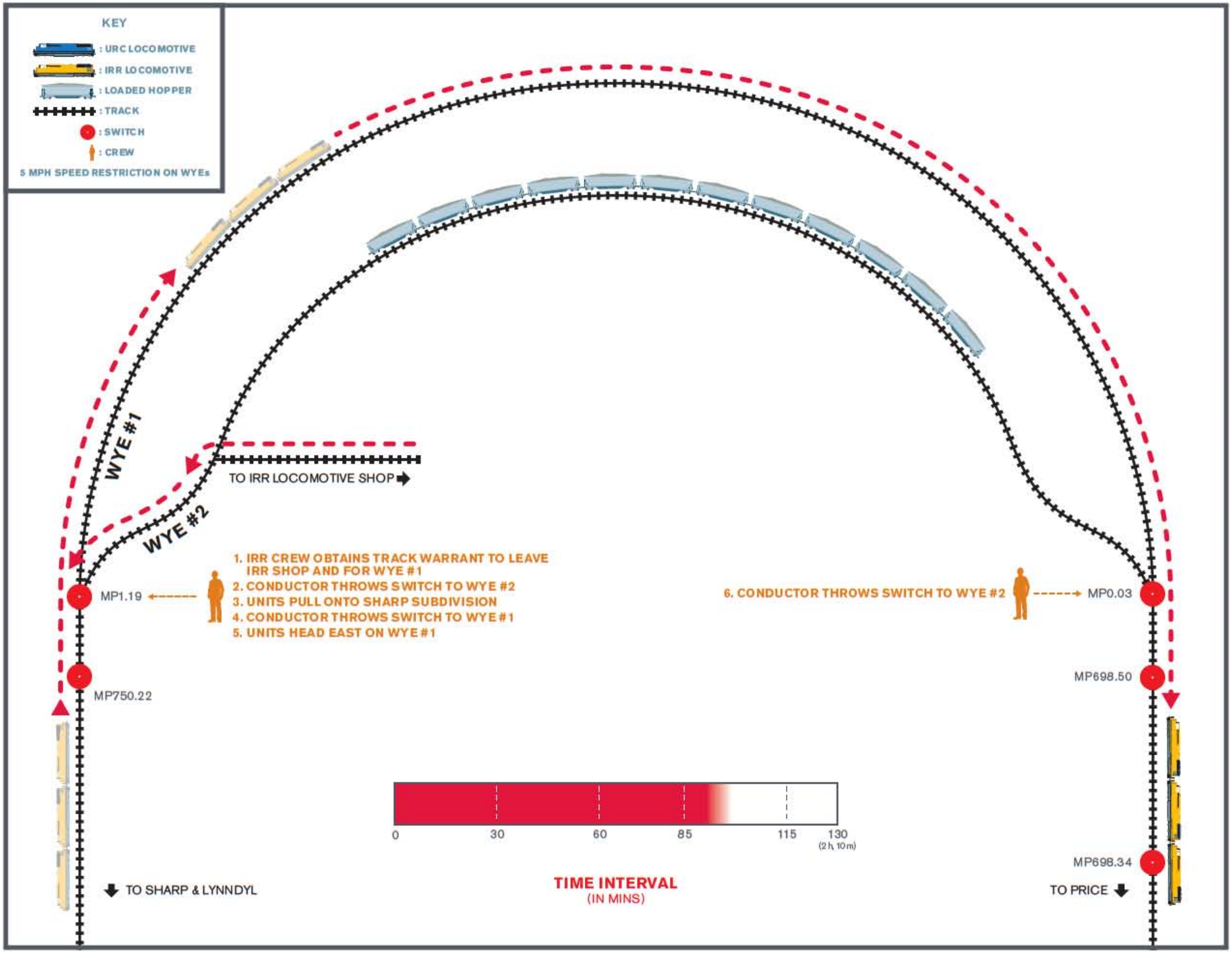

KEY
: URC LOCOMOTIVE
: IRR LOCOMOTIVE
: LOADED HOPPER
: TRACK
: SWITCH
: CREW
5 MPH SPEED RESTRICTION ON WYEs
MP0.03
MP698.50
MP698.34
TO PRICE
1. CONDUCTOR GETS OFF LOCOMOTIVE
2. CONDUCTOR UNCOUPLES
3. HEAD-END CREW OBTAINS TRACK WARRANT FOR SHARP SUBDIVISION
TO IRR LOCOMOTIVE SHOP
WYE #1
WYE #2
MP1.19
MP750.22
TO SHARP & LYNNDYL
TIME INTERVAL
(IN MINS)
0
30
130
(2h 10m)

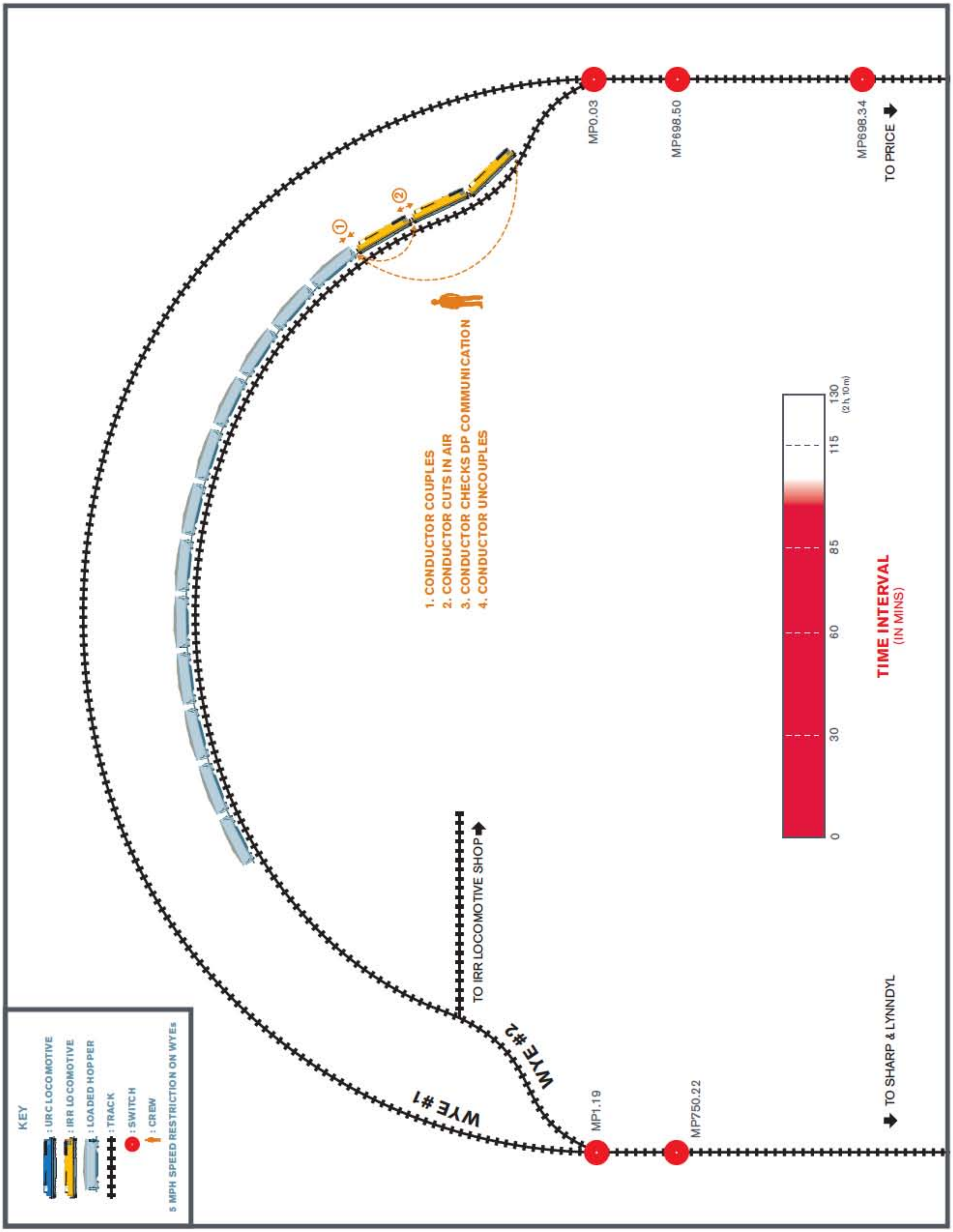

KEY
: URC LOCOMOTIVE
: IRR LOCOMOTIVE
: LOADED HOPPER
: TRACK
: SWITCH
: CREW
5 MPH SPEED RESTRICTION ON WYEs
MP0.03
MP698.50
MP698.34
TO PRICE
1. HEAD-END CREW PULLS FRONT PORTION ONTO SHARP SUBDIVISION
2. CONDUCTOR SETS HAND BRAKES
3. CONDUCTOR UNCOUPLES
4. CONDUCTOR GETS ON LOCOMOTIVE
TO IRR LOCOMOTIVE SHOP
WYE #1
WYE #2
MP1.19
MP750.22
TO SHARP & LYNNDYL
TIME INTERVAL
(IN MINS)
0
30
130
(2 h, 10 m)

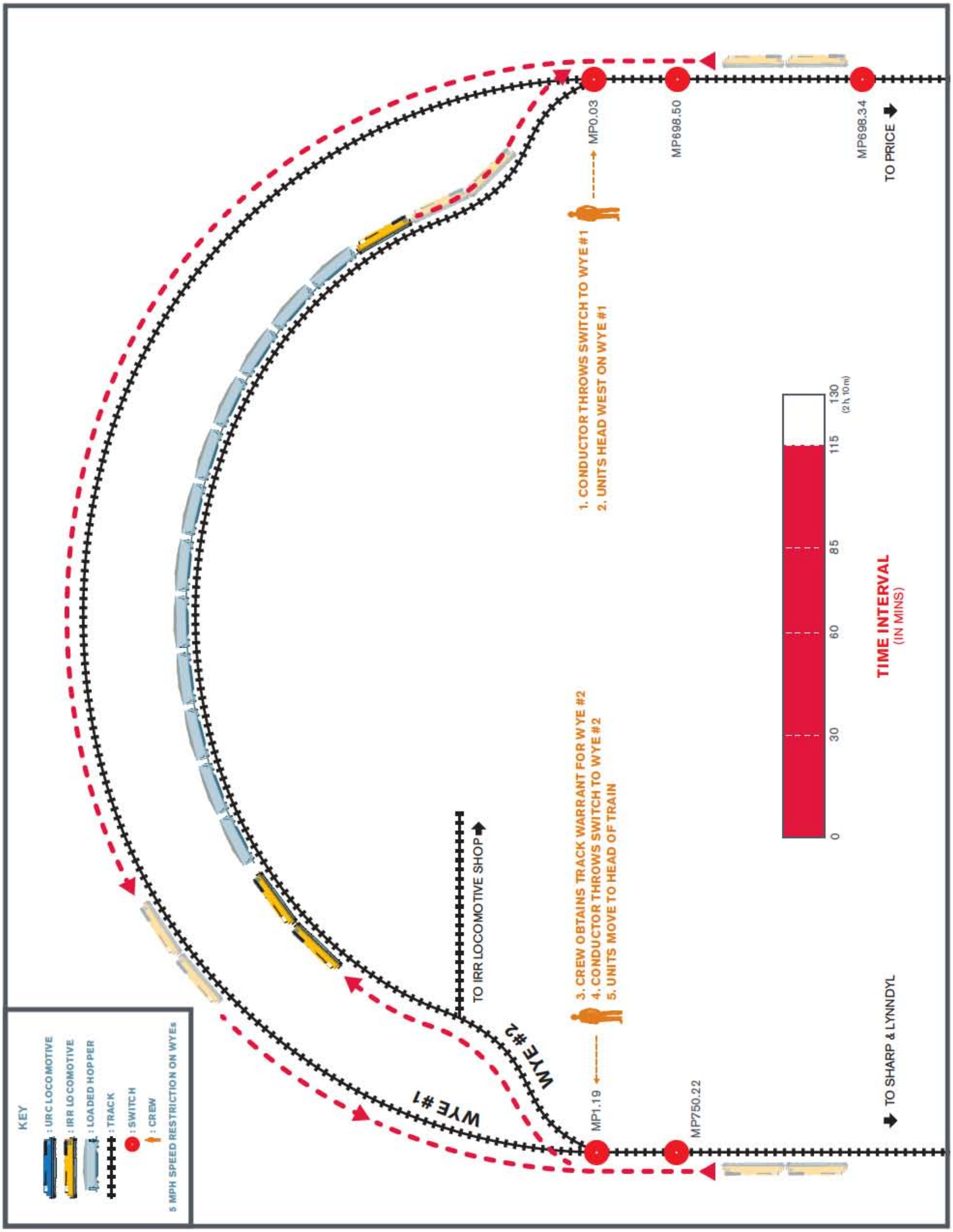

MP0.03
MP698.50
MP698.34
TO PRICE
TO IRR LOCOMOTIVE SHOP
1. MIDDLE UNIT CREW OBTAINS TRACK WARRANT FOR WYE #1
2. CONDUCTOR THROWS SWITCH TO WYE #1
3. MIDDLE UNITS RETURN TO URC PROPERTY
WYE #1
WYE #2
MP1.19
MP750.22
TO SHARP & LYNNDYL
TIME INTERVAL
(IN MINS)
0
30
130
(2 h, 10 m)
KEY
: URC LOCOMOTIVE
: IRR LOCOMOTIVE
: LOADED HOPPER
: TRACK
: SWITCH
: CREW
5 MPH SPEED RESTRICTION ON WYEs


KEY
: URC LOCOMOTIVE
: IRR LOCOMOTIVE
: LOADED HOPPER
: TRACK
: SWITCH
: CREW
5 MPH SPEED RESTRICTION ON WYEs
WYE #1
WYE #2
MP1.19
MP750.22
TO SHARP & LYNNDYL
1. CONDUCTOR THROWS SWITCH TO WYE #2
2. HEAD-END CREW SHOVES FRONT PORTION BACK
TO IRR LOCOMOTIVE SHOP
3. CONDUCTOR COUPLES
4. CONDUCTOR RELEASES HAND BRAKES
5. CONDUCTOR WALKS TOWARD FRONT OF TRAIN
TIME INTERVAL
(IN MINS)
0
30
60
130
(2 h 10 m)
MP0.03
MP698.50
MP698.34
TO PRICE


KEY
: URC LOCOMOTIVE
: IRR LOCOMOTIVE
: LOADED HOPPER
: TRACK
: SWITCH
: CREW
5 MPH SPEED RESTRICTION ON WYEs
MP0.03
MP698.50
MP698.34
TO PRICE
TO IRR LOCOMOTIVE SHOP
1. CONDUCTOR SETS HAND BRAKES
2. CONDUCTOR UNCOUPLES
3. CONDUCTOR GETS ON LOCOMOTIVE
4. HEAD-END CREW OBTAINS TRACK WARRANT FOR WYE #1
5. CONDUCTOR THROWS SWITCH TO WYE #1
6. HEAD UNITS RETURN TO URC PROPERTY
WYE #1
WYE #2
MP1.19
MP750.22
TO SHARP & LYNNDYL
0
30
60
85
130
(2 h 10 m)
TIME INTERVAL
(IN MINS)


KEY
: URC LOCOMOTIVE
: IRR LOCOMOTIVE
: LOADED HOPPER
: TRACK
: SWITCH
: CREW
5 MPH SPEED RESTRICTION ON WYEs
WYE #1
WYE #2
TO IRR LOCOMOTIVE SHOP
1. IRR CREW OBTAINS TRACK WARRANT TO LEAVE IRR SHOP AND FOR WYE #1
2. CONDUCTOR THROWS SWITCH TO WYE #2
3. UNITS PULL ONTO SHARP SUBDIVISION
4. CONDUCTOR THROWS SWITCH TO WYE #1
5. UNITS HEAD EAST ON WYE #1
6. CONDUCTOR THROWS SWITCH TO WYE #2
MP1.19
MP750.22
MP0.03
MP698.50
MP698.34
TO SHARP & LYNNDYL
TO PRICE
0
30
60
85
115
130
(2 h, 10 m)
TIME INTERVAL
(IN MINS)


KEY
: URC LOCOMOTIVE
: IRR LOCOMOTIVE
: LOADED HOPPER
: TRACK
: SWITCH
: CREW
5 MPH SPEED RESTRICTION ON WYEs
MP0.03
MP698.50
MP698.34
TO PRICE
1
2
1. CONDUCTOR COUPLES
2. CONDUCTOR CUTS IN AIR
3. CONDUCTOR CHECKS DP COMMUNICATION
4. CONDUCTOR UNCOUPLES
0
30
60
85
115
130
(2 h, 10 m)
TIME INTERVAL
(IN MINS)
TO IRR LOCOMOTIVE SHOP
WYE #2
WYE #1
MP1.19
MP750.22
TO SHARP & LYNNDYL


KEY
: URC LOCOMOTIVE
: IRR LOCOMOTIVE
: LOADED HOPPER
: TRACK
: SWITCH
: CREW
5 MPH SPEED RESTRICTION ON WYEs
MP0.03
MP698.50
MP698.34
TO PRICE
1. CONDUCTOR THROWS SWITCH TO WYE #1
2. UNITS HEAD WEST ON WYE #1
3. CREW OBTAINS TRACK WARRANT FOR WYE #2
4. CONDUCTOR THROWS SWITCH TO WYE #2
5. UNITS MOVE TO HEAD OF TRAIN
TO IRR LOCOMOTIVE SHOP
WYE #1
WYE #2
MP1.19
MP750.22
TO SHARP & LYNNDYL
TIME INTERVAL
(IN MINS)
0
30
60
85
115
130
(2 h 10 m)

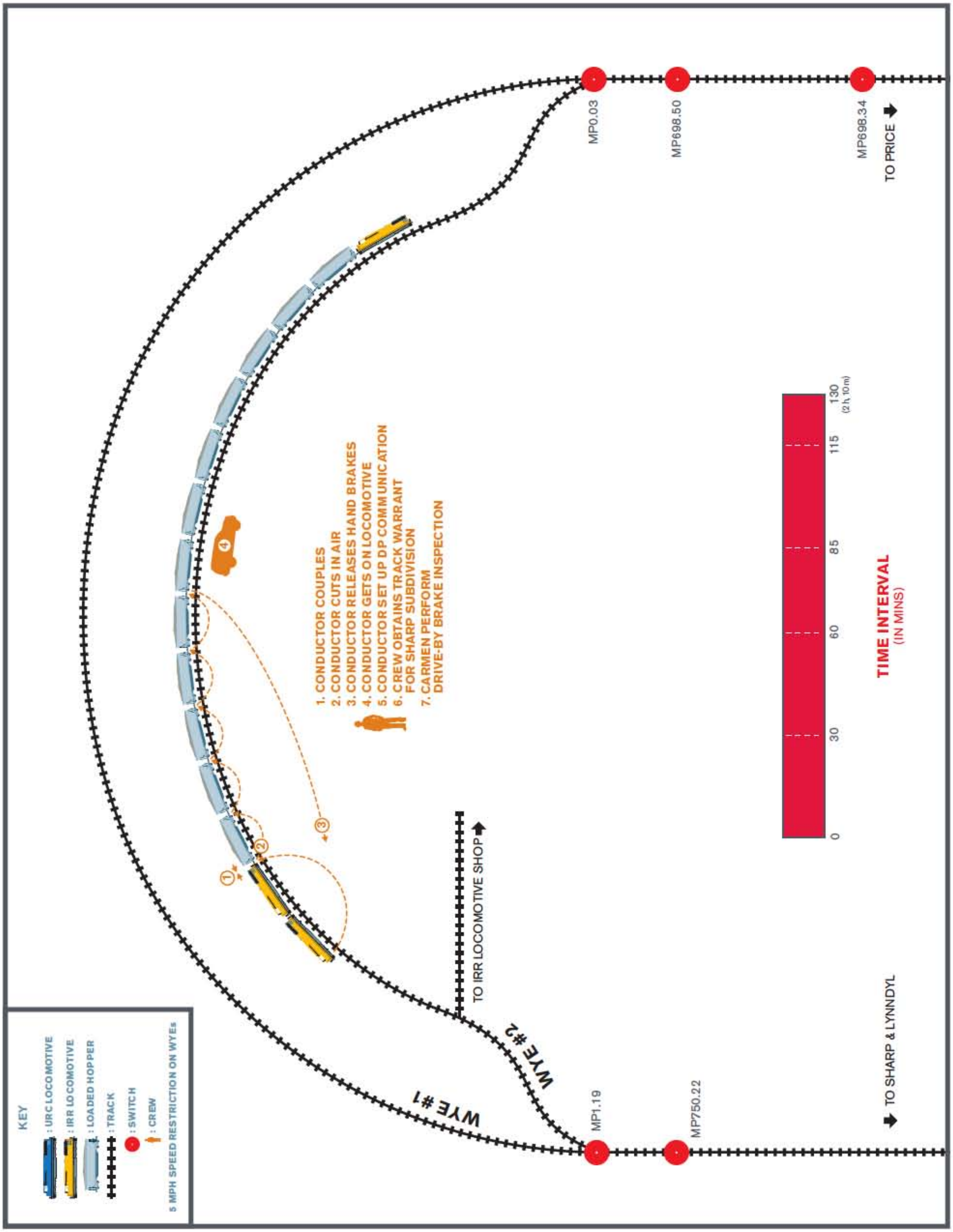

KEY
: URC LOCOMOTIVE
: IRR LOCOMOTIVE
: LOADED HOPPER
: TRACK
: SWITCH
: CREW
5 MPH SPEED RESTRICTION ON WYEs
WYE #1
WYE #2
MP1.19
MP750.22
TO SHARP & LYNNDYL
TO IRR LOCOMOTIVE SHOP
MP0.03
MP698.50
MP698.34
TO PRICE
1. CONDUCTOR COUPLES
2. CONDUCTOR CUTS IN AIR
3. CONDUCTOR RELEASES HAND BRAKES
4. CONDUCTOR GETS ON LOCOMOTIVE
5. CONDUCTOR SET UP DP COMMUNICATION
6. CREW OBTAINS TRACK WARRANT FOR SHARP SUBDIVISION
7. CARMEN PERFORM DRIVE-BY BRAKE INSPECTION
0
30
60
85
115
130 (2 h, 10 m)
TIME INTERVAL
(IN MINS)

TABLE A: IRR ANNUAL COST OF CAPITAL

Year (1)	Industry Cost of Capital (2)	Industry Cost of Debt 1/ (3)	Industry Cost of Preferred Equity 2/ (4)	Industry Cost of Equity 3/ (5)	IRR 's Cost of Debt (6)	IRR 's Cost of Preferred Equity (7)	IRR 's Cost of Equity (8)	Debt as a Percent of Total Investment (9)	Preferred Equity as a Percent of Total Investment (10)	Equity as a Percent of Total Investment (11)	Composite Cost of Capital (12)	1 + Cost of Capital (13)	STB Prescribed Debt as a % of Capital 4/ (14)
2008	11.75%	6.57%	0.00%	13.17%	6.57%	0.00%	13.17%	21.54%	0.00%	78.46%	11.75%	1.1175	21.54%
2009	10.43%	5.72%	0.00%	12.37%	5.72%	0.00%	12.37%	29.10%	0.00%	70.90%	10.43%	1.1043	29.10%
2010	11.03%	4.61%	0.00%	12.99%	4.61%	0.00%	12.99%	23.37%	0.00%	76.63%	11.03%	1.1103	23.37%
2011					5.22%	0.00%	12.84%	26.03%	0.00%	73.97%	10.86%	1.1086	
2012					5.22%	0.00%	12.84%	26.03%	0.00%	73.97%	10.86%	1.1086	
2013					5.22%	0.00%	12.84%	26.03%	0.00%	73.97%	10.86%	1.1086	
2014					5.22%	0.00%	12.84%	26.03%	0.00%	73.97%	10.86%	1.1086	
2015					5.22%	0.00%	12.84%	26.03%	0.00%	73.97%	10.86%	1.1086	
2016					5.22%	0.00%	12.84%	26.03%	0.00%	73.97%	10.86%	1.1086	
2017					5.22%	0.00%	12.84%	26.03%	0.00%	73.97%	10.86%	1.1086	
2018					5.22%	0.00%	12.84%	26.03%	0.00%	73.97%	10.86%	1.1086	
2019					5.22%	0.00%	12.84%	26.03%	0.00%	73.97%	10.86%	1.1086	
2020					5.22%	0.00%	12.84%	26.03%	0.00%	73.97%	10.86%	1.1086	

1/ Cost of railroad industry debt from the STB Decision in Ex Parte No. 558 (Sub-No. 12), Railroad Cost of Capital - 2008, decided September 24, 2009, STB Decision in Ex Parte No. 558 (Sub-No. 13), Railroad Cost of Capital - 2009, decided September 30, 2010, and the AAR's Opening Evidence in Ex Parte No. 558 (Sub-No. 14), Railroad Cost of Capital - 2010, submitted April 29, 2011.

2/ No preferred equity was issued in 2008 - 2010.

3/ Cost of railroad industry cost of equity from the STB Decision in Ex Parte No. 558 (Sub-No. 12), Railroad Cost of Capital - 2008, decided September 24, 2009, STB Decision in Ex Parte No. 558 (Sub-No. 13), Railroad Cost of Capital - 2009, decided September 30, 2010, and the AAR's Opening Evidence in Ex Parte No. 558 (Sub-No. 14), Railroad Cost of Capital - 2010, submitted April 29, 2011.

4/ Capital structure from the STB Decisions in Ex Parte No. 558 (Sub-No. 12), Railroad Cost of Capital - 2009, decided September 24, 2008, Ex Parte No. 558 (Sub-No. 13), Railroad Cost of Capital - 2009, decided September 30, 2010, and the AAR's Opening Evidence in Ex Parte No. 558 (Sub-No. 14), Railroad Cost of Capital - 2010, submitted April 29, 2011.

TABLE B: IRR INFLATION INDEXES

Period (1)	Land 1/ (2)	Hybrid RCAF 2/ (3)	MWSExFuel 3/ (4)	Mat & Suppl 4/ (5)	Wages & Supps 5/ (6)
3Q 2008	100 0		426 1	341 8	442 2
4Q 2008	99 8		431 3	373 2	442 2
1Q 2009	99 5		449 5	385 1	461 6
2Q 2009	99 3		448 2	377 5	461 6
3Q 2009	99 1		453 5	376 5	468 1
4Q 2009	98 9		448 3	349 1	467 3
1Q 2010	98 6		467 4	352 0	489 8
2Q 2010	98 4		466 7	349 1	489 7
3Q 2010	98 2		465 6	355 8	486 9
4Q 2010	98 0		467 2	364 6	486 9
1Q 2011	97 7	100 0	460 8	364 0	479 2
2Q 2011	97 5	107 6	463 5	377 4	479 6
3Q 2011	97 3	110 3	464 8	364 6	483 0
4Q 20011	97 1	110 5	467 4	361 7	486 3
1Q 2012	96 9	109 3	474 7	359 9	495 1
2Q 2012	96 6	110 3	476 0	356 7	497 1
3Q 2012	96 4	110 4	478 3	361 0	499 1
4Q 2012	96 2	111 7	480 6	365 7	501 1
1Q 2013	96 0	112 5	488 7	367 9	510 1
2Q 2013	95 8	113 9	490 5	368 3	512 1
3Q 2013	95 5	114 3	492 5	370 1	514 2
4Q 2013	95 3	115 7	495 1	373 1	516 7
1Q 2014	95 1	116 3	498 2	374 5	520 1
2Q 2014	94 9	116 8	501 3	375 9	523 4
3Q 2014	94 7	117 3	504 3	377 3	526 8
4Q 2014	94 5	117 9	507 5	378 7	530 2
1Q 2015	94 2	118 5	511 4	380 9	534 4
2Q 2015	94 0	119 2	515 3	383 2	538 6
3Q 2015	93 8	119 8	519 3	385 5	542 8
4Q 2015	93 6	120 5	523 3	387 8	547 1
1Q 2016	93 4	121 4	527 5	389 9	551 7
2Q 2016	93 2	122 3	531 8	392 0	556 4
3Q 2016	93 0	123 2	536 1	394 1	561 0
4Q 2016	92 7	124 1	540 4	396 3	565 7
1Q 2017	92 5	124 7	545 0	398 0	570 8
2Q 2017	92 3	125 4	549 6	399 6	575 8
3Q 2017	92 1	126 0	554 2	401 3	580 9
4Q 2017	91 9	126 7	558 8	403 0	586 1
1Q 2018	91 7	127 3	563 6	404 0	591 5
2Q 2018	91 5	128 0	568 3	405 0	596 8
3Q 2018	91 3	128 6	573 1	406 0	602 3
4Q 2018	91 1	129 2	578 0	407 1	607 8
1Q 2019	90 9	129 7	582 9	408 3	613 3
2Q 2019	90 6	130 2	587 9	409 5	618 9
3Q 2019	90 4	130 7	592 9	410 7	624 6
4Q 2019	90 2	131 1	597 9	411 9	630 3
1Q 2020	90 0	131 5	602 6	412 7	635 7
2Q 2020	89 8	131 7	607 4	413 4	641 2
3Q 2020	89 6	132 0	612 3	414 1	646 8
4Q 2020	89 4	132 3	617 1	414 8	652 3
Annual Inflation Rate 6/	-0 91%		2 82%	1 30%	2 97%

1/ Used to index Road Property Account 2 Based on historic change in land prices as reported by the USDA
2/ Used to index expenses in Table K Based on the RCAF-U and RCAF-A through 2Q11 then Global Insight forecast for remaining periods
3/ Used to index Road Property Accounts 3, 5, 6, 13, 17, 19, 20, 26, 27, 37, and 39 Based RCR indices - West Region through 2Q11 then Global Insight forecast
4/ Used to index Road Property Accounts 8, 9, and 11 Based on RCR indexes - West Region through 2Q11 then Global Insight forecast for remaining periods
5/ Used to index Road Property Accounts 1, 1A and 12 Based on RCR indexes - West Region through 2Q11 then Global Insight forecast for remaining periods
6/ 4Q2010 ÷ 4Q2020^(1/10) - 1 The Annual Rate is used to develop asset replacement values at the end of asset lives

TABLE C: IRR PROPERTY INVESTMENT VALUES

Construction of the IRR occurs between July 1, 2008 and January 1, 2011.
Investments are assumed to be in January 1, 2011 dollars.

Property Account (1)	Property Component (2)	Service Life In Years 1/ (3)	Investment In 7/1/2008 Dollars 2/ (4)	Investment In 7/1/2009 Dollars 3/ (5)	Investment In 7/1/2010 Dollars 4/ (6)	2008 Investment Value 5/ (7)	2009 Investment Value 6/ (8)	2010 Investment Value 7/ (9)	Total Property Investment 1Q 2011 8/ (10)
1	Engineering	NA	$98,025,735	$103,767,179	$107,934,713	$45,242,647	$55,874,635	$0	$101,117,282
2	Land	NA	45,971,134	45,553,191	45,139,048	6,567,305	39,045,592	0	45,612,897
3	Grading	86	348,365,514	370,766,864	380,659,430	0	247,177,909	126,886,477	374,064,386
5	Tunnels	118	61,733,383	65,703,096	67,456,144	0	47,784,070	18,397,130	66,181,200
6	Bridges & Culverts	71	44,086,703	46,921,661	48,173,595	0	29,326,038	18,065,098	47,391,136
8	Ties	21	52,307,937	57,618,310	54,450,450	0	19,206,103	36,300,300	55,506,403
9	Rails and OTM	27	100,273,633	110,453,548	104,380,804	0	36,817,849	69,587,202	106,405,052
11	Ballast	34	204,149,676	224,875,229	212,511,571	0	74,958,410	141,674,380	216,632,790
12	Labor	30	111,802,341	118,350,691	123,103,934	0	39,450,230	82,069,289	121,519,520
13	Fences and Roadway Signs	59	6,841,030	7,280,937	7,475,202	0	0	7,475,202	7,475,202
16	Stations and Office Buildings	31	2,945,551	3,134,962	3,218,607	0	626,992	2,574,886	3,201,878
17	Roadway Buildings	32	2,507,265	2,668,493	2,739,692	0	0	2,739,692	2,739,692
19	Wastewater Treatment	31	106,693	113,554	116,584	0	0	116,584	116,584
20	Shops and Enginehouses	47	12,796,181	13,619,028	13,982,403	0	1,513,225	12,428,802	13,942,028
26	Communications Systems	31	9,016,568	9,596,371	9,852,415	0	0	9,852,415	9,852,415
27	Signals and Interlockers	35	43,331,133	46,117,505	47,347,983	0	0	47,347,983	47,347,983
39	Public Improvements	47	17,849,791	18,997,607	19,504,489	0	0	19,504,489	19,504,489
	Total		$1,162,110,267	$1,245,538,224	$1,248,047,064	$51,809,952	$591,781,054	$595,019,930	$1,238,610,936

1/ 1 ÷ Depreciation Rate shown in Schedule 332 of UP's 2010 Annual Report R-1.
2/ July 1, 2008, indexed to 2008 dollars; Investment Exhibit - 1Q11 x Inflation Index from Table B, 3Q2008 ÷ 1Q2011.
3/ July 1, 2009, indexed to 2009 dollars; Investment Exhibit - 1Q11 x Inflation Index from Table B, 3Q2009 ÷ 1Q2011.
4/ July 1, 2010, indexed to 2010 dollars; Investment Exhibit - 1Q11 x Inflation Index from Table B, 3Q2010 ÷ 1Q2011.
5/ Column (4) x Percent constructed in 2008.
6/ Column (5) x Percent constructed in 2009.
7/ Column (6) x Percent constructed in 2010.
8/ Sum of Columns (7) through (9).

TABLE D: INTEREST DURING CONSTRUCTION

Month of Installation (1)	Cost of Funds 1/ (2)	Timing of Account 1 Investment 2/ (3)	Timing of Account 2 Investment 2/ (4)	Timing of Accounts 3,5 and 6 Investment 2/ (5)	Timing of Accounts 8 Through 39 Investment 2/ (6)	Total Investment by Month 3/ (7)	Interest During Construction 4/ (8)	Cost of Debt 5/ (9)	Deductible Interest During Construction 6/ (10)
Jul-08	0 93%	$7,540,441	$0	$0	$0	$7,540,441	$0	0 53%	$0
Aug-08	0 93%	7,540,441	0	0	0	7,540,441	70,123	0 53%	8,636
Sep-08	0 93%	7,540,441	0	0	0	7,540,441	140,898	0 53%	17,351
Oct-08	0 93%	7,540,441	0	0	0	7,540,441	212,331	0 53%	26,148
Nov-08	0 93%	7,540,441	0	0	0	7,540,441	284,429	0 53%	35,027
Dec-08	0 93%	7,540,441	6,567,305	0	0	14,107,746	357,197	0 53%	43,988
Jan-09	0 83%	7,982,091	5,577,942	0	0	13,560,032	439,158	0 46%	71,487
Feb-09	0 83%	7,982,091	5,577,942	0	0	13,560,032	555,430	0 46%	90,415
Mar-09	0 83%	7,982,091	5,577,942	27,650,395	0	41,210,427	672,667	0 46%	109,499
Apr-09	0 83%	7,982,091	5,577,942	27,650,395	0	41,210,427	1,020,531	0 46%	166,125
May-09	0 83%	7,982,091	5,577,942	33,623,403	0	47,183,436	1,371,285	0 46%	223,222
Jun-09	0 83%	7,982,091	5,577,942	33,623,403	0	47,183,436	1,774,561	0 46%	288,868
Jul-09	0 83%	7,982,091	5,577,942	33,623,403	0	47,183,436	2,181,186	0 46%	355,060
Aug-09	0 83%	0	0	33,623,403	0	33,623,403	2,591,189	0 46%	421,802
Sep-09	0 83%	0	0	33,623,403	42,608,148	76,231,552	2,891,973	0 46%	470,764
Oct-09	0 83%	0	0	33,623,403	42,608,148	76,231,552	3,549,141	0 46%	577,740
Nov-09	0 83%	0	0	33,623,403	42,921,644	76,545,048	4,211,767	0 46%	685,604
Dec-09	0 83%	0	0	33,623,403	44,434,870	78,058,273	4,882,501	0 46%	794,788
Jan-10	0 88%	0	0	34,520,522	46,330,106	80,850,627	5,875,190	0 38%	589,878
Feb-10	0 88%	0	0	34,520,522	46,806,152	81,326,673	6,634,780	0 38%	666,142
Mar-10	0 88%	0	0	34,520,522	46,806,152	81,326,673	7,405,192	0 38%	743,492
Apr-10	0 88%	0	0	28,388,145	46,806,152	75,194,297	8,182,351	0 38%	821,520
May-10	0 88%	0	0	28,388,145	48,674,952	77,063,097	8,912,607	0 38%	894,839
Jun-10	0 88%	0	0	3,010,850	67,741,751	70,752,601	9,665,627	0 38%	970,444
Jul-10	0 88%	0	0	0	64,491,003	64,491,003	10,369,971	0 38%	1,041,161
Aug-10	0 88%	0	0	0	64,014,957	64,014,957	11,025,642	0 38%	1,106,991
Sep-10	0 88%	0	0	0		0	11,682,887	0 38%	1,172,980
Oct-10	0 88%	0	0	0	0	0	11,785,211	0 38%	1,183,253
Nov-10	0 88%	0	0	0	0	0	11,888,432	0 38%	1,193,617
Dec-10	0 88%	0	0	0	0	0	11,992,557	0 38%	1,204,071
Total		$101,117,282	$45,612,897	$487,636,722	$604,244,035	$1,238,610,936	$142,626,816		$15,974,913

1/ ((1 + Cost of Capital from Table A for the applicable year)^(1/12) - 1) x 100
2/ Applicable account value from Table C for the applicable investment period
3/ Sum of Columns (3) through (6)
4/ August 08 equals Column (2) x prior Column (7), all other periods equal Column (2) x ((Sum of Column (7) for all prior periods) + (Sum of Column (8) for all prior periods)
5/ ((1 + Cost of Debt from Table A for the applicable year)^(1/12) - 1) x 100
6/ August 08 equals prior Column (7) x Column (9) x Table A, Column (9) for 2008, all other periods equal Column (9) x ((Sum of Column (7) for all prior periods)
(Sum of Column (8) for all prior periods)) x Table A, Column (9) for the applicable year

TABLE E: IRR INTEREST PAYMENTS FOR ASSETS PURCHASED WITH DEBT CAPITAL

INTEREST SCHEDULE FOR
THE IRR 2008 ROAD PROPERTY
INVESTMENT FOR THE 1Q2011 START-UP

1	TOTAL INVESTMENT	$51,809,952	1/
2	IDC	$1,064,979	2/
3	PRINCIPAL	$11,389,260	3/
4	INTEREST	6 57%	4/
5	TERM (QUARTERS)	80	5/
6	PAYMENT	$253,683	6/

Quarter (1)	Beginning Balance	Ending Balance	Payment	Principal	Interest 7/ (2)
1	$11,389,260	$11,318,205	$253,683	$71,055	$182,629
2	11,318,205	11,246,011	253,683	72,194	181,489
3	11,246,011	11,172,660	253,683	73,352	180,332
4	11,172,660	11,098,132	253,683	74,528	179,155
5	11,098,132	11,022,409	253,683	75,723	177,960
6	11,022,409	10,945,471	253,683	76,937	176,746
7	10,945,471	10,867,300	253,683	78,171	175,512
8	10,867,300	10,787,876	253,683	79,424	174,259
9	10,787,876	10,707,178	253,683	80,698	172,985
10	10,707,178	10,625,186	253,683	81,992	171,691
11	10,625,186	10,541,879	253,683	83,307	170,377
12	10,541,879	10,457,237	253,683	84,643	169,041
13	10,457,237	10,371,237	253,683	86,000	167,684
14	10,371,237	10,283,858	253,683	87,379	166,305
15	10,283,858	10,195,078	253,683	88,780	164,903
16	10,195,078	10,104,874	253,683	90,204	163,480
17	10,104,874	10,013,224	253,683	91,650	162,033
18	10,013,224	9,920,105	253,683	93,120	160,564
19	9,920,105	9,825,492	253,683	94,613	159,071
20	9,825,492	9,729,362	253,683	96,130	157,553
21	9,729,362	9,631,691	253,683	97,671	156,012
22	9,631,691	9,532,453	253,683	99,238	154,446
23	9,532,453	9,431,624	253,683	100,829	152,855
24	9,431,624	9,329,178	253,683	102,446	151,238
25	9,329,178	9,225,090	253,683	104,088	149,595
26	9,225,090	9,119,332	253,683	105,758	147,926
27	9,119,332	9,011,879	253,683	107,453	146,230
28	9,011,879	8,902,703	253,683	109,176	144,507
29	8,902,703	8,791,775	253,683	110,927	142,756
30	8,791,775	8,679,070	253,683	112,706	140,978
31	8,679,070	8,564,557	253,683	114,513	139,170
32	8,564,557	8,448,207	253,683	116,349	137,334
33	8,448,207	8,329,992	253,683	118,215	135,468
34	8,329,992	8,209,882	253,683	120,111	133,573
35	8,209,882	8,087,845	253,683	122,037	131,647
36	8,087,845	7,963,852	253,683	123,993	129,690
37	7,963,852	7,837,870	253,683	125,982	127,702
38	7,837,870	7,709,868	253,683	128,002	125,682
39	7,709,868	7,579,814	253,683	130,054	123,629
40	7,579,814	7,447,674	253,683	132,140	121,544

INTEREST SCHEDULE FOR
THE IRR 2009 ROAD PROPERTY
INVESTMENT FOR THE 1Q2011 START-UP

1	TOTAL INVESTMENT	$591,781,054	1/
2	IDC	$26,141,389	2/
3	PRINCIPAL	$179,815,431	3/
4	INTEREST	5 72%	4/
5	TERM (QUARTERS)	80	5/
6	PAYMENT	$3,751,137	6/

Quarter (3)	Beginning Balance	Ending Balance	Payment	Principal	Interest 7/ (4)
1	$179,815,431	$178,582,270	$3,751,137	$1,233,161	$2,517,976
2	178,582,270	177,331,840	3,751,137	1,250,429	2,500,708
3	177,331,840	176,063,901	3,751,137	1,267,939	2,483,198
4	176,063,901	174,778,207	3,751,137	1,285,694	2,465,443
5	174,778,207	173,474,509	3,751,137	1,303,698	2,447,439
6	173,474,509	172,152,555	3,751,137	1,321,954	2,429,183
7	172,152,555	170,812,090	3,751,137	1,340,465	2,410,672
8	170,812,090	169,452,854	3,751,137	1,359,236	2,391,901
9	169,452,854	168,074,584	3,751,137	1,378,270	2,372,868
10	168,074,584	166,677,014	3,751,137	1,397,570	2,353,568
11	166,677,014	165,259,875	3,751,137	1,417,140	2,333,997
12	165,259,875	163,822,890	3,751,137	1,436,984	2,314,153
13	163,822,890	162,365,784	3,751,137	1,457,107	2,294,031
14	162,365,784	160,888,273	3,751,137	1,477,511	2,273,627
15	160,888,273	159,390,073	3,751,137	1,498,200	2,252,937
16	159,390,073	157,870,893	3,751,137	1,519,180	2,231,957
17	157,870,893	156,330,440	3,751,137	1,540,453	2,210,684
18	156,330,440	154,768,416	3,751,137	1,562,024	2,189,113
19	154,768,416	153,184,518	3,751,137	1,583,897	2,167,240
20	153,184,518	151,578,441	3,751,137	1,606,077	2,145,060
21	151,578,441	149,949,874	3,751,137	1,628,567	2,122,570
22	149,949,874	148,298,502	3,751,137	1,651,372	2,099,765
23	148,298,502	146,624,006	3,751,137	1,674,496	2,076,641
24	146,624,006	144,926,062	3,751,137	1,697,945	2,053,193
25	144,926,062	143,204,341	3,751,137	1,721,721	2,029,416
26	143,204,341	141,458,510	3,751,137	1,745,830	2,005,307
27	141,458,510	139,688,233	3,751,137	1,770,278	1,980,860
28	139,688,233	137,893,166	3,751,137	1,795,067	1,956,070
29	137,893,166	136,072,962	3,751,137	1,820,203	1,930,934
30	136,072,962	134,227,270	3,751,137	1,845,692	1,905,445
31	134,227,270	132,355,733	3,751,137	1,871,537	1,879,600
32	132,355,733	130,457,988	3,751,137	1,897,745	1,853,392
33	130,457,988	128,533,669	3,751,137	1,924,319	1,826,818
34	128,533,669	126,582,403	3,751,137	1,951,266	1,799,872
35	126,582,403	124,603,814	3,751,137	1,978,589	1,772,548
36	124,603,814	122,597,518	3,751,137	2,006,296	1,744,841
37	122,597,518	120,563,128	3,751,137	2,034,390	1,716,747
38	120,563,128	118,500,250	3,751,137	2,062,878	1,688,259
39	118,500,250	116,408,486	3,751,137	2,091,765	1,659,372
40	116,408,486	114,287,430	3,751,137	2,121,056	1,630,081

INTEREST SCHEDULE FOR
THE IRR 2010 ROAD PROPERTY
INVESTMENT FOR THE 1Q2011 START-UP

1	TOTAL INVESTMENT	$595,019,930	1/
2	IDC	$115,420,448	2/
3	PRINCIPAL	$166,029,916	3/
4	INTEREST	4 61%	4/
5	TERM (QUARTERS)	80	5/
6	PAYMENT	$3,167,183	6/

Quarter (5)	Beginning Balance	Ending Balance	Payment	Principal	Interest 7/ (6)
1	$166,029,916	$164,744,011	$3,167,183	$1,285,906	$1,881,278
2	164,744,011	163,443,534	3,167,183	1,300,476	1,866,707
3	163,443,534	162,128,322	3,167,183	1,315,212	1,851,971
4	162,128,322	160,798,208	3,167,183	1,330,115	1,837,069
5	160,798,208	159,453,021	3,167,183	1,345,186	1,821,997
6	159,453,021	158,092,593	3,167,183	1,360,428	1,806,755
7	158,092,593	156,716,750	3,167,183	1,375,843	1,791,340
8	156,716,750	155,325,317	3,167,183	1,391,433	1,775,750
9	155,325,317	153,918,118	3,167,183	1,407,199	1,759,984
10	153,918,118	152,494,974	3,167,183	1,423,144	1,744,039
11	152,494,974	151,055,704	3,167,183	1,439,270	1,727,914
12	151,055,704	149,600,126	3,167,183	1,455,578	1,711,605
13	149,600,126	148,128,055	3,167,183	1,472,071	1,695,112
14	148,128,055	146,639,304	3,167,183	1,488,751	1,678,432
15	146,639,304	145,133,684	3,167,183	1,505,620	1,661,563
16	145,133,684	143,611,004	3,167,183	1,522,680	1,644,503
17	143,611,004	142,071,070	3,167,183	1,539,934	1,627,250
18	142,071,070	140,513,688	3,167,183	1,557,382	1,609,801
19	140,513,688	138,938,659	3,167,183	1,575,029	1,592,154
20	138,938,659	137,345,783	3,167,183	1,592,876	1,574,308
21	137,345,783	135,734,858	3,167,183	1,610,924	1,556,259
22	135,734,858	134,105,681	3,167,183	1,629,178	1,538,006
23	134,105,681	132,458,043	3,167,183	1,647,638	1,519,545
24	132,458,043	130,791,735	3,167,183	1,666,307	1,500,876
25	130,791,735	129,106,547	3,167,183	1,685,188	1,481,995
26	129,106,547	127,402,264	3,167,183	1,704,283	1,462,901
27	127,402,264	125,678,670	3,167,183	1,723,594	1,443,589
28	125,678,670	123,935,546	3,167,183	1,743,124	1,424,059
29	123,935,546	122,172,671	3,167,183	1,762,875	1,404,308
30	122,172,671	120,389,821	3,167,183	1,782,850	1,384,333
31	120,389,821	118,586,769	3,167,183	1,803,052	1,364,132
32	118,586,769	116,763,287	3,167,183	1,823,482	1,343,701
33	116,763,287	114,919,143	3,167,183	1,844,144	1,323,040
34	114,919,143	113,054,103	3,167,183	1,865,040	1,302,144
35	113,054,103	111,167,931	3,167,183	1,886,172	1,281,011
36	111,167,931	109,260,386	3,167,183	1,907,545	1,259,639
37	109,260,386	107,331,228	3,167,183	1,929,159	1,238,025
38	107,331,228	105,380,210	3,167,183	1,951,018	1,216,165
39	105,380,210	103,407,085	3,167,183	1,973,125	1,194,058
40	103,407,085	101,411,602	3,167,183	1,995,482	1,171,701

1/ From Table D, Column (7) for the applicable year investmen
2/ From Table D, Column (8) for the applicable year investmen
3/ (Total Investment + IDC) x (Proportion of Debt from Table A, Column (9))
4/ From Table A, Column (6) for the applicable year investmen
5/ Based on Ex Parte No. 657 20-year payment period x 4
6/ Quarterly coupon payments on Line 3 principal and Line 4 interest rate
7/ Line 6 coupon payment

TABLE E: IRR INTEREST PAYMENTS FOR ASSETS PURCHASED WITH DEBT CAPITAL
(Continued)

INTEREST SCHEDULE FOR THE IRR 2008 ROAD PROPERTY INVESTMENT FOR THE 1Q2011 START-UP

1	TOTAL INVESTMENT	$51,809,952	1/
2	IDC	$1,064,979	2/
3	PRINCIPAL	$11,389,260	3/
4	INTEREST	6 57%	4/
5	TERM (QUARTERS)	80	5/
6	QUARTERLY COUPON	$253,683	6/

Quarter (1)	Beginning Balance	Ending Balance	Payment	Principal	Interest 7/ (2)
41	$7,447,674	$7,313,415	$253,683	$134,259	$119,425
42	7,313,415	7,177,004	253,683	136,412	117,272
43	7,177,004	7,038,405	253,683	138,599	115,084
44	7,038,405	6,897,583	253,683	140,821	112,862
45	6,897,583	6,754,504	253,683	143,079	110,604
46	6,754,504	6,609,130	253,683	145,374	108,310
47	6,609,130	6,461,425	253,683	147,705	105,979
48	6,461,425	6,311,352	253,683	150,073	103,610
49	6,311,352	6,158,872	253,683	152,480	101,204
50	6,158,872	6,003,947	253,683	154,925	98,759
51	6,003,947	5,846,538	253,683	157,409	96,274
52	5,846,538	5,686,605	253,683	159,933	93,750
53	5,686,605	5,524,107	253,683	162,498	91,186
54	5,524,107	5,359,004	253,683	165,103	88,580
55	5,359,004	5,191,253	253,683	167,751	85,933
56	5,191,253	5,020,812	253,683	170,441	83,243
57	5,020,812	4,847,638	253,683	173,174	80,510
58	4,847,638	4,671,688	253,683	175,951	77,733
59	4,671,688	4,492,915	253,683	178,772	74,911
60	4,492,915	4,311,277	253,683	181,639	72,045
61	4,311,277	4,126,725	253,683	184,551	69,132
62	4,126,725	3,939,215	253,683	187,511	66,173
63	3,939,215	3,748,697	253,683	190,517	63,166
64	3,748,697	3,555,125	253,683	193,572	60,111
65	3,555,125	3,358,448	253,683	196,676	57,007
66	3,358,448	3,158,618	253,683	199,830	53,853
67	3,158,618	2,955,584	253,683	203,034	50,649
68	2,955,584	2,749,294	253,683	206,290	47,393
69	2,749,294	2,539,696	253,683	209,598	44,085
70	2,539,696	2,326,737	253,683	212,959	40,724
71	2,326,737	2,110,363	253,683	216,374	37,310
72	2,110,363	1,890,520	253,683	219,843	33,840
73	1,890,520	1,667,151	253,683	223,369	30,315
74	1,667,151	1,440,201	253,683	226,950	26,733
75	1,440,201	1,209,611	253,683	230,590	23,094
76	1,209,611	975,324	253,683	234,287	19,396
77	975,324	737,280	253,683	238,044	15,639
78	737,280	495,419	253,683	241,861	11,822
79	495,419	249,680	253,683	245,739	7,944
80	249,680	0	253,683	249,680	4,004

INTEREST SCHEDULE FOR THE IRR 2009 ROAD PROPERTY INVESTMENT FOR THE 1Q2011 START-UP

1	TOTAL INVESTMENT	$591,781,054	1/
2	IDC	$26,141,389	2/
3	PRINCIPAL	$179,815,431	3/
4	INTEREST	5 72%	4/
5	TERM (QUARTERS)	80	5/
6	QUARTERLY COUPON	$3,751,137	6/

Quarter (3)	Beginning Balance	Ending Balance	Payment	Principal	Interest 7/ (4)
41	$114,287,430	$112,136,672	$3,751,137	$2,150,757	$1,600,380
42	112,136,672	109,955,798	3,751,137	2,180,875	1,570,263
43	109,955,798	107,744,384	3,751,137	2,211,414	1,539,724
44	107,744,384	105,502,004	3,751,137	2,242,380	1,508,757
45	105,502,004	103,228,223	3,751,137	2,273,781	1,477,357
46	103,228,223	100,922,603	3,751,137	2,305,621	1,445,517
47	100,922,603	98,584,696	3,751,137	2,337,906	1,413,231
48	98,584,696	96,214,052	3,751,137	2,370,644	1,380,493
49	96,214,052	93,810,211	3,751,137	2,403,841	1,347,296
50	93,810,211	91,372,709	3,751,137	2,437,502	1,313,635
51	91,372,709	88,901,074	3,751,137	2,471,635	1,279,502
52	88,901,074	86,394,829	3,751,137	2,506,245	1,244,892
53	86,394,829	83,853,489	3,751,137	2,541,341	1,209,797
54	83,853,489	81,276,561	3,751,137	2,576,927	1,174,210
55	81,276,561	78,663,549	3,751,137	2,613,012	1,138,125
56	78,663,549	76,013,947	3,751,137	2,649,603	1,101,535
57	76,013,947	73,327,241	3,751,137	2,686,705	1,064,432
58	73,327,241	70,602,914	3,751,137	2,724,327	1,026,810
59	70,602,914	67,840,438	3,751,137	2,762,477	988,661
60	67,840,438	65,039,278	3,751,137	2,801,160	949,977
61	65,039,278	62,198,893	3,751,137	2,840,385	910,752
62	62,198,893	59,318,734	3,751,137	2,880,159	870,978
63	59,318,734	56,398,244	3,751,137	2,920,490	830,647
64	56,398,244	53,436,858	3,751,137	2,961,386	789,751
65	53,436,858	50,434,003	3,751,137	3,002,855	748,282
66	50,434,003	47,389,099	3,751,137	3,044,904	706,233
67	47,389,099	44,301,557	3,751,137	3,087,542	663,595
68	44,301,557	41,170,779	3,751,137	3,130,777	620,360
69	41,170,779	37,996,161	3,751,137	3,174,618	576,519
70	37,996,161	34,777,089	3,751,137	3,219,073	532,065
71	34,777,089	31,512,939	3,751,137	3,264,150	486,988
72	31,512,939	28,203,081	3,751,137	3,309,858	441,279
73	28,203,081	24,846,875	3,751,137	3,356,206	394,931
74	24,846,875	21,443,672	3,751,137	3,403,204	347,934
75	21,443,672	17,992,813	3,751,137	3,450,859	300,278
76	17,992,813	14,493,631	3,751,137	3,499,182	251,955
77	14,493,631	10,945,450	3,751,137	3,548,181	202,956
78	10,945,450	7,347,583	3,751,137	3,597,867	153,270
79	7,347,583	3,699,335	3,751,137	3,648,248	102,889
80	3,699,335	0	3,751,137	3,699,335	51,802

INTEREST SCHEDULE FOR THE IRR 2010 ROAD PROPERTY INVESTMENT FOR THE 1Q2011 START-UP

1	TOTAL INVESTMENT	$595,019,930	1/
2	IDC	$115,420,448	2/
3	PRINCIPAL	$166,029,916	3/
4	INTEREST	4 61%	4/
5	TERM (QUARTERS)	80	5/
6	QUARTERLY COUPON	$3,167,183	6/

Quarter (5)	Beginning Balance	Ending Balance	Payment	Principal	Interest 7/ (6)	FUTURE INT DISCOUNTED 45,108,599
41	$101,411,602	$99,393,509	$3,167,183	$2,018,093	$1,149,090	2,795,899
42	99,393,509	97,352,549	3,167,183	2,040,960	1,126,223	2,672,393
43	97,352,549	95,288,463	3,167,183	2,064,086	1,103,097	2,552,699
44	95,288,463	93,200,989	3,167,183	2,087,474	1,079,709	2,436,713
45	93,200,989	91,089,862	3,167,183	2,111,127	1,056,056	2,324,331
46	91,089,862	88,954,814	3,167,183	2,135,048	1,032,135	2,215,454
47	88,954,814	86,795,573	3,167,183	2,159,240	1,007,943	2,109,982
48	86,795,573	84,611,867	3,167,183	2,183,707	983,477	2,007,823
49	84,611,867	82,403,416	3,167,183	2,208,450	958,733	1,908,882
50	82,403,416	80,169,943	3,167,183	2,233,474	933,709	1,813,071
51	80,169,943	77,911,161	3,167,183	2,258,781	908,402	1,720,302
52	77,911,161	75,626,786	3,167,183	2,284,376	882,808	1,630,489
53	75,626,786	73,316,526	3,167,183	2,310,260	856,924	1,543,550
54	73,316,526	70,980,089	3,167,183	2,336,437	830,746	1,459,403
55	70,980,089	68,617,178	3,167,183	2,362,911	804,272	1,377,971
56	68,617,178	66,227,492	3,167,183	2,389,685	777,498	1,299,177
57	66,227,492	63,810,730	3,167,183	2,416,763	750,421	1,222,946
58	63,810,730	61,366,583	3,167,183	2,444,147	723,037	1,149,206
59	61,366,583	58,894,741	3,167,183	2,471,841	695,342	1,077,887
60	58,894,741	56,394,892	3,167,183	2,499,850	667,334	1,008,920
61	56,394,892	53,866,716	3,167,183	2,528,175	639,008	942,237
62	53,866,716	51,309,894	3,167,183	2,556,822	610,361	877,775
63	51,309,894	48,724,101	3,167,183	2,585,793	581,390	815,469
64	48,724,101	46,109,008	3,167,183	2,615,093	552,091	755,259
65	46,109,008	43,464,284	3,167,183	2,644,724	522,459	697,084
66	43,464,284	40,789,592	3,167,183	2,674,692	492,492	640,886
67	40,789,592	38,084,594	3,167,183	2,704,998	462,185	586,609
68	38,084,594	35,348,945	3,167,183	2,735,649	431,535	534,197
69	35,348,945	32,582,299	3,167,183	2,766,646	400,537	483,596
70	32,582,299	29,784,305	3,167,183	2,797,995	369,189	434,754
71	29,784,305	26,954,606	3,167,183	2,829,699	337,485	387,621
72	26,954,606	24,092,844	3,167,183	2,861,762	305,421	342,147
73	24,092,844	21,198,655	3,167,183	2,894,188	272,995	298,283
74	21,198,655	18,271,673	3,167,183	2,926,982	240,201	255,983
75	18,271,673	15,311,525	3,167,183	2,960,148	207,036	215,202
76	15,311,525	12,317,836	3,167,183	2,993,689	173,494	175,895
77	12,317,836	9,290,225	3,167,183	3,027,611	139,573	138,019
78	9,290,225	6,228,309	3,167,183	3,061,916	105,267	101,531
79	6,228,309	3,131,698	3,167,183	3,096,611	70,573	66,392
80	3,131,698	0	3,167,183	3,131,698	35,485	32,561

1/ From Table D, Column (7) for the applicable year investment.
2/ From Table D, Column (8) for the applicable year investmen
3/ (Total Investment + IDC) x (Proportion of Debt from Table A, Column (9)
4/ From Table A, Column (6) for the applicable year investmen
5/ Based on Ex Parte No. 657 20-year payment period x 4
6/ Quarterly coupon payments on Line 3 principal and Line 4 interest rate
7/ Line 6 coupon payment

TABLE F: IRR PRESENT VALUE OF REPLACEMENT COST

Property Account	Property Component	Service Life In Years 1/	Investment 2/	Salvage 3/	Replacement Year Asset Net Cost 4/	Replacement Cost Adjusted To Reflect An Infinite Life 5/	Present Value Of Replacement Cost Adjusted To Reflect An Infinite Life (2009 Dollars) 6/
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
3	Grading	86	$4,909,618,761	$0	$3,987,586,356	$3,991,356,680	$467,546
5	Tunnels	118	2,082,369,218	0	1,691,297,733	1,691,423,733	7,298
6	Bridges & Culverts	71	406,624,459	0	296,207,049	297,172,140	173,281
8	Ties	21	87,323,687	0	54,915,320	66,802,218	7,085,444
9	Rails and OTM	27	180,781,846	13,827,912	104,910,221	117,874,840	6,690,162
11	Ballast	34	401,282,933	0	252,355,134	269,626,513	7,579,473
12	Labor	30	351,913,510	0	221,308,144	242,295,868	10,082,221
13	Fences and Roadway Signs	59	46,259,704	0	33,698,047	33,983,222	68,055
16	Stations and Office Buildings	31	8,947,039	0	6,517,503	7,119,285	286,978
17	Roadway Buildings	32	8,044,362	0	5,859,944	6,322,756	211,388
19	Wastewater Treatment	31	329,220	0	239,821	261,238	10,120
20	Shops and Enginehouses	47	60,674,162	0	44,198,312	45,254,417	342,444
26	Communications Systems	31	27,822,185	0	17,496,561	19,059,047	738,316
27	Signals and Interlockers	35	149,459,734	4,939,342	91,102,531	96,847,251	2,463,631
39	Public Improvements	47	85,918,575	0	62,587,695	64,030,167	462,804
	Total		$8,798,422,354	$18,767,254	$6,870,280,372	$6,949,429,374	$36,669,161

1/ From Table C, Column (3)
2/ (Table C, Column (10) after allocation of Engineering) x (Table B, 1 0 + Annual Inflation Index)^(Column (3))
3/ [(Column (4) x Salvage %) - (Table C, Column (10) after allocation of Engineering x Salvage %)] x (1 - Current Federal Tax Rate) + (Table C, Column (10) after allocation of Engineering x Salvage %)
4/ Column (4) - (Present Value of the remaining tax deductions for depreciation, interest expense and the Present Value of any salvage)
5/ Column (6) + [(Column (6) / ((1 + Real Cost of Capital)^Column (3) - 1)]
6/ Column (7) / ((1 + Average Nominal Cost of Capital from Table A Column (2))^Column (3))

TABLE G: IRR TAX DEPRECIATION SCHEDULES

Depreciation of Start-up investment for tax purposes using
accounting lives from Modified Accelerated Cost Recovery System (MACRS) 1/

Road Property Account (1)	Road Property Component (2)	Asset Lives Per MACRS 2/ (3)	Total 1Q 2011 Investment (4)	Depreciable Base (5)
1	Engineering	5	$101,117,282	$101,117,282
2	Land	N/A	45,612,897	0
3	Grading	50	374,064,386	374,064,386
5	Tunnels	50	66,181,200	66,181,200
6	Bridges & Culverts	20	47,391,136	47,391,136
8	Ties	7	55,506,403	55,506,403
9	Rails and OTM	7	106,405,052	106,405,052
11	Ballast	7	216,632,790	216,632,790
12	Labor	7	121,519,520	121,519,520
13	Fences and Roadway Signs	20	7,475,202	7,475,202
16	Stations and Office Buildings	20	3,201,878	3,201,878
17	Roadway Buildings	20	2,739,692	2,739,692
19	Fuel Stations	20	116,584	116,584
20	Shops and Enginehouses	20	13,942,028	13,942,028
26	Communications Systems	7	9,852,415	9,852,415
27	Signals and Interlockers	7	47,347,983	47,347,983
39	Public Improvements	20	19,504,489	19,504,489
	Total		$1,238,610,936	$1,192,998,039

1/ Applicable Depreciation Method: 200 or 150 percen
Declining Balance Switching to Straight Lin
Applicable Recovery Periods: 7, 15 and 50 a/ years
Applicable Convention: Mid-quarter(property placed in service in first quarte

The Depreciation Rates are as follows for the corresponding
Recovery Period and Recovery year

Recovery Year	5-Year	7-year	15-year	50-year
1	20 00%	25 00%	8 750%	2 00%
2	20 00%	21 43%	9 130%	2 00%
3	20 00%	15 31%	8 210%	2 00%
4	20 00%	10 93%	7 390%	2 00%
5	20 00%	8 75%	6 650%	2 00%
6		8 74%	5 990%	2 00%
7		8 75%	5 900%	2 00%
8		1 09%	5 910%	2 00%
9		0 00%	5 900%	2 00%

Recovery Year	7-year	15-year	50-year
10	0 00%	5 910%	2 00%
11	0 00%	5 900%	2 00%
12	0 00%	5 910%	2 00%
13	0 00%	5 900%	2 00%
14	0 00%	5 910%	2 00%
15	0 00%	5 900%	2 00%
16	0 00%	0 740%	2 00%
17	0 00%	0 000%	2 00%
18	0 00%	0 000%	2 00%
19-50	0 00%	0 000%	2 00%

a/ 50 year property uses the Straight Line Method for all time period

2/ Bonus Depreciation Per the **Economic Stimulus Act of 2008,** the **American Recovery & Reinvestment Ac**, and the **The Tax Relief, Unemployment Insurance Reauthorization and Job Creation Act of 201** for the following depreciable assets

MACRS Lives (1)	Bonus Depreciation (2)
7	$278,632,081
20	$47,185,504

TABLE G: IRR TAX DEPRECIATION SCHEDULES
(Continued)

	Amortization - 5 Years			Road Property Depreciation - MACRS 7 Years			Depreciation - MACRS **20** Years			Depreciation - MACRS 50 Years			
Year	Unamortized Investment 1/	Rate 2/	Annual Amort. 3/	Undepreciated Investment 4/	Rate 2/	Annual Amount 5/	Undepreciated Investment 6/	Rate 2/	Annual Amount 7/	Unamortized Investment 8/	Rate 2/	Annual Amount 9/	Total Annual Depreciation 10/
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1	$101,117,282	20.00%	$20,223,456	$278,632,081	25.00%	$69,658,020	$47,185,504	6.56%	$3,096,785	$440,245,586	2%	$8,804,912	$427,600,759
2	80,893,825	20.00%	20,223,456	208,974,061	21.43%	59,710,855	44,088,720	7.00%	3,302,985	431,440,674	2%	8,804,912	92,042,208
3	60,670,369	20.00%	20,223,456	149,263,206	15.31%	42,658,572	40,785,734	6.48%	3,058,564	422,635,762	2%	8,804,912	74,745,504
4	40,446,913	20.00%	20,223,456	106,604,634	10.93%	30,454,487	37,727,170	6.00%	2,829,243	413,830,851	2%	8,804,912	62,312,097
5	20,223,456	20.00%	20,223,456	76,150,148	8.75%	24,380,307	34,897,927	5.55%	2,616,908	405,025,939	2%	8,804,912	56,025,583
6				51,769,841	8.74%	24,352,444	32,281,019	5.13%	2,420,616	396,221,027	2%	8,804,912	35,577,972
7				27,417,397	8.75%	24,380,307	29,860,403	4.75%	2,239,424	387,416,116	2%	8,804,912	35,424,643
8				3,037,090	1.09%	3,037,090	27,620,979	4.46%	2,104,002	378,611,204	2%	8,804,912	13,946,003
9							25,516,977	4.46%	2,104,002	369,806,292	2%	8,804,912	10,908,913
10					100.00%		23,412,975	4.46%	2,104,002	361,001,380	2%	8,804,912	10,908,913
11							21,308,974	4.46%	2,104,002	352,196,469	2%	8,804,912	10,908,913
12							19,204,972	4.46%	2,104,473	343,391,557	2%	8,804,912	10,909,385
13							17,100,499	4.46%	2,104,002	334,586,645	2%	8,804,912	10,908,913
14							14,996,497	4.46%	2,104,473	325,781,734	2%	8,804,912	10,909,385
15							12,892,023	4.46%	2,104,002	316,976,822	2%	8,804,912	10,908,913
16							10,788,022	4.46%	2,104,473	308,171,910	2%	8,804,912	10,909,385
17							8,683,548	4.46%	2,104,002	299,366,998	2%	8,804,912	10,908,913
18							6,579,547	4.46%	2,104,473	290,562,087	2%	8,804,912	10,909,385
19							4,475,073	4.46%	2,104,002	281,757,175	2%	8,804,912	10,908,913
20							2,371,072	4.46%	2,104,473	272,952,263	2%	8,804,912	10,909,385
21							266,598	0.57%	266,598	264,147,352	2%	8,804,912	9,071,510
										255,342,440	2%	8,804,912	8,804,912
										246,537,528	2%	8,804,912	8,804,912
										237,732,616	2%	8,804,912	8,804,912
										228,927,705	2%	8,804,912	8,804,912
										220,122,793	2%	8,804,912	8,804,912
										211,317,881	2%	8,804,912	8,804,912
										202,512,970	2%	8,804,912	8,804,912
										193,708,058	2%	8,804,912	8,804,912
										184,903,146	2%	8,804,912	8,804,912
										176,098,234	2%	8,804,912	8,804,912
										167,293,323	2%	8,804,912	8,804,912
										158,488,411	2%	8,804,912	8,804,912

1/ From Table G, Page 8, Column (5), Road Property Accounts 1 minus Page 8, 5-Year Bonus Depreciation
2/ From Table G, Footnote 1/, Page 8
3/ Column (2), Year 1 x Column (3)
4/ From Table G, Page 8, Column (5), Road Property Accounts 8, 9, 11, 12, 26 and 27 minus Page 10, 7-Year Bonus Depreciation
5/ Column (5), Year 1 x Column (6)
6/ From Table G, Page 8, Column (5), Road Property Accounts 6, 13, 16, 17, 19, 20 and 39 minus Page 8, 15-Year Bonus Depreciation
7/ Column (8), Year 1 x Column (9)
8/ From Table G, Page 8, Column (5), Road Property Accounts 3 and 5
9/ Column (11), Year 1 x Column (12)
10/ Column (4) + Column (7) + Column (10) + Column (13) plus Page 8, 5, 7 & 15 Year Bonus Depreciation

TABLE H: IRR AVERAGE ANNUAL INFLATION IN ASSET PRICES

Development of average annual inflation factors for all capital assets

1. 1Q2011 Land value	$45,612,897	1/
2. 1Q2011 Property asset value accounts 3, 5, 6, 13, 17, 26, 27, 39 and 52	$591,816,992	1/
3. 1Q2011 Road Property asset value accounts 8, 9, and 11	$378,544,245	1/
4. 1Q2011 Road Property asset value accounts 1 and 12	$222,636,801	1/

Period (1)	Quarter (2)	Inflation Index For Land 2/ (3)	Inflation Index For Line 2 Property Assets 3/ (4)	Inflation Index For Line 3 Road Property Assets 4/ (5)	Inflation Index For Line 4 Road Property Assets 5/ (6)	Land Value 6/ (7)	Road Property Value 7/ (8)	1Q2009 Inflation Index 8/ (9)
0		1.000	1.000	1.000	1.000	$45,612,897	$1,192,998,039	1.000
1	2011 1 Qtr	0.998	0.986	0.998	0.984	45,508,871	1,180,747,156	0.990
2	2011 2 Qtr	0.995	0.992	1.035	0.985	45,405,081	1,198,262,720	1.004
3	2011 3 Qtr	0.993	0.995	1.000	0.992	45,301,528	1,188,236,885	0.996
4	2011 4 Qtr	0.991	1.000	0.992	0.999	45,198,212	1,190,011,544	0.997
5	2012 1 Qtr	0.989	1.016	0.987	1.017	45,095,131	1,201,428,932	1.006
6	2012 2 Qtr	0.986	1.019	0.978	1.021	44,992,285	1,200,621,737	1.006
7	2012 3 Qtr	0.984	1.024	0.990	1.025	44,889,673	1,208,874,428	1.012
8	2012 4 Qtr	0.982	1.029	1.003	1.029	44,787,296	1,217,634,040	1.019
9	2013 1 Qtr	0.980	1.046	1.009	1.048	44,685,152	1,234,257,223	1.033
10	2013 2 Qtr	0.977	1.050	1.010	1.052	44,583,241	1,237,860,763	1.035
11	2013 3 Qtr	0.975	1.054	1.015	1.056	44,481,563	1,243,257,316	1.040
12	2013 4 Qtr	0.973	1.060	1.023	1.061	44,380,116	1,250,815,438	1.046
13	2014 1 Qtr	0.971	1.066	1.027	1.068	44,278,901	1,257,646,973	1.051
14	2014 2 Qtr	0.969	1.073	1.031	1.075	44,177,917	1,264,517,516	1.057
15	2014 3 Qtr	0.966	1.079	1.035	1.082	44,077,163	1,271,427,298	1.062
16	2014 4 Qtr	0.964	1.086	1.039	1.089	43,976,638	1,278,376,550	1.068
17	2015 1 Qtr	0.962	1.095	1.045	1.097	43,876,343	1,287,585,710	1.075
18	2015 2 Qtr	0.960	1.103	1.051	1.106	43,776,277	1,296,862,115	1.082
19	2015 3 Qtr	0.958	1.111	1.057	1.115	43,676,439	1,306,206,261	1.090
20	2015 4 Qtr	0.955	1.120	1.064	1.124	43,576,829	1,315,618,650	1.097

1/ Table C, Page 3, Column (10)
2/ Previous Column (3) x (1 + Quarterly Inflation Rate Change from Table B)
3/ Previous Column (4) x (1 + Quarterly Inflation Rate Change from Table B)
4/ Previous Column (5) x (1 + Quarterly Inflation Rate Change from Table B)
5/ Previous Column (6) x (1 + Quarterly Inflation Rate Change from Table B)
6/ Line 1 x Column (3) for applicable quarter
7/ (Line 2 x Column (4) for applicable quarter) + (Line 3 x Column (5)for applicable quarter) + (Line 4 x Column (6) for applicable quarter)
8/ (Column (7) + Column (8)) ÷ (Period 0; (Column (7) + Column (8)))
9/ Annual weighted inflation using the last two quarters, used to calculate real cost of capital

TABLE H: IRR AVERAGE ANNUAL INFLATION IN ASSET PRICES
(Continued)

Development of average annual inflation factors for all capital assets

1. 1Q2011 Land value	$45,612,897	1/
2. 1Q2011 Property asset value accounts 3, 5, 6, 13, 17, 26, 27, 39 and 52	$591,816,992	1/
3. 1Q2011 Road Property asset value accounts 8, 9, and 11	$378,544,245	1/
4. 1Q2011 Road Property asset value accounts 1 and 12	$222,636,801	1/

Period	Quarter	Inflation Index For Land 2/	Inflation Index For Line 2 Property Assets 3/	Inflation Index For Line 3 Road Property Assets 4/	Inflation Index For Line 4 Road Property Assets 5/	Land Value 6/	Road Property Value 7/	1Q2009 Inflation Index 8/
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
21	2016 1 Qtr	0.953	1.129	1.069	1.133	$43,477,445	$1,325,281,854	1.105
22	2016 2 Qtr	0.951	1.138	1.075	1.143	43,378,289	1,335,018,121	1.113
23	2016 3 Qtr	0.949	1.147	1.081	1.152	43,279,358	1,344,828,018	1.121
24	2016 4 Qtr	0.947	1.157	1.087	1.162	43,180,654	1,354,712,113	1.129
25	2017 1 Qtr	0.945	1.166	1.091	1.172	43,082,174	1,364,504,818	1.136
26	2017 2 Qtr	0.942	1.176	1.096	1.183	42,983,919	1,374,373,689	1.144
27	2017 3 Qtr	0.940	1.186	1.101	1.193	42,885,888	1,384,319,347	1.152
28	2017 4 Qtr	0.938	1.196	1.105	1.204	42,788,081	1,394,342,416	1.160
29	2018 1 Qtr	0.936	1.206	1.108	1.215	42,690,496	1,403,814,819	1.168
30	2018 2 Qtr	0.934	1.216	1.111	1.226	42,593,134	1,413,362,729	1.175
31	2018 3 Qtr	0.932	1.227	1.114	1.237	42,495,995	1,422,986,782	1.183
32	2018 4 Qtr	0.930	1.237	1.116	1.248	42,399,076	1,432,687,622	1.191
33	2019 1 Qtr	0.927	1.248	1.120	1.260	42,302,379	1,442,712,155	1.199
34	2019 2 Qtr	0.925	1.258	1.123	1.271	42,205,903	1,452,816,547	1.207
35	2019 3 Qtr	0.923	1.269	1.126	1.283	42,109,646	1,463,001,473	1.215
36	2019 4 Qtr	0.921	1.280	1.130	1.294	42,013,609	1,473,267,611	1.223
37	2020 1 Qtr	0.919	1.290	1.132	1.306	41,917,791	1,482,518,006	1.231
38	2020 2 Qtr	0.917	1.300	1.134	1.317	41,822,191	1,491,838,968	1.238
39	2020 3 Qtr	0.915	1.310	1.136	1.328	41,726,810	1,501,231,067	1.246
40	2020 4 Qtr	0.913	1.321	1.138	1.340	41,631,646	1,510,694,872	1.253
Annual Average 9/								2.45%

1/ Table C, Page 3, Column (10)
2/ Previous Column (3) x (1 + Quarterly Inflation Rate Change from Table B)
3/ Previous Column (4) x (1 + Quarterly Inflation Rate Change from Table B)
4/ Previous Column (5) x (1 + Quarterly Inflation Rate Change from Table B)
5/ Previous Column (6) x (1 + Quarterly Inflation Rate Change from Table B)
6/ Line 1 x Column (3) for applicable quarter
7/ (Line 2 x Column (4) for applicable quarter) + (Line 3 x Column (5)for applicable quarter) + (Line 4 x Column (6) for applicable quarter)
8/ (Column (7) + Column (8)) ÷ (Period 0; (Column (7) + Column (8)))
9/ Annual weighted inflation using the last two quarters, used to calculate real cost of capital

TABLE I: IRR DISCOUNTED CASH FLOW
(Road Property)

Discounted Cash Flow
Present Value of the Cash Flow Discounted at the Cost of Capital in Table A
Inflation In Asset Values From Table H

1. 1Q2011 Road Property Investment	$1,239,484,708 1/	Federal Tax Rate	35.0%	
2. Interest During Construction (1Q2011 Invest.) & Equity Finance	$178,083,238 2/			
3. Total 1Q2011 Investment	$1,417,567,946 3/	Route Mile Weighted		
4. Present Value Of Replacement Cost for the IRR	$36,669,161 4/	Average State Tax Rate	5.0%	6/
5. Total Cost Recovered From Quarterly Revenue Flow	$1,454,237,107 5/			

Period (1)	Quarter (2)	Quarterly Levelized Capital Carrying Charge Requirement 7/ (3)	Interest on Investment Financed With Debt 8/ (4)	Tax Depreciation 9/ (5)	Actual Federal Tax Payments 10/ (6)	Actual State Tax Payments 11/ (7)	Cash Flow 12/ (8)	Present Value Cash Flow 13/ (9)	Cumulative Present Value 14/ (10)
1	2011 1 Qtr	$37,559,795	$4,581,882	$106,900,190	$0	$0	$37,559,795	$37,078,879	$37,078,879
2	2011 2 Qtr	38,093,111	4,548,904	106,900,190	0	0	38,093,111	36,648,534	73,727,413
3	2011 3 Qtr	37,782,852	4,515,501	106,900,190	0	0	37,782,852	35,425,147	109,152,560
4	2011 4 Qtr	37,834,044	4,481,667	106,900,190	0	0	37,834,044	34,570,565	143,723,125
5	2012 1 Qtr	38,180,598	4,447,397	23,010,552	0	0	38,180,598	33,999,553	177,722,678
6	2012 2 Qtr	38,152,723	4,412,685	23,010,552	0	0	38,152,723	33,110,276	210,832,953
7	2012 3 Qtr	38,402,357	4,377,524	23,010,552	0	0	38,402,357	32,478,945	243,311,898
8	2012 4 Qtr	38,667,526	4,341,911	23,010,552	0	0	38,667,526	31,871,109	275,183,008
9	2013 1 Qtr	39,173,559	4,305,837	18,686,376	0	0	39,173,559	31,466,657	306,649,665
10	2013 2 Qtr	39,280,813	4,269,298	18,686,376	0	0	39,280,813	30,749,978	337,399,643
11	2013 3 Qtr	39,442,993	4,232,288	18,686,376	0	0	39,442,993	30,091,302	367,490,945
12	2013 4 Qtr	39,671,388	4,194,799	18,686,376	0	0	39,671,388	29,495,468	396,986,413
13	2014 1 Qtr	39,877,536	4,156,826	15,578,024	0	0	39,877,536	28,894,353	425,880,767
14	2014 2 Qtr	40,084,885	4,118,363	15,578,024	0	0	40,084,885	28,305,581	454,186,348
15	2014 3 Qtr	40,293,443	4,079,404	15,578,024	0	0	40,293,443	27,728,897	481,915,245
16	2014 4 Qtr	40,503,217	4,039,940	15,578,024	0	0	40,503,217	27,164,049	509,079,294
17	2015 1 Qtr	40,782,219	3,999,967	14,006,396	0	0	40,782,219	26,655,241	535,734,535
18	2015 2 Qtr	41,063,287	3,959,478	14,006,396	0	0	41,063,287	26,156,055	561,890,590
19	2015 3 Qtr	41,346,437	3,918,465	14,006,396	0	0	41,346,437	25,666,307	587,556,897
20	2015 4 Qtr	41,631,684	3,876,921	14,006,396	0	0	41,631,684	25,185,818	612,742,715
21	2016 1 Qtr	41,924,620	3,834,841	8,894,493	1,150,327	172,982	40,601,312	23,937,507	636,680,222
22	2016 2 Qtr	42,219,802	3,792,217	8,894,493	9,819,753	1,476,655	30,923,394	17,767,764	654,447,986
23	2016 3 Qtr	42,517,245	3,749,041	8,894,493	9,933,009	1,493,686	31,090,551	17,409,280	671,857,266
24	2016 4 Qtr	42,816,968	3,705,306	8,894,493	10,047,209	1,510,858	31,258,901	17,058,187	688,915,453
25	2017 1 Qtr	43,113,899	3,661,006	8,856,161	10,173,413	1,529,837	31,410,649	16,704,861	705,620,314

TABLE I: IRR DISCOUNTED CASH FLOW
(Road Property Continued)

Period (1)	Quarter (2)	Quarterly Levelized Capital Carrying Charge Requirement 7/ (3)	Interest on Investment Financed With Debt 8/ (4)	Tax Depreciation 9/ (5)	Actual Federal Tax Payments 10/ (6)	Actual State Tax Payments 11/ (7)	Cash Flow 12/ (8)	Present Value Cash Flow 13/ (9)	Cumulative Present Value 14/ (10)
26	2017 2 Qtr	$43,413,170	$3,616,133	$8,856,161	$10,287,841	$1,547,044	$31,578,285	$16,366,705	$721,987,019
27	2017 3 Qtr	43,714,799	3,570,679	8,856,161	10,403,246	1,564,398	31,747,155	16,035,566	738,022,585
28	2017 4 Qtr	44,018,806	3,524,637	8,856,161	10,519,638	1,581,900	31,917,268	15,711,295	753,733,880
29	2018 1 Qtr	44,305,954	3,477,998	3,486,501	12,416,034	1,867,073	30,022,847	14,402,733	768,136,613
30	2018 2 Qtr	44,595,421	3,430,756	3,486,501	12,527,990	1,883,908	30,183,523	14,111,388	782,248,001
31	2018 3 Qtr	44,887,227	3,382,902	3,486,501	12,640,927	1,900,891	30,345,409	13,826,096	796,074,097
32	2018 4 Qtr	45,181,391	3,334,428	3,486,501	12,754,854	1,918,023	30,508,514	13,546,728	809,620,826
33	2019 1 Qtr	45,485,478	3,285,326	2,727,228	13,124,747	1,973,646	30,387,084	13,149,498	822,770,323
34	2019 2 Qtr	45,792,017	3,235,588	2,727,228	13,243,209	1,991,460	30,557,348	12,886,725	835,657,048
35	2019 3 Qtr	46,101,029	3,185,206	2,727,228	13,362,708	2,009,430	30,728,891	12,629,338	848,286,386
36	2019 4 Qtr	46,412,536	3,134,170	2,727,228	13,483,253	2,027,557	30,901,726	12,377,222	860,663,608
37	2020 1 Qtr	46,692,937	3,082,473	2,727,228	13,593,676	2,044,162	31,055,100	12,122,164	872,785,772
38	2020 2 Qtr	46,975,507	3,030,106	2,727,228	13,705,042	2,060,909	31,209,556	11,872,484	884,658,256
39	2020 3 Qtr	47,260,262	2,977,060	2,727,228	13,817,361	2,077,799	31,365,102	11,628,066	896,286,321
40	2020 4 Qtr	47,547,220	2,923,326	2,727,228	13,930,641	2,094,833	31,521,745	11,536,509	907,822,831
	Future	2,330,396,737	45,108,599	95,998,288	727,938,875	109,464,492	1,492,993,369	546,414,276	1,454,237,107

1/ From Table C, Column (10) + Rail Grinding Capital Costs from [MOW Costs - Final xls]
2/ From Table D, Column (8)
3/ Line 1 + Line 2
4/ Table F Column (8)
5/ Line 3 + Line 4
6/ Utah corporate income tax rate
7/ Quarterly carrying costs needed to recover the total investment over 40 quarters after consideration of the applicab
interest payments, tax depreciation and tax liability The Future value is an estimate of a perpetual income stream for the IR
and is calculated by taking the Period 40, Column (3) value and dividing it by the IRR 's estimated quarterly Real Cost of Capit
8/ Value from Table E
9/ Value from Table G, Page 12, Column (14) divided by 4 quarters
10/ Table J: Part 1 Page 16 of 20
11/ Table J: Part 2 Page 17 of 20
12/ (Column (3) - Column (6) - Column (7))
13/ Column (8) discounted by the fourth root of the annual Cost of Capital adjusted to midquarter dollars from Table A
14/ Cumulative total of Column (9)

TABLE J - PART 1: COMPUTATION OF FEDERAL TAX LIABILITY - TAXABLE INCOME
(Road Property)

Time Period (1)	Taxable Income B/4 NOL's IRR 1/ (2)	Net Operating Losses Generated 2/ (3)	NOL's Generated Plus Carryforward 3/ (4)	Carryforward Utilized 4/ (5)	Carryforward Remaining 5/ (6)	Carryback Available 6/ (7)	Carryback Utilized 7/ (8)	Carryback Remaining 8/ (9)	Annual Taxable Income 9/ (10)	Annual Tax Liability 10/ (11)
2008	($131,150)	($131,150)	($131,150)	$0	($131,150)	($131,150)	$0	($131,150)	$0	$0
2009	(4,255,375)	(4,255,375)	(4,386,525)	0	(4,386,525)	(4,386,525)	0	(4,386,525)	0	0
2010	(11,588,388)	(11,588,388)	(15,974,913)	0	(15,974,913)	(15,974,913)	0	(15,974,913)	0	0
2011 1 Qtr	(73,922,277)	(73,922,277)	(89,897,190)	0	(89,897,190)	(89,897,190)	0	(89,897,190)	0	0
2011 2 Qtr	(73,355,983)	(73,355,983)	(163,253,172)	0	(163,253,172)	(163,253,172)	0	(163,253,172)	0	0
2011 3 Qtr	(73,632,839)	(73,632,839)	(236,886,011)	0	(236,886,011)	(236,886,011)	0	(236,886,011)	0	0
2011 4 Qtr	(73,547,812)	(73,547,812)	(310,433,824)	0	(310,433,824)	(310,433,824)	0	(310,433,824)	0	0
2012 1 Qtr	10,722,649	0	(310,433,824)	10,722,649	(299,711,175)	(299,711,175)	0	(299,711,175)	0	0
2012 2 Qtr	10,729,487	0	(299,711,175)	10,729,487	(288,981,688)	(288,981,688)	0	(288,981,688)	0	0
2012 3 Qtr	11,014,281	0	(288,981,688)	11,014,281	(277,967,408)	(277,967,408)	0	(277,967,408)	0	0
2012 4 Qtr	11,315,063	0	(277,967,408)	11,315,063	(266,652,345)	(266,652,345)	0	(266,652,345)	0	0
2013 1 Qtr	16,181,346	0	(266,652,345)	16,181,346	(250,470,999)	(250,470,999)	0	(250,470,999)	0	0
2013 2 Qtr	16,325,139	0	(250,470,999)	16,325,139	(234,145,860)	(234,145,860)	0	(234,145,860)	0	0
2013 3 Qtr	16,524,329	0	(234,145,860)	16,524,329	(217,621,531)	(217,621,531)	0	(217,621,531)	0	0
2013 4 Qtr	16,790,213	0	(217,621,531)	16,790,213	(200,831,317)	(200,831,317)	0	(200,831,317)	0	0
2014 1 Qtr	20,142,685	0	(200,831,317)	20,142,685	(180,688,632)	(180,688,632)	0	(180,688,632)	0	0
2014 2 Qtr	20,388,497	0	(180,688,632)	20,388,497	(160,300,135)	(160,300,135)	0	(160,300,135)	0	0
2014 3 Qtr	20,636,015	0	(160,300,135)	20,636,015	(139,664,120)	(139,664,120)	0	(139,664,120)	0	0
2014 4 Qtr	20,885,253	0	(139,664,120)	20,885,253	(118,778,868)	(118,778,868)	0	(118,778,868)	0	0
2015 1 Qtr	22,775,856	0	(118,778,868)	22,775,856	(96,003,012)	(96,003,012)	0	(96,003,012)	0	0
2015 2 Qtr	23,097,413	0	(96,003,012)	23,097,413	(72,905,599)	(72,905,599)	0	(72,905,599)	0	0
2015 3 Qtr	23,421,576	0	(72,905,599)	23,421,576	(49,484,023)	(49,484,023)	0	(49,484,023)	0	0
2015 4 Qtr	23,748,367	0	(49,484,023)	23,748,367	(25,735,656)	(25,735,656)	0	(25,735,656)	0	0
2016 1 Qtr	29,022,305	0	(25,735,656)	25,735,656	0	0	0	0	3,286,649	1,150,327
2016 2 Qtr	28,056,437	0	0	0	0	0	0	0	28,056,437	9,819,753
2016 3 Qtr	28,380,026	0	0	0	0	0	0	0	28,380,026	9,933,009
2016 4 Qtr	28,706,310	0	0	0	0	0	0	0	28,706,310	10,047,209
2017 1 Qtr	29,066,895	0	0	0	0	0	0	0	29,066,895	10,173,413
2017 2 Qtr	29,393,832	0	0	0	0	0	0	0	29,393,832	10,287,841
2017 3 Qtr	29,723,561	0	0	0	0	0	0	0	29,723,561	10,403,246
2017 4 Qtr	30,056,108	0	0	0	0	0	0	0	30,056,108	10,519,638
2018 1 Qtr	35,474,382	0	0	0	0	0	0	0	35,474,382	12,416,034
2018 2 Qtr	35,794,256	0	0	0	0	0	0	0	35,794,256	12,527,990
2018 3 Qtr	36,116,933	0	0	0	0	0	0	0	36,116,933	12,640,927
2018 4 Qtr	36,442,440	0	0	0	0	0	0	0	36,442,440	12,754,854
2019 1 Qtr	37,499,277	0	0	0	0	0	0	0	37,499,277	13,124,747
2019 2 Qtr	37,837,740	0	0	0	0	0	0	0	37,837,740	13,243,209
2019 3 Qtr	38,179,165	0	0	0	0	0	0	0	38,179,165	13,362,708
2019 4 Qtr	38,523,580	0	0	0	0	0	0	0	38,523,580	13,483,253
2020 1 Qtr	38,839,074	0	0	0	0	0	0	0	38,839,074	13,593,676
2020 2 Qtr	39,157,264	0	0	0	0	0	0	0	39,157,264	13,705,042
2020 3 Qtr	39,478,175	0	0	0	0	0	0	0	39,478,175	13,817,361
2020 4 Qtr	39,801,833	0	0	0	0	0	0	0	39,801,833	13,930,641
Future	2,079,825,357	0	0	0	0	0	0	0	2,079,825,357	727,938,875

1/ Table I, Page 13, Column (3) - Table E, Page 5, Columns (2),(4) & (6) - Table G, Column (14) / 4 - Table J Part 2, Page 15, Column (11)
Values for 2008-2010 from Table D, Sum of Column (10)
2/ Column (2) if less than zero, otherwise zero
3/ Cumulative total of Column (2)
4/ If Column (2) is greater than zero, and (Column (2) + Column (4) is less than zero, then Column (2), otherwise Column (4)
5/ Column (4) + Column (5) + Column (8)
6/ Previous period Column (9) + current period Column (3) - current period Column (5)
7/ If previous Column (10) is greater than zero, and previous Column (10) is less than current Column (7), then previous Column (10), otherwise zero
8/ Column (7) + Column (8)
9/ If Column (2) is greater than zero, then Column (2) - Column (5) - Column (8), otherwise zero
10/ Column (10) times applicable Federal Statutory Tax Rate

TABLE J - PART 2: COMPUTATION OF STATE TAX LIABILITY - TAXABLE INCOME

(Road Property)

Time Period	Taxable Income B/4 NOL's IRR 1/	Net Operating Losses Generated 2/	NOL's Generated Plus Carryforward 3/	Carryforward Utilized 4/	Carryforward Remaining 5/	Carryback Available 6/	Carryback Utilized 7/	Carryback Remaining 8/	Annual Taxable Income 9/	Annual Tax Liability 10/
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
2008	($131,150)	($131,150)	($131,150)	$0	($131,150)	($131,150)	$0	($131,150)	$0	$0
2009	(4,255,375)	(4,255,375)	(4,386,525)	0	(4,386,525)	(4,386,525)	0	(4,386,525)	0	0
2010	(11,588,388)	(11,588,388)	(15,974,913)	0	(15,974,913)	(15,974,913)	0	(15,974,913)	0	0
2011 1 Qtr	(73,922,277)	(73,922,277)	(89,897,190)	0	(89,897,190)	(89,897,190)	0	(89,897,190)	0	0
2011 2 Qtr	(73,355,983)	(73,355,983)	(163,253,172)	0	(163,253,172)	(163,253,172)	0	(163,253,172)	0	0
2011 3 Qtr	(73,632,839)	(73,632,839)	(236,886,011)	0	(236,886,011)	(236,886,011)	0	(236,886,011)	0	0
2011 4 Qtr	(73,547,812)	(73,547,812)	(310,433,824)	0	(310,433,824)	(310,433,824)	0	(310,433,824)	0	0
2012 1 Qtr	10,722,649	0	(310,433,824)	10,722,649	(299,711,175)	(299,711,175)	0	(299,711,175)	0	0
2012 2 Qtr	10,729,487	0	(299,711,175)	10,729,487	(288,981,688)	(288,981,688)	0	(288,981,688)	0	0
2012 3 Qtr	11,014,281	0	(288,981,688)	11,014,281	(277,967,408)	(277,967,408)	0	(277,967,408)	0	0
2012 4 Qtr	11,315,063	0	(277,967,408)	11,315,063	(266,652,345)	(266,652,345)	0	(266,652,345)	0	0
2013 1 Qtr	16,181,346	0	(266,652,345)	16,181,346	(250,470,999)	(250,470,999)	0	(250,470,999)	0	0
2013 2 Qtr	16,325,139	0	(250,470,999)	16,325,139	(234,145,860)	(234,145,860)	0	(234,145,860)	0	0
2013 3 Qtr	16,524,329	0	(234,145,860)	16,524,329	(217,621,531)	(217,621,531)	0	(217,621,531)	0	0
2013 4 Qtr	16,790,213	0	(217,621,531)	16,790,213	(200,831,317)	(200,831,317)	0	(200,831,317)	0	0
2014 1 Qtr	20,142,685	0	(200,831,317)	20,142,685	(180,688,632)	(180,688,632)	0	(180,688,632)	0	0
2014 2 Qtr	20,388,497	0	(180,688,632)	20,388,497	(160,300,135)	(160,300,135)	0	(160,300,135)	0	0
2014 3 Qtr	20,636,015	0	(160,300,135)	20,636,015	(139,664,120)	(139,664,120)	0	(139,664,120)	0	0
2014 4 Qtr	20,885,253	0	(139,664,120)	20,885,253	(118,778,868)	(118,778,868)	0	(118,778,868)	0	0
2015 1 Qtr	22,775,856	0	(118,778,868)	22,775,856	(96,003,012)	(96,003,012)	0	(96,003,012)	0	0
2015 2 Qtr	23,097,413	0	(96,003,012)	23,097,413	(72,905,599)	(72,905,599)	0	(72,905,599)	0	0
2015 3 Qtr	23,421,576	0	(72,905,599)	23,421,576	(49,484,023)	(49,484,023)	0	(49,484,023)	0	0
2015 4 Qtr	23,748,367	0	(49,484,023)	23,748,367	(25,735,656)	(25,735,656)	0	(25,735,656)	0	0
2016 1 Qtr	29,195,286	0	(25,735,656)	25,735,656	0	0	0	0	3,459,630	172,982
2016 2 Qtr	29,533,092	0	0	0	0	0	0	0	29,533,092	1,476,655
2016 3 Qtr	29,873,711	0	0	0	0	0	0	0	29,873,711	1,493,686
2016 4 Qtr	30,217,169	0	0	0	0	0	0	0	30,217,169	1,510,858
2017 1 Qtr	30,596,732	0	0	0	0	0	0	0	30,596,732	1,529,837
2017 2 Qtr	30,940,876	0	0	0	0	0	0	0	30,940,876	1,547,044
2017 3 Qtr	31,287,959	0	0	0	0	0	0	0	31,287,959	1,564,398
2017 4 Qtr	31,638,009	0	0	0	0	0	0	0	31,638,009	1,581,900
2018 1 Qtr	37,341,455	0	0	0	0	0	0	0	37,341,455	1,867,073
2018 2 Qtr	37,678,164	0	0	0	0	0	0	0	37,678,164	1,883,908
2018 3 Qtr	38,017,824	0	0	0	0	0	0	0	38,017,824	1,900,891
2018 4 Qtr	38,360,463	0	0	0	0	0	0	0	38,360,463	1,918,023
2019 1 Qtr	39,472,923	0	0	0	0	0	0	0	39,472,923	1,973,646
2019 2 Qtr	39,829,200	0	0	0	0	0	0	0	39,829,200	1,991,460
2019 3 Qtr	40,188,595	0	0	0	0	0	0	0	40,188,595	2,009,430
2019 4 Qtr	40,551,137	0	0	0	0	0	0	0	40,551,137	2,027,557
2020 1 Qtr	40,883,236	0	0	0	0	0	0	0	40,883,236	2,044,162
2020 2 Qtr	41,218,172	0	0	0	0	0	0	0	41,218,172	2,060,909
2020 3 Qtr	41,555,974	0	0	0	0	0	0	0	41,555,974	2,077,799
2020 4 Qtr	41,896,666	0	0	0	0	0	0	0	41,896,666	2,094,833
Future	2,189,289,850	0	0	0	0	0	0	0	2,189,289,850	109,464,492

1/ Table I, Page 15, Column (3) - Table E, Page 5, Columns (2),(4) & (6) - Table G, Column (14) / 4
Values for 2008-2010 from Table D, Sum of Column (10)
2/ Column (2) if less than zero, otherwise zero
3/ Cumulative total of Column (2)
4/ If Column (2) is greater than zero, and (Column (2) + Column (4) is less than zero, then Column (2), otherwise Column (4)
5/ Column (4) + Column (5) + Column (8)
6/ Previous period Column (9) + current period Column (3) - current period Column (5)
7/ If previous Column (10) is greater than zero, and previous Column (10) is less than current Column (7), then previous Column (10), otherwise zero
8/ Column (7) + Column (8)
9/ If Column (2) is greater than zero, then Column (2) - Column (5) - Column (8), otherwise zero
10/ Column (10) times applicable route mile weighted State Statutory Tax Rates

TABLE K: IRR OPERATING EXPENSES

Item (1)		2011 (2)	2012 (3)	2013 (4)	2014 (5)	2015 (7)	2016 (8)	2017 (9)	2018 (10)	2019 (11)	2020 (12)
1 Train & Engine Personnel		$5,402,329	$5,294,834	$5,620,545	$5,653,802	$5,740,568	$5,833,662	$5,963,743	$5,872,928	$5,901,934	$5,983,568
2 Locomotive Lease Expense		$1,797,962	$1,762,187	$1,870,587	$1,881,656	$1,910,532	$1,941,515	$1,984,808	$1,954,584	$1,964,237	$1,991,406
3 Locomotive Maintenance Expense		$1,273,494	$1,248,154	$1,324,934	$1,332,774	$1,353,227	$2,234,133	$2,283,951	$2,249,171	$2,260,280	$2,291,543
4 Locomotive Operating Expense		$17,893,751	$17,537,703	$18,616,534	$18,726,688	$19,014,075	$19,322,424	$19,753,285	$19,452,484	$19,548,557	$19,818,949
5 Railcar Lease Expense		$4,020,345	$3,940,348	$4,182,739	$4,207,488	$4,272,058	$4,341,337	$4,438,142	$4,370,559	$4,392,144	$4,452,896
6 Material & Supply Operating		$553,730	$553,730	$553,730	$553,730	$553,730	$553,730	$553,730	$553,730	$553,730	$553,730
7 Ad Valorem Tax		$1,479,125	$1,479,125	$1,479,125	$1,479,125	$1,479,125	$1,479,125	$1,479,125	$1,479,125	$1,479,125	$1,479,125
8 Operating Managers		$3,213,025	$3,213,025	$3,213,025	$3,213,025	$3,213,025	$3,213,025	$3,213,025	$3,213,025	$3,213,025	$3,213,025
9 General & Administration		$10,932,582	$8,845,644	$8,845,644	$8,845,644	$8,845,644	$8,845,644	$8,845,644	$8,845,644	$8,845,644	$8,845,644
10 Loss and Damage		$58,186	$57,028	$60,536	$60,894	$61,829	$62,832	$64,233	$63,254	$63,567	$64,446
11 Trackage Rights		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
12 Intermodal Lift Costs		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
13 Residual UP Costs		$553,571	$542,556	$575,931	$579,339	$588,230	$597,769	$611,098	$601,792	$604,765	$613,130
14 Insurance	3 73%	$2,126,818	$2,025,965	$2,095,680	$2,102,799	$2,121,370	$2,173,335	$2,201,892	$2,181,956	$2,188,323	$2,206,245
15 Maintenance of Way		$9,840,034	$9,840,034	$9,840,034	$9,840,034	$9,840,034	$9,840,034	$9,840,034	$9,840,034	$9,840,034	$9,840,034
16 Total Operating Expenses		$59,144,951	$56,340,333	$58,279,044	$58,476,996	$58,993,445	$60,438,564	$61,232,710	$60,678,285	$60,855,364	$61,353,740
17 Expense Per Quarter		$14,786,238	$14,085,083	$14,569,761	$14,619,249	$14,748,361	$15,109,641	$15,308,177	$15,169,571	$15,213,841	$15,338,435

TABLE K: IRR OPERATING EXPENSES, INDEXED
(Continued)

Period (1)	Quarter (2)	Hybrid Index 1/ (3)	Operating Expense Indexed For Inflation 2/ (4)	Period (5)	Quarter (6)	Hybrid Index 1/ (7)	Operating Expense Indexed For Inflation 2/ (8)
1	2011 1 Qtr	100.000	$14,786,238	27	2017 3 Qtr	126.025	$19,292,200
2	2011 2 Qtr	107.573	15,905,955	28	2017 4 Qtr	126.679	19,392,207
3	2011 3 Qtr	110.293	16,308,158	29	2018 1 Qtr	127.324	19,314,577
4	2011 4 Qtr	110.456	16,332,323	30	2018 2 Qtr	127.963	19,411,365
5	2012 1 Qtr	109.254	15,388,582	31	2018 3 Qtr	128.604	19,508,637
6	2012 2 Qtr	110.346	15,542,287	32	2018 4 Qtr	129.248	19,606,398
7	2012 3 Qtr	110.407	15,550,949	33	2019 1 Qtr	129.730	19,736,900
8	2012 4 Qtr	111.684	15,730,758	34	2019 2 Qtr	130.197	19,808,016
9	2013 1 Qtr	112.507	16,392,067	35	2019 3 Qtr	130.666	19,879,388
10	2013 2 Qtr	113.938	16,600,485	36	2019 4 Qtr	131.137	19,951,017
11	2013 3 Qtr	114.280	16,650,308	37	2020 1 Qtr	131.450	20,162,441
12	2013 4 Qtr	115.742	16,863,280	38	2020 2 Qtr	131.745	20,207,588
13	2014 1 Qtr	116.270	16,997,858	39	2020 3 Qtr	132.040	20,252,835
14	2014 2 Qtr	116.796	17,074,672	40	2020 4 Qtr	132.335	20,298,184
15	2014 3 Qtr	117.324	17,151,833				
16	2014 4 Qtr	117.854	17,229,343				
17	2015 1 Qtr	118.508	17,478,033				
18	2015 2 Qtr	119.162	17,574,451				
19	2015 3 Qtr	119.819	17,671,401				
20	2015 4 Qtr	120.480	17,768,886				
21	2016 1 Qtr	121.374	18,339,174				
22	2016 2 Qtr	122.268	18,474,295				
23	2016 3 Qtr	123.169	18,610,411				
24	2016 4 Qtr	124.077	18,747,530				
25	2017 1 Qtr	124.729	19,093,731				
26	2017 2 Qtr	125.376	19,192,709				

1/ 1Q11 equals 100.0, all other quarters equal Quarterly Inflation Indexes for the Hybrid Index from Table B).

2/ (Quarterly expense from Table K, Page 18, for the applicable time period x Column (3) or Column (7) ÷ 1Q11.

TABLE L : IRR - Stand-Alone Costs and Revenues

Quarterly Revenue Requirements to Cover Total Stand-Alone Costs

Period	Quarter	Quarterly Capital Requirement Road Property	Quarterly Operating Expense	Annual Stand-Alone Requirement	Quarterly Stand-Alone Revenues	Annual Stand-Alone Revenues	Overpayments Or Shortfalls In Revenues	PV Difference	Cumulative PV Difference	PV Required Reduction In Revenues
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1	2011 1 Qtr	$37,559,795	$14,786,238		$25,373,825					
2	2011 2 Qtr	38,093,111	15,905,955		25,373,825					
3	2011 3 Qtr	37,782,852	16,308,158		25,373,825					
4	2011 4 Qtr	37,834,044	16,332,323	214,602,475	25,373,825	101,495,299	(113,107,176)	(107,424,590)	(107,424,590)	$0
5	2012 1 Qtr	38,180,598	15,388,582		25,493,231					
6	2012 2 Qtr	38,152,723	15,542,287		25,493,231					
7	2012 3 Qtr	38,402,357	15,550,949		25,493,231					
8	2012 4 Qtr	38,667,526	15,730,758	215,615,780	25,493,231	101,972,924	(113,642,856)	(97,360,496)	(204,785,087)	$0
9	2013 1 Qtr	39,173,559	16,392,067		27,681,616					
10	2013 2 Qtr	39,280,813	16,600,485		27,681,616					
11	2013 3 Qtr	39,442,993	16,650,308		27,681,616					
12	2013 4 Qtr	39,671,388	16,863,280	224,074,893	27,681,616	110,726,465	(113,348,428)	(87,595,790)	(292,380,877)	$0
13	2014 1 Qtr	39,877,536	16,997,858		28,352,575					
14	2014 2 Qtr	40,084,885	17,074,672		28,352,575					
15	2014 3 Qtr	40,293,443	17,151,833		28,352,575					
16	2014 4 Qtr	40,503,217	17,229,343	229,212,786	28,352,575	113,410,299	(115,802,488)	(80,725,867)	(373,106,743)	$0
17	2015 1 Qtr	40,782,219	17,478,033		29,289,143					
18	2015 2 Qtr	41,063,287	17,574,451		29,289,143					
19	2015 3 Qtr	41,346,437	17,671,401		29,289,143					
20	2015 4 Qtr	41,631,684	17,768,886	235,316,398	29,289,143	117,156,571	(118,159,828)	(74,300,505)	(447,407,248)	$0
21	2016 1 Qtr	41,924,620	18,339,174		30,410,676					
22	2016 2 Qtr	42,219,802	18,474,295		30,410,676					
23	2016 3 Qtr	42,517,245	18,610,411		30,410,676					
24	2016 4 Qtr	42,816,968	18,747,530	243,650,045	30,410,676	121,642,703	(122,007,343)	(69,204,603)	(516,611,851)	$0
25	2017 1 Qtr	43,113,899	19,093,731		31,682,559					
26	2017 2 Qtr	43,413,170	19,192,709		31,682,559					
27	2017 3 Qtr	43,714,799	19,292,200		31,682,559					
28	2017 4 Qtr	44,018,806	19,392,207	251,231,522	31,682,559	126,730,238	(124,501,284)	(63,701,540)	(580,313,392)	$0
29	2018 1 Qtr	44,305,954	19,314,577		31,704,227					
30	2018 2 Qtr	44,595,421	19,411,365		31,704,227					
31	2018 3 Qtr	44,887,227	19,508,637		31,704,227					
32	2018 4 Qtr	45,181,391	19,606,398	256,810,969	31,704,227	126,816,908	(129,994,061)	(59,996,610)	(640,310,002)	$0
33	2019 1 Qtr	45,485,478	19,736,900		32,363,396					
34	2019 2 Qtr	45,792,017	19,808,016		32,363,396					
35	2019 3 Qtr	46,101,029	19,879,388		32,363,396					
36	2019 4 Qtr	46,412,536	19,951,017	263,166,378	32,363,396	129,453,585	(133,712,793)	(55,667,697)	(695,977,698)	$0
37	2020 1 Qtr	46,692,937	20,162,441		33,189,201					
38	2020 2 Qtr	46,975,507	20,207,588		33,189,201					
39	2020 3 Qtr	47,260,262	20,252,835		33,189,201					
40	2020 4 Qtr	47,547,220	20,298,184	269,396,974	33,189,201	132,756,804	(136,640,170)	(51,313,989)	**(747,291,688)**	$0

Department of Water and Power the City of Los Angeles

October 29, 2010

Mr. Jeffrey W. Maier
AVP - Energy
Union Pacific Railroad Company
1400 Douglas Street
STOP 1260
Omaha, NE 68179-1260

Dear Mr. Maier:

Subject: Common Carrier Rate Request

In accordance with 49 U.S.C. § 11101 and 49 C.F.R. Part 1300, Intermountain Power Agency ("IPA") hereby requests that Union Pacific Railroad Company ("UP") either: (a) disclose the existing common carrier rates, charges, and service terms that will apply to the transportation described in Attachment A to this letter; or (b) establish and disclose reasonable common carrier rates, charges and service terms for application to said transportation. Please provide the requested information, in writing, to the undersigned as soon as possible and, in any event, in compliance with the above-referenced requirements. If you require clarification of any aspect of our request, please contact me in writing at your convenience.

Sincerely,

Nick C. Kezman
Operating Agent

Attachment

c: C. Michael Loftus
Slover & Loftus LLP
Lance C. Lee
John L. Aguilar

ATTACHMENT A

Commodity:	Coal classified as bituminous or sub-bituminous and transported under STCC 11, or Dried, Enhanced, or Beneficiated Coal transported under STCC 29-911-91
Origins/Interchange:	The following UP-served origins or points of interchange: (a) the Powder River Basin of WY; (b) Black Buttes, WY; (c) Colorado's North Fork Branch; (d) Levan, UT; (e) Skyline, UT; (f) Savage, UT; (g) Provo, UT.
Destination:	Intermountain Power Agency, Power Plant at Lynndyl, UT
Volume:	Trainload service with annual volumes generally consistent with historic levels moved via UP to Destination
Equipment Supply:	Shipper-supplied rail cars
Car Capacity:	Please provide separate rates from each origin/point of interchange: (i) for cars rated for 263,000 pounds gross weight on rail; and (ii) for cars rated for 286,000 pounds gross weight on rail. All cars shall be suitable for use at the loading and unloading facilities
Train Length:	104 car minimum
Unloading:	Six hours free time

REDACTED

From: Jeff W. Maier [mailto:JWMAIER@up.com]
Sent: Thursday, November 04, 2010 3:15 PM
To: Lee, Lance; Aguilar, John
Cc: Franklin D. Sams; Louise A. Rinn
Subject: Reply to Letter of October 29, 2010

Lance and John:

This will respond to the letter we received from your organization requesting the establishment of common carrier rates and other service terms from various mine origins or loadouts to your Power Plant at Lynndyl, Utah. Currently rail transportation contracts with you are in effect until the end of 2010 and they supply the applicable rates and terms. We will endeavor to provide common carrier rates and terms no later than December 1, 2010 unless IPA and UP are successful in establishing new rail contract rates and terms that would apply as a replacement for the expiring rail contract before then.

Please pass this information to those in your organization, including Mr. Kezman.

Thank you,

Jeff

Jeff Maier
Union Pacific Railroad
1400 Douglas St. STOP 1260
Omaha, NE 68179-1260
(402) 544-4502
(402) 203-5495 (cell)
e-mail: jwmaier@up.com

**

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Department of Water and Power the City of Los Angeles

ANTONIO R. VILLARAIGOSA
Mayor

Commission
LEE KANON ALPERT, *President*
THOMAS S. SAYLES, *Vice-President*
ERIC HOLOMAN
CHRISTINA E. NOONAN
JONATHAN PARFREY
BARBARA E. MOSCHOS, *Secretary*

AUSTIN BEUTNER
General Manager
RAMAN RAJ
Chief Operating Officer

November 8, 2010

Mr. Jeffrey W. Maier
AVP - Energy
Union Pacific Railroad Company
1400 Douglas Street
STOP 1260
Omaha, NE 68179-1260

Dear Mr. Maier:

Subject: Common Carrier Rate Request

We are in receipt of your email correspondence dated November 4, 2010 in which Union Pacific (UP) declines to provide common carrier rates in response to our October 29, 2010 request apparently on the grounds that Intermountain Power Agency (IPA) and UP have a contract that will remain in effect until the end of the year. UP proposes to delay its required responses until December 1, 2010.

UP's delay in responding to our request is contrary to the Surface Transportation Board's (STB) regulations and precedent, and will hamper IPA's ability to plan for post-2010 coal deliveries. We are currently within only a few weeks of the termination of our current contract and our discussions, to date, with UP regarding a replacement contract have not been productive. Consequently, there are no rates currently in existence that would govern the transportation of IPA's substantial coal volumes on or after January 1, 2011. Under these circumstances, IPA renews its request that UP provide the requested rates within ten business days after the date of our request (*i.e.*, by Friday, November 12, 2010). *See* 49 C.F.R. § 1300.3.

Given our significant need for these rates, IPA is prepared to seek the STB's assistance in resolving this matter should that become necessary.

Sincerely,

Nick C. Kezman
Operating Agent

c: C. Michael Loftus
Slover & Loftus LLP
Lance C. Lee
John L. Aguilar

REDACTED

From: Jeff W. Maier [mailto:JWMAIER@up.com]
Sent: Wednesday, November 10, 2010 6:42 PM
To: Raquel.Lopez@ladwp.com; Lee, Lance; Aguilar, John; Michael Loftus
Cc: Doug Glass; Franklin D. Sams; Louise A. Rinn
Subject: UP Reply

City of Los Angeles Department of Water and Power:

This letter responds to your letter of November 8, 2010, which claims that Union Pacific would be acting contrary to Surface Transportation (STB) rules if it does not provide Intermountain Power Agency (IPA) with certain requested common carrier rates by November 12, 2010. Union Pacific has complied, and will continue to comply, with STB rules.

STB rules provide in 49 C.F.R. § 1300.3 that a carrier must promptly establish and provide to the requester a common carrier rate and applicable service terms "in the absence of an existing rate for particular transportation." In our November 4, 2010 response to your correspondence dated October 29, 2010, Union Pacific explained that contract rates currently exist for the particular transportation about which you inquired and that those rates will continue to apply to IPA's traffic through December 31, 2010. We also advised that no common carrier rates currently exist for the transportation at issue, but that Union Pacific would endeavor to provide such rates by December 1-one month before they could possibly apply to any shipment by IPA.

Your letter insists that we establish common carrier rates by November 12, which would be some seven weeks before IPA could possibly use them, and you claim that any delay will somehow hamper IPA's ability to plan for post-2010 coal deliveries. However, IPA could not assume that any rates we might establish by November 12 would remain in place on or after January 1, 2011. Under STB rules, Union Pacific is permitted to change its common carrier rates and applicable service terms on 20 days notice. In other words, even if STB rules required Union Pacific to provide common carrier rates by November 12, we could still establish new rates after that date and put them into effect on January 1, 2011. Pressing Union Pacific to establish common carrier rates before we can complete our analysis of appropriate and lawful common carrier rate levels would defeat your asserted objective of obtaining reliable information about the rates we would actually change once IPA's current contract expires on December 31, 2010.

We believe that our commitment to provide IPA with common carrier rates by December 1 is consistent with STB rules and will give us sufficient time to satisfy ourselves that the rates we establish are lawful. If IPA concludes that the rates we establish exceed a maximum reasonable level, then IPA's obtaining the rates on December 1 rather than November 12 would not have a significant impact on IPA's planning process: IPA would still face the uncertainties involved in pursuing a rate case. However, if the additional time allows us to complete our analysis and provide rates that IPA concludes would withstand STB scrutiny, then both parties will have avoided unnecessary legal costs, and IPA will still have a month's time before any traffic would move under those rates.

In summary, Union Pacific believes that we are in compliance with both the letter and the spirit of STB rules regarding the establishment of common carrier rates. We will provide common carrier rates and terms for IPA's traffic no later than December 1, 2010.

Sincerely,

Jeff Maier
Union Pacific Railroad
1400 Douglas St. STOP 1260
Omaha, NE 68179-1260
(402) 544-4502
(402) 203-5495 (cell)
e-mail: jwmaier@up.com

Via E-mail
December 1, 2010

Mr. Nick C. Kezman
Operating Agent
Los Angeles Department of Water and Power
Box 51111
Los Angeles, CA 90051-5700

Dear Mr. Kezman:

This letter responds to your request that Union Pacific establish and disclose common carrier rates, charges and service terms that will apply to the transportation of coal to your Intermountain Power Agency, Generating Station at Lynndyl, UT.

Enclosed in the icon below are a draft copy of UP Tariff 4222 and Item 6200, which would apply to coal originated at Levan or Savage, Utah, or received in interchange from the Utah Railway at Provo for movement beyond to Lynndyl. Those are the origins that IPA has identified as originating coal in its previously provided forecast. The Rate Item will become effective January 1, 2011. Rates are subject to increase on 20 days' notice; the applicable fuel surcharge may change on the first day of each month depending on what happens to the price of fuel.

We are also quoting common carrier rates for those origins that were not included in your written forecast for 2011 coal originations but were included in your request for disclosure of rates, charges and terms:

Cars:	286 Capacity Cars	263 Capacity
Rate Quote(s):		
SPRB UP served Mines, WY, (train size 120 cars)	$25.05 NT	$25.72 NT
Black Buttes, WY, (train size 114 cars)	$15.85 NT	$16.17 NT
Colorado's North Fork Branch, (train size 104 cars)	$18.05 NT	$18.41 NT
Skyline, UT, (train size 104 cars)	$10.60 NT	$10.79 NT

Should you decide to ship from the above origins, please furnish your revised annual forecast by origin mine so that we can arrange for resources to handle the traffic. (To the extent that decision would reduce the volume you plan to take from Levan, Savage or via the Utah Railway, please advise of those adjustments.) These rates are subject to same terms, conditions, and fuel surcharge as those in UP Tariff 4222 and Item 6200. The rate(s) can be published promptly in Item 6200, and are subject to increase on 20 days' notice.

Jeff W. Maier
Assistant Vice President - Energy

UNION PACIFIC RAILROAD
1400 Douglas Street, Stop 1260, Omaha, Nebraska 68179-1260
ph. (402) 544-4502 fx. (402) 233-3039
jwmaier@up.com

Should you have any questions and/or require additional information, please do not hesitate to call me at (402) 544-4502 or Franklin Sams at (402) 544-4504.

Sincerely,

Jeff W. Maier
Assistant Vice President - Energy

UNION PACIFIC RAILROAD
1400 Douglas Street, Stop 1260, Omaha, Nebraska 68179-1260
ph. (402) 544-4502 fx. (402) 233-3039
jwmaier@up.com

UP TARIFF 4222

UNIT TRAIN COAL COMMON CARRIER TARIFF

Publication of rates, terms and conditions applying on:

Unit Coal Trains with movement from, to or via the

Union Pacific Railroad Company

Issued By:
G. A. NAVALKAR - MANAGER PRICING SERVICES

Union Pacific Railroad Company
1400 Douglas Street Omaha, NE 68179

UNION PACIFIC UP 4222	**Item:** 1 DEFINITION OF ITEM SYMBOLS

DEFINITION OF ITEM SYMBOLS

A or [a] = Add
C or [c] = Change
D or [d] = Decrease
I or [i] = Increase
X or [x] = Expire

UP 4222

Item: 5
GOVERNING RULES

GOVERNING RULES DOCUMENTS

This publication is governed, except as otherwise specifically provided herein, by the provisions of publications below as amended from time to time:

Bureau of Explosives	BOE 6000-series
Directory of Hazardous Materials Shipping Description	(Issued by RAILINC)
Official Railroad Station List	OPSL 6000-series
Official Railway Equipment Register	RER-series
Standard Transportation Commodity Code	STCC 6001-series
Uniform Freight Classification	UFC 6000-series
Union Pacific Railroad Company Accessorial Tariff	UP 6004-series
Union Pacific Railroad Governing Rules for Regulated Traffic	UP 6007-series
Union Pacific Railroad General Rules for Coal Trains	UP 6602-series; UP 6603-series; and UP 6605-series
Association of American Railroads "AAR Interchange Rules" Manual	(Issued by AAR)
Association of American Railroads "Open Top Loading Rules Manual"	(Issued by AAR)

UP 4222

Item: 11
REVISIONS/CANCELLATIONS

REVISIONS/CANCELLATIONS

Unless otherwise provided, as this Pricing Document (or items contained herein) is revised, current letter suffixes cancel prior suffixes. Letter suffixes will be used in alphabetical sequence starting with A. Example: Pricing Document 3000-A cancels 3000, 3000-B cancels 3000-A; item 100-A cancels Item 100, Item 100-B cancels Item 100-A.

UP 4222	Item: 100 GENERAL RULES AND DEFINITIONS

General Rules and Definitions

For purposes of applying this Tariff, the following will govern.

Commodity/Coal: Coal, a mineral substance whose Standard Transportation Commodity Code (STCC) as set forth in the Standard Transportation Commodity code tariff ICC STCC 6001-Series, begins with the two digits 11.

Origin(s): Coal mine origins as specified in individual Rate Items.

Destination(s): Rail station capable of receiving trainloads of Coal as specified in individual Rate Items.

Shipper: Party who is paying the freight charges under this Tariff. Shipper shall have the same meaning as Customer.

UP: Union Pacific Railroad Company

Railroad: UP and any other rail carrier that is a party to this Tariff for a joint rate to the specified Destination as listed in Items 1000-9999 of this Tariff.

Rates: Are in U.S. dollars and cents per net ton of 2,000 lbs. Rates apply only for Coal consumed at the station(s) noted in the Item Description of the Rate Item, unless otherwise provided. Railroad may adjust or cancel Rates subject to 20 days' notice for increases.

Rate Item: Schedule of Rates, charges, and terms applicable to particular Destination, as listed in Items 1000-9999 of this Tariff.

Diversions: Diversions may be permitted under certain circumstances, as provided in UP Circular 6602-series; 6603-series or 6605-series.

Request for Service: Transportation under this Tariff will take place on lines which are subject to intense use and operational limitations. In order to maximize the utilization of the rail lines and loading facilities for the benefit of all parties involved in transportation of Coal from Origins, UP must coordinate with the mine operators and Shippers. Shipper requesting transportation under this Tariff must provide a "Monthly Coal Tonnage Forecast" as provided in Item 250 of UP Circular 6602-series; 6603-series or 6605-series. That Item defines the monthly process for the submission of forecasts by both the receivers of coal and the producers who will load those tons for shipment via UP. This condition applies in addition to any specific notice requirements stated in this Tariff.

Shipper Owned or Leased Equipment: Railcars owned, leased or otherwise furnished by Shipper for transportation under this Tariff.

Railroad Owned or Leased Equipment: Railcars owned, leased or otherwise furnished by Railroad, subject to availability, for transportation under this Tariff.

Equipment: If Rate Item for Destination specifies Shipper Owned or Leased Equipment, Shipper will provide suitable equipment at no charge to Railroad. Railcars shall be compatible with the loading facility and the unloading facility.

All railcars used for transportation under this Tariff shall be open-top hopper or gondola railcars, and shall have a marked capacity sufficient to meet the Minimum Lading Weight per Railcar as specified in the Rate Item for

Continued on next page

Destination.

Loaded railcars shall not exceed the maximum gross-weight-on-rail ("GWOR") associated with the route of movement, but in no case greater than 286,000 lbs. In some corridors the GWOR will be less than 286,000 lbs, in which case Railroad will note in the applicable Rate Item the maximum weight capability on the route of movement.

Such railcars shall also meet or exceed the Association of American Railroads ("AAR") Interchange Rules, as amended from time to time, and shall have been inspected and approved by UP for safety in accordance with Federal Railroad Administration ("FRA") regulations, as amended from time to time. Railcars must also comply with Item 226 of UP 6602-series; 6603-series and 6605-series.

Transportation under this Tariff is subject to the provisions of the AAR Interchange Rules, including those rules governing railcar repair, maintenance, damage, or destruction, in a manner prescribed by the "Field Manual of Interchange Rules" and the "Office Manual of Interchange Rules" adopted by and currently in use by the AAR.

Maximum Volume: The maximum volume that Railroad will transport under each Rate Item is specified in the Rate Item.

Trainsets: UP reserves the right, in its sole judgement, to limit the number of trainsets that will be in service pursuant to each Rate Item in order to retain fluidity or to meet loading schedules, or if adding trainsets in active service would not materially increase delivered tonnage.

Annual Volume Estimate: For planning purposes, Shipper shall advise Railroad of its intent to ship under this Tariff as specified in Monthly Coal Tonnage Forecast. In addition, not later than July 1 each year, Shipper shall provide to Railroad an estimate of tons of Coal anticipated to be loaded in the next calendar year by month ("Annual Volume Estimate"). This information should include tons from each of its suppliers and origins as soon as it is known. The nominated tonnage must be ratable. A monthly nomination is ratable if it is no more than 10% greater or 10% less than one-twelfth of the annual total. If Shipper decides to begin shipments within any time-frame other than a full calendar year basis, then Shipper shall provide Railroad an Annual Volume Estimate for the remaining months of that calendar year, at least ninety calendar days prior to the first shipment, unless otherwise mutually agreed. The Annual Volume Estimate must be submitted electronically via UP's secured website (www.uprr.com/customers/energy Bulk Train Planner), and may be revised at any time prior to October 1 each year.

Service: Railroad shall use reasonable efforts to transport Coal based on the circumstances when the transportation occurs. Railroad shall not be responsible for delays due to weather, track maintenance or construction, equipment failures, embargoes, Acts of God, labor activities, including strikes, denial of or limitation of access to track controlled by any party other than Railroad, excessive demand, or events outside the control of the Railroad. Railroad intends to use reasonable efforts to deliver the Annual Volume Estimate and the Monthly Coal Tonnage Forecast furnished by Shipper but has no binding obligation to comply with these planning estimates.

In no event shall Railroad be liable for any service guarantee. Further, to the extent allowed by law, under no circumstances will Railroad be liable for any direct, indirect, actual or consequential damages or any other liability, or additional costs of any kind arising out of or caused by service interruptions, reductions, or excessive demand.

Freight Charges: Freight charges shall be calculated based on the greater of the actual lading weight of all Coal in a train as determined by weighing pursuant to the rules in UP Circular 6602-series; 6603-series or 6605-series, or the minimum tender per shipment weight, which is specified by Destination in the Rate Item. Rates shall be subject to the fuel surcharge as published in Item 695-series of Tariff UP 6007-series, unless otherwise specified in the Rate Item.

Payment: Railroad may invoice Shipper by means of mail or electronic transfer of documentation. Shipper shall pay the amount invoiced by means of mail or electronic transfer of funds within 15 calendar days after date of invoice. Late payment and other credit terms shall be in accordance with UP's credit terms as published in Rule 62 of UFC 6000-series. If Shipper fails to pay in accordance with the requirements or if, in UP's sole discretion, adverse credit conditions occur which could affect Shipper's ability to meet payment terms, UP may revoke credit privileges and institute any one or more of the Revocation of Credit and Other Remedies procedures outlined in UFC 6000-series.

Continued on next page

Notices: Notices to UP should be addressed to:

Attn: General Director- Logistics and Demand
Union Pacific Railroad
Marketing and Sales Energy Group
Stop 1260
1400 Douglas Street
Omaha, NE 68179
Fax (402) 501-0163

Other General Rules: Shipments made under this Tariff shall be subject to Circular UP 6602-series; 6603-series or 6605-series or their successors, which contain the General Loading Rules, Accessorial Charges and Fuel Surcharge for Coal Trains moving via UP, and related items.

Services or other matters not specifically addressed in this Tariff shall continue to be governed by and paid for in accordance with rules, regulations, statutory provisions and provisions of the applicable tariffs, rules circulars, publications or in other applicable rate and service terms established under 49 U.S.C. Section 11101 or 10702. Such rules, regulations and provisions, as amended from time to time, are herein incorporated by reference without being specifically listed. To the extent any such rules, regulations or provisions as they relate to the parties hereto are inconsistent with the terms of this Tariff, the terms of this Tariff shall govern. When reference is made in this Tariff to tariffs, circulars, items, notes, rules, etc., such references are continuous and include revisions and supplements to and successive issues of such tariffs, circulars,items,notes, rules, etc.

In the event of any conflict between the terms of this Tariff and the terms of the Rate Item, the provisions of the Rate Item shall govern.

UP 4222

Item: 6200
Itm Desc: UT, Lynndyl, IPA Generating Station

Unit Coal Trains from Origins in Utah
to IPA Generating Station, Lynndyl, UT

For billing purposes use the following rate authority: UP 4222-6200

STCC/GROUP	STCC	DESCRIPTION
11		Coal

Prices are subject to Fuel surcharges.

GENERAL RULE ITEM 6200
The Maximum Volume that Railroad will transport under this item is 6,500,000 Net Tons per calendar year.

Shipper shall provide its Annual Volume Estimate for 2011 to Railroad by December 31, 2010

Rates for trains interchanged to UP at Provo, Utah are contingent on utilization of UP locomotives and a new run-through power agreement between UTAH and UP.

GENERAL APPLICATION RULES FOR ITEM 6200

1. Applies in Customer/Shipper-owned or -leased equipment bearing private (non-railcarrier) reporting marks.
2. Mileage allowance payment on private equipment will not apply.
3. Free time to unload will be 6 hour(s).

APPLICATION AND RATES

COLUMN	RATE APPLICATION RULES
1.	Rates are in U.S. dollars Per Net Ton. Subject to a minimum lading weight of 100 tons per car. Applies if minimum tender per shipment is 91 Car(s) and maximum not greater than 104 Car(s). Price must be used in combination with other prices for the portion of the shipment prior to specified origin. Separate freight bills will be issued for each price used according to the provisions of Railway Accounting Rule 11, **AND** Applies when immediately prior movement was via rail on the UTAH.

	Col 1 Rate	Route Code/Group
STCC: 11 Coal **From:** UT, PROVO **To:** UT, LYNNDYL	7.27	UP

Continued on next page

APPLICATION AND RATES		
COLUMN	**RATE APPLICATION RULES**	
1.	Rates are in U.S. dollars Per Net Ton. Subject to a minimum lading weight of 115 tons per car. Applies if minimum tender per shipment is 91 Car(s) and maximum not greater than 104 Car(s). Price must be used in combination with other prices for the portion of the shipment prior to specified origin. Separate freight bills will be issued for each price used according to the provisions of Railway Accounting Rule 11, **AND** Applies when immediately prior movement was via rail on the UTAH.	

	Col 1 Rate	Route Code/Group
STCC: 11 Coal **From:** UT, PROVO **To:** UT, LYNNDYL	7.13	UP

APPLICATION AND RATES	
COLUMN	**RATE APPLICATION RULES**
1.	Rates are in U.S. dollars Per Net Ton. Subject to a minimum lading weight of 100 tons per car. Applies if minimum tender per shipment is 91 Car(s) and maximum not greater than 104 Car(s).

	Col 1 Rate	Route Code/Group
STCC: 11 Coal **From:** UT, SAVAGE **To:** UT, LYNNDYL	10.40	UP

APPLICATION AND RATES	
COLUMN	**RATE APPLICATION RULES**
1.	Rates are in U.S. dollars Per Net Ton. Subject to a minimum lading weight of 115 tons per car. Applies if minimum tender per shipment is 91 Car(s) and maximum not greater than 104 Car(s).

	Col 1 Rate	Route Code/Group
STCC: 11 Coal **From:** UT, SAVAGE **To:** UT, LYNNDYL	10.20	UP

APPLICATION AND RATES	
COLUMN	**RATE APPLICATION RULES**
1.	Rates are in U.S. dollars Per Net Ton. Subject to a minimum lading weight of 100 tons per car. Applies if minimum tender per shipment is 91 Car(s) and maximum not greater than 104 Car(s).

Continued on next page

	Col 1 Rate	Route Code/Group
STCC: 11 Coal From: UT, SHARP To: UT, LYNNDYL	3.49	UP

APPLICATION AND RATES	
COLUMN	**RATE APPLICATION RULES**
1.	Rates are in U.S. dollars Per Net Ton. Subject to a minimum lading weight of 115 tons per car. Applies if minimum tender per shipment is 91 Car(s) and maximum not greater than 104 Car(s).

	Col 1 Rate	Route Code/Group
STCC: 11 Coal From: UT, SHARP To: UT, LYNNDYL	3.37	UP

Union Pacific Railroad

Department of Water and Power the City of Los Angeles

December 10, 2010

Mr. Jeffrey Maier
Assistant Vice President – Energy
Union Pacific Railroad Company
1400 Douglas Street, STOP 1260
Omaha, Nebraska 68179-1260

Dear Mr. Maier:

Subject: Union Pacific (UP) Tariff 4222 and Item 6200

In your December 1, 2010 letter to Intermountain Power Agency (IPA), you provided copies of UP Tariff 4222 and Item 6200, and you also provided rates for service from certain additional mines not referenced in Item 6200 (*i.e.*, "origins that were not included in [IPA's] written forecast for 2011 coal originations but were included in [IPA's] request for disclosure of rates").

You request that if IPA decides to ship from these origins, we should furnish our revised annual forecast by origin mine so that UP can arrange for resources to handle the traffic. You also state that the rates that you have provided for these additional origins "can be published promptly in Item 6200 . . . ."

IPA is able to advise you at this time that it intends to ship coal in 2011 from the Skyline Mine. Accordingly, please publish your rates for service from Skyline in Item 6200. We will try to determine this month whether we will be shipping coal in 2011 from the other origins listed in your letter, although it may not be possible to do so within this time frame. We will provide our Annual Volume Estimate for 2011 to UP by December 31, 2010, in accordance with your General Rule Item 6200.

Sincerely,

For

Nick C. Kezman
Coal Business Manager

c: C. Michael Loftus
Slover & Loftus
William W. Engels
Lance C. Lee
John L. Aguilar

REDACTED

From: Jeff W. Maier [mailto:JWMAIER@up.com]
Sent: Tuesday, December 14, 2010 9:48 AM
To: Lopez, Raquel
Cc: Michael Loftus; FDSAMS@up.com; Aguilar, John; Lee, Lance; Engels, William; Louise A. Rinn
Subject: Re: Union Pacific (UP) Tariff 4222 and Item 6200

Mr. Kezman:

Per your request in your letter dated December 10, please find enclosed in the icon below a copy of UP Tariff 4222 and an updated copy of Item 6200-A, which has been amended to include rates from the Skyline Mine:

(See attached file: UP 4222 Item 6200A Lynndyl.pdf)

Should you have any questions and/or require additional information, please do not hesitate to call me at (402) 544-4504 or Franklin Sams at (402) 544-4504.

Thank you.

Jeff Maier
Union Pacific Railroad
1400 Douglas St. STOP 1260
Omaha, NE 68179-1260
(402) 544-4502
(402) 203-5495 (cell)
e-mail: jwmaier@up.com

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UP TARIFF 4222

UNIT TRAIN COAL COMMON CARRIER TARIFF

Publication of rates, terms and conditions applying on:

Unit Coal Trains with movement from, to or via the

Union Pacific Railroad Company

Issued By:
G. A. NAVALKAR - MANAGER PRICING SERVICES

Union Pacific Railroad Company
1400 Douglas Street Omaha, NE 68179

UNION PACIFIC UP 4222	**Item:** 1 DEFINITION OF ITEM SYMBOLS

DEFINITION OF ITEM SYMBOLS

A or [a] = Add
C or [c] = Change
D or [d] = Decrease
I or [i] = Increase
X or [x] = Expire

UP 4222

Item: 5
GOVERNING RULES

GOVERNING RULES DOCUMENTS

This publication is governed, except as otherwise specifically provided herein, by the provisions of publications below as amended from time to time:

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Uniform Freight Classification	UFC 6000-series
Union Pacific Railroad Company Accessorial Tariff	UP 6004-series
Union Pacific Railroad Governing Rules for Regulated Traffic	UP 6007-series
Union Pacific Railroad General Rules for Coal Trains	UP 6602-series; UP 6603-series; and UP 6605-series
Association of American Railroads "AAR Interchange Rules" Manual	(Issued by AAR)
Association of American Railroads "Open Top Loading Rules Manual"	(Issued by AAR)

UNION PACIFIC	UP 4222	**Item:** 11 REVISIONS/CANCELLATIONS

REVISIONS/CANCELLATIONS

Unless otherwise provided, as this Pricing Document (or items contained herein) is revised, current letter suffixes cancel prior suffixes. Letter suffixes will be used in alphabetical sequence starting with A. Example: Pricing Document 3000-A cancels 3000, 3000-B cancels 3000-A; item 100-A cancels Item 100, Item 100-B cancels Item 100-A.

UP 4222

Item: 100
GENERAL RULES AND DEFINITIONS

General Rules and Definitions

For purposes of applying this Tariff, the following will govern.

Commodity/Coal: Coal, a mineral substance whose Standard Transportation Commodity Code (STCC) as set forth in the Standard Transportation Commodity code tariff ICC STCC 6001-Series, begins with the two digits 11.

Origin(s): Coal mine origins as specified in individual Rate Items.

Destination(s): Rail station capable of receiving trainloads of Coal as specified in individual Rate Items.

Shipper: Party who is paying the freight charges under this Tariff. Shipper shall have the same meaning as Customer.

UP: Union Pacific Railroad Company

Railroad: UP and any other rail carrier that is a party to this Tariff for a joint rate to the specified Destination as listed in Items 1000-9999 of this Tariff.

Rates: Are in U.S. dollars and cents per net ton of 2,000 lbs. Rates apply only for Coal consumed at the station(s) noted in the Item Description of the Rate Item, unless otherwise provided. Railroad may adjust or cancel Rates subject to 20 days' notice for increases.

Rate Item: Schedule of Rates, charges, and terms applicable to particular Destination, as listed in Items 1000-9999 of this Tariff.

Diversions: Diversions may be permitted under certain circumstances, as provided in UP Circular 6602-series; 6603-series or 6605-series.

Request for Service: Transportation under this Tariff will take place on lines which are subject to intense use and operational limitations. In order to maximize the utilization of the rail lines and loading facilities for the benefit of all parties involved in transportation of Coal from Origins, UP must coordinate with the mine operators and Shippers. Shipper requesting transportation under this Tariff must provide a "Monthly Coal Tonnage Forecast" as provided in Item 250 of UP Circular 6602-series; 6603-series or 6605-series. That Item defines the monthly process for the submission of forecasts by both the receivers of coal and the producers who will load those tons for shipment via UP. This condition applies in addition to any specific notice requirements stated in this Tariff.

Shipper Owned or Leased Equipment: Railcars owned, leased or otherwise furnished by Shipper for transportation under this Tariff.

Railroad Owned or Leased Equipment: Railcars owned, leased or otherwise furnished by Railroad, subject to availability, for transportation under this Tariff.

Equipment: If Rate Item for Destination specifies Shipper Owned or Leased Equipment, Shipper will provide suitable equipment at no charge to Railroad. Railcars shall be compatible with the loading facility and the unloading facility.

All railcars used for transportation under this Tariff shall be open-top hopper or gondola railcars, and shall have a marked capacity sufficient to meet the Minimum Lading Weight per Railcar as specified in the Rate Item for

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Destination.

Loaded railcars shall not exceed the maximum gross-weight-on-rail ("GWOR") associated with the route of movement, but in no case greater than 286,000 lbs. In some corridors the GWOR will be less than 286,000 lbs, in which case Railroad will note in the applicable Rate Item the maximum weight capability on the route of movement.

Such railcars shall also meet or exceed the Association of American Railroads ("AAR") Interchange Rules, as amended from time to time, and shall have been inspected and approved by UP for safety in accordance with Federal Railroad Administration ("FRA") regulations, as amended from time to time. Railcars must also comply with Item 226 of UP 6602-series; 6603-series and 6605-series.

Transportation under this Tariff is subject to the provisions of the AAR Interchange Rules, including those rules governing railcar repair, maintenance, damage, or destruction, in a manner prescribed by the "Field Manual of Interchange Rules" and the "Office Manual of Interchange Rules" adopted by and currently in use by the AAR.

Maximum Volume: The maximum volume that Railroad will transport under each Rate Item is specified in the Rate Item.

Trainsets: UP reserves the right, in its sole judgement, to limit the number of trainsets that will be in service pursuant to each Rate Item in order to retain fluidity or to meet loading schedules, or if adding trainsets in active service would not materially increase delivered tonnage.

Annual Volume Estimate: For planning purposes, Shipper shall advise Railroad of its intent to ship under this Tariff as specified in Monthly Coal Tonnage Forecast. In addition, not later than July 1 each year, Shipper shall provide to Railroad an estimate of tons of Coal anticipated to be loaded in the next calendar year by month ("Annual Volume Estimate"). This information should include tons from each of its suppliers and origins as soon as it is known. The nominated tonnage must be ratable. A monthly nomination is ratable if it is no more than 10% greater or 10% less than one-twelfth of the annual total. If Shipper decides to begin shipments within any time-frame other than a full calendar year basis, then Shipper shall provide Railroad an Annual Volume Estimate for the remaining months of that calendar year, at least ninety calendar days prior to the first shipment, unless otherwise mutually agreed. The Annual Volume Estimate must be submitted electronically via UP's secured website (www.uprr.com/customers/energy Bulk Train Planner), and may be revised at any time prior to October 1 each year.

Service: Railroad shall use reasonable efforts to transport Coal based on the circumstances when the transportation occurs. Railroad shall not be responsible for delays due to weather, track maintenance or construction, equipment failures, embargoes, Acts of God, labor activities, including strikes, denial of or limitation of access to track controlled by any party other than Railroad, excessive demand, or events outside the control of the Railroad. Railroad intends to use reasonable efforts to deliver the Annual Volume Estimate and the Monthly Coal Tonnage Forecast furnished by Shipper but has no binding obligation to comply with these planning estimates.

In no event shall Railroad be liable for any service guarantee. Further, to the extent allowed by law, under no circumstances will Railroad be liable for any direct, indirect, actual or consequential damages or any other liability, or additional costs of any kind arising out of or caused by service interruptions, reductions, or excessive demand.

Freight Charges: Freight charges shall be calculated based on the greater of the actual lading weight of all Coal in a train as determined by weighing pursuant to the rules in UP Circular 6602-series; 6603-series or 6605-series, or the minimum tender per shipment weight, which is specified by Destination in the Rate Item. Rates shall be subject to the fuel surcharge as published in Item 695-series of Tariff UP 6007-series, unless otherwise specified in the Rate Item.

Payment: Railroad may invoice Shipper by means of mail or electronic transfer of documentation. Shipper shall pay the amount invoiced by means of mail or electronic transfer of funds within 15 calendar days after date of invoice. Late payment and other credit terms shall be in accordance with UP's credit terms as published in Rule 62 of UFC 6000-series. If Shipper fails to pay in accordance with the requirements or if, in UP's sole discretion, adverse credit conditions occur which could affect Shipper's ability to meet payment terms, UP may revoke credit privileges and institute any one or more of the Revocation of Credit and Other Remedies procedures outlined in UFC 6000-series.

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Notices: Notices to UP should be addressed to:

Attn: General Director- Logistics and Demand
Union Pacific Railroad
Marketing and Sales Energy Group
Stop 1260
1400 Douglas Street
Omaha, NE 68179
Fax (402) 501-0163

Other General Rules: Shipments made under this Tariff shall be subject to Circular UP 6602-series; 6603-series or 6605-series or their successors, which contain the General Loading Rules, Accessorial Charges and Fuel Surcharge for Coal Trains moving via UP, and related items.

Services or other matters not specifically addressed in this Tariff shall continue to be governed by and paid for in accordance with rules, regulations, statutory provisions and provisions of the applicable tariffs, rules circulars, publications or in other applicable rate and service terms established under 49 U.S.C. Section 11101 or 10702. Such rules, regulations and provisions, as amended from time to time, are herein incorporated by reference without being specifically listed. To the extent any such rules, regulations or provisions as they relate to the parties hereto are inconsistent with the terms of this Tariff, the terms of this Tariff shall govern. When reference is made in this Tariff to tariffs, circulars, items, notes, rules, etc., such references are continuous and include revisions and supplements to and successive issues of such tariffs, circulars,items,notes, rules, etc.

In the event of any conflict between the terms of this Tariff and the terms of the Rate Item, the provisions of the Rate Item shall govern.

UNION PACIFIC	UP 4222	**Item:** 6200-A **Itm Desc:** UT, Lynndyl, IPA Generating Station

Unit Coal Trains from Origins in Utah
to IPA Generating Station, Lynndyl, UT

For billing purposes use the following rate authority: UP 4222-6200-A

STCC/GROUP	STCC	DESCRIPTION
11		Coal

Prices are subject to Fuel surcharges.

GENERAL RULE ITEM 6200
The Maximum Volume that Railroad will transport under this item is 6,500,000 Net Tons per calendar year.

Shipper shall provide its Annual Volume Estimate for 2011 to Railroad by December 31, 2010

Rates for trains interchanged to UP at Provo, Utah are contingent on utilization of UP locomotives and a new run-through power agreement between UTAH and UP.

GENERAL APPLICATION RULES FOR ITEM 6200-A

1. Applies in Customer/Shipper-owned or -leased equipment bearing private (non-railcarrier) reporting marks.
2. Mileage allowance payment on private equipment will not apply.
3. Free time to unload will be 6 hour(s).

APPLICATION AND RATES

COLUMN	RATE APPLICATION RULES
1.	Rates are in U.S. dollars Per Net Ton. Subject to a minimum lading weight of 100 tons per car. Applies if minimum tender per shipment is 91 Car(s) and maximum not greater than 104 Car(s). Price must be used in combination with other prices for the portion of the shipment prior to specified origin Separate freight bills will be issued for each price used according to the provisions of Railway Accounting Rule 11, **AND** Applies when immediately prior movement was via rail on the UTAH.

	Col 1 Rate	Route Code/Group
STCC: 11 Coal		
From: UT, PROVO		
To: UT, LYNNDYL	7.27	UP

Continued on next page

APPLICATION AND RATES	
COLUMN	RATE APPLICATION RULES
1.	Rates are in U.S. dollars Per Net Ton. Subject to a minimum lading weight of 115 tons per car. Applies if minimum tender per shipment is 91 Car(s) and maximum not greater than 104 Car(s). Price must be used in combination with other prices for the portion of the shipment prior to specified origin. Separate freight bills will be issued for each price used according to the provisions of Railway Accounting Rule 11, **AND** Applies when immediately prior movement was via rail on the UTAH.

	Col I Rate	Route Code/Group
STCC: 11 Coal		
From: UT, PROVO		
To: UT, LYNNDYL	7.13	UP

APPLICATION AND RATES	
COLUMN	RATE APPLICATION RULES
1.	Rates are in U.S. dollars Per Net Ton. Subject to a minimum lading weight of 100 tons per car. Applies if minimum tender per shipment is 91 Car(s) and maximum not greater than 104 Car(s).

	Col I Rate	Route Code/Group
STCC: 11 Coal		
From: UT, SAVAGE		
To: UT, LYNNDYL	10.40	UP

APPLICATION AND RATES	
COLUMN	RATE APPLICATION RULES
1.	Rates are in U.S. dollars Per Net Ton. Subject to a minimum lading weight of 115 tons per car. Applies if minimum tender per shipment is 91 Car(s) and maximum not greater than 104 Car(s).

	Col I Rate	Route Code/Group
STCC: 11 Coal		
From: UT, SAVAGE		
To: UT, LYNNDYL	10.20	UP

APPLICATION AND RATES	
COLUMN	RATE APPLICATION RULES
1.	Rates are in U.S. dollars Per Net Ton. Subject to a minimum lading weight of 100 tons per car. Applies if minimum tender per shipment is 91 Car(s) and maximum not greater than 104 Car(s).

Continued on next page

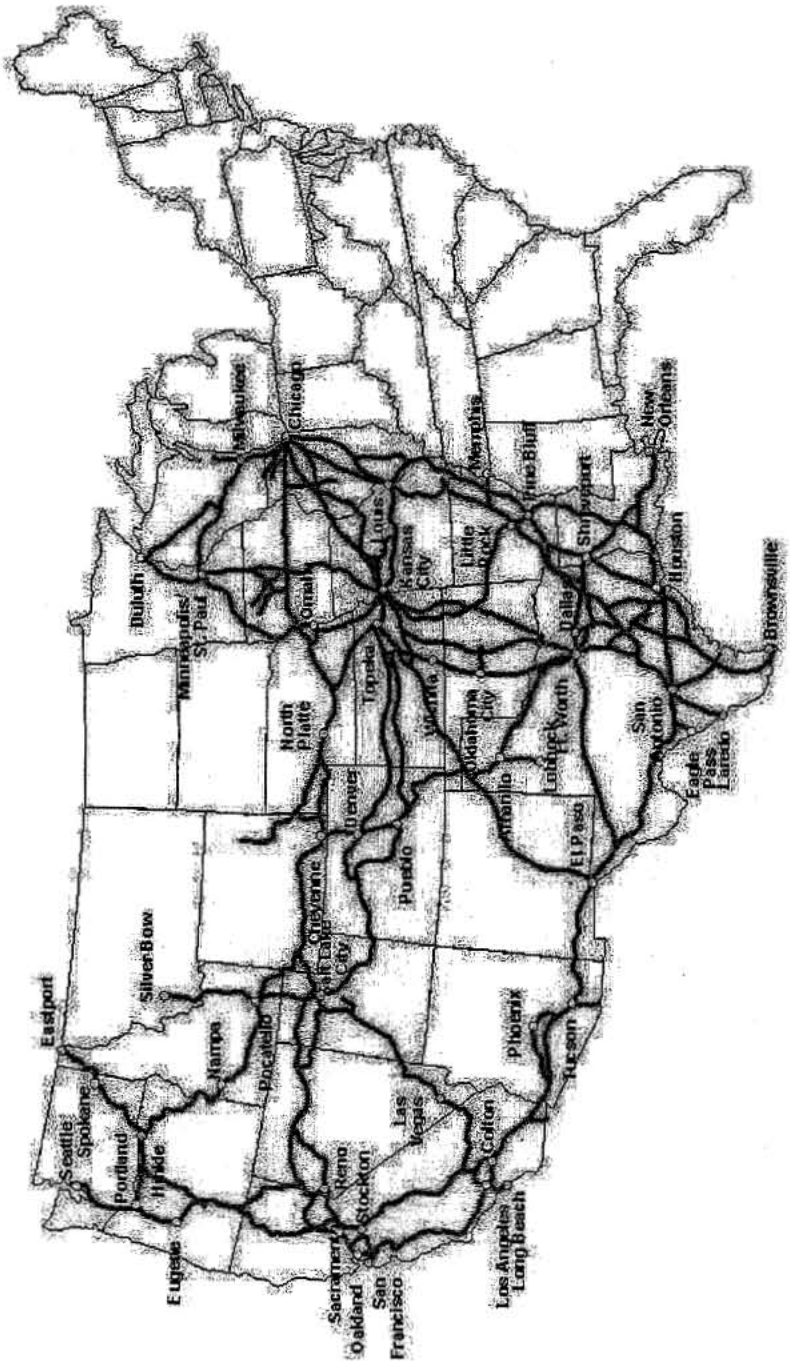
	Col 1 Rate	Route Code/Group
STCC: 11 Coal		
From: UT, SHARP		
To: UT, LYNNDYL	3.49	UP
From: UT, SKYLINE		
To: UT, LYNNDYL	10.79	UP

APPLICATION AND RATES

COLUMN	RATE APPLICATION RULES
1.	Rates are in U.S. dollars Per Net Ton. Subject to a minimum lading weight of 115 tons per car. Applies if minimum tender per shipment is 91 Car(s) and maximum not greater than 104 Car(s).

	Col 1 Rate	Route Code/Group
STCC: 11 Coal		
From: UT, SHARP		
To: UT, LYNNDYL	3.37	UP
From: UT, SKYLINE		
To: UT, LYNNDYL	10.60	UP

Union Pacific Railroad



BEFORE THE
SURFACE TRANSPORTATION BOARD

INTERMOUNTAIN POWER AGENCY Complainant, v. UNION PACIFIC RAILROAD COMPANY, Defendant.	Docket No. 42127

UNION PACIFIC'S FIRST SET OF DISCOVERY REQUESTS

Defendant Union Pacific Railroad Company ("UP") hereby requests pursuant to 49 C.F.R. §§ 1114.26 and 1114.30 that complainant Intermountain Power Agency ("IPA") respond to the following document requests and interrogatories (collectively, "requests"), in accordance with the definitions and instructions set forth below, within thirty (30) days of the date of these requests.

Responses should be delivered to Michael L. Rosenthal at Covington & Burling LLP, 1201 Pennsylvania Ave., N.W., Washington, D.C. 20004.

DEFINITIONS AND INSTRUCTIONS

A. "Complainant" or "IPA" or "your" or "you" means Intermountain Power Agency, including its officers, directors, agents, employees, and representatives, including but not limited to the Los Angeles Department of Water and Power and the Intermountain Power Service Corporation, and any predecessor corporation, past or present subsidiary or affiliated corporation, and the officers, directors, agents, employees, and representatives of any such predecessor, subsidiary, or affiliate.

(b) shipments from Utah mines, Wyoming mines, and Colorado mines to Destination;

(c) electric generating output for each of the generating units at Destination.

Interrogatory No. 7: For each projection, forecast, or estimate produced in response to a Document Request, identify and describe in detail the methodology used to develop or prepare it, including, but not limited to, the assumptions and sources of information used.

Interrogatory No. 8: Identify each local, state, or federal proceeding since January 1, 2007 in which IPA has been a party regarding procurement or transportation of coal to one of its electric generating facilities or regarding electric power generation at one of those facilities.

Interrogatory No. 9: Explain IPA's current policies and procedures for determining whether and to what extent to generate or purchase electricity for use by its customers.

Interrogatory No. 10: Explain IPA's current process for fuel supply planning.

Interrogatory No. 11: Explain IPA's current planning process for making coal transportation arrangements.

Interrogatory No. 12: Identify and describe the harm that IPA suffered UP as a result of the conduct that IPA alleges constituted an unreasonable practice by UP.

Respectfully submitted,

J. Michael Hemmer
Louise A. Rinn
Union Pacific Railroad Company
1400 Douglas Street
Omaha, NE 68719

Michael L. Rosenthal
Covington & Burling LLP
1201 Pennsylvania Ave., N.W.
Washington, D.C. 20004
(202) 662-6000

Counsel for Union Pacific Railroad Company

January 11, 2011

BEFORE THE
SURFACE TRANSPORTATION BOARD

INTERMOUNTAIN POWER AGENCY	)	
Complainant,	)	
v.	)	Docket No. 42127
UNION PACIFIC RAILROAD COMPANY,	)	
Defendant.	)	

COMPLAINANT'S RESPONSES AND OBJECTIONS
TO DEFENDANT'S FIRST SET OF DISCOVERY REQUESTS

Complainant Intermountain Power Agency ("IPA"), pursuant to 49 C.F.R. Part 1114, hereby responds to the First Set of Discovery Requests served on January 11, 2011 by Defendant Union Pacific Railroad Company ("UP").

GENERAL OBJECTIONS

In addition to the specific objections raised below in response to individual Document Requests and/or Interrogatories, IPA generally objects to UP's Document Requests and/or Interrogatories as follows:

1. Product and/or Geographic Competition. IPA objects to the Document Requests and/or Interrogatories on grounds of relevance, burden and overbreadth to the extent that they seek documents that are relevant solely or principally to the subject of indirect competition (*i.e.*, product and/or geographic competition) for UP's service to the IPA's Intermountain Generating Station located at Lynndal, Utah

Response:

IPA objects to this Interrogatory as vague. Subject to and without waiving the foregoing objection, IPA will produce non-privileged, responsive documents sufficient to show the policies or procedures used by IPA when seeking or evaluating bids for the transportation of coal to the Destination, to the extent that such documents exist and are reasonably available.

Interrogatory No. 12: Identify and describe the harm that IPA suffered UP as a result of the conduct that IPA alleges constituted an unreasonable practice by UP.

Response:

IPA objects to this Interrogatory as irrelevant. A complainant need not show a specific harm in order to allege an unreasonable practice claim. IPA further objects to this Interrogatory as premature.

INTERMOUNTAIN POWER AGENCY

By: C. Michael Loftus
Christopher A. Mills
Andrew B. Kolesar III
Daniel M. Jaffe
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Attorneys for Complainant

OF COUNSEL:

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1224 Seventeenth Street, N.W.
Washington, D.C. 20036
(202) 347-7170
Dated: February 10, 2011

BEFORE THE
SURFACE TRANSPORTATION BOARD

INTERMOUNTAIN POWER AGENCY Complainant, v. UNION PACIFIC RAILROAD COMPANY, Defendant.	)	Docket No. 42127

UNION PACIFIC'S FIRST SET OF DISCOVERY REQUESTS

Defendant Union Pacific Railroad Company ("UP") hereby requests pursuant to 49 C.F.R. §§ 1114.26 and 1114.30 that complainant Intermountain Power Agency ("IPA") respond to the following document requests and interrogatories (collectively, "requests"), in accordance with the definitions and instructions set forth below, within thirty (30) days of the date of these requests.

Responses should be delivered to Michael L. Rosenthal at Covington & Burling LLP, 1201 Pennsylvania Ave., N.W., Washington, D.C. 20004.

DEFINITIONS AND INSTRUCTIONS

A. "Complainant" or "IPA" or "your" or "you" means Intermountain Power Agency, including its officers, directors, agents, employees, and representatives, including but not limited to the Los Angeles Department of Water and Power and the Intermountain Power Service Corporation, and any predecessor corporation, past or present subsidiary or affiliated corporation, and the officers, directors, agents, employees, and representatives of any such predecessor, subsidiary, or affiliate.

documents that show the planned and actual time, duration, and cause of each plant outage, curtailment, or interruption.

Document Request No. 49: Documents, regardless of date, sufficient to describe, identify, or depict the current form of organization and governance structure of IPA, including member-owner cooperatives, divisions, units, departments, committees, boards, and working groups.

Document Request No. 50: All quarterly and annual financial statements and annual reports, including attachments and exhibits.

Document Request No. 51: All reports provided to IPA's stakeholders or member entities.

Document Request No. 52: All your RUS Form 12 reports, EIA Form 759, 860, and 861 reports, FERC Form 423 and 580 reports, and responses to FERC queries under Docket No. IN79-6, including all attachments and exhibits.

Document Request No. 53: All correspondence, reports, comments, or other documents submitted to any federal, state or local public or governmental entity related to the transportation of coal to IPA, the cost of such transportation, or plans for future coal transportation.

Document Request No. 54: Each Integrated Resource Plan or similar report or study prepared by, for or about IPA, including supporting materials.

Document Request No. 55: All documents related to any harm suffered by IPA as a result of the conduct that IPA alleges constituted an unreasonable practice by UP.

Document Request No. 56: All documents, regardless of date, relied upon or referenced in your responses to the interrogatories that appear below.

BEFORE THE
SURFACE TRANSPORTATION BOARD

INTERMOUNTAIN POWER AGENCY	)	
Complainant,	)	
v.	)	Docket No. 42127
UNION PACIFIC RAILROAD COMPANY,	)	
Defendant.	)	

COMPLAINANT'S RESPONSES AND OBJECTIONS
TO DEFENDANT'S FIRST SET OF DISCOVERY REQUESTS

Complainant Intermountain Power Agency ("IPA"), pursuant to 49 C.F.R. Part 1114, hereby responds to the First Set of Discovery Requests served on January 11, 2011 by Defendant Union Pacific Railroad Company ("UP").

GENERAL OBJECTIONS

In addition to the specific objections raised below in response to individual Document Requests and/or Interrogatories, IPA generally objects to UP's Document Requests and/or Interrogatories as follows:

1. Product and/or Geographic Competition. IPA objects to the Document Requests and/or Interrogatories on grounds of relevance, burden and overbreadth to the extent that they seek documents that are relevant solely or principally to the subject of indirect competition (*i.e.*, product and/or geographic competition) for UP's service to the IPA's Intermountain Generating Station located at Lynndal, Utah

1. IPA further objects to the production of the documents sought to the extent that such documents are publicly available. *See* General Objection No. 7. Subject to and without waiving the foregoing objections, IPA will produce non-privileged, responsive documents, to the extent that such documents exist and are reasonably available.

Document Request No. 53: All correspondence, reports, comments, or other documents submitted to any federal, state or local public or governmental entity related to the transportation of coal to IPA, the cost of such transportation, or plans for future coal transportation.

Response:

IPA objects to the production of the documents sought to the extent that such documents are publicly available. *See* General Objection No. 7. Subject to and without waiving the foregoing objections, IPA will produce non-privileged, responsive documents, to the extent that such documents exist and are reasonably available.

Document Request No. 54: Each Integrated Resource Plan or similar report or study prepared by, for or about IPA, including supporting materials.

Response:

IPA objects to this request to the extent it seeks information with only indirect relevance (if any) to an issue in dispute in this case. *See* General Objection No. 1. IPA further objects to the production of the documents sought to the extent that such documents are publicly available. *See* General Objection No. 7. IPA further states that there are no documents responsive to this Request.

Document Request No. 55: All documents related to any harm suffered by IPA as a result of the conduct that IPA alleges constituted an unreasonable practice by UP.

<u>Response</u>:

IPA objects to this request as irrelevant. A complainant need not show a specific harm in order to allege an unreasonable practice claim. IPA further objects to this Request as premature.

Document Request No. 56: All documents, regardless of date, relied upon or referenced in your responses to the interrogatories that appear below.

<u>Response</u>:

IPA objects to the Request on the ground that it exceeds the scope of IPA's obligations under the Board's Rules of Practice as they are applied in proceedings under the *Coal Rate Guidelines.*

<u>INTERROGATORIES</u>

Interrogatory No. 1: Identify any electric generating facility other than Destination that you own or operate, or in which you have any ownership interest or operating or management responsibility, and identify the percentage of ownership interest.

<u>Response</u>:

IPA objects to this Interrogatory on the ground of relevance. Without waiving the foregoing objection, IPA states that it does not operate, manage or have an ownership interest in any electric generating facility other than Destination.

Interrogatory No. 2: Identify all persons other than railroad employees who have provided any service related to the transportation of coal for use at Destination, including fueling and inspection of trains, switching, handling, loading, unloading, or storage of rail cars, and maintenance, inspection, and repair of rail cars, describe the service provided, when that service was provided, and, if the person is affiliated with IPA, the nature of that affiliation.

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March 11, 2011

VIA E-MAIL

Michael L. Rosenthal, Esq.
Covington & Burling
1201 Pennsylvania Avenue, N.W.
Washington, D.C. 20004

Re: Docket No. 42127, *Intermountain Power Agency v. Union Pacific Railroad Company*

Dear Mike:

In our recent discovery conference call, UP requested that we investigate whether or not IPA has any documents that are responsive to UP's Document Request No. 55. We have determined that no responsive documents exist.

During the same call, UP requested that IPA produce its contract with the Utah Railway, as well as non-routine correspondence between IPA and the Utah Railway and between IPA and its Price-area coal suppliers concerning Provo-related interchange costs and operational issues. IPA will produce the Utah Railway contract once the proper disclosure notice has been served on the railroad. As for the other correspondence, we have determined that no responsive documents exist.

Please contact us if you have any questions.

Sincerely,

Daniel M. Jaffe