STB DOCKET NO. 42056

TEXAS MUNICIPAL POWER AGENCY
v.
THE BURLINGTON NORTHERN AND SANTA FE RAILWAY COMPANY

Decided March 21, 2003

The Board finds that the defendant railroad has market dominance over the transportation at issue and that the challenged rate is unreasonably high. A maximum reasonable rate is prescribed and reparations are ordered.

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ACRONYMS USED

AAR	Association of American Railroads
AFE	Authority for Expenditure
AREA	American Railway Engineering Association
AREMA	American Railway Engineering and Maintenance-of-Way Association
BNSF	The Burlington Northern and Santa Fe Railway Company
CMP	constrained market pricing
CTC	centralized traffic control
CWR	continuous welded rail
CY	cubic yard
DCF	discounted cash flow
DP	distributed power
e-W.P.	electronic workpaper
EIA	Energy Information Administration, Department of Energy

EMD	General Motors' Electro-Motive Division
ENR	Engineering News Record
EOTD	end-of-train device
Exh.	exhibit
FADB	Fixed Asset Data Base
FED	failed equipment detector
FRA	Federal Railroad Administration
G&A	general and administrative
GCRR	Gibbons Creek Railroad
GTM	gross ton-mile
ICC	Interstate Commerce Commission
I&I	inter/intratrain
L&D	loss and damage
LUM	locomotive unit-mile
MGT	million gross tons
MGTM	million gross ton-miles
MMBP	modified mileage block prorate
MOW	maintenance-of-way
MP	milepost
Narr.	Narrative
O/D	origin/destination
Open.	opening evidence
PPI	producer price index
PRB	Powder River Basin
R-1	Annual Report Form R-1
RAILS	Railway Analysis and Interactive Line Simulator
RCAF-A	rail cost adjustment factor, adjusted for changes in productivity
RCAF-U	rail cost adjustment factor, unadjusted for changes in productivity
Reb.	rebuttal evidence
ROI	return on investment
ROW	right-of-way
RRB	retirement, replacement and betterment
R/VC	revenue-to-variable cost
SAC	stand-alone cost
SARR	stand-alone railroad
SF	square feet
SFGT	speed factored gross ton

STB	Surface Transportation Board
T&E	train and engine crew
TMPA	Texas Municipal Power Agency
UP	Union Pacific Railroad Company
URCS	Uniform Railroad Costing System
USDA	United States Department of Agriculture
USOA	Uniform System of Accounts
V.S.	verified statement
W.P.	workpaper
WSAC	weighted system average cost
WYDOT	Wyoming Department of Transportation

BY THE BOARD:

By complaint filed October 19, 2001, Texas Municipal Power Agency (TMPA)[1] challenges, under 49 U.S.C. 10701(d)(1), the reasonableness of a common carriage rate[2] charged by The Burlington Northern and Santa Fe Railway Company (BNSF) for the transportation of coal in unit trains from certain mine origins in Wyoming's Powder River Basin (PRB)[3] to TMPA's Gibbons Creek Steam Electric Station at Iola, near Carlos, TX. TMPA asks us to prescribe the maximum rate for coal shipments to Gibbons Creek and to award reparations for amounts collected by BNSF for this transportation since April 1, 2001,[4] that exceed those allowable under the rate level that we prescribe, together with interest.

I. PRELIMINARY MATTER

The challenged rate applies only to movements in BNSF-supplied rail cars. In its complaint, TMPA also asks us to find that BNSF's refusal to establish a common carrier rate for transportation in rail cars supplied by TMPA or a third party at no cost to BNSF is an unreasonable practice under 49 U.S.C. 10702 and to prescribe a rate for coal shipments in TMPA-supplied rail cars. However,

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[1] TMPA is a municipal agency created in 1975 by the State of Texas to provide electric power to the Texas cities of Bryan, Denton, Garland, and Greenville.

[2] The challenged rate is contained in Common Carrier Pricing Authority BNSF-90042.

[3] The mines named in the complaint are Caballo Rojo, Cordero, Antelope, and Jacobs Ranch.

[4] Prior to April 2001, this traffic was governed by a rail transportation contract under 49 U.S.C. 10709.

railroads have the right to use their own cars in preference to privately owned cars. *Atchison, Topeka & Santa Fe Ry. v. United States*, 232 U.S. 199, 214 (1914) ("Whatever transportation service or facility the law requires the carrier to supply they have the right to furnish. They can therefore use their own cars, and cannot be compelled to accept those tendered by the shipper on the condition that a lower freight rate be charged."). *Accord Shippers Committee, OT-5 v. Ann Arbor R.R.*, 5 I.C.C.2d 856 (1989), *aff'd sub nom. Shippers Committee, OT-5 v. ICC*, 968 F.2d 75 (D.C. Cir. 1992). Thus, so long as BNSF is capable of meeting its common carrier obligations using its own rail cars (and there has been no showing to the contrary here), it is under no obligation to provide rates for transportation in privately owned cars. Until such time as there is an indication that shipper-owned cars will be needed to move TMPA's traffic, BNSF need not establish a rate for such service. *Burlington N.R.R. v. STB*, 75 F.3d 685 (D.C. Cir. 1996).

II. MARKET DOMINANCE INQUIRY

We are authorized to consider the reasonableness of a challenged rate only if the carrier has market dominance over the traffic involved. 49 U.S.C. 10701(d)(1), 10707(b). Market dominance is "an absence of effective competition from other carriers or modes of transportation for the transportation to which a rate applies." 49 U.S.C. 10707(a). The statute precludes a finding of market dominance, however, where the carrier shows that the revenues produced by the movements at issue are less than 180% of the carrier's variable costs for providing the service.[5] 49 U.S.C. 10707(d)(1)(A). We first address this quantitative threshold, then proceed to examine whether there are any effective transportation alternatives for this traffic (a qualitative market dominance analysis).

A. Quantitative Threshold

Because no shipments moved from either the Antelope or Jacobs Ranch mines under the challenged rate before the record was developed in this case, there is not sufficient data available to determine the variable costs for movements from these two origins. If TMPA should originate coal from either the Antelope or Jacobs Ranch mine in the future, the parties should use the

[5] Variable costs are those railroad costs that vary with the level of output.

procedures and findings in Appendix A to calculate the variable costs associated with serving these mines so as to determine whether that service is subject to our rate regulation and our rate prescription.

For the Cordero and Caballo Rojo mines, from which traffic currently moves, the variable cost evidence associated with serving them was developed for the 2nd, 3rd, and 4th Quarters of 2001.[6] The parties' variable costs and revenue-to-variable cost (R/VC) presentations, as well as our findings relative to this evidence, are summarized in Appendix A. To estimate the total variable costs incurred by BNSF in providing transportation service to TMPA during those quarters from each mine, we first sum the system-average variable costs produced by our Uniform Railroad Costing System (URCS)[7] for each of the various cost categories. We then evaluate whether adjustments to the system-average cost figures that are proposed by the parties would better reflect the particular costs of serving the TMPA traffic. Where the proponent of an adjustment demonstrates the appropriateness of the adjustment, we substitute that evidence for the corresponding URCS figure. Our findings regarding the adjustments proposed by the parties are discussed in detail in Appendix A.[8] Based on the record before us, we find that the challenged rate produces revenues that exceed 180% of the variable costs of providing service from both the Cordero and Caballo Rojo mines.

B. Qualitative Analysis

It is undisputed that there is currently no other feasible means of transporting coal from the PRB to the Gibbons Creek power plant. BNSF asserts, however, that potential intramodal competition effectively constrains its rate because

[6] BNSF concedes that in the 4th Quarter of 2001, revenues associated with the Cordero and Caballo Rojo mines exceeded 180% of the variable cost incurred to serve this traffic.

[7] URCS is our general purpose costing model that is used to determine, for each Class I railroad, what portion of each category of costs shown in its Annual Report to the Board (STB Form R-1) constitutes its system-average variable unit cost for that cost category for that year. Under 49 U.S.C. 10707(d)(1)(B), a carrier's variable costs are to be determined using URCS, but we may allow adjustments to the URCS costs where we find them to be appropriate.

[8] In prior rate complaint cases, an adjustment to the system-average maintenance-of-way variable cost has been proposed by both the defendant railroad and the complaining shipper. In those cases, we used the variable cost developed by the so-called "speed factored gross ton" (SFGT) model as a substitute for the system-average figure developed by URCS. However, as discussed in Appendix A, BNSF has persuaded us in this case that the SFGT model is so outdated as to no longer be reliable for developing the variable maintenance-of-way expense. Therefore, we use the URCS system-average figure for this variable cost category.

TMPA could construct a 13.5-mile spur track to connect its power plant to a line of the Union Pacific Railroad Company (UP). BNSF contends that similar build-outs have provided competition for other utilities and that this build-out would be practical financially. TMPA acknowledges that it has studied this build-out option, but contends that this option has not proved to be practical or economically feasible.[9]

While we recognize that specific build-outs have provided effective competitive options for utilities in certain instances, we cannot conclude from this record that the potential for a build-out poses an effective competitive constraint for the issue traffic here. The feasibility study that was conducted for TMPA estimated that the cost of building the track to connect to UP would be at least $49 million.[10] A 20-year discounted cash flow (DCF) analysis using that figure shows that TMPA would need a savings of at least $3.21 per ton to cover the costs of the build-out.[11] The record shows that, on numerous occasions between 1996 and 1999, TMPA sought rate estimates or quotations from UP for transporting coal from the PRB to Gibbons Creek if such a connection were built. The record also shows that UP declined to discuss rates or negotiate with TMPA.[12] With no assurance of rate reductions sufficient to reduce its overall transportation cost, TMPA abandoned further consideration of the project. Under these circumstances, we cannot conclude that the build-out option is financially feasible or provides sufficient competitive pressure to effectively discipline BNSF's rate. Accordingly, we find that BNSF has market dominance over TMPA's traffic from the PRB to the Gibbons Creek plant.

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[9] BNSF asserts that the lower rates it proposed during contract negotiations reflect the prospect of a build-out, while TMPA attributes these lower rate offers to the prospect of TMPA seeking rate relief from us. TMPA points to the statement in BNSF's contract offer that "[t]his proposal is presented to TMPA as a confidential offer in settlement of our outstanding dispute over which TMPA has threatened litigation* * * *" BNSF Reply, Exh. II-B-4, BNSF letter dated September 22, 2000, page 1.

[10] TMPA Open. W.P. at 4078-94. The feasibility study noted a number of contingencies and environmental obstacles that could either increase that cost or preclude construction. These included: additional track or other facilities to prevent obstruction of the entry road to the station; purchase of additional right-of-way in order to maintain existing roadways; proximity of a large, privately owned ranch to the planned route; Texas Department of Transportation design plans for highway crossings; prospective need for highway modifications; need for facilities to connect the spur to the UP main line; contingencies concerning wetlands and navigable waterways permits, including Clean Water Act permits incidental to construction of a crossing over the Navasota River; and need to investigate and deal with cultural, archaeological and endangered species habitat sites identified but not yet studied.

[11] BNSF Reply Narr. Vol. I at II-58.

[12] *See* TMPA Reb. W.P. at 9962-68.

III. RATE REASONABLENESS STANDARDS

A. Constrained Market Pricing

Our general standards for judging the reasonableness of rail freight rates are set forth in *Coal Rate Guidelines, Nationwide*, 1 I.C.C.2d 520 (1985) (*Guidelines*), *aff'd sub nom. Consolidated Rail Corp. v. United States*, 812 F.2d 1444 (3d Cir. 1987). Those guidelines impose a set of pricing principles known as "constrained market pricing" (CMP).[13] CMP imposes three main constraints[14] on the extent to which a railroad may charge differentially higher rates on captive traffic: revenue adequacy,[15] management efficiency,[16] and stand-alone cost (SAC).[17]

The revenue adequacy and management efficiency constraints employ a "top-down" approach, examining the incumbent carrier's existing operations. If the carrier is revenue adequate (earning sufficient funds to cover its costs and provide a fair return on its investment), or would be revenue adequate after eliminating unnecessary costs from specifically identified inefficiencies in its operations, a complaining shipper may be entitled to rate relief. The SAC constraint uses a "bottom-up" approach, calculating what a hypothetical new, optimally efficient carrier would need to charge for providing rail service only over those lines and facilities that are needed to serve the complaining shipper

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[13] The objectives of CMP can be simply stated. A captive shipper should not be required to pay more than is necessary for the carrier(s) involved to earn adequate revenues. Nor should it pay more than is necessary for efficient service. A captive shipper should not bear the cost of any facilities or services from which it derives no benefit. Responsibility for payment for facilities or services that are shared by other shippers should be apportioned according to the demand elasticities of the various shippers. *Guidelines*, 1 I.C.C.2d at 523-24.

[14] A fourth constraint—phasing—can be used to limit the introduction of otherwise-permissible rate increases if such increases would lead to undue inflation and dislocation of important economic resources. *Id.* at 546-47.

[15] The revenue adequacy constraint ensures that a captive shipper will "not be required to continue to pay differentially higher rates than other shippers when some or all of that differential is no longer necessary to ensure a financially sound carrier capable of meeting its current and future service needs." *Id.* at 535-36.

[16] The management efficiency constraint protects a captive shipper from paying for avoidable inefficiencies that are shown to increase a railroad's revenue need and have a resulting effect on the rate charged to the shipper. The management efficiency constraint focuses on both short-run and long-run efficiency. *Id.* at 537-42.

[17] The SAC constraint measures efficiency, ensures that the captive shipper does not cross-subsidize other traffic, and protects the shipper from having to pay more than the revenue needed to replicate rail service in the absence of barriers to entry and exit. *Id.* at 542-46.

(and other traffic using the same lines and facilities, to the extent the complainant wishes to take advantage of cost-sharing). The complainant, who has the ultimate burden of persuasion, may choose which of the two approaches to use.

B. SAC Test

TMPA has chosen to proceed here using a SAC analysis. A SAC analysis seeks to determine the lowest cost at which a hypothetical, optimally efficient carrier could provide the service at issue free from any costs associated with inefficiencies or cross-subsidization. As the proponent of the SAC analysis, the complainant has the burden to demonstrate in its case-in-chief the reasonableness of its assumptions and selections. *Guidelines*, 1 I.C.C.2d at 544. To begin the analysis, the complainant hypothesizes a stand-alone railroad (SARR) that could serve a selected traffic group if the rail industry were free of barriers to entry or exit. Under the SAC constraint, the rate at issue cannot be higher than what the SARR would need to charge to serve the complaining shipper while fully covering all of its costs, including a reasonable return on its investment.

To make a SAC presentation, the complainant designs a SARR specifically tailored to serve an identified traffic group using the optimum physical plant or rail system needed for that traffic. The traffic group includes the complainant's traffic (the issue traffic) and other traffic designated by the complainant (the non-issue traffic). Based on the traffic group designated, the services that would need to be provided, and the terrain that would be traversed, the complainant develops a detailed operating plan to define the physical plant that the SARR would need.[18] The operating plan is a prime determinant of the total investment that would be required and the annual operating costs that the SARR would need to incur. It is assumed that the SARR would make investments prior to the start of service and that recovery of the investment would occur over the economic life of the assets.[19] We use a DCF model to simulate the SARR's expected recovery of its investments after taking into account inflation, Federal and state tax

[18] For example, roadway must be sufficient to permit the attainment of the speeds and densities that are assumed. The length and frequency of passing sidings must be able to accommodate the specific train lengths and frequency of train meets that are assumed, and traffic control devices must be designed to allow trains traveling in opposite directions on the same track to be handled safely and efficiently based on the density assumed in the operating plan.

[19] Our SAC analyses are limited to finite periods of time (usually, 20 years), but parties provide for sufficient investment to enable the SARR to operate into the indefinite future. We estimate the economic value of the SARR's assets at the end of the analysis period by computing the present value of a perpetual stream of earnings at the revenue requirement in the last period of the analysis.

liabilities, and a reasonable rate of return (set at its cost of capital). The SARR's investment costs are then combined with its annual operating costs to calculate the SARR's total annual revenue requirements (including what would be needed to meet the target rate of return).

We then compare the revenue requirements of the SARR to the revenues that it could expect to receive from its traffic group. Absent better evidence, we presume that the initial revenue contribution from non-issue traffic would be the actual revenues generated by the base-year movements of each component of the stand-alone traffic group.[20] The forecasted (future) tonnage and rate levels for that traffic group determine future revenue contributions.

By comparing the total costs of the stand-alone system to the total revenues (from both issue and non-issue traffic) that would be available to the SARR over the period of analysis (usually a 20-year period), we determine whether there would be over- or under-recovery of costs. Because the analysis period is lengthy, we use a present-value analysis that takes into account the time value of money, netting annual over-recovery and under-recovery as of a common point in time.

If the sum of the present value of over-recoveries exceeds the under-recoveries, we can conclude that the existing rate levels are too high. We must then determine the extent to which the revenues of the traffic group should be reduced so that, over the multi-year analysis period, there would be no net over- or under-recovery. Absent better evidence, we assume that any annual over-recovery should be distributed among the traffic in the group using an identical percentage reduction to all rates. In that way, we can determine the rate that the SARR would need to charge to the complainant each year, and hence the maximum reasonable rate that the complainant should pay the defendant carrier for equivalent service each year. *See generally*, *FMC Wyoming Corp. & FMC Corp. v. Union Pacific RR. Co.*, 4 S.T.B. 699 (2000) (*FMC*).

IV. STAND-ALONE COST ANALYSIS

A. Configuration

For this case TMPA designed a hypothetical SARR called the Gibbons Creek Railroad (GCRR). The GCRR would replicate over 1,600 miles of existing BNSF lines extending from Eagle Junction, WY (in the northern portion

[20] *Guidelines*, 1 I.C.C.2d at 544.

of the Wyoming PRB) to Iola, TX (where it would connect with private trackage leading to TMPA's Gibbons Creek Station).[21] From Eagle Junction, the GCRR route would proceed in a southerly direction through the PRB, then southeast to Northport, NE, then eastward through Nebraska to Kansas City, MO, then south through Kansas, Oklahoma, and Texas, ending at Iola.

The GCRR would interchange traffic with five railroads along its route: (1) BNSF, at Donkey Creek, Bridger Junction, and Moba, WY; Northport and Lincoln, NE; Kansas City, MO; and Fort Scott, KS; (2) UP, at Northport and Falls City, NE; and Kansas City, MO; (3) Kyle Railroad Company, at Lincoln, NE; (4) The Kansas City Southern Railway Company, at Kansas City, MO; and (5) Kiamichi Railroad Company, Inc., at Madill, OK.

A map showing the GCRR configuration, together with our resolution of evidentiary disputes regarding the amount of track that would be needed for the GCRR to operate this system, is contained in Appendix B.

B. GCRR Traffic Group

TMPA assumed that the GCRR would transport coal moving in unit-train service from PRB mine origins to electric utilities at 76 destinations. The traffic to six of these destinations[22] (comprising approximately 10% of the total tonnage of TMPA's GCRR traffic group) would be "local traffic" to the GCRR, i.e., would both originate and terminate on the GCRR. The traffic to eight other destinations[23] (approximately 15% of the total tonnage) would be interline traffic for which the GCRR would fully replace BNSF by interchanging the traffic with another (non-BNSF) railroad at the same point at which BNSF now interchanges that traffic with the other carrier. For the remaining 62 destinations[24] (roughly 75% of the GCRR's total tonnage), TMPA assumed that the GCRR would not replace BNSF entirely (i.e., the GCRR would not replicate all of the BNSF lines

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[21] TMPA also assumes that the GCRR would operate over a 0.25-mile segment of UP line on the Oklahoma/Texas border (the Red River Bridge), under the same trackage rights terms under which BNSF operates over that segment of track.

[22] TMPA's Gibbons Creek facility; Basin Electric's Laramie River plant at Moba, WY; Kansas City Power & Light's Iatan Generating Station at Sadler, MO; Public Service Company of Oklahoma's Northeastern Station at Oologah, OK; Reliant HL&P's Limestone plant at Donie, TX; and TXU's Big Brown Station near Big Brown, TX. TMPA Open. Narr. at III-A-123.

[23] These destinations are electric generation facilities located near Welsh and Martin Lake Junction, TX; Flint Creek, AR; Jeffery and Nearman, KS; Amsterdam, MO; Pryor, OK; and Mossville, LA.

[24] *See* TMPA Open. Exh. III-A-2 (listing all destinations for the GCRR traffic group).

needed for BNSF's existing service for that traffic), but would instead use new hypothetical interchanges to hand off this "cross-over traffic" to a "residual BNSF" at the point where the GCRR could no longer handle the traffic.

1. Eligible Traffic

BNSF argues that traffic to 17 of the 76 destinations in the traffic group designated by TMPA (approximately 16% of the GCRR tonnage) must be excluded because there are rail transportation contracts governing the traffic that (1) specify a routing different from that assumed by TMPA[25] and/or (2) specify single-carrier service for movements that TMPA would make cross-over (joint-line) traffic.[26] TMPA counters that a complainant designing a SARR has discretion to group and route traffic as it chooses, so long as it accounts for all relevant costs (which TMPA claims it has done in this case).[27]

While a complainant has considerable flexibility in designing and locating the SARR and grouping traffic to take advantage of traffic densities,[28] it does not have unbridled discretion. The reasonableness of both the placement of the SARR and the traffic group selected by the complainant is open to challenge.[29] 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. *See Bituminous Coal–Hiawatha, UT to Moapa, NV*, 10 I.C.C.2d 259, 272-73, 288-89 (1994) (*Nevada Power*). And in determining the reasonableness or propriety of assumptions and selections made by a SAC proponent, we are guided by the underlying purpose and objectives of the SAC test. *See PPL Montana, LLC v. Burlington Northern & Santa Fe Railway Co.*, 6 S.T.B. 286 (2002) (*PPL*), at 293-96.[30]

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[25] BNSF Motion to Dismiss.

[26] BNSF Reply Narr. III-A-1 through III-A-4.

[27] TMPA Brief at 19-20.

[28] *See Guidelines*, 1 I.C.C.2d at 543-44 (declining to impose restrictions in advance on the design of a SARR or on the traffic that could potentially be included in a stand-alone traffic group).

[29] *Id*. at 544 (the proponent of a particular stand-alone system must identify, and be prepared to defend, the assumptions and selections it has made).

[30] We are contemporaneously issuing a decision denying a petition for reconsideration in that case.

a. Single-Carrier Contract Term Where No Rerouting

It is well established that a SAC presentation may include cross-over traffic[31] and that cross-over traffic may include traffic that is currently moving under a rail transportation contract.[32] As our predecessor, the Interstate Commerce Commission (ICC),[33] explained in *Nevada Power*, 10 I.C.C.2d at 265 n.12, excluding cross-over traffic "would weaken the SAC test because it would deprive the SARR of the ability to take advantage of the same economies of scale, scope and density that the incumbents enjoy over the identical route of movement." Therefore, for purposes of a SAC analysis, we assume that the SARR would replace the defendant carrier for the particular segment of the rail system that it would replicate.[34]

BNSF does not object to the inclusion of contract traffic moving to most of the destinations in this case. But it argues that, where there is a contract specifying single-line service (or BNSF-direct service to an interchange point beyond the SARR),[35] the SAC proponent is not free to substitute two-carrier (GCRR/BNSF) cross-over service for the single-carrier service specified in the contract.[36]

As TMPA points out,[37] however, any contract with a single carrier is by definition for single-carrier service.[38] If traffic were automatically disqualified from being included as cross-over traffic in a SAC group solely because the contract specifies single-carrier service, carriers could manipulate and artificially limit what traffic could be included in future SAC cases by revising their

[31] *See Nevada Power*, 10 I.C.C.2d at 265-67.

[32] *See Wisconsin Power & Light v. Union Pacific Railroad Company*, 5 S.T.B. 955 (2001) (*WPL*) at 975-76 & n.56.

[33] In the ICC Termination Act of 1995, Pub. L. No. 104-88, 109 Stat. 803 (1995), the ICC was abolished, and this Board was created to assume the remaining rail regulatory responsibilities, effective January 1, 1996.

[34] *Nevada Power*, 10 I.C.C.2d at 267.

[35] *See* BNSF Reply Narr. at III-A-3, Table III-A-1, line 7 (Boardman contract).

[36] BNSF relies on a statement in *West Texas Util. Co. v. Burlington N.R.R.*, 1 S.T.B. 638, 657 (1996) (*West Texas*), that, as to traffic that currently moves under rail transportation contracts, "[t]he SAC analysis assumes that the [SARR] would replace [the defendant carrier], that is, step into the shoes of [the defendant carrier] under the existing transportation contracts." But as TMPA correctly notes (TMPA Reply to Motion to Dismiss at 16 n.16), that statement merely referred to the ruling in *Nevada Power*, 10 I.C.C.2d at 267, that the SARR would not have to contend with post-entry responses by the defendant carrier. *West Texas*, 1 S.T.B. at 657 n.40.

[37] TMPA Reply to Motion to Dismiss at 11.

[38] TMPA also points out that the contracts in question allow the serving carrier to alter the routing with the consent of the shipper. *Id.* at 10.

contracts to include such language. Allowing carriers to foreclose contract traffic from being included as cross-over traffic in SAC cases in this manner would weaken the SAC test in the very way sought to be avoided in *Nevada Power*. Accordingly, we do not believe that, in applying the SAC test, special significance should be attached to a contract provision mentioning or calling for single-carrier service, absent evidence that single-carrier service is necessary to meet the shipper's transportation needs.

As to the challenged destinations for which the traffic would move over the same routes it currently uses, there is no evidence to suggest that the interline service posited by TMPA would not meet each shipper's transportation needs.[39] Therefore, we conclude that it is permissible in this case to include the traffic to these destinations as cross-over traffic.

b. Rerouted Traffic

As BNSF recognizes,[40] the complainant has considerable freedom to select how the SARR would move the traffic that is the subject of the complaint. *See Guidelines*, 1 I.C.C.2d at 534-44 & n.60. But TMPA's SAC presentation also reroutes some non-issue traffic. BNSF challenges the propriety of the reroutings of non-issue traffic for which existing transportation contracts specify a routing over lines not replicated by the GCRR.

As we explain below, we agree that TMPA may not assume a rerouting of the traffic moving to three of these destinations here.[41] However, our conclusion is not based upon the terms of the contract or even the existence of a contract. Consistent with our analysis of contractual provisions regarding single-carrier service (discussed above), the determination of what traffic may be included in a SAC analysis should not be controlled by the specific language of a contract that has been drafted (or its terms set) at least in part by the defendant railroad. Rather, our determination is based on (1) a factual assessment of whether the transportation needs of the shipper would be met by the SARR and (2) a more fundamental consideration of whether the underlying purpose and objectives of the SAC test would be met.

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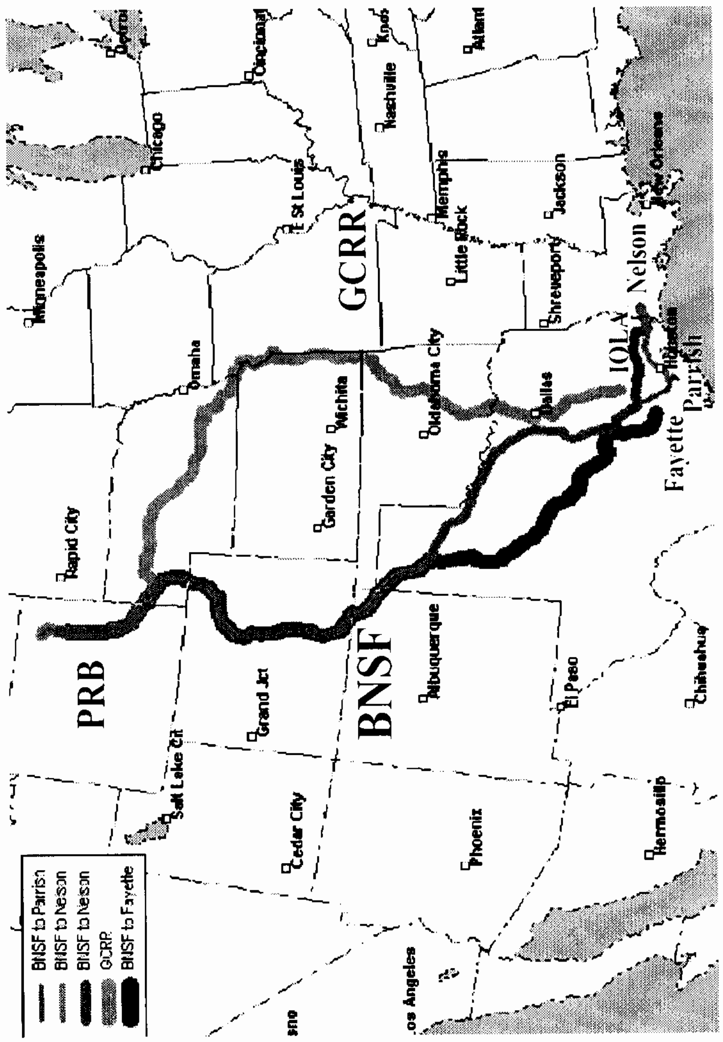
[39] There is no evidence that there would be either increased transportation costs for the shipper or longer cycle times.

[40] BNSF Motion to Dismiss at 8.

[41] As discussed *infra*, we do not believe it is necessary, however, to exclude this traffic from the SAC analysis altogether, as BNSF has argued. Rather, we exclude from our analysis only the rerouted portion of those movements.

i. Rerouting Dimensions

There are three dimensions to the rerouting of traffic in TMPA's presentation, as illustrated in the following map.


PRB
BNSF
GCRR
IOLA
Nelson
Parrish
Fayette
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BNSF to Nelson
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GCRR
BNSF to Fayette
Minneapolis
Chicago
Cincinnati
St Louis
Nashville
Memphis
Little Rock
Jackson
Shreveport
New Orleans
Omaha
Wichita
Garden City
Oklahoma City
Dallas
Houston
Rapid City
Salt Lake Cit
Grand Jct
Cedar City
Albuquerque
El Paso
Phoenix
Chihuahua
Hermosillo
Los Angeles

The first rerouting dimension involves how coal is routed out of the PRB. BNSF uses two lines to carry coal traffic out of the PRB—one from Campbell, WY, to Northport, NE; the other from Bill, WY, to Northport. For the GCRR, however, TMPA would have only one line out of the PRB (from Bill to Northport) and would direct all of the GCRR's traffic over that line.

The second rerouting dimension involves how traffic is routed out of Northport. BNSF has more than one route that it can use to transport PRB coal from Northport to points in Texas and Louisiana. For five of the non-issue-traffic destinations included in the GCRR traffic group,[42] BNSF routes the traffic southwest along the front range of the Rocky Mountains through Denver and Pueblo, CO, then southeast into Texas and Louisiana (the Front Range Route). To achieve maximum traffic densities for the GCRR, TMPA would have the GCRR transport this traffic over a route that replicates a somewhat longer but higher-density BNSF route that extends east from Northport and then southeast through Kansas City, then south into Oklahoma and Texas (the Central Corridor Route).

The third rerouting dimension arises because the traffic to three of the destinations rerouted from the Front Range Route to the Central Corridor Route would be cross-over traffic that the GCRR would hand off to the residual BNSF.[43] This traffic currently does not move through Iola (the terminus of the GCRR)—the point where TMPA assumes that this traffic would be interchanged between GCRR and the residual BNSF. Rather, BNSF currently serves these destinations via lines extending off of the Front Range Route at Amarillo and Fort Worth, TX. Thus, TMPA's proposed rerouting of this traffic would affect not only how the GCRR would move the traffic but also how it could be moved by the residual BNSF.

ii. Rerouting Principles

We conclude that a SAC proponent may reroute traffic that the SARR would handle from origin to destination, so long as the new route is reasonable and

[42] These include the four destinations to which BNSF objected (on contract grounds) in its motion to dismiss: TXU's Big Brown Plant near Fairfield, TX; LRCA/Austin's Fayette Plant at Halsted, TX; Reliant Energy's Parish plant at Smithers Lake, TX; and Entergy's Nelson plant at Mossville, LA. They also include Reliant Energy's plant at Donie, TX. Because the traffic moving to the Donie plant is not under a contract, BNSF did not object to the rerouting of traffic to that destination. BNSF Motion to Dismiss at 7 n.8.

[43] These are: the LRCA/Austin's Fayette Plant at Halsted, TX; Reliant Energy's Parish Plant at Smithers Lake, TX; and Entergy's Nelson Plant at Mossville, LA.

would meet the shipper's transportation needs. In that circumstance our SAC analysis can ensure that any added costs from the new route are reflected in the SAC analysis and, for the complainant to prevail, covered by the revenues available from that traffic.

On the other hand, redirecting the off-SARR portion of traffic introduces new variables that extend the inquiry well beyond the original parameters of the SAC analysis. Such new variables might include: off-SARR operational issues (such as, in this case, rerouting traffic through the busy rail network in the Houston metropolitan area); off-SARR cost issues (for example, whether the residual carrier would need additional off-SARR facilities to handle traffic along the different route); and whether the revenues from the rerouted traffic would be sufficient to cover the costs over the entire route that traffic would travel from origin to destination, including the off-SARR part.[44] Thus, to reroute non-issue traffic, the complainant's SAC analysis must either take responsibility for the entire movement from origin to destination or fully account for the ramifications of requiring the residual carrier to alter its handling of the traffic.[45]

iii. Application to This Case

We now turn to the traffic to the four destinations for which BNSF has objected to a rerouting. With respect to the Big Brown plant, as this traffic would be local to the GCRR, we need only examine whether the GCRR's service would meet the shipper's transportation needs. The GCRR would provide the same or superior level of service as the shipper receives under the contract, as the GCRR cycle time for this traffic would be shorter than the current BNSF cycle time.[46] But because this traffic moves in shipper-supplied cars, the shipper would incur additional maintenance costs for its cars due to the increased mileage.[47]

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[44] For cross-over traffic that is not rerouted, it is reasonable to assume that the actual rates have been set to cover the cost over the existing route.

[45] *Cf. McCarty Farms, Inc. v. Burlington Northern, Inc.*, 2 S.T.B. 460, 468 (1997) (seriously questioning the propriety of a SARR configuration that excluded branch lines necessary to serve some of the traffic included in the SARR traffic group).

[46] *See* BNSF Reply, e-W.P. Kent/Klick III-C-1, Cycle Times.xls & Kent Cycle Times.xls.

[47] A portion of car maintenance cost is a function of the number of miles a car travels.

For purposes of a SAC analysis, it is reasonable to assume that the SARR could adjust the rate paid by the shipper,[48] to provide for equivalent service at the same total cost to the shipper, thereby matching the contract terms from the shipper's perspective.[49] For the Big Brown movement, we calculate that the shipper would incur additional car maintenance costs of $25.01 per car per movement, based on a cost of 7.7 cents per car-mile for maintenance of Type H cars[50] and an additional 324.8 miles traveled (round-trip). Accordingly, in our SAC analysis we will offset the revenues that the GCRR would receive from the Big Brown traffic by that amount to cover the additional car costs incurred by the shipper.

As to the three destinations that would involve cross-over traffic (the Fayette, Parish, and Nelson plants), TMPA has not adequately accounted for all off-SARR ramifications of such a change and thus has not supported its rerouting assumption. TMPA has not addressed the many potential off-SARR operational implications (such as the rerouting of traffic through the Houston area) nor fully addressed the variety of off-SARR costs (both capital costs and operating costs) that could be associated with rerouting this traffic. Nor has it demonstrated that the revenues from the rerouted traffic would be sufficient to cover all costs for the entire movement as rerouted, including all off-SARR costs. Without fully addressing all aspects of an off-SARR rerouting, TMPA may not assume that off-SARR traffic could be rerouted in this manner.

TMPA's failure in this case to account for all of the ramifications of its off-SARR rerouting is highlighted by its failure to address the concerns that were raised by BNSF regarding the potentially serious operational problems associated with rerouting this traffic through the Houston area.[51] (BNSF now routes the Fayette, Parish, and some of the Nelson traffic in such a way as to avoid the Houston area.) We are quite familiar with "the inadequate infrastructure in the Houston area: the rail system in Houston has limited capacity, antiquated facilities, and an inefficient configuration unable to cope with surges in

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[48] BNSF argues that the contract terms cannot be varied. BNSF Brief at 10; BNSF Motion to Dismiss at 14-16. But as TMPA points out (TMPA Reply to Motion to Dismiss at 13), any cross-over traffic requires an assumption that some contract terms would be modified, such as the identity of the parties and the establishment of the fictional interchange.

[49] Unlike TMPA's projected rate relief rationale for a rate reduction (which we agree with BNSF would put "the cart before the horse," BNSF Motion to Dismiss at 15), the revenue adjustment we envision does not depend upon or derive from the outcome of the SAC analysis.

[50] The parties agree on this cost, which is drawn from BNSF's R-1 annual report.

[51] *See* BNSF Reply Narr. at I-13-17; BNSF Reply V.S. Mueller at 30-32; BNSF Motion to Dismiss at 4, 16-19.

demand."[52] Although infrastructure improvements in the Houston area are underway, we agree with BNSF[53] that TMPA's proposal to divert an average of seven heavy, slow-moving coal trains per day through the Houston corridor could cause serious problems. The last time we witnessed unexpected delays due to congestion in Houston, the impact affected multiple railroads and had a ripple effect across the entire rail network, affecting countless shippers. The Houston situation is illustrative of why a complainant may not simply assume that traffic could be rerouted, without examining all potential ramifications of such a change and accounting for all impacts.

In its opening case, TMPA did not address the residual BNSF's off-SARR handling of rerouted traffic at all. On rebuttal, TMPA addressed some off-SARR issues specifically mentioned by BNSF in its reply.[54] TMPA included capital costs for certain new off-SARR facilities or rehabilitation of existing off-SARR facilities;[55] and it included a siding south of Iola to address congestion at that interchange point;[56] but it argued that it need not account for added costs that BNSF claimed would be associated with handling certain movements to an off-SARR railcar repair facility that BNSF is contractually obligated to conduct for some of the rerouted traffic.[57]

Neither party has addressed other obvious potential ramifications of the reroutings that would have had to be explored before we could be assured that the impacts of rerouting were fully accounted for here. For example, there is no evidence in the record as to whether additional crew costs would be incurred as a result of the longer time that would surely be needed to move these trains through the busy Houston area. Nor does the record address numerous other potential variables regarding off-SARR operations that would be examined in detail if they were on the SARR.[58] A complainant cannot avoid the potential impacts that might result from its rerouting of traffic by choosing to terminate the SARR before the point at which those impacts would occur. Thus, there is not a sufficient record here upon which to find that the off-SARR rerouting

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[52] *Joint Petition for Service Order*, 3 S.T.B. 44, 48 (1998).

[53] *See* BNSF Reply V.S. Mueller at 30.

[54] BNSF has not purported to address all of the costs associated with the off-SARR rerouting. *See* BNSF Motion to Dismiss at 20.

[55] TMPA Reb. Narr. at 604.

[56] *Id.* at 307.

[57] *Id.* at 387.

[58] Operational variables include such factors as the availability of locomotives, switch locomotives, and crews; signaling issues; equipment delays and breakdowns; maintenance windows; random failures; helper services; and so on.

assumptions in this case are reasonable. In fact, there is some question as to whether an off-SARR rerouting could be supported short of a full SAC analysis.

Accordingly, we conclude that it is improper in this case for TMPA to assume a rerouting that would alter off-SARR handling of that traffic. But we do not believe it is necessary to exclude this traffic from the SAC analysis altogether, as BNSF has argued. Because TMPA would have been free to include that traffic for the portion of the movements from the PRB to Northport (the point at which the GCRR route would diverge from the actual route of movement), we include that portion of each of the three movements in our SAC analysis.

c. Threshold Cross-Subsidy Issue

In its motion to dismiss, BNSF argues that, if we were to exclude the rerouted traffic to the four destinations that it challenged (the Big Brown, Fayette, Parish, and Nelson plants), the portion of the GCRR from Madill, OK, to Iola, TX, would not be viable. It claims that the traffic that would remain on the Madill-Iola segment—the movements to the Donie plant (scheduled to begin in 2002) and to TMPA's Gibbons Creek plant—would not generate sufficient revenues to cover the incremental costs of constructing that line segment. As a result, BNSF claims, the traffic south of Madill would depend upon improper cross-subsidization from traffic that would not use that portion of the GCRR system.

As we have explained before,[59] a basic principle of the SAC test is that traffic should not be subsidized by other traffic, and the purpose of the SAC test is to remove such cross-subsidies.[60] Thus, revenues from non-issue traffic should not be relied upon to pay for portions of a SAC system over which the non-issue traffic would not move.

Here, BNSF has failed to show that the Madill-to-Iola segment would require a cross-subsidy. BNSF's witness claims that, without any of the traffic to the four challenged destinations, there would be a $5.8 million shortfall in

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[59] *PPL, 6 S.T.B. at 294-95, citing Arizona Electric Power Cooperative, Inc. v. The Burlington Northern and Santa Fe Railway Company and Union Pacific Railroad Company*, S.T.B. Docket No. 42058 (STB served December 31, 2001).

[60] Cost sharing (grouping traffic to share the joint and common, i.e., unattributable, costs of providing rail service), which *Guidelines* permits, must be distinguished from cross-subsidization (recovery of a shipper's attributable costs from other shippers), which *Guidelines* proscribe. *PPL*, 6 S.T.B. at 294-95.

2001 in what the GCRR would need to earn to cover the cost of constructing the Madill-to-Iola line segment. (With the addition of the Donie traffic in 2002, the shortfall calculated by BNSF would be reduced to $1.8 million and eliminated by 2009.) But, while we disallow the rerouting as to three of the destinations, we allow TMPA's routing of the Big Brown traffic for the GCRR. This adds $26 million in annual revenues to the GCRR traffic base, which would be more than sufficient to cover the investment identified by BNSF.

2. Tonnages

There is no dispute as to the forecasted tonnages for the GCRR traffic group during the 20-year SAC analysis period. Those figures were developed using BNSF's 2001 Coal Long Range Plan report[61] and coal forecasts of the United States Department of Energy's Energy Information Administration (EIA). The totals are set forth below in Table 1. Our disallowance of rerouting of traffic for three destinations does not remove that traffic from the GCRR traffic group. It simply means that the traffic would move a shorter distance over the GCRR system before being interchanged with a residual BNSF. While that affects the GCRR's portion of the revenues from that traffic, it does not affect the GCRR's total tonnage.

[61] BNSF Reply W.P. at 653-761.

Table 1
GCRR Tonnages

Year	Tonnage
2001	178,572,000
2002	180,438,000
2003	181,072,000
2004	181,252,000
2005	183,245,756
2006	181,787,299
2007	183,925,414
2008	185,440,422
2009	186,246,173
2010	186,952,812
2011	187,576,712
2012	188,117,243
2013	188,738,519
2014	189,130,231
2015	189,421,911
2016	190,837,025
2017	191,530,215
2018	191,784,497
2019	192,257,949
2020	192,947,115

3. Revenues

There are two significant disagreements regarding the revenues assumed for the GCRR over the SAC analysis period. The first involves how to forecast changes in coal transportation rates from the PRB after existing contracts expire. The second involves how revenues from cross-over traffic should be divided between GCRR and the residual BNSF.[62]

a. Rate Forecasts

i. 2001-2004

For the period 2001-2004, there is no dispute as to the rate levels assumed for each of the movements in the GCRR traffic group. Those rate levels are based on the existing contract or common carrier rate in effect for each movement and any applicable rate escalation provisions contained in the contract or common carrier rate schedule.[63] For contracts that would expire prior to 2004, the parties agreed to an assumption that post-contract rate increases through 2004 would be based upon BNSF's most recent long-range forecast for coal.

Based on the agreed-upon rate levels and tonnages, there is no dispute as to the total revenues assumed for the GCRR in 2001-2004 from local traffic and from traffic interchanged with other carriers at historical BNSF interchanges.[64] For cross-over traffic, however, there is a dispute as to what portion of the joint-line revenue the GCRR could reasonably expect to receive as its division—an issue addressed separately *infra*.

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[62] As discussed above, for traffic moving to the Fayette, Nelson, and Parrish plants—for which we disallow TMPA's rerouting—we assume that the traffic would be interchanged at Northport, rather than at Iola.

[63] The contract escalation factors are pegged to the level of the rail cost adjustment factor, unadjusted for changes in railroad productivity (RCAF-U). The RCAF-U is an index of railroad costs that we compute on a quarterly basis, pursuant to 49 U.S.C. 10708. The parties use an agreed-to forecast of the future RCAF-U.

[64] The rates that the parties use for TMPA's own Gibbons Creek traffic ($17.48 for all of 2001, and $19.35 for 2002-2004) are inconsistent with BNSF's rate of $19.09 for the second quarter of 2001 and with the rate and escalation provisions contained in its Common Carrier Pricing Authority BNSF 90042. We use the rate escalation provision contained in BNSF 90042 (the rate provision under challenge here) for the entire SAC analysis period (i.e., through 2020).

ii. 2005-2020

There is a dispute as to forecasts of post-2004 rate levels after individual contracts expire.[65] TMPA segregated traffic based on whether it would be captive or competitive traffic for the GCRR. For captive traffic, TMPA escalated the rate at the end of the contract period by the weighted average rate adjustment for captive shippers remaining under contract. For competitive shippers, TMPA estimated a new competitive market rate[66] and for subsequent years escalated that rate by the weighted average rate adjustment for competitive shippers remaining under contract. Overall, TMPA forecasts a 1.7% average annual increase in rail coal transportation rates for the GCRR traffic group.[67]

BNSF complains that TMPA's escalation percentages are based on only a few older, unexpired long-term contracts that do not reflect current market practices. BNSF also points to an EIA forecast of an overall 1.1% increase in coal transportation rates as a benchmark to show that TMPA's rate forecasts are overly optimistic.[68] TMPA responds that EIA's forecast for coal transportation rates from the PRB is actually for a 1.4% annual increase in rates[69] and that this figure is closer to TMPA's forecast than any forecast offered by BNSF. We agree with BNSF that TMPA's forecasts, which are more reflective of past rate changes, are not the best evidence of what change in rates would reasonably be expected in the future.

BNSF has offered three other rate forecasts—the DRI-WEFA forecast,[70] a forecast by its vice-president of coal marketing,[71] and the EIA forecast—but

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[65] The parties agree that rates should continue at the level specified in existing contracts (and reflect the contract rate escalation provisions) until those contracts are scheduled to expire.

[66] TMPA calculated a new rate by estimating a competitive market rate in mills per ton-mile and multiplying that mills per ton-mile rate by the competitive movement's length of haul. The calculated rate was compared to the contract rate from the last year under contract, and the lower of the two rates was used.

[67] TMPA Reb. Narr. Vol. I at 288-89.

[68] BNSF Reply Narr. III-A at 45-46.

[69] TMPA references BNSF's Reply, Warther's e-W.P. EIA Data - Workpaper.xls, tab Nominal Dollars.

[70] *See* BNSF Reply Narr. Part III-A at 30-32; Novak V.S. That forecast shows a relatively flat rate trend, with a projection of the rate level at the time of a contract's expiration as if a forecasted 0.32% increase in rates had been implemented starting in 2005.

[71] This forecast adjusted each contract rate downward at the contract's expiration. The amount of the downward adjustment was based on a study performed by BNSF's witness Kraemer. After the initial post-contract downward adjustment, the rates were then escalated using the DRI-WEFA forecast factors. BNSF Reply V.S. Kent-Klick at 22-24.

relies primarily upon the DRI-WEFA forecast.[72] TMPA attacks the DRI-WEFA forecast on several grounds. TMPA states that as much as 40% of the base data used to develop the forecast was not PRB coal, but Colorado and Illinois Basin coal and North Dakota and Gulf States lignite. TMPA also claims the base data include charges paid to other carriers and modes not serving the PRB. Finally, TMPA asserts that almost 40% of the coal tonnage that would move by the GCRR would terminate outside the states from which the base data were drawn and thus that data are not representative of the GCRR's traffic. TMPA also claims that the DRI-WEFA forecast does not pass standard statistical tests for significance.

We agree that BNSF's DRI-WEFA forecast is also inappropriate. This forecast was developed from a data set that contained a large amount of information not pertaining to PRB coal. We are also reluctant to rely on forecasts prepared specifically for this litigation, which includes both the DRI-WEFA forecast and the forecast by one of BNSF's vice-presidents. Thus, we use the EIA forecast—a 1.4% annual rate increase on Wyoming and Montana PRB coal for the time period 2004-2020—as the best evidence in the record as to post-contract rate changes beyond 2004. Our use of this evidence is consistent with the parties' reliance on EIA forecasts for the future tonnages that are assumed for the GCRR traffic group. Our restated revenue values are shown in Table 2.

[72] To support its DRI-WEFA forecast, BNSF conducted a study of new contracts negotiated with existing customers after 1997. BNSF contends that this study shows that rates for both competitive and sole-served destinations are declining at a rapid rate and that shippers are negotiating shorter contracts to take advantage of larger-than-expected post-contract rate decreases and market conditions generally favorable to shippers. BNSF claims that this finding is consistent with its own internal forecasts projecting that the decline in the initial renewal rate more than offsets the effect of escalation provisions during the course of new contracts.

Table 2
GCRR Revenues

Year*	BNSF** (DRI-WEFA)	BNSF** (EIA)	BNSF** (VP-Coal)	TMPA	STB***
2001	986,292,250	986,292,250	986,292,250	982,421,079	694,545,861
2002	1,022,594,082	1,022,594,082	1,022,594,082	1,017,832,444	926,912,908
2003	1,016,254,166	1,016,254,166	1,016,254,166	1,010,063,411	916,860,253
2004	1,014,574,213	1,014,574,213	1,014,574,213	1,009,230,943	931,025,162
2005	1,040,043,084	1,044,842,346	1,029,411,780	1,041,186,965	970,825,163
2006	1,042,801,698	1,053,361,473	1,028,581,022	1,052,958,118	978,641,868
2007	1,054,044,263	1,079,340,363	1,008,297,958	1,082,557,838	1,006,377,918
2008	1,065,357,846	1,098,213,860	1,016,561,922	1,113,264,928	1,027,659,230
2009	1,078,416,315	1,114,609,371	1,031,434,391	1,140,894,404	1,043,939,883
2010	1,081,274,101	1,125,742,275	1,026,183,182	1,169,144,708	1,059,780,926
2011	1,085,050,074	1,134,397,419	1,025,696,236	1,197,981,266	1,072,553,608
2012	1,090,529,417	1,144,126,312	1,022,393,890	1,226,686,991	1,084,882,418
2013	1,096,995,064	1,155,089,797	1,031,501,772	1,256,664,754	1,098,977,187
2014	1,087,668,965	1,154,837,250	1,011,731,070	1,286,050,505	1,110,208,708
2015	1,092,898,331	1,169,599,082	1,009,336,917	1,315,123,122	1,126,637,514
2016	1,105,062,781	1,192,042,065	1,022,967,933	1,353,156,597	1,149,708,340
2017	1,114,471,550	1,212,058,850	1,015,410,215	1,386,839,193	1,170,791,657
2018	1,121,934,182	1,231,962,692	1,012,979,515	1,417,888,642	1,192,041,566
2019	1,131,299,194	1,256,638,742	1,012,554,034	1,451,417,336	1,217,359,537
2020	1,143,043,260	1,285,796,635	1,015,965,391	1,487,201,775	1,246,794,856
2021					311,698,714

* The STB 2001 figure omits the 1st quarter of the year, as the challenged rate was not yet in effect. The STB column includes a figure for one quarter of 2021, derived from the annual figure used by the parties for 2020.

** The various revenue projections submitted by BNSF are based on TMPA's traffic assumptions and do not reflect BNSF's argument that some traffic should be excluded.
*** Our restated revenue projections are lower than either party's figures, because they reflect our disallowance of off-SARR rerouting, resulting in an interchange at Northport rather than Iola for the affected traffic.

b. Revenue Divisions for Cross-over Traffic

Normally, when two or more railroads serve a shipper in joint-line service, they negotiate a market-based revenue division of the rate.[73] Lacking information to determine BNSF's typical percentage division in various market-driven situations, TMPA divided the revenues on cross-over traffic between the GCRR and the residual BNSF based on the modified mileage block prorate (MMBP) method that has been used in prior SAC cases.[74] Under that method, each carrier obtains one mileage block of credit for each 100 miles (or portion thereof) that it handles the shipment. The originating and terminating carriers each get credit for an additional block to cover the added cost associated with originating and terminating the traffic. The total revenues are then divided by the total number of blocks to determine each carrier's portion of the revenues.

Here, BNSF argues that the relative costs of originating or terminating coal unit-train traffic is considerably lower than for other traffic. Therefore, it argues that, based upon a cost study that it conducted, the portion of revenue allocated for originating or terminating coal unit-train traffic should be predicated on a mileage block of only 25.8 miles. However, after correcting for computation errors in TMPA's revenue allocation evidence, we find that BNSF's evidence would not reduce the GCRR's total revenues from cross-over traffic below what TMPA calculated.[75] Therefore, we use TMPA's evidence.

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[73] The revenue each carrier receives should cover the attributable costs of the service it provides and make some contribution to its unattributable costs. As long as the traffic makes any contribution to a carrier's unattributable cost, the railroad is better off participating in the transportation than not participating in it. *See Rate Guidelines – Non-Coal Proceedings*, 1 S.T.B. 1004, 1016 (1996).

[74] We have not adopted a single, preferred procedure for developing revenue divisions on cross-over traffic. *PPL*, 6 S.T.B. at 293 n.14.

[75] TMPA double counted the cross-over revenues for the Northtown power plants. *See* TMPA Reb. e.-W.P. III-A-1/GCRRTRAFFIC>123, sheet "BN Projection," lines 63 & 64. We have corrected for this error.

c. Operating Plan and Operating Expenses

Because the GCRR would transport only unit trains of coal, its operations would be significantly less complex than that of existing large, general commodity railroads. Given the relatively uncomplex operations, the major operational dispute between the parties is over cycle time—the time it would take GCRR trains to complete round trips from the mines to the utilities that the GCRR would serve or to GCRR interchange points with connecting railroads, and return for reloading at the mines. As discussed in Appendix C, because TMPA failed to support the model that it used to develop its estimates of the time it would take GCRR trains to traverse various segments of the hypothetical rail system, we use BNSF's evidence on that issue. But we come out somewhere between the parties' estimates on the amount of time it would take GCRR trains to be loaded, serviced and fueled, interchanged, and unloaded.

As shown in Table C-1 of Appendix C, there is a significant disagreement over a variety of the annual costs that would be incurred to operate the GCRR. We discuss in detail each of the disputed cost estimates in Appendix C. Our restatement of the operating costs, while between the parties' estimates, is somewhat closer to the total estimate submitted by TMPA.

d. Road Property Investment

Despite the fact that there is relatively little difference between TMPA's and BNSF's estimate of total track miles (2,214 and 2,369 miles, respectively), there is a substantial difference between the parties' estimates on the level of investment that would be required to construct the GCRR. TMPA claims that the GCRR could be built for $3.2 billion, while BNSF claims that $4.8 billion would need to be expended. Table D-1 in Appendix D provides a summary of the parties' investment figures by category and our restatement. As shown there, we have determined that approximately $4.1 billion would be required to construct the GCRR.

Six of the 11 investment categories account for 95% of the difference between the parties. They are (in order of magnitude) track construction, roadbed preparation, contingencies, bridges, engineering, and land. With respect to track construction costs, the major disagreements concern the cost of transporting materials to the various construction sites and the cost of sub-ballast. Because we find TMPA's evidence on these costs unsupported, we use BNSF's evidence on these issues. As to roadbed preparation, the parties argue over the roadbed width that would be required on double-track segments, whether access roads would be needed along the entire length of the railroad, the cost of grading the Eagle Butte-to-Campbell line, the cost of excavating a tunnel, and the equipment that would be needed to prepare the roadbed. For the most part, we find in favor of TMPA on these matters.

For the size of the contingency fund that would be needed (to cover unforeseen expenses that might arise during construction), we use the figure advocated by BNSF (10% of construction costs), a figure we have used in prior SAC cases. Regarding bridges, we agree with TMPA on the number that would be needed, but use BNSF's evidence on the cost of constructing those bridges, which is based on nationally recognized construction standards.

Concerning the cost of engineering services for the GCRR, we find TMPA's evidence unsupported and we use BNSF's evidence with some adjustment. And we use BNSF's evidence on the cost of the land that the GCRR would need, because its evidence is based on a more detailed study of comparable land values.

e. DCF Analysis

The DCF analysis compares the stream of revenues that would be generated by the GCRR to the stream of costs that the GCRR would incur, discounted to a common point in time. To do that, the DCF model computes and distributes the total cost of the GCRR over the 20-year analysis period, thus determining the amount of revenues that would be needed by the GCRR to cover its operating expenses, meet its tax obligations, recover its investment, and obtain an adequate return on that investment.

The results of our DCF calculations are shown in Appendix E, Table E-1. Under the current rate structure, in each year of the first 11 years of the 20-year SAC analysis period, the GCRR would generate greater revenues than it would need to cover all the costs that would be incurred in and assigned to each year; but in the remaining years the GCRR would somewhat under-recover. However, as Table E-1 indicates, the sum of the present values of over-recoveries exceeds the under-recoveries, thus demonstrating that the existing rate level is too high. The last column of Table E-1 shows the percentage amount that the GCRR rate structure would need to be reduced in each of the first 11 years, so that over the entire 20-year period the GCRR would earn just enough to cover all its costs and earn a reasonable return of its investment.

CONCLUSIONS

Based on our review of the evidence submitted by the parties, we find that we have jurisdiction to review the reasonableness of the challenged rate from the PRB mine origins of Caballo Rojo and Cordero to TMPA's Gibbons Creek Steam Electric Station. The rate produces R/VC ratios that exceed the 180% jurisdictional threshold and TMPA does not have an effective transportation alternative for the transportation.

In our SAC analysis, we find that the SAC rate would be lower than the challenged rate until the year 2012. Accordingly, we find the challenged rate to be unreasonable and we prescribe a maximum reasonable rate through the year 2011. The prescribed rate is to be set at the higher of the SAC rate or the regulatory rate floor (the 180% R/VC rate level), as shown in Table 3 (for movements from the Caballo Rojo mine) and Table 4 (for movements from the Cordero mine). We are not able to compute the regulatory rate floor beyond 2001, as we do not have the variable cost information needed to compute that for later periods. (The parties should calculate this rate floor, in a manner consistent with the procedures and findings contained in Appendix A, as the necessary information for each time period becomes available.)

Table 3
Caballo Rojo to Iola, Texas

Year	Tariff Rate	SAC Rate Reduction	SAC Rate	180% R/VC Rate	STB Prescribed Rate
2001 Q2	$19.09	4.66%	$18.20	$17.60	$18.20
2001 Q3	19.28	4.40%	18.43	17.69	18.43
2001 Q4	19.39	4.14%	18.59	16.96	18.59
2002	19.55	5.52%	18.47	To be determined by the parties once variable costs for each year are known.	Higher of SAC rate or 180% R/VC rate.
2003	20.06	3.36%	19.39		
2004	20.64	2.85%	20.05		
2005	21.26	3.84%	20.44		
2006	21.89	3.01%	21.23		
2007	22.53	3.08%	21.84		
2008	23.18	2.76%	22.54		
2009	23.88	2.15%	23.37		
2010	24.60	1.47%	24.24		
2011	25.33	0.56%	25.19		
2012	26.09	0.00%	26.09		
2013	26.88	0.00%	26.88		
2014	27.68	0.00%	27.68		
2015	28.51	0.00%	28.51		
2016	29.37	0.00%	29.37		
2017	30.25	0.00%	30.25		
2018	31.16	0.00%	31.16		
2019	32.09	0.00%	32.09		
2020	33.05	0.00%	33.05		
2021 Q1	33.05	0.00%	33.05		

Table 4
Cordero to Iola, Texas

Year	Tariff Rate	SAC Rate Reduction	SAC Rate	180% R/VC Rate	STB Prescribed Rate
2001 Q2	$19.09	4.66%	$18.20	$17.26	$18.20
2001 Q3	19.28	4.40%	18.43	17.33	18.43
2001 Q4	19.39	4.14%	18.59	17.03	18.59
2002	19.55	5.52%	18.47	To be determined by the parties once variable costs for each year are known.	Higher of SAC rate or 180% R/VC rate.
2003	20.06	3.36%	19.39		
2004	20.64	2.85%	20.05		
2005	21.26	3.84%	20.44		
2006	21.89	3.01%	21.23		
2007	22.53	3.08%	21.84		
2008	23.18	2.76%	22.54		
2009	23.88	2.15%	23.37		
2010	24.60	1.47%	24.24		
2011	25.33	0.56%	25.19		
2012	26.09	0.00%	26.09		
2013	26.88	0.00%	26.88		
2014	27.68	0.00%	27.68		
2015	28.51	0.00%	28.51		
2016	29.37	0.00%	29.37		
2017	30.25	0.00%	30.25		
2018	31.16	0.00%	31.16		
2019	32.09	0.00%	32.09		
2020	33.05	0.00%	33.05		
2021 Q1	33.05	0.00%	33.05		

Finally, we award reparations to TMPA for the unreasonable portion of the rate that it has paid prior to this rate prescription taking effect. The amount of reparations for movements in the 2nd, 3rd and 4th Quarters of 2001 are shown in Table 5. The parties should determine what reparations, if any, are due after the 4th Quarter 2001 until this rate prescription takes effect. Interest is also awarded in accordance with 49 CFR 1141. The total amount of reparations and interest are to be calculated by the parties in accordance with this decision.

Table 5
Reparations Based on Prescribed Rate

	Tons	Tariff Rate	Amount Paid	Prescribed Rate	Reparations
2Q2001	454,852	$19.09	$8,683,119	$18.20	$404,818
3Q2001	524,538	19.28	7,319,128	18.43	$445,857
4Q2001	455,980	19.39	8,841,450	18.59	$364,784
Totals	1,291,370		$24,843,697		$1,215,460

This decision will not significantly affect either the quality of the human environment or the conservation of energy resources.

Commissioner Morgan, commenting:

This is likely to be the last major rail rates decision on which I will vote as a Member of the Surface Transportation Board. In the recent past, and for the foreseeable future, rate cases have been and will continue to be among the most important matters the agency handles. Therefore, I believe that it is appropriate for me to reflect here on where we started out, where we are now, and how we got here.

Nearly all of the agency's rate decisions have been processed under the 1985 "Coal Rate Guidelines." The Coal Rate Guidelines are, as their name indicates, guidelines. What that means is that they established general principles about how rate cases should be decided, with the details to be filled in on a case-by-case basis. When I came to the Interstate Commerce Commission in 1994, parties still did not really know just how the guidelines would be implemented, as hardly any such cases had been decided. Therefore, one of my priorities was to process these cases with a view toward providing some certainty about what the parties could do in constructing a SAC case, and what they could not do.

We have made much progress in this regard. Beginning with the 1994 "Nevada Power" case, we have allowed shippers to develop stand-alone railroads that differed from the existing carriers in various ways. For example, shippers may take advantage of existing traffic densities by including in their presentations "cross-over" traffic, that is, traffic that would move partly on the stand-alone railroad and partly on the defendant carrier's remaining system. Our approach has been that shippers may develop systems uniquely designed to maximize efficiency – even though they would operate differently from the way the subject railroad actually operates – as long as the hypothetical operations are realistic. But as we said in the "McCarty Farms" case, SAC principles do not permit shippers to construct hypothetical railroads whose operations are premised on assumptions that would simply not be feasible in the real world.

Today we are voting on the "PPL Montana" and "TMPA" cases. Both decisions, which I fully support, continue the process of ruling, once concrete proposals are put before us, on where to draw lines in the hypothetical world of SAC and SARRs. In PPL Montana, we hold that the cross-subsidy principle that is at the heart of SAC goes in both directions, and that no shipper should really be expected to pay for facilities that it would not use. And in TMPA, we continue to hold that a shipper is not always bound by the way traffic currently moves, and that a shipper may depart from existing transportation contracts in setting up its SARR; but when its SAC presentation would require connecting railroads to change the way they operate, we must take a hard look at what the real-world implications would be. That certainly makes sense; as we have said all along, even though SAC principles permit shippers to construct hypothetical railroads, the assumptions as to how the stand-alone railroad and its connecting carriers would act must be reasonable. I cannot predict how far reaching our rerouting analysis will be, but I suspect, as the decision suggests, that it will be difficult in the future for a shipper to justify major off-SARR changes on operational grounds (and perhaps even on economic grounds). But that, of course, is a matter that will be decided within the factual context of future cases under the same principles we have been following since 1994.

These are important cases. I am pleased to have had the opportunity to help clarify the rules of the road so that the parties will have more certainty as they pursue their commercial dealings in the private sector.

It is ordered:

1. Defendant shall, within 60 days, establish and maintain a rate for movements of the issue traffic from the Caballo Rojo and Cordero mines that does not exceed the maximum reasonable rate prescribed by this decision.

2. Defendant shall pay reparations and interest, in accordance with this decision, for all TMPA shipments from the Caballo Rojo and Cordero mines

covered by the complaint that moved prior to the establishment of a reasonable rate pursuant to ordering paragraph 1.

3. This decision is effective 30 days from the service date.

By the Board, Chairman Nober and Commissioner Morgan.

APPENDIX A – R/VC CALCULATIONS FOR TMPA TRAFFIC

In its complaint, TMPA challenges BNSF's rate for unit-train movements of coal from the Wyoming PRB mines of Antelope, Caballo Rojo, Cordero, and Jacobs Ranch to its Gibbons Creek power plant. BNSF argues that, for certain time periods, the revenues generated by TMPA's traffic have not met the statutory threshold for regulatory review, which is 180% of the variable costs of providing the service at issue. 49 U.S.C. 10707(d)(1)(A).

Initially, we note that no shipments moved under the challenged rate from either the Antelope or Jacobs Ranch mines before the record was developed in this case. Thus, there is insufficient information to develop the variable costs associated with serving these two origins, although TMPA's complaint and SAC analysis embrace movements from the Antelope and Jacobs Ranch mines. If TMPA should originate coal from either the Antelope or Jacobs Ranch mine in the future, the parties should use the procedures and findings in this appendix to calculate the variable costs associated with serving these mines to determine whether that service is subject to our rate regulation and our rate prescription.

The variable cost evidence associated with serving the Cordero and Caballo Rojo mines was developed for those time periods for which actual data on movements under the challenged rates were available—the 2nd, 3rd and 4th quarters of 2001. The parties' evidence and our findings are summarized in Table A-1. Based on the record before us, we find that for shipments from the Cordero and Caballo Rojo mines the challenged rates produce R/VC percentages that exceed the 180% R/VC threshold.

Table A-1
Variable Costs and R/VC Percentages

	BNSF		TMPA		STB	
	Var. Cost	**R/VC**	**Var. Cost**	**R/VC**	**Var. Cost**	**R/VC**
CABALLO ROJO						
2nd Qtr 2001	$11.61	172.14%	$7.75	246.32%	$9.78	195.19%
3rd Qtr 2001	$11.21	173.07%	$7.67	251.37%	$9.83	196.13%
4th Qtr 2001	$10.84	180.88%	$7.49	258.88%	$9.42	205.84%
CORDERO						
2nd Qtr 2001	$10.90	175.14%	$7.67	248.89%	$9.59	199.06%
3rd Qtr 2001	$10.94	176.23%	$7.59	254.02%	$9.63	200.21%
4th Qtr 2001	$10.77	180.04%	$7.42	261.32%	$9.46	204.97%

A. GENERAL COST ESTIMATION PROCEDURES

URCS is the cost accounting tool that we use to estimate variable costs. URCS reflects the extent to which different types of railroad costs have been found to change in direct relation to changes in output. Each year, we use cost and accounting statistics from each Class I railroad's Annual Report (STB Form R-1), Carload Waybill Sample, Annual Report of Cars Loaded and Terminated (STB Form 54), and Report of Freight Commodity Statistics (STB Form QCS) to determine the URCS system-average variable costs for each carrier. Here, the most recent data available are for 2000.[76] Thus, we use the BNSF 2000 URCS numbers as the starting point to develop the variable costs associated with providing coal transportation for TMPA.

[76] Final URCS numbers for any given calendar year are generally available in the second half of the following year. In 2001, there were unanticipated problems in assembling and verifying the cost data. As a result, the final BNSF numbers for 2000 were not available until January 15, 2002. In many instances, the parties were able to incorporate the final numbers in their rebuttal evidence. Where the parties relied on preliminary 2000 URCS data, we have restated the evidence to reflect the final numbers.

As a general matter, although both parties use BNSF's 2000 URCS costs, BNSF would adjust the URCS general overhead markup ratio for return on investment (ROI)[77] to exclude expenses recorded in its R-1 report in Account 76 (interest during construction) and to include expenses recorded in Account 90 (construction in progress) so that it can earn the full cost of capital on that investment. BNSF contends that, in *Standards & Procedures for the Establishment of Adequate Railroad Revenue Levels*, 358 I.C.C. 844, 881-82 (1978) (*Standards*), the ICC found it appropriate, for purposes of evaluating the earnings of a railroad, to reflect short-term construction projects in the carrier's investment base by including the investments in Account 90, thereby allowing the railroad to earn a return on those investments.[78] BNSF further notes that the inclusion of Account 90 has been accepted in several rail rate complaint cases.[79]

TMPA argues that BNSF is entitled only to recover the interest paid on the construction loan, not a full cost-of-capital rate of return on projects not yet completed and assets not yet dedicated to public service. TMPA maintains that, since the adoption of URCS, all rate proceedings have included Account 76 in the variable cost calculations and excluded Account 90.

Contrary to TMPA's assertion, treatment of Accounts 76 and 90 has varied. In *FMC* and *WPL*, we stated that a full return on Account 90 investment should not be substituted for Account 76 expenses unless it is shown that the construction projects contained in Account 90 are of a relatively short duration, so that the investment would soon be dedicated to public service. But as BNSF notes, in other cases the substitution of Account 90 for Account 76 has been allowed, on the premise that rail construction projects are by nature generally of relatively short duration.[80] We therefore agree with BNSF that the longstanding precedent is that substitution of Account 90 for Account 76 is appropriate in rate cases unless the construction projects included in Account 90 are long-term in nature such that they will not be available for transportation service for an extended period of time. Here, BNSF has provided evidence that its Account 90

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[77] The overhead ratio allocates unassignable investment costs among all categories of investment and therefore affects many different variable cost categories.

[78] To avoid a double counting of ROI expenses, Account 76 expenses (which compensates a carrier for the cost of raising funds for the construction project) would have to be excluded; otherwise it would duplicate the return a carrier is allowed to earn on investment in its rate base.

[79] *See Georgia Power Co. v. Southern Ry.*, Docket No. 40581 (ICC served November 8, 1993) (*Georgia Power*); *West Texas*; *Arizona Pub. Serv. Co. v. Atchison, T.&S.F. Ry.*, 2 S.T.B. 367 (1997) (*Arizona*).

[80] *Standards*, 358 I.C.C. at 882.

expenses involve only short-term construction projects. Thus, we make the substitution.

B. MOVEMENT-SPECIFIC ADJUSTMENTS

Because a carrier's system-wide average costs are not necessarily representative of the costs of providing a particular service, movement-specific adjustments are sometimes introduced into evidence to better reflect the variable costs attributable to providing that service. We evaluate each proposed adjustment to determine whether it is supported by reliable evidence and whether it produces costs more reflective of the service at issue than system-average costs.[81]

Tables A-2 and A-3 show the various service units and operating characteristics we use to develop the variable costs associated with transporting TMPA's traffic. As explained below, where the parties disagree on elements of the service units and operating characteristics, their differences are minor.

[81] We have noticed that the spreadsheets used to develop movement-specific adjustments have become more complex and detailed. Given the size of the record in SAC rate cases, the complexity of these cases, and our statutory deadlines for resolving them, the proponent of a particular adjustment must fully explain the rationale for any adjustment and not rely upon our staff to determine the basis for it in reviewing the electronic spreadsheets.

Table A-2
Traffic Statistics
Caballo Rojo Movement

ITEM	2nd Qtr. 2001	3rd Qtr. 2001	4th Qtr. 2001
1. Lading Weight (Tons)	120.4	119.6	121.4
2. Tare Weight (Tons)	21.9	21.9	21.9
3. Cars Per Train	117.5	118.4	118.0
4. Loaded Miles	1,413.80	1,413.80	1,413.80
5. Empty Miles	1,416.50	1,416.50	1,416.50
6. Round Trip Miles	2,830.30	2,830.30	2,830.30
7. Origin Loop Miles – Loaded	2.31	2.31	2.31
8. Origin Loop Miles – Empty	2.15	2.15	2.15
9. Destination Loop Miles – Loaded	9.10	9.10	9.10
10. Destination Loop Miles – Empty	9.83	9.83	9.83
11. Round Trip Miles (incl. loop track)	2,853.69	2,853.69	2,853.69
12. Locomotive Units	3.00	3.00	3.00
13. Cycle Hours	228	237	220
14. Sw. - Yd. Loco. (SEM/Car)	1.33787	1.32770	1.33220
15. Sw. - Rd. Loco, non-yd (SEM/Car)	0.88681	0.88007	0.88305
16. Sw. - Rd. Loco, yd (SEM/Car)	0	0	0
17. Gross Ton Miles	232,205.09	231,074.05	233,618.89
18. Train-Miles Per Car	24.2867	24.1021	24.1838
19. Locomotive Unit-Miles Per Car	72.2124	71.6636	71.9063
20. Total All Freight Car Miles (000)	8,930,918	8,930,918	8,930,918

Table A-3
Traffic Statistics
Cordero Movement

ITEM	2nd Qtr. 2001	3rd Qtr. 2001	4th Qtr. 2001
1. Lading Weight (Tons)	120.8	120.9	120.5
2. Tare Weight (Tons)	21.9	21.9	21.9
3. Cars Per Train	118.0	117.5	118.0
4. Loaded Miles	1,407.80	1,407.80	1,407.80
5. Empty Miles	1,411.70	1,411.70	1,411.70
6. Round Trip Miles	2,819.50	2,819.50	2,819.50
7. Origin Loop Miles – Loaded	2.36	2.36	2.36
8. Origin Loop Miles – Empty	3.20	3.20	3.20
9. Destination Loop Miles – Loaded	9.10	9.10	9.10
10. Destination Loop Miles – Empty	9.83	9.83	9.83
11. Round Trip Miles (incl. loop track)	2,843.99	2,843.99	2,843.99
12. Locomotive Units	3.00	3.00	3.00
13. Cycle Hours	219	227	227
14. Sw. - Yd. Loco. (SEM/Car)	1.33220	1.33787	1.33220
15. Sw. - Rd. Loco, non-yd (SEM/Car)	0.88305	0.88681	0.88305
16. Sw. - Rd. Loco, yd (SEM/Car)	0	0	0
17. Gross Ton Miles	231,809.29	231,950.07	231,386.95
18. Train-Miles Per Car	24.1016	24.2041	24.1016
19. Locomotive Unit-Miles Per Car	71.6094	71.9141	71.6095
20. Total All Freight Car Miles (000)	8,930,918	8,930,918	8,930,918

1. Service Units and Operating Statistics (Items 1-3, 12-13, and 17-20)

BNSF used movement data for only the last three quarters of 2001, which is when TMPA's traffic moved under the challenged rate that year. TMPA argues that, to account for seasonal influences, the operating statistics and service units from all four quarters of 2001 should be used to develop annual averages.

We have previously rejected attempts to use a 1-year average rather than actual data for individual quarters,[82] as variable costs are generally computed on a quarterly basis. The service units for individual quarters reflect any seasonal variations that occur within a quarter and produce the most accurate results for each quarter. Moreover, in this case inclusion of data for the 1st quarter of 2001 (when TMPA's traffic was moving under a contract rate) could inappropriately skew the data, as the service characteristics of the contract movements differed from those of the common carriage movements.[83] Therefore, for Items 1-3, 12-13 and 17-20 in Table A-2 and A-3, we use BNSF's evidence.

2. Mileages (Items 4-6, 11)

Although the parties' opening presentations differed with respect to certain mileages, subsequent evidentiary submissions resolved the majority of these initial differences.[84] The only remaining difference between the parties' mileage calculations is attributable to TMPA's inclusion of data on movements from the 1st quarter of 2001, which reflect a different route for some of the traffic transported under contract. Thus, to the extent that the parties differ on mileages, we use BNSF's evidence.

3. Yard and Road Locomotive Switching (Items 14 and 15)

Both road and yard locomotives perform a variety of switching services for TMPA's traffic. Neither party relies on BNSF's system-average switch engine

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[82] *See WPL*, 5 S.T.B. at 991.

[83] For example, the contract traffic often moved from the PRB through Donkey Creek, WY, but since the common carriage rates went into effect no loaded TMPA trains have moved through Donkey Creek.

[84] BNSF accedes to TMPA's procedure for calculating origin loop track mileage and acknowledges that its initial evidence transposed loaded and empty mileages. TMPA accedes to BNSF's calculation of destination loop track mileages.

minutes (SEM) per car. Rather, both parties estimated the SEM and the number of switches associated with TMPA's traffic, compiling the SEM for each of the various switching activities to arrive at a single SEM per car figure.

a. Bad-Order Cars (SEM per Car)

Rail cars with mechanical defects (bad-order cars) are switched out of TMPA's coal trains for repairs by both road and yard locomotives. After being repaired, the cars are placed into trains (inter/intratrain (I&I) switching) for return to the Guernsey or Alliance yards, where the cars are placed back into service in coal trains. While the parties agree on the number of bad-order cars that were switched out of and into trains, they disagree on the amount of time it takes to switch a bad-order car at various locations and the average number of I&I switches needed to return the cars to the Guernsey or Alliance yards. Both parties' time estimates[85] are based solely on the opinions of their respective witnesses, as are their estimates of the number of I&I switches.[86] No study of TMPA's traffic was undertaken by either party to sample the time and frequency of the switching associated with bad-order cars.

We accept adjustments to the inputs used to develop URCS system-average costs only when it is shown that an adjustment produces numbers that better reflect the movement at issue. In this case, because neither party's estimate is based on empirical observations for switching bad-order cars, we use BNSF 2000 URCS system-average SEM per car and the number of I&I switches assumed by URCS.

b. Yard Switching (SEM per Train)

Based on a 1989 study at Guernsey, BNSF assigns 50.19 SEM per train for switching cars into trains and repositioning locomotives within a train. TMPA does not include any time for these activities, arguing that the time associated with switching cars is already reflected in bad-order switching and that the

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[85] BNSF estimates that it takes 40 minutes to switch a bad-order car out of a train at the mines or destination, and 20 minutes to switch a car out of or into a train at the Guernsey or Alliance yards. TMPA estimates that it takes 30 minutes to switch cars at the mines or destination, and 15 minutes to switch a bad-order car out of a train at the yards and 4.65 minutes to switch a repaired car into a train.

[86] BNSF estimates that, on average, five I&I switches are required to return a car to the yards, whereas TMPA estimates that it takes only three such switches. Both parties use the system-average time (1.38 SEM per car) for each I&I switch.

repositioning of locomotives is accounted for in the cycle time calculation. Further, TMPA contends that the 1989 study is inapplicable to current operations at the Guernsey yard.

We reject BNSF's evidence. BNSF made no attempt to determine the switching that takes place on TMPA trains at Guernsey. Rather, it simply relies on a 1989 study to estimate the total amount of time associated with yard switching, with no attempt to show that the study is applicable to its current operations. Moreover, BNSF has failed to explain why the time provided to switch repaired bad-order cars back into trains at the yard (developed in Bad-Order Cars, *supra*) does not account for a portion of the time it estimates is associated with switching at Guernsey. Thus, we include no additional time for these activities.

c. Distributed Power Locomotives (SEM per Train)

In providing service to TMPA's Gibbons Creek plant, distributed power (DP) road locomotives are sometimes switched out of the train on arrival and reattached prior to departing the plant. BNSF includes 90 SEM per train for switching DP locomotives, based on its witness' claim that this operation takes 1.5 to 2 hours. TMPA notes that BNSF did not provide any documentation or other empirical evidence to support the 90-minute estimate. TMPA assigns 27.21 SEM per train, based on its Unloading Reports for 2001, which show that DP switching occurred 44.6% of the time, and that the average time uncoupling and reattaching the locomotive was 28 and 33 minutes, respectively.[87]

BNSF argues that TMPA's Unloading Reports are designed to register events of significance to the utility but are not meant to track the operational details of BNSF's actions. However, BNSF offered no probative evidence supporting its estimates of time associated with switching of DP locomotives at Gibbons Creek. Thus, the only supported evidence is that provided by TMPA, and we use TMPA's numbers on this issue.

C. VARIABLE COSTS

Tables A-4 through A-9 show the variable cost calculations of the parties, and our findings, by mine and quarter. The parties agree on the expenses associated with variable cost Items 1 and 5. As explained below (following

[87] (28 min. + 33 min.) x .446 = 27.21 min.

Tables A-4 through A-9), for Items 2, 14 and 20, we use TMPA's evidence. For Items 8, 17 and 19, we use BNSF's evidence. Our figures for Items 3, 4, 6, 7, 9-13, 15-16 and 18 differ from both parties' estimates.

Table A-4
Variable Cost Per Ton
Caballo Rojo Movement
(2nd Quarter 2001)

ITEM	TMPA	BNSF	STB
1. Carload O/T Clerical Expense	$5.60	$5.60	$5.60
2. Carload Handling – Other Expense	0.74	1.63	0.74
3. Switching Exp – Yard Locomotives	2.31	6.93	0.28
4. Switching Exp – Road Locos (Non-Yard)	0.43	1.21	1.18
5. Switching Exp – Road Locos (Yard)	0.00	0.00	0.00
6. Gross Ton-Mile Expense (GTM)	354.19	573.13	449.51
7. Loop Track Expense – Origin & Destination	1.91	2.76	2.76
8. Train-Mile Expense – Other than Crew	6.44	6.48	6.48
9. Train-Mile Expense – Train & Engine Crew	148.32	175.30	169.15
10. Helper Service Expense – Other than Crew	3.51	4.39	4.00
11. Helper Service Expense – T&E Crew	5.19	10.88	8.14
12. Locomotive Unit-Mile Expense	118.28	165.88	165.62
13. Locomotive Ownership Expense	106.9	176.98	168.94
14. User Responsibility for Car Repair Expense	0.00	3.05	0.00
15. Car Ownership Expense	114.11	131.05	125.09
16. Car Operating Expense	46.72	52.51	52.35
17. Caboose & EOTD Ownership Expense	0.14	0.21	0.21
18. Joint Facility Payment	21.97	24.89	24.80
19. Third-Party Loading Crew Expense	0.59	0.00	0.00
20. Loss and Damage Expense	0.37	0.35	0.37
21. Total Variable Cost Per Carload	$937.72	$1,343.23	$1,185.20
22. Variable Costs Per Ton	$7.80	$11.16	$9.84
23. RFA – URCS Linking Factor	0.9934	0.9934	0.9934
24. Linked Variable Cost Per Ton (L.22 x L.23)	$7.75	$11.09	$9.78
25. Jurisdictional Threshold (L.24 x 180%)	$13.95	$19.96	$17.60
26. Rate Per Ton	$19.09	$19.09	$19.09
27. R/VC Percentage (L.26/L.24)	246.32%	172.14%	195.19%

Table A-5
Variable Cost Per Ton
Cordero Movement
(2nd Quarter 2001)

ITEM	TMPA	BNSF	STB
1. Carload O/T Clerical Expense	$5.60	$5.60	$5.60
2. Carload Handling – Other Expense	0.74	1.63	0.74
3. Switching Exp – Yard Locomotives	2.31	6.90	0.28
4. Switching Exp – Road Locos (Non-Yard)	0.43	1.21	1.17
5. Switching Exp – Road Locos (Yard)	0.00	0.00	0.00
6. Gross Ton-Mile Expense (GTM)	348.80	571.18	446.86
7. Loop Track Expense – Origin & Destination	1.91	2.82	2.82
8. Train-Mile Expense – Other than Crew	6.43	6.43	6.43
9. Train-Mile Expense – Train & Engine Crew	148.14	174.47	168.10
10. Helper Service Expense – Other than Crew	3.52	4.39	3.99
11. Helper Service Expense – T&E Crew	5.20	10.83	8.10
12. Locomotive Unit-Mile Expense	115.20	163.82	163.55
13. Locomotive Ownership Expense	108.18	169.27	161.57
14. User Responsibility for Car Repair Expense	0.00	3.04	0.00
15. Car Ownership Expense	115.17	125.88	120.15
16. Car Operating Expense	46.62	51.81	51.64
17. Caboose & EOTD Ownership Expense	0.14	0.20	0.20
18. Joint Facility Payment	21.99	24.90	24.81
19. Third-Party Loading Crew Expense	0.62	0.00	0.00
20. Loss and Damage Expense	0.37	0.35	0.37
21. Total Variable Cost Per Carload	$931.36	$1,324.73	$1,166.38
22. Variable Costs Per Ton	$7.72	$10.97	$9.66
23. RFA – URCS Linking Factor	0.9934	0.9934	0.9934
24. Linked Variable Cost Per Ton (L.22 x L.23)	$7.67	$10.90	$9.59
25. Jurisdictional Threshold (L.24 x 180%)	$13.81	$19.62	$17.26
26. Rate Per Ton	$19.09	$19.09	$19.09
27. R/VC Percentage (L.26/L.24)	248.89%	175.14%	199.06%

Table A-6
Variable Cost Per Ton
Caballo Rojo Movement
(3rd Quarter 2001)

ITEM	TMPA	BNSF	STB
1. Carload O/T Clerical Expense	$5.58	$5.58	$5.58
2. Carload Handling – Other Expense	0.73	1.62	0.73
3. Switching Exp – Yard Locomotives	2.29	6.85	0.28
4. Switching Exp – Road Locos (Non-Yard)	0.42	1.20	1.17
5. Switching Exp – Road Locos (Yard)	0.00	0.00	0.00
6. Gross Ton-Mile Expense (GTM)	348.54	567.23	444.28
7. Loop Track Expense – Origin & Destination	1.84	2.70	2.70
8. Train-Mile Expense – Other than Crew	6.41	6.40	6.40
9. Train-Mile Expense – Train & Engine Crew	149.76	173.96	168.09
10. Helper Service Expense – Other than Crew	3.41	4.32	3.94
11. Helper Service Expense – T&E Crew	5.24	10.88	8.14
12. Locomotive Unit-Mile Expense	114.39	162.79	162.53
13. Locomotive Ownership Expense	105.89	180.58	172.37
14. User Responsibility for Car Repair Expense	0.00	3.04	0.00
15. Car Ownership Expense	113.61	135.62	129.46
16. Car Operating Expense	46.53	52.85	52.69
17. Caboose & EOTD Ownership Expense	0.14	0.21	0.21
18. Joint Facility Payment	22.15	24.84	24.75
19. Third-Party Loading Crew Expense	0.59	0.00	0.00
20. Loss and Damage Expense	0.37	0.35	0.37
21. Total Variable Cost Per Carload	$927.88	$1,341.01	$1,183.69
22. Variable Costs Per Ton	$7.72	$11.21	$9.90
23. RFA – URCS Linking Factor	0.9934	0.9934	0.9934
24. Linked Variable Cost Per Ton (L.22 x L.23)	$7.67	$11.14	$9.83
25. Jurisdictional Threshold (L.24 x 180%)	$13.81	$20.05	$17.69
26. Rate Per Ton	$19.28	$19.28	$19.28
27. R/VC Percentage (L.26/L.24)	251.37%	173.07%	196.13%

Table A-7
Variable Cost Per Ton
Cordero Movement
(3rd Quarter 2001)

ITEM	TMPA	BNSF	STB
1. Carload O/T Clerical Expense	$5.58	$5.58	$5.58
2. Carload Handling – Other Expense	0.73	1.62	0.73
3. Switching Exp – Yard Locomotives	2.29	6.91	0.28
4. Switching Exp – Road Locos (Non-Yard)	0.42	1.20	1.18
5. Switching Exp – Road Locos (Yard)	0.00	0.00	0.00
6. Gross Ton-Mile Expense (GTM)	343.34	568.41	444.07
7. Loop Track Expense – Origin & Destination	1.84	2.78	2.78
8. Train-Mile Expense – Other than Crew	6.40	6.43	6.43
9. Train-Mile Expense – Train & Engine Crew	149.58	175.21	169.04
10. Helper Service Expense – Other than Crew	3.42	4.35	3.96
11. Helper Service Expense – T&E Crew	5.25	10.96	8.20
12. Locomotive Unit-Mile Expense	111.46	162.67	162.41
13. Locomotive Ownership Expense	107.15	174.28	166.36
14. User Responsibility for Car Repair Expense	0.00	3.03	0.00
15. Car Ownership Expense	114.67	129.91	124.00
16. Car Operating Expense	46.42	52.09	51.92
17. Caboose & EOTD Ownership Expense	0.14	0.21	0.21
18. Joint Facility Payment	22.17	24.91	24.82
19. Third-Party Loading Crew Expense	0.62	0.00	0.00
20. Loss and Damage Expense	0.37	0.35	0.37
21. Total Variable Cost Per Carload	$921.85	$1,330.89	$1,172.34
22. Variable Costs Per Ton	$7.64	$11.01	$9.70
23. RFA – URCS Linking Factor	0.9934	0.9934	0.9934
24. Linked Variable Cost Per Ton (L.22 x L.23)	$7.59	$10.94	$9.63
25. Jurisdictional Threshold (L. 24 x 180%)	$13.66	$19.69	$17.33
26. Rate Per Ton	$19.28	$19.28	$19.28
27. R/VC Percentage (L.26/L.24)	254.02%	176.23%	200.21%

Table A-8
Variable Cost Per Ton
Caballo Rojo Movement
(4th Quarter 2001)

ITEM	TMPA	BNSF	STB
1. Carload O/T Clerical Expense	$5.39	$5.53	$5.53
2. Carload Handling – Other Expense	0.71	1.60	0.73
3. Switching Exp – Yard Locomotives	2.23	6.82	0.28
4. Switching Exp – Road Locos (Non-Yard)	0.40	1.16	1.17
5. Switching Exp – Road Locos (Yard)	0.00	0.00	0.00
6. Gross Ton-Mile Expense (GTM)	339.21	564.73	440.56
7. Loop Track Expense – Origin & Destination	1.77	2.61	2.61
8. Train-Mile Expense – Other than Crew	6.20	6.38	6.38
9. Train-Mile Expense – Train & Engine Crew	149.77	174.21	167.87
10. Helper Service Expense – Other than Crew	3.30	4.22	3.83
11. Helper Service Expense – T&E Crew	5.24	10.92	8.17
12. Locomotive Unit-Mile Expense	110.25	157.81	157.56
13. Locomotive Ownership Expense	103.94	166.01	158.46
14. User Responsibility for Car Repair Expense	0.00	3.01	0.00
15. Car Ownership Expense	109.87	124.81	119.13
16. Car Operating Expense	44.96	51.34	51.18
17. Caboose & EOTD Ownership Expense	0.12	0.19	0.19
18. Joint Facility Payment	22.15	24.93	24.84
19. Third-Party Loading Crew Expense	0.59	2.73	2.73
20. Loss and Damage Expense	0.36	0.35	0.37
21. Total Variable Cost Per Carload	$906.46	$1,309.37	$1,151.59
22. Variable Costs Per Ton	$7.54	$10.79	$9.49
23. RFA – URCS Linking Factor	0.9934	0.9934	0.9934
24. Linked Variable Cost Per Ton (L.22 x L.23)	$7.49	$10.72	$9.42
25. Jurisdictional Threshold (L.24 x 180%)	$13.48	$19.30	$16.96
26. Rate Per Ton	$19.39	$19.39	$19.39
27. R/VC Percentage (L.26/L.24)	258.88%	180.88%	205.84%

Table A-9
Variable Cost Per Ton
Cordero Movement
(4th Quarter 2001)

ITEM	TMPA	BNSF	STB
1. Carload O/T Clerical Expense	$5.39	$5.53	$5.53
2. Carload Handling – Other Expense	0.71	1.60	0.73
3. Switching Exp – Yard Locomotives	2.23	6.82	0.28
4. Switching Exp – Road Locos (Non-Yard)	0.40	1.16	1.17
5. Switching Exp – Road Locos (Yard)	0.00	0.00	0
6. Gross Ton-Mile Expense (GTM)	334.18	558.42	434.49
7. Loop Track Expense – Origin & Destination	1.77	2.68	2.68
8. Train-Mile Expense – Other than Crew	6.19	6.35	6.35
9. Train-Mile Expense – Train & Engine Crew	149.59	168.66	162.62
10. Helper Service Expense – Other than Crew	3.31	4.22	3.83
11. Helper Service Expense – T&E Crew	5.25	10.92	8.17
12. Locomotive Unit-Mile Expense	107.43	156.53	156.27
13. Locomotive Ownership Expense	105.17	171.29	163.50
14. User Responsibility for Car Repair Expense	0.00	3.00	0.00
15. Car Ownership Expense	110.89	128.77	122.92
16. Car Operating Expense	44.86	51.64	51.47
17. Caboose & EOTD Ownership Expense	0.13	0.19	0.19
18. Joint Facility Payment	22.17	24.89	24.80
19. Third-Party Loading Crew Expense	0.62	2.71	2.71
20. Loss and Damage Expense	0.36	0.35	0.37
21. Total Variable Cost Per Carload	$900.65	$1,305.72	$1,148.09
22. Variable Costs Per Ton	$7.47	$10.84	$9.53
23. RFA – URCS Linking Factor	0.9934	0.9934	0.9934
24. Linked Variable Cost Per Ton (L.22 x L.23)	$7.42	$10.77	$9.46
25. Jurisdictional Threshold (L.24 x 180%)	$13.36	$19.39	$17.03
26. Rate Per Ton	$19.39	$19.39	$19.39
27. R/VC Percentage (L.26/L.24)	261.32%	180.04%	204.97%

1. Carload Handling – Other Expense (Item 2)

BNSF relies on system-average unit costs to determine TMPA's variable expenses for carload handling. TMPA objects to the inclusion of expenses reflected in the system average that are associated with equipment or services not used by TMPA, such as expenses for cleaning car interiors and for car loading devices and grain doors. As we have found in other cases,[88] the costs excluded by TMPA are clearly not associated with the transportation of coal. Thus, they do not relate to BNSF's provision of service to TMPA, and we use TMPA's evidence.

2. Switching Expense – Yard and Road Locomotives (Items 3 and 4)

As discussed in Yard and Road Locomotive Switching, *supra*, we reject both parties' estimates of SEM associated with switching bad-order cars; we reject BNSF's SEM associated with yard switching at Guernsey; and we accept TMPA's evidence regarding SEM associated with the switching of DP locomotives at Gibbons Creek. Accordingly, we restate the parties' switching costs for this variable cost item based on those findings.

3. Gross Ton-Mile Expense (Item 6)

As part of their gross ton-mile (GTM) expense calculations, the parties include costs for MOW, ROI and depreciation for road property, locomotive fuel, locomotive maintenance, and other miscellaneous expenses. As discussed below, the parties' GTM expenses differ significantly. Tables A-10 and A-11 summarize the GTM expenses included in our restatement for the Caballo Rojo and Cordero movements, respectively.

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[88] *See*, *e.g.*, *WPL*, 5 S.T.B. at 998; *FMC*, 4 S.T.B. at 765.

Table A-10
GTM Per Car Expense
Caballo Rojo Movement

Category	2nd Qtr 2001	3rd Qtr 2001	4th Qtr 2001
Maintenance-of-Way Expense	$83.84	$83.09	$83.26
Road Property ROI	87.60	87.18	88.14
Road Property Depreciation	61.04	60.49	60.63
Locomotive Fuel Expense	112.30	109.76	104.51
Locomotive Maintenance Expense	33.92	33.60	33.69
Other GTM Expense	70.81	70.16	70.33
TOTAL	**$449.51**	**$444.28**	**$440.56**

Table A-11
GTM Per Car Expense
Cordero Movement

Category	2nd Qtr 2001	3rd Qtr 2001	4th Qtr 2001
Maintenance-of-Way Expense	$83.69	$83.38	$82.44
Road Property ROI	86.71	86.76	86.55
Road Property Depreciation	60.71	60.49	59.82
Locomotive Fuel Expense	111.46	109.53	102.92
Locomotive Maintenance Expense	33.86	33.74	33.35
Other GTM Expense	70.43	70.17	69.41
TOTAL	**$446.86**	**$444.07**	**$434.49**

a. Maintenance-of-Way Costs

For variable MOW costs BNSF relies on URCS system-average cost. TMPA argues that the SFGT model, which has been accepted in previous rail rate reasonableness cases, develops MOW costs more specific to TMPA's traffic than URCS system-average cost data. BNSF contends that the SFGT model is outdated and thus does not produce reliable estimates of MOW costs. We agree that the SFGT model, derived in the 1970s, reflects railroad accounting and maintenance practices of the period 1950-1970, while present-day railroad accounting and maintenance practices bear little resemblance to those of 30 to 50 years ago.

In a 1986 rate case, the ICC accepted the SFGT model as a reliable estimate of 1978 MOW expenses. *San Antonio, TX, Acting By and Through Its City Pub. Serv. Bd. v. Burlington N.R.R.*, ICC Docket No. 36180 (ICC served April 11, 1986) (SFGT-calculated MOW costs were shown to be within 8% of BNSF's actual 1978 MOW expenditures, whereas system-average costs produced by Rail Form A (the predecessor to URCS) were 55% greater than actual costs). Based on that showing, the ICC began to favor use of the SFGT model over system-average MOW costs in rate cases.[89] And in rate cases filed in the mid-1990s, both the railroads and shippers used the SFGT model to develop adjusted variable MOW expenses.[90]

More recently, defendant railroads began to object to continued use of the SFGT model. But they argued for making a different adjustment to URCS system-average costs: using a "Weighted System-Average Cost" (WSAC) model, which produced variable MOW costs in excess of system-average variable MOW costs. In *FMC* (4 S.T.B. at 767), we rejected the WSAC model because the railroad had "not shown that WSAC is an appropriate tool for developing variable MOW costs for freight traffic." And again in *WPL* (5 S.T.B. at 1000), we rejected the WSAC model because the railroad had "submitted no data indicating that the WSAC results are comparable to actual MOW costs for any rail line."

Here, we are asked to compare SFGT not with WSAC, but with URCS. While we have previously regarded SFGT as an acceptable method for

[89] *See, e.g.*, *Bituminous Coal - Hiawatha, UT, to Moapa, NV*, 6 I.C.C. 2d 1 (1989); *Omaha Pub. Power District v. Burlington N.R.R.*, 3 I.C.C.2d 123, 150-151& n.48 (1986).

[90] *See Arizona*, 2 S.T.B. at 426; *West Texas*, 1 S.T.B. at 723.

estimating MOW variable costs,[91] we must now consider whether the SFGT model remains a reliable methodology to estimate variable MOW expenses more than 25 years after it was adopted.

As BNSF correctly observes, the rail industry has changed significantly since the SFGT was developed, in the manner of accounting for MOW expenses, in maintenance practices, in traffic densities, and in the types of track materials used.[92] But SFGT has not been re-benchmarked to take into account these changes. And we do not have in this record the type of evidence that was presented in the 1986 case, showing that the SFGT model produces MOW expenses that are comparable to current actual MOW costs for any rail line. Accordingly, we are persuaded that the passage of time has rendered the SFGT formulas unreliable. Thus, just as we reject the BNSF's reliance on a dated study to estimate the time it takes to switch cars at the Guernsey yard (see Yard Switching, *supra*), we find that the information on which SFGT is based is too dated to be used. We therefore use the URCS system-average MOW unit costs, as the statute directs us to use unless we find another method preferable.[93]

b. Return on Road Property and Depreciation Expense

The parties use different procedures to estimate road property ROI and depreciation expenses. BNSF relies on URCS system-average costs for these expenses. TMPA contends that system-average ROI and depreciation unit costs should be reduced to reflect economies associated with traffic traveling over very

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[91] *See WPL*, 5 S.T.B. at 1000.

[92] As BNSF notes, in 1983 we changed the accounting system that is used by railroads from a retirement, replacement, and betterment (RRB) system to a depreciation accounting system, which treats a significantly greater portion of maintenance as capital cost rather than operating expense than did RRB. BNSF states that in 1978 the average rail line had 111-lb. rail, only 6% of which was continuous welded rail (CWR); by 1999, the average weight of rail was 125-lb., and 62% of that was CWR. And BNSF points out that industry maintenance practices have changed over the years, so that more of the maintenance that is being performed is planned maintenance that is capitalized under depreciation accounting.

[93] Because both TMPA and BNSF use actual joint-facility payments in developing MOW expense, BNSF's 2000 URCS system-average MOW unit cost (.00036969) must be adjusted to exclude the joint-facility charges. BNSF has eliminated the "Joint Facility - Debit Running" unit cost, but has failed to exclude "Joint Facility Rents - Debit" expenses (.0000038). To avoid a double-count, we exclude this expense from the MOW expense here.

high density lines.[94] TMPA develops movement-specific adjustments to the system-average costs using data from BNSF's Fixed Asset Data Base (FADB), which contains investment data for individual segments of the railroad. BNSF argues that use of its FADB numbers is inappropriate because those figures do not correlate to its R-1 annual report numbers, which are used as the basis for developing URCS system-average costs. Furthermore, BNSF claims that the FADB does not reflect investment in assets that are not assigned to any particular line segment.[95]

We find BNSF's arguments against the use of its FADB unpersuasive. Contrary to BNSF's arguments, FADB information appears to be compatible with the information in the R-1 reports. BNSF argues that, because the FADB investment figures used by TMPA are nearly 30% less than the total road property investment figures in its R-1 annual report, it is inappropriate to adjust URCS road property system-average costs using FADB data. However, the FADB used by TMPA includes only data for the 13 road property investment accounts that are used by URCS to develop ROI and depreciation variable costs.[96] Comparison of the FADB numbers used by TMPA to the corresponding 13 accounts in the R-1 report shows a close correspondence between the two sets of data. Indeed, BNSF has used the FADB data itself to propose adjustments to URCS system-average costs in prior cases.[97]

Moreover, contrary to the situation in *WPL*, where we found that unassigned investment was not reflected in the line segment investment data base at issue

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[94] On rebuttal, BNSF argues for the first time that an adjustment is inappropriate because variable expenses increase as a percent of total costs as densities exceed system-average levels. BNSF Reb. V.S. Fisher at 44-46. While BNSF's argument may have merit, we are unable to rule on it now because it is not fully supported, nor has TMPA had an opportunity to respond to this argument. As we have continually reiterated, it is inappropriate to introduce new evidence and arguments on rebuttal and we will not consider the material in such circumstances. *Procedures for Presenting Evidence in Stand-Alone Cost Rate Cases*, 5 S.T.B. 441 (2001) (*SAC Procedures*), at 445-46.

[95] The parties argue over the precedential value of our decision in *WPL*, 5 S.T.B. at 1019, where we rejected adjustments to URCS ROI and depreciation system-average costs and relied on system-average data. Our decision in *WPL* was case-specific and does not indicate a fundamental shift in our approach of accepting supported adjustments to URCS system-average costs.

[96] BNSF inappropriately compares the totals for these 13 accounts to the 30 road property accounts in the R-1 report, as the other 17 accounts are not used in the URCS calculation of ROI and depreciation.

[97] *See*, *e.g.*, *West Texas*, 1 S.T.B. at 724.

there,[98] BNSF's witness states that BNSF's investment costs that are not assignable to any particular segment are allocated across-the-board to all line segments in its system, based on the relative mileage of each line segment.[99] Thus, unassigned investments appear to be taken into account in the FADB. Therefore, we accept the procedure advocated by TMPA, although we correct it for one error.[100]

c. Locomotive Fuel Expense

To determine locomotive fuel expense, the parties agreed to conduct a study of locomotive fuel usage in a three-locomotive set (consist) using an event recorder. The event recorder documented the amount of time a locomotive consist operated at a particular throttle setting. Based on manufacturer-provided fuel consumption levels at different throttle settings,[101] an estimate of the gallons of fuel consumed in serving TMPA was then developed. TMPA made additional adjustments, however, and the parties also used different figures for the cost of fuel.

Because we are determining the variable costs associated with the provision of common carriage service, we do not accept TMPA's adjustments to the data to account for fuel consumption when the traffic moved under contract. In addition, given that the study was of three-locomotive consists, we exclude the few observations involving five-locomotive consists. Finally, we use the actual fuel prices paid by BNSF during the 2nd, 3rd and 4th quarters of 2001. We find

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[98] In *WPL*, there were also significant other problems with the parties' attempted adjustment of system-average ROI and depreciation unit costs that could not have been corrected. *See WPL* (decision on reconsideration served May 14, 2002) slip op. at 2, 15-18.

[99] BNSF Reply V.S. Elliott at 7.

[100] The error involves TMPA's calculation of depreciation expense for the movements from the Cordero and Caballo Rojo mines. In developing its adjustment ratio for depreciation, TMPA inappropriately included all annual depreciation charges. However, the URCS model divides depreciation expense into two categories (running and switching), and only the running portion is utilized in the calculation of the system-average depreciation unit cost per GTM. We have corrected TMPA's calculation accordingly, which results in revised depreciation adjustment factors for the Cordero and Caballo Rojo movements of 0.62467 and 0.62776, respectively. In addition, we accept TMPA's ROI adjustment factors of 0.43052 and 0.43423, respectively.

[101] The parties used slightly different manufacturer-provided fuel consumption rates. We cannot determine which are more appropriate. But TMPA relied on figures that were provided to it by BNSF in discovery, and it ought to be able to rely on such information. BNSF has not shown that the figure it used is superior. Therefore, we use the figure it provided to TMPA in discovery.

that actual 2001 prices are preferable to estimating fuel prices by indexing 2000 prices, as TMPA did in its evidence.

d. Locomotive Maintenance

New SD70MAC locomotives are used to handle 99.8 % of TMPA's movements. BNSF relies on URCS system-average figures for locomotive maintenance costs. TMPA developed locomotive maintenance costs based on BNSF's contract with General Motors' Electro-Motive Division (EMD), the manufacturer of the SD70MAC locomotives. BNSF points out, however, that many repair costs are not covered by the contract (such as costs incurred due to wrecks, derailments, vandalism, abuse, or running out of fuel).

We reject TMPA's evidence because it accounts for only the routine locomotive maintenance costs. As pointed out by BNSF, other, non-routine maintenance costs are incurred and must be accounted for in developing variable costs. Therefore, we use system-average locomotive maintenance costs that reflect all locomotive maintenance costs incurred by BNSF.

e. Other GTM Expense

This expense category includes costs for: maintaining locomotive repair shops and service facilities; locomotive administrative matters; locomotive equipment damage; small tools; work equipment and non-revenue equipment repair; and other casualty expenses. Both parties develop these expenses based on the URCS system-average costs, but they arrive at differing expense figures due to differences in GTM per car, the ROI general overhead ratio, and use of different preliminary BNSF 2000 URCS data. As discussed above, we accept BNSF's GTM per car and ROI general overhead ratio, and we use the final BNSF 2000 URCS data in our restatement.

4. Loop Track Expense (Item 7)

This expense reflects costs associated with running over the loop tracks at origin and destination. This composite expense includes fuel, locomotive maintenance, and other GTM expenses. We address these expenses in Gross Ton-Mile Expense, *supra*. In addition, loop track expenses include locomotive unit-mile (LUM) expenses, which are discussed *infra*. We apply our findings discussed in those sections to the loop track expense.

5. Train-Mile Expense – Other Than Crew (Item 8)

This expense includes road operations and ownership expense, track inspection expense, and caboose expense. The only disagreement on this item arises from the differences in the parties' treatment of Accounts 76 and 90 and the total round-trip miles. As discussed above, we use BNSF's evidence on both of these points.

6. Train-Mile Expense – Train & Engine Crew (Item 9)

The parties developed train and engine crew (T&E) costs based on the actual crew costs incurred in providing TMPA service. Although the parties used the same methodology, they arrived at slightly different numbers due to: (1) the use of T&E wages from different time periods; (2) the use of a different mark-up ratio; and (3) a disagreement on the number of loading crews required at Cordero and Caballo Rojo.

a. Movement-Specific Crew Wages

BNSF developed its estimate of crew wages based on data from the 2nd - 4th quarters of 2001, while TMPA used full-year 2001 data. As discussed above, we limit our variable cost analysis to the 2nd, 3rd, and 4th quarters of 2001. Therefore, BNSF's evidence is more appropriate.

b. Mark-Up Ratio

Both parties mark up crew wages to account for compensation paid by BNSF to crew personnel that is not assignable to any particular train, such as compensation for medical leave and vacations. BNSF developed its mark-up ratio using October 1999-October 2000 data, and applied the ratio to its 2001 T&E wage data. TMPA used data from the first 7 months of 2001 for its ratio.

TMPA argues that BNSF's mark-up ratio is inappropriate because it is based on data from incompatible time periods and because BNSF included costs for "deadheading" and "held-away-from-home" crew expenses in developing its ratio. TMPA asserts that costs associated with deadheading and held-away-from-home expenses are not incurred on TMPA traffic.

TMPA has presented no evidence to back up its claim that deadheading and held-away-from-home costs are not incurred on its traffic, even though they are generally incurred on traffic throughout BNSF's system. Furthermore, neither party developed a ratio for individual quarters of the year. A ratio representing an average for a full year is preferable to one including data for only 7 months of the year.

c. Loading Crews

In addition to normal crew costs, for the 2nd and 3rd quarters of 2001, BNSF included costs for special crews to load coal at the Cordero and Caballo Rojo mines.[102] TMPA examined BNSF's engineer records for each empty TMPA train and found that TMPA Cordero and Caballo Rojo trains required loading crews in 32% and 14% of their runs, respectively.[103] BNSF claims that the TMPA study does not include all of the relevant records. However, BNSF has not produced other relevant records or otherwise shown that TMPA's percentage for loading crews is understated.[104] Thus, TMPA has presented the only probative evidence of loading crew activities, and we use its evidence on the percentage of trains using special loading crews.

7. Helper Service (Items 10 and 11)

BNSF, which provides helper service to approximately 6-10 trains per day at Logan Hill, assigns one-third of the crew costs associated with this helper service to TMPA's movements. TMPA, noting that its trains are powered by three high-powered SD70MAC locomotives distributed throughout the trains, argues that helper service at Logan Hill is unnecessary.

Whether any particular train requires helper service depends on the locomotive tractive power employed, the trailing weight, and a host of other factors. BNSF has not shown that any TMPA trains require such service, and given that TMPA traffic represents only about 1% of the traffic moving over Logan Hill, BNSF's assignment of one-third of all helper service costs at Logan Hill is questionable. Thus, we reject BNSF's assignment of helper service cost to TMPA trains.

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[102] Beginning in the 4th quarter of 2001, BNSF paid a contractor to load coal. *See* Third-Party Loading Crew Expense, *infra*.

[103] *See* BNSF Reply e-W.P. "WG2001TK.DAT" and "WG2001AL.DAT."

[104] BNSF did not provide any 2001 data to support its position that special loading crews are required on all trains at Cordero and Caballo Rojo. It submitted a summary of the results of an August 10-September 13, 2001 study, but not the study itself for our review. TMPA argues that train crews moving empty trains to these mines normally have sufficient time to load trains, and that a special loading crew is normally not used.

8. Locomotive Unit-Mile Expense (Item 12)

The parties' LUM expense includes costs associated with locomotive maintenance and fuel expenses. In Gross Ton-Mile Expense, *supra*, we discuss our findings relative to locomotive maintenance and fuel costs. We restate the parties' LUM expense evidence based on those findings.

9. Locomotive Ownership Expense (Item 13)

BNSF developed its ownership costs based solely on the SD70MAC locomotives used to serve TMPA, whereas TMPA developed its locomotive ownership cost from data on the various types of locomotives in BNSF's Alliance Locomotive Pool. But as TMPA has acknowledged, 99.8% of the locomotives used in TMPA service are SD70MAC locomotives. Thus, we use the locomotive ownership costs that are specific to the cost of those locomotives.

BNSF includes a 10% spare margin of locomotives, based on our findings in other coal rate proceedings. TMPA argues that only a 5% spare margin is needed, based on the 95% availability guaranteed by the contract between BNSF and EMD. BNSF argues that TMPA's 5% margin is unreasonable, but presents no quantitative evidence to support a different percentage. Therefore, we use TMPA's 5% spare margin.

10. User Responsibility for Car Repair Expense (Item 14)

This expense is incurred when a railroad performs maintenance on shipper-owned cars. Because the cars used to serve TMPA are owned by the railroad, we agree with TMPA that this cost is inapplicable to its traffic.

11. Car Ownership Expense (Item 15)

The parties' calculations of this expense item differ due to differences in: (1) cycle times; (2) the treatment of Accounts 76 and 90; (3) the spare margin; (4) the pool of cars used; and (5) the depreciation rates, service lives and salvage values of cars.

a. Cycle Times and Accounts 76 and 90

As discussed above, we accept BNSF's evidence on cycle times and its treatment of Accounts 76 and 90.

b. Spare Margin

Relying on our findings in other cases, BNSF assumes that a 10% spare margin of cars is needed. TMPA notes that BNSF's recent contracts with shippers call for a 5% spare margin. We accept TMPA's evidence. Information relating to BNSF's current spare-margin requirement is preferable to reliance on findings in prior cases.

c. Pool of Cars

TMPA derives its expense estimate based on all of the BNSF coal cars available in 2000, whereas BNSF's estimates are based on a sampling of the actual cars used to provide common carriage service to TMPA. When available, data relating to the actual cars used to provide service during the period for which variable costs are being developed is preferable to averages developed from the universe of cars available in 2000 to transport coal. Therefore, we use BNSF's evidence.

d. Depreciation Rates and Service Lives

TMPA does not explain the derivation of the depreciation rates, service lives, and salvage values it used to develop car ownership expense. In contrast, BNSF used the most recent statistics on depreciation rates and service lives on file with us. Therefore, we accept BNSF's depreciation rates, service lives, and salvage values as the only evidence with any support.

12. Car Operating Expense (Item 16)

The disparity between the parties' estimates for this expense results from differences in the mix of cars used and the treatment of the URCS system-average unit cost per in-service day. As discussed above, we accept BNSF's pool of cars.

URCS develops a system-average maintenance unit cost by spreading maintenance expenses over the days in which the cars are actually used. TMPA would spread maintenance expense over 365 calendar days. TMPA argues that the URCS procedure results in an artificial inflation of the per-day maintenance cost by assigning the expenses only to the days during which the cars are actually in use.

Adjustments to unit costs are permitted when data are available that more accurately reflect the service at issue. Adjustments that alter the logic and assumptions in URCS, however, are a collateral attack on the model itself and are thus inappropriate here. In any event, because the railroad receives revenue only when cars are in service, the URCS formula properly spreads car maintenance costs over active car days. This procedure allows the railroad to recover all of its maintenance costs from the users of the cars. Thus, we use BNSF's evidence, which is based on URCS.

13. Caboose & EOTD Ownership Expense (Item 17)

The differences in the parties' estimates for these expenses are due to differences in cycle times, treatment of Accounts 76 and 90, and expected service life of the end-of-train devices (EOTDs). As discussed above, we resolve the cycle times and treatment of Accounts 76 and 90 issues in favor of BNSF. Regarding EOTD service life, TMPA used an expected life of 11 years, based on outdated data that had previously been filed with us by BNSF. In contrast, BNSF relied on a service life of 5 years, based on more recent data submitted to, and approved by, us. We use BNSF's evidence, as it represents the most up-to-date information on service life.

14. Joint Facility Payment (Item 18)

Joint facility payments reflect costs incurred by BNSF for using facilities owned by other railroads. The major disagreement between the parties is whether any of the joint facility payments are for switching services accounted for elsewhere in the variable cost calculation. TMPA asserts that, on a system-wide basis, 12% of joint facility payments made by BNSF are for switching services. TMPA therefore argues that, to avoid a double count, BNSF's estimate of joint facility payments should be 12% lower here.

We have no reason to believe that a double count exists here. BNSF's system-wide experience is not relevant here, as we do not rely upon system-average figures for either switching expenses or the joint-facility charges here. We have examined the bad-order car evidence and it does not appear that any switches for TMPA cars occurred on joint facilities. In any event, the charges that BNSF pays for the joint facilities used by TMPA's traffic are based on a flat (per-car, per gross ton-mile or per car-mile) fee, with no separate charge for switching activity. Thus, there is no double count, and we reject TMPA's proposed reduction.

The parties also disagree as to how trains operate in the Ft. Worth-Dallas area. While BNSF contends that trains always use the same route, the record indicates that TMPA's trains do, on occasion, use the Dallas Area Rapid Transit joint facility. Therefore, we adopt TMPA's evidence, which reflects that TMPA trains use two routes through the Ft. Worth-Dallas region.[105]

15. Third-Party Contract Loading Expense (Item 19)

In the 4th quarter of 2001, BNSF began using contract crews to load coal at the PRB mines. The third-party contract loading crews are paid $0.0225 per ton. To account for this 4th quarter expense, BNSF includes loading costs of $2.73 and $2.71 per carload for Caballo Rojo and Cordero, respectively, in the 4th quarter 2001 variable costs. TMPA allocates that loading charge over all four quarters of 2001, deriving a charge of $0.59 per carload for Caballo Rojo and $0.62 per carload for Cordero for the 2nd through 4th quarters of 2001.

There is no basis for TMPA's allocation of a third-party loading cost to all four quarters of 2001, as BNSF did not incur these costs until the 4th quarter of 2001. Therefore, we accept BNSF's assignment of these loading costs to only that quarter.

16. Loss and Damage Expense (Item 20)

BNSF based its loss and damage (L&D) expense on its 1999 URCS system-average L&D for all coal traffic. TMPA's L&D expense is based on an analysis of the actual L&D experience for TMPA's coal traffic during the years 1995 through 2000. Because TMPA's 6-year average is specific to the traffic for which variable costs are being estimated, we use its figure.

17. Indexing

To bring BNSF 2000 URCS costs to 2001 levels, TMPA developed an annualized index for crew wages, fuel and a composite index (excluding fuel and crew wages). In contrast, BNSF relies on actual data for the 2nd through 4th quarters of 2001 to develop its indexes.

We find that BNSF's indices are more accurate because they are based on data for the quarters for which we are developing variable costs. In contrast,

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[105] We note that the difference between the parties' cost estimates from this issue is negligible.

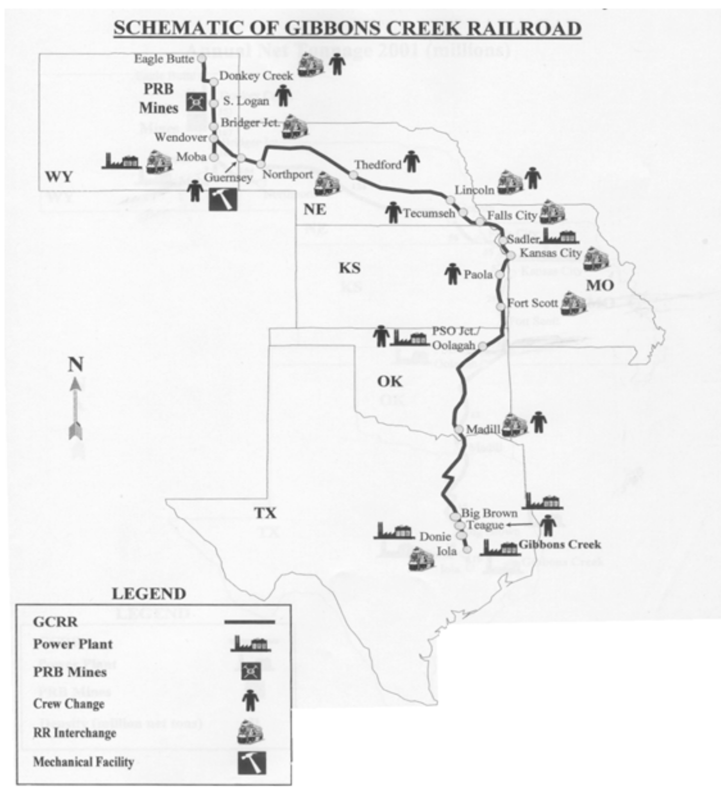
TMPA's indexed values (like the rest of its variable costs) are annualized, rather than specific to any particular quarter. Therefore, Table A-14 contains the indexes we use to develop the variable costs associated with BNSF's service to TMPA.

Table A-12
Indices

Category	**2nd Qtr 2001**	**3rd Qtr 2001**	**4th Qtr 2001**
Composite	1.02226	1.01793	1.00909
Fuel	1.05252	1.03373	0.97358
Crew Wages	1.00000	1.00000	1.00000

APPENDIX B — GCRR CONFIGURATION

As shown in the following map, the GCRR would extend over 1,600 miles, replicating existing BNSF lines from the Wyoming PRB to Iola, TX. The GCRR would begin in northern Wyoming at Eagle Butte and proceed in a southerly direction through the PRB, to Northport, NE. The rail system would continue eastward through Nebraska to Kansas City, MO, then south through Kansas, Oklahoma, and Texas, where it would terminate in Iola, the location of the Gibbons Creek power plant.



A. Main-line Track

There is no dispute as to the overall length of the GCRR,[106] but the parties disagree on the number of tracks that would be needed at various locations to handle the peak traffic volumes forecasted for the GCRR in 2020.[107]

TMPA assumed an alternating single-track/double-track system.[108] BNSF claims that more track capacity would be needed west of Lincoln, NE, and submitted a "grid" analysis of the line between the PRB and Kansas City to show the deficiency in TMPA's main-line track configuration. A grid analysis computes the total amount of time trains would occupy a particular segment of track on any given day to determine whether it would be possible for all of the trains scheduled to traverse that segment to practically do so. Because it is unrealistic to assume that trains could be scheduled so tightly as to leave no idle time on a segment and no time for track maintenance, the theoretical maximum capacity of a segment of track must be reduced to reflect operational necessities. An industry standard is that practical capacity can be no more than 75% of theoretical capacity.[109] Based on its grid analysis, BNSF argues that TMPA's track configuration would be inadequate to handle peak traffic on the highest-density segments of the GCRR.[110]

BNSF offered a modified configuration for the GCRR using the "RAILS" computer model.[111] Based on that model, BNSF asserts that the GCRR would need: double track on the lines north of Northport, NE, from existing milepost

[106] The GCRR would be comprised of 1,629.55 route-miles, including 0.25 miles of trackage rights over UP's Red River Bridge.

[107] The amount of traffic the GCRR would handle in 2020 is not in dispute.

[108] TMPA used a proprietary string-diagram computerized program to show that its system would have sufficient track capacity to handle peak-year traffic. A string diagram is a graphical representation of the position over time of trains traversing a rail system. It is a rail industry tool used in planning and scheduling traffic flows over a system. BNSF asserts that TMPA's string model does not account for many of the required rail activities or take into account the physical capacity of many of the proposed facilities. In addition, BNSF charges that TMPA's string model assumes seamless interchanges, with loaded trains leaving the GCRR at interchange points followed immediately by empty trains flowing back onto the GCRR.

[109] American Railway Engineering Association (AREA) Manual at 16-4-23 (1996); BNSF Reply WP 04935-04942.

[110] TMPA modified its string analysis on rebuttal, and BNSF moved to strike. We need not address BNSF's motion in light of our conclusions here.

[111] RAILS, the Railway Analysis and Interactive Line Simulator, is a proprietary computer program which CANAC, Inc., licenses for use.

(MP) 32.5 on its Orin subdivision to MP 353.2 on its Sand Hills subdivision; triple track for a 10-mile section of the Orin subdivision over Logan Hill (MP 58.4 to MP 68.4); and approximately 30 miles of additional double track between Northport and Lincoln, NE, to connect several 10-mile sections of passing sidings proposed by TMPA.

The parties' main-line track-mile estimates are summarized in Table B-1, and the differences in their estimates are discussed below.

Table B-1
Miles of Main-Line Track

	BNSF	**TMPA**	**STB**
Single track	885.30	1,051.24	1,000.42
Double track*	726.76	581.43	621.64
Triple track	10.00	0.00	0.00
Total track miles	**2,368.82**	**2,214.10**	**2,243.70**

* Double track includes sections of single track with long passing sidings.

Both parties used computer models to ensure that there would be sufficient track to handle peak traffic, but neither party adequately documented how its model operates. TMPA supplied its model, but the lack of documentation prevented us from testing the reliability of the model's results.[112] BNSF's "RAILS" program was not made available to us for our review and manipulation, nor was any documentation supplied. Thus, we are left with the grid analysis submitted by BNSF as the only useable evidence of record with which to evaluate the reasonableness of the competing configurations for the GCRR.

The grid analysis shows that portions of TMPA's GCRR configuration between MP 32.5 and MP 353.2 would have insufficient track capacity. Several segments of single track would have load factors in excess of 100% of practical capacity. TMPA has not shown that the addition of 13.45 miles of double track

[112] The program contains undocumented algorithms/subroutines, along with poorly documented databases, so that we cannot determine if TMPA's revisions made in response to BNSF's criticisms of the model solved any of the questions raised by BNSF. For example, TMPA has not shown that yard capacity is accounted for in the string program, so as to ensure siding availability prior to when a train would move into a yard.

in its rebuttal evidence would alleviate these congestion problems. Accordingly, we include additional double track between MP 32.5 and MP 353.2 for those segments with load factors exceeding 100%.[113]

The grid analysis does not indicate that any of those single-track sections east of MP 353.2 would be inadequate. (The single-track segments between MP 353.2 and Lincoln, NE, would have average load factors generally falling between 57% and 69%, with two segments having load factors of 75% and 77%.) Similarly, the grid analysis does not indicate that triple track would be required on the 10-mile section of the Orin subdivision over Logan Hill.[114] Therefore, we do not include any triple track in the GCRR configuration. Finally, we conclude that TMPA's proposed single-line track between MP 353.2 and Lincoln would have sufficient capacity to handle GCRR traffic.

B. Sidings

In its opening evidence, TMPA included 7,940-foot sidings. BNSF argues that 8,800-foot (1.66-mile) sidings would be needed to allow 135-car unit trains to stop after entering a siding. TMPA concedes that its original siding length was inadequate but argues that BNSF's siding length is excessive. TMPA now asserts that passing sidings would only need to be 8,448 feet (1.6 miles) long to accommodate a unit coal train. BNSF has acknowledged elsewhere in its evidence that 1.6-mile sidings could be used.[115] Accordingly, we use TMPA's revised figure for siding length.

BNSF argues that an additional siding would be needed at Iola to accommodate traffic moving on to Texas and Louisiana utilities via an interchange with a residual BNSF at Iola. Because we disallow the routing of traffic in this manner, we do not include any sidings or other facilities south of Iola.

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[113] Specifically, we include additional double track in the following locations: on the Orin subdivision, between Converse and Logan, Siding 3 and Siding 4; on the Canyon/Valley subdivision, between Guernsey and Siding 6; on the Valley subdivision, between Siding 6 and Siding 7; and on the Angora/Sand Hills subdivision, between Siding 13 and Siding 14.

[114] BNSF's RAILS model called for the use of triple track on the Logan Hill portion.

[115] BNSF Reply Narr. Part III-B at 52.

C. Yard and Other Track

Table B-2
Miles of Yard, Set-Out, and Other Track

	BNSF	**TMPA**	**STB**
Yard track	140.21	122.53	130.89
Set-out track	29.66	19.69	26.10
Other track*	7.24	5.75	7.24
Total Track-Miles	**177.11**	**147.97**	**164.23**

* Other track includes mine leads and interchange track.

There is no dispute regarding the number of yards, yard placement,[116] or (with the exception of the Thedford, Lincoln, Falls City, PSO Junction, and Madill yards, discussed below) the configuration of yards and other interchange facilities.[117]

1. Thedford, NE

Thedford would be a crew-change point for the GCRR. TMPA intially provided for a single main-line track and one siding to accommodate crew changes. BNSF contends that eight tracks would be needed to accommodate peak traffic and to hold trains when the Guernsey yard could not accommodate them. On rebuttal, TMPA added an additional track, for a total of three tracks.

We find that three tracks would not be sufficient. Over 60 trains per day would pass through Thedford during the peak periods, with each train taking a minimum of 20 minutes for changing crews. Given the minimum intervals necessary between trains and the delays that routinely occur, three tracks would not accommodate the number of trains that would stop at Thedford during peak

[116] The GCRR would have 10 yards, located at: South Logan and Guernsey, WY; Northport, Thedford, Lincoln and Falls City, NE; Sadler and Kansas City, MO; and PSO Junction and Madill, OK.

[117] Non-yard interchange points would be located at Donkey Creek, Moba, and Bridger Junction, WY, and at Fort Scott, KS.

traffic periods. Accordingly, we use the only other evidence of record— the eight tracks that BNSF asserts would be needed for Thedford.

2. Lincoln, NE

The yard at Lincoln would be used for changing crews, interchanging trains (to BNSF and the Kyle Railroad), and fueling locomotives. TMPA would have the GCRR construct six 8,448-foot-long yard tracks at Lincoln, with fuel racks adjacent to all tracks and at both ends of the yard. Without explanation, BNSF advocates eight 8,800-foot-long yard tracks at Lincoln, with fuel racks at both ends of the yard and a fuel truck to fuel locomotives at the rear of the trains. TMPA argues, however, that it would be more efficient to use permanent fuel racks, rather than fuel trucks, to fuel the rear locomotives at Lincoln, given the volume of traffic involved. We see no need for the fuel truck proposed by BNSF, given that there would be fuel racks at both ends of the yard, and we find TMPA's configuration sufficient for this yard.

3. Falls City, NE

BNSF would place two crossover tracks between the main-line tracks at the GCRR interchange with UP at Falls City. TMPA contends that a single crossover track would be sufficient, in view of the limited volume of traffic that would move through Falls City and the infrequent interchange of trains with UP.[118] We agree with TMPA.

4. PSO Junction, OK

TMPA includes a small yard at PSO Junction, where the GCRR would perform 1,000-mile inspections. There is no dispute that this yard would need a 1.6-mile track for inspections. TMPA also includes a 600-foot set-out track with switches at both ends, whereas BNSF asserts that a 1,900-foot set-out track would be needed. However, BNSF has not explained why a longer track would be needed. Given the reduction in traffic levels that would move over this region of the GCRR in view of our disallowance of the rerouting to three destinations, we conclude that a 600-foot set-out track with switches at both ends would be sufficient.

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[118] Only one loaded train per week would be interchanged here with UP, even during peak traffic periods.

5. Madill, OK

Madill would be a crew-change point, a locomotive fueling point, and an interchange point with the Kiamichi Railroad. TMPA designed the Madill yard to include one interchange track and a 300-foot stub-end set-out track. A permanent fuel rack would be located between the main line and the interchange track to fuel lead locomotives, while rear locomotives would be fueled by a mobile fuel truck.

BNSF suggests that, in addition to the availability of a fuel truck, fuel racks should be installed at each end of the yard. However, fewer than five trains per day would need refueling at Madill during the peak period: those being interchanged with the Kiamichi Railroad, and those moving to the Gibbons Creek, Big Brown, and Donie power plants. Given the low traffic volume, fuel racks at both ends of the yard seem unnecessary given that a fuel truck would be available to fuel locomotives at one end of the trains. Thus, we find that TMPA's configuration of the Madill yard would be adequate.

D. Set-out Tracks

There is no dispute that the GCRR should install "failed equipment detectors" (FEDs)[119] and that there should be set-out tracks on both sides of a FED, one of which should be double-ended (i.e., connected to the main track at each end of the set-out track). TMPA would make the double-ended track 1,100 feet long and the set-out track on the other side a 600-foot stub-end track.

BNSF asserts, without detail, that it would be necessary to lengthen the double-ended set-out tracks to 1,900 feet to provide additional room for MOW equipment. TMPA argues that this is unnecessary and that there is sufficient room on its proposed set-out tracks for the occasional storage of MOW equipment. Because a 1,100-foot track does not appear to be inadequate, we use TMPA's evidence.

[119] FEDs combine dragging-equipment and hot-bearing detectors.

E. Other Track

In its opening evidence, TMPA included 4.51 miles of other track for the GCRR-owned portion of mine leads and interchange tracks. In its reply, BNSF specified the locations where other track would be needed and calculated that the GCRR would need 7.24 miles of such track. On rebuttal, without discussion, TMPA included in a table 5.75 miles of other track.

By revising its estimate, TMPA has acknowledged that its opening evidence was deficient, but it included no support for its revised estimates. We therefore use the 7.24-mile figure for the GCRR-owned portion of mine leads and interchange tracks.

APPENDIX C — OPERATING PLAN AND OPERATING EXPENSES

In this appendix, we examine how it is assumed that the GCRR would operate and the level of expenses it would need to incur to staff, equip, run, and maintain the SARR. Because, as discussed in the body of the decision, we disallow TMPA's rerouting of traffic as to three destinations, we reduce the amount of traffic moving east of Northport from the levels used by TMPA.[120] This in turn reduces the number of personnel and amount of equipment that would be required by the GCRR.

A. Cycle Time

The time required for a train to complete a round trip[121] (cycle time) is a prime measure of a railroad's efficiency and an important determinant of its personnel and equipment requirements. The GCRR's cycle time includes running time (the time a train would spend traversing the GCRR), interchange time, loading time at a mine, locomotive servicing and fueling time at the staging yard, and unloading time at a utility. We discuss each of these components below.

1. Running Time

As noted above, in Appendix B (Section A—Main-Line Track), TMPA used a computerized string diagram program to develop running times for various segments of the GCRR. BNSF argues that TMPA's program ignored important factors influencing running time, such as track grade, curvature and speed restrictions, time spent repairing random equipment and track failures, and delays caused by weather or other unexpected occurrences. BNSF also contends that TMPA's acceleration/deceleration algorithm contained incorrect assumptions regarding the tractive effort of the locomotives, resulting in an understatement of running time. BNSF claims that the operations assumed by TMPA's program would be impossible and unsafe in the real world.

[120] Specifically, our analysis assumes that coal traffic destined for Smithers Lake and Halsted, TX, and Sulphur, LA, would be interchanged at Northport, NE, rather than Iola, TX.

[121] The round-trip begins with an empty train positioned at the Guernsey, WY yard. From there, the train would move to the PRB to be loaded with coal and then return to Guernsey for fuel before being dispatched to a utility or interchange point. The cycle would be completed with the return of the empty train to Guernsey.

Specifically, it contends that TMPA's model would permit train meets (collisions) between trains traveling in opposite directions on the same section of track and would move trains into yards or sidings when there would be no available track for those trains.

On rebuttal, TMPA conceded certain defects in its initial program. It acknowledged that the program did not allow enough time to account for all grade and curvature issues nor correctly reflect the time needed for trains to clear the switches at passing sidings. Accordingly, TMPA reduced the train speeds on several line segments (to accommodate additional grade and curvature) and increased the time intervals between trains (to allow sufficient clearance for train meets at the switches). TMPA asserts that delays resulting from random equipment failures would be accounted for by the slower average train speeds in its revised analysis and that slowing the trains down over the entire GCRR system would allow sufficient time for maintenance.

Because TMPA's program is so poorly documented, we cannot determine how the program estimates running times, nor verify that the assumptions incorporated in the model are reasonable. We cannot, for example, determine the impact on running times of TMPA's acceleration/deceleration algorithm or its train speed assumption. Thus, we cannot judge whether the adjustments made by TMPA adequately address the shortcomings identified by BNSF. In sum, TMPA has failed to meet its burden of proof with respect to the issue of running times.

The only other evidence regarding running times is what was submitted by BNSF. For segments south of Kansas City, BNSF agrees with TMPA's running time estimates (except that BNSF would add 1.5 hours for delay of trains at the UP Red River bridge and at crossings of Dallas area commuter lines). For movements between the PRB mines and Kansas City, BNSF developed running times using CANAC's "RAILS" model. That program is undocumented.[122] But, because TMPA bears the burden of proof on this issue and has not met that burden, we rely on BNSF's evidence as the only other evidence of record as to running times.

[122] *See* Appendix B (Section A—Main-Line Track) rejecting the use of RAILS to develop track requirements. The grid analysis on which we base track requirements is not capable of developing running times.

2. Interchange Time

BNSF asserts that returning empty trains would be delayed 4 hours during interchanges at Bridger Junction, WY, Northport and Falls City, NE, and Fort Scott, TX, because those would be away-from-home terminals for GCRR crews.[123] TMPA agrees that 1 hour of this time would be needed for the crew to be briefed, receive paperwork, perform an air test, and depart. BNSF argues that an additional 3 hours would be needed because, once an empty train arrives and a crew is called, the crew would have 1.5 hours to report for duty[124] and would need another 1.5 hours of travel time to get from their home terminal to the interchange point. TMPA counters that, as a non-union railroad, the GCRR could call crews in time so that they would be positioned at the interchange point when an empty train arrives, or the crew of an arriving loaded train would be available to crew a returning empty train.

BNSF has not explained why the GCRR could not coordinate with the delivering carriers so that crews would be available at the interchange points when needed. Therefore, we reject its argument that an additional 3 hours of interchange time would be needed at these locations.

3. Mine Loading Time

TMPA assumes that it would take an average of 4 hours to load a train at PRB mines. TMPA contends that, unlike the BNSF, GCRR trains would not have to wait in queues at mines prior to loading, nor wait to reenter the GCRR. BNSF argues that the GCRR could not avoid queue delays occurring on mine tracks, because mines in the PRB require that trains be available when the mines call for them. BNSF conducted a study showing that the average time spent from the time a train arrives on the mine tracks to be loaded to the time it is spotted under the tipple to begin the loading operation is approximately 1.5 hours and that an additional 1.4 hours in delay is incurred while a loaded train waits to reenter the main line.[125] BNSF maintains that a train would spend 6 hours at the mine, an estimate which it deems conservative.

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[123] BNSF does not suggest that there would be any delay for interchanges at Lincoln, NE, and Kansas City, MO.

[124] BNSF's argument is based on the maximum time allowable under its own rules for a crew to be available.

[125] BNSF Reply V.S. Mueller Exh. LEM-4.

TMPA has not explained how the GCRR could avoid loading delays while on privately owned mine tracks that it would not control and that would also be used by other carriers. However, a GCRR train would be unlikely to incur delays waiting to reenter the main line after it is loaded because the GCRR would not share the main line in the PRB with another carrier, as BNSF does.[126] Therefore, in our restatement of cycle time, we use 5.5 hours for the average total time at the mine.

4. Locomotive Servicing and Fueling

Like the BNSF, the GCRR would stage empty trains and service loaded trains at Guernsey. The parties agree that empty trains would spend 6 hours at Guernsey in preparation for movement to the PRB mines, but they disagree on the time loaded trains would spend at the yard before departure. Relying on historical dwell times at its Alliance, NE, and Guernsey facilities, BNSF projects a 3-hour dwell time for the GCRR.[127] TMPA argues that, based on the GCRR's efficient operations at Guernsey, 2 hours would be ample time to refuel, switch-out any bad-order cars, and change crews.

We are not persuaded that GCRR's Guernsey yard would need to function in the same fashion as do BNSF's Guernsey or Alliance yards, nor that the required activities at GCRR's Guernsey yard would need to be done sequentially. BNSF's Guernsey locomotive service track is currently used to fuel locomotives, fueling the head-end locomotives first and then pulling the train forward to fuel the rear locomotives. TMPA assumes that the GCRR would use a fuel truck to fuel the rear locomotives while the lead locomotives were fueling at the fuel rack, so that the fueling of head and rear locomotives would be done simultaneously. This appears reasonable, and we accept TMPA's evidence.

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[126] BNSF's and UP's predecessors shared in the construction cost of the jointly owned PRB main line. In contrast, TMPA assumes that the GCRR would fund all construction costs and be the only carrier using the GCRR line in the PRB.

[127] According to BNSF, average dwell time for loaded coal unit trains is 3.88 hours at Alliance and 2.75 hours at Guernsey. BNSF Reply, V.S. Mueller, Exh. LEM-5.

5. Utility Unloading Time

There is a dispute as to how much time it would take to unload at five of the six plants that would be local to the GCRR.[128] BNSF asserts that the average time its trains spend at those destinations ranges from 10 to 19 hours. TMPA points out, however, that the applicable BNSF contracts or tariffs specify time limits for the unloading process ranging from 4 to 6 hours, and that the utilities are required to compensate the railroad when unloading exceeds the specified free time.[129] TMPA argues that this charge would compensate the GCRR for additional equipment or labor costs if the unloading time exceeded the free time. Accordingly, in its cycle time estimates for these plants, TMPA included only the maximum unloading time provided for in BNSF's contracts or tariffs.

In developing an estimate for cycle time, our concern is how long unloading could reasonably be expected to take, not whether the shipper would pay a penalty for unloading that exceeds the free time.[130] TMPA has failed to show that trains could be expected to be unloaded within the free time provided, in light of BNSF's experience. Accordingly, we use BNSF's actual unloading times, adjusted to exclude the time a train must wait to reenter the main line after unloading (a matter that would be within the GCRR's control).

B. Operating Costs

As BNSF notes, the operations posited by TMPA would make the GCRR much more efficient than the average Class I railroad.[131] TMPA argues that the GCRR could attain higher levels of labor productivity and equipment utilization than other railroads, due to its simplified structure. The GCRR, which would transport only one commodity (coal), would provide service to only 6 local customers and have only 10 interchange points. TMPA also assumes that the GCRR would outsource many of the functions that are typically handled

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[128] The five plants are Big Brown, Gibbons Creek, Iatan, Laramie River, and Northeastern. The parties agree that it would take 12 hours to unload at the Donie plant.

[129] These detention charges range from $250 to $500 per hour.

[130] To the extent that such charges would be paid, they should be factored into the revenues the GCRR would receive. However, TMPA has presented no evidence as to the total amount of such fees that the GCRR would receive.

[131] In contrast, BNSF bases many of its cost estimates for the GCRR on the costs incurred by itself or other Class I railroads. For example, BNSF relies on a relationship between the number of personnel and the revenues or tonnages of existing railroads as support for its staffing levels on the GCRR.

in-house by Class I railroads,[132] including marketing, initial training of employees, several accounting and financial functions, and human resource functions. Finally, TMPA asserts that the GCRR's information technology requirements would be substantially less complex than those of other carriers. TMPA would have the GCRR rely heavily on commercially available software for the administration of many of the functions that would be performed in-house, including not only the retained general and administrative functions, but some operational functions as well (such as dispatching and crew calling).[133]

It is clear that the structure of the GCRR would be substantially simpler than that of the BNSF or any other large-scale, general commodity rail carrier. Under these circumstances, we agree that the costs incurred by BNSF or other large carriers generally are not necessarily a reliable indicator of the costs that would need to be incurred by the GCRR. Accordingly, we will not further address BNSF's cost comparison arguments unless they are supported by other evidence.

Table C-1 summarizes the parties' differing estimates of the operating costs that would need to be incurred by the GCRR and our restatement of the evidence.[134] The elements of the various expense categories are then discussed.

[132] To develop many of the costs associated with these outsourced activities, TMPA relied on URCS unit costs.

[133] BNSF for the most part does not refute the GCRR's ability to rely on outsourcing and on commercial software. Indeed, in many instances, BNSF concedes the reasonableness of TMPA's outsourcing proposals. *See, e.g.*, BNSF Reply V.S. Gilbertson at 24.

[134] Because the outputs from TMPA's string diagram program are an integral part of TMPA's spreadsheets, we have used BNSF's spreadsheets to restate the operating expenses for the GCRR. However, we have changed the operating assumptions contained in BNSF's spreadsheets as appropriate to take into account the TMPA evidence that we accept.

Table C-1
GCRR 2001 Operating Costs[135]
(Millions of Dollars)

	BNSF	TMPA	STB
Locomotive Lease	$40.32	$27.74	$27.82
Locomotive Maintenance	28.29	27.73	22.88
Locomotive Operating	124.54	89.44	103.01
Railcar Lease	8.28	5.03	6.00
Railcar Maintenance	17.55	10.97	13.23
Recruiting and Training	89.78	13.70	32.43
Train & Engine Personnel	102.97	68.29	75.04
Operating Managers	19.07	11.47	12.90
Material & Supplies	2.98	1.45	1.45
General & Administration	29.67	11.20	13.38
Ad Valorem Tax	10.07	8.30	8.30
Loss and Damage	0.33	0.33	0.33
Maintenance-of-Way	93.03	33.89	83.30
Easement Rental	0.00	0.01	0.01
Trackage Rights	0.02	0.07	0.02
Third Party Expenses	2.22	0.30	0.30
Insurance	16.75	8.69	11.76
Total Operating Costs	**$585.87**	**$318.61**	**$412.16**

[135] For some costs, our figures are lower than those of either party as a result of our disallowance of the rerouting with respect to traffic to three of the destinations, which decreases the amount of traffic on the GCRR east of Northport.

1. Locomotives

TMPA assumes that the GCRR would meet its locomotive needs by leasing SD70MAC and SD40-2 locomotives. BNSF disputes the total number of locomotives that would be needed and the lease cost that TMPA assumed for the SD70MACs.[136]

a. Cost of Leased Locomotives

The annual lease cost for SD70MAC locomotives was developed based on the lease agreement provided by BNSF in discovery. In its opening evidence, TMPA calculated an average annual lease payment using the effective internal rate of return derived from the schedule of payments. BNSF would use a simple average annual cost, by summing the semi-annual payments called for in the lease over the life of the lease and dividing that total by the number of periods. TMPA maintains that BNSF's method would overstate the annual cost in the early years of the lease. In its rebuttal, TMPA instead used the actual payments specified in the lease agreement.[137]

We agree that basing lease costs on the actual payment schedules in the lease agreements is most appropriate. Neither party has justified a departure from this obvious measure.

b. Number of Locomotives

Locomotive requirements are largely based on cycle time and the number of locomotives needed for each train. TMPA assumes that the GCRR would use SD70MAC locomotives for line-haul and helper service and SD40-2 locomotives for switching service. As discussed below, we find that a total of 241 SD70MAC and 20 SD40-2 locomotives would be required by the GCRR.

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[136] BNSF agrees that the cost of leasing an SD40-2 locomotive would be $74,825 per year.

[137] TMPA notes that this method is consistent with precedent (*see Arizona*, 2 S.T.B. at 413) and is the method used by both parties to calculate the variable cost portion of locomotive costs for the TMPA movement.

Table C-2
Number of Locomotives in 2001

Type	BNSF	TMPA	STB
SD70MAC	271	237	241
SD40-2	21	5	20
TOTAL	**292**	**242**	**261**

i. Line-Haul Service

The parties generally agree on the number of locomotives needed per train, with two exceptions. BNSF points out that the coal trains it interchanges to the Kyle Railroad at Lincoln, NE, require two lead and two rear locomotives, and that five locomotives are used on trains interchanged to UP at Kansas City. BNSF asserts that the GCRR would also need to supply this additional locomotive power so that these trains could negotiate the grades and terrain that they would traverse after leaving the GCRR.

TMPA argues that BNSF has not provided any evidence to support its assertions regarding the grade and terrain of the off-SARR portion of these movements, but that, even if more power would be needed for the off-SARR portion, the additional locomotives would be the responsibility of the interchange railroads. We agree that it would not be necessary or efficient for the GCRR to supply extra locomotives solely for the benefit of other carriers without any form of compensation.

ii. Spare-Margin/Peaking Requirement

The number of line-haul locomotives needed to provide service during peak traffic periods, as well as the number needed to provide a spare-margin allowance, are disputed. To compute these needs, TMPA first determined, based on information provided by BNSF in discovery, that the peak traffic day during the 20-year analysis period would be January 15, 2020. Then, using the cycle times calculated by its string diagram program, TMPA determined the locomotive hours in a 2-week test period surrounding the peak traffic day, annualized the result, adjusted to reflect the volume difference between 2020 and

2001,[138] and divided by the number of hours in a year (8,760) to arrive at a base locomotive requirement. TMPA then added a 5% spare margin, based on the 95% availability guaranteed by EMD.

As discussed above, we cannot rely on the cycle times developed in TMPA's string diagram program.[139] Thus, we turn to BNSF's evidence. BNSF based its calculation of locomotive unit hours for 2020 on its own calculation of the GCRR's aggregate cycle time for all trains moving in that year. It divided these total hours by the 8,760 hours in a year to develop the number of locomotives (229) that would be needed on average in 2020.[140] Finally, BNSF calculated the additional locomotives that would be needed during peak periods by dividing the peak-day train starts (45 trains) by the average daily train starts (38 trains). The resulting 18% spare margin in non-peak periods is not a defect in the analysis, as TMPA argues, but simply an inescapable consequence of the seasonality of the traffic and a carrier's obligation to have sufficient locomotives to serve its customers during peak periods. We use BNSF's approach as the best evidence of record. After adjusting both for the decrease in volume due to our disallowance of the rerouting for three destinations and for our cycle time restatement, we conclude that the GCRR would require 221 (187 x 1.18) road locomotives in 2001, rising to 239 (202 x 1.18) in 2020.

iii. Helper Service

The parties agree that 19 SD70MAC locomotives would be needed to supply helper service, but they disagree as to the spare-margin requirement. BNSF would add a 10% spare margin, a percentage that we have used in prior cases. TMPA argues that this margin is too high, and points to the BNSF's EMD 95% availability guarantee that recognizes a 5% spare margin as adequate. Because the GCRR would have a similar availability guarantee, a 5% locomotive spare margin is appropriate and provides a better estimate than the 10% figure used in prior cases. Therefore, we find that the total number of helper locomotives, including spares, that would be needed is 20.

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[138] TMPA uses a tonnage deflator of 7.5%, as does BNSF, to reduce the locomotive requirement from the 2020 peak year to 2001.

[139] As BNSF notes, TMPA's opening presentation posited average yearly locomotive unit miles per locomotive that are nearly twice as high as BNSF's utilization goal for the high power units used in unit-train coal service.

[140] Using the same tonnage deflator as TMPA, BNSF arrived at a figure of 212 locomotives in 2001.

iv. Switching Service and Work Trains

The parties agree that the GCRR would need five SD40-2 locomotives for switching service. BNSF would have the GCRR include an additional 14 SD40-2s for work trains, plus two spares, as part of MOW operations. TMPA, however, assumes that the GCRR's track maintenance would be handled by outside contractors, and it asserts that the GCRR thus would not need to supply locomotives for work trains. Because, as discussed *infra*, we accept BNSF's MOW evidence, which calls for the GCRR to have 14 work trains, we accept BNSF's evidence that the GCRR would need additional SD40-2 locomotives for this purpose. But because we reduce BNSF's spare-margin estimate from 10% to 5%, we conclude that the GCRR would need one less spare locomotive than BNSF allocated.

We disagree with BNSF, however, that SD40-2 locomotives would need to be leased for switching and work trains. Because SD40-2 locomotives would be needed for construction, we assume that 20 of those locomotives would be retained and used as switching and work train locomotives, rather than being disposed of at the completion of construction.

c. Locomotive Maintenance

There is no dispute as to the maintenance cost-per-mile, overhaul cost, and service interval for the SD70MAC locomotives. The differences in the parties' computations of annual cost for maintaining the fleet of SD70MAC locomotives are due to the differences in the total locomotive unit miles and the number of locomotives that they assumed for the GCRR. We restate the SD70MAC locomotive maintenance cost using our restated count of locomotives and locomotive unit miles.[141]

The parties also computed the annual cost for maintaining SD40-2 locomotives differently. TMPA relied on the annual maintenance cost figures for SD40-2 locomotives that was used in *West Texas*, 1 S.T.B. at 691, indexed to 2001 levels. BNSF based its estimate on its system-average maintenance costs for all of its locomotives as reported in its 2000 R-1 annual report. TMPA argues that BNSF's figure is inappropriate because it reflects costs associated with all type of locomotives, not just SD40-2s. We agree. We find that TMPA's

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[141] As previously noted, our disallowance of rerouting for three destinations reduces the total number of miles traveled by GCRR locomotives.

estimate of $83,116 per locomotive, which is specific to the locomotive type in question, is the better evidence.

d. Locomotive Servicing and Fueling

While the parties agree on the cost of servicing a locomotive,[142] they disagree on both the level of fuel consumption and the price of fuel. Based on our analysis of fuel consumption and fuel price discussed in the variable cost analysis set forth in Appendix A, we use BNSF's evidence on locomotive fuel expense.

2. Freight Cars

The parties agree on the unit cost of leasing hopper and gondola cars, but they disagree on the number of such cars that the GCRR would need.

a. Freight Car Requirements

With the exception of the Western Farmers movement, there is no dispute as to which shippers would use their own cars and which would need railroad-provided cars. TMPA points out that Western Farmers owns a fleet of 353 coal cars that have historically been used for coal transportation. Based on this evidence, we agree that the GCRR would not need to supply cars for the Western Farmers movement.

For railroad-supplied cars, TMPA used a 5% spare margin in its opening evidence. BNSF argues for a 10% spare margin, because that figure has been used in prior cases. But as TMPA pointed out on rebuttal, only a 5% spare margin has been specified in recent BNSF coal transportation contracts with regard to shipper-supplied cars.[143]

We agree with TMPA that an efficient, least-cost operation would not incur the cost to lease and store more spare cars than it would require shippers

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[142] Because TMPA began using common carrier service in April 2001, we agree with TMPA that the unit cost should be indexed to second quarter of 2001, not the third quarter as BNSF claims.

[143] BNSF argues that this is new evidence presented for the first time on rebuttal. We do not believe that reference to existing contracts, which were already on the record, constitutes impermissible rebuttal. Rather, it is an appropriate response to support the figure used in TMPA's opening evidence.

providing their own cars to have on hand. Accordingly, we find that a 5% spare margin should be sufficient for the GCRR.

Based on these findings, our restatement of cycle time, and our disallowance of TMPA's rerouting of traffic for three destinations, we find that the GCRR would require 124 bottom dump cars, 1,278 rotary dump cars, and 183 rapid discharge cars.

Table C-3
Freight Car Requirements

Car Type	BNSF	TMPA	STB
Bottom Dump (Type H cars)	584	187	124
Rotary Dump (Type J cars)	1,389	1,087	1,278
Rapid Discharge (Type K cars)	214	53	183
TOTAL	**2,187**	**1,327**	**1,585**

b. Maintenance

In its opening evidence, TMPA developed freight-car maintenance costs using the system-average maintenance cost for all types of freight cars, obtained from BNSF's R-1 report. On reply, BNSF submitted maintenance cost data limited to the types of cars that the GCRR would use. On rebuttal, TMPA accepted BNSF's evidence but adjusted the maintenance costs to reflect its position that the GCRR would have a higher car utilization rate than BNSF.[144]

BNSF objects that TMPA's introduction of a utilization adjustment is impermissible rebuttal. We agree. Because a utilization adjustment was not in TMPA's opening evidence and BNSF did not raise the utilization issue in its evidence, allowing this evidence would introduce an entirely new issue for the first time on rebuttal. BNSF has had no opportunity to respond to this evidence. Therefore, we use BNSF's unit costs (without TMPA's utilization adjustment) and, factoring in our restated railroad car-miles, calculate a cost of $13.23 million for freight car maintenance for railroad-supplied cars in 2001.

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[144] Because car maintenance costs are partly a function of time, more intensive use of cars results in a less-than-proportionate increase in maintenance.

3. Recruiting and Training Costs

TMPA estimates that it would cost the GCRR $13.7 million to hire and train personnel, whereas BNSF contends that it would cost nearly $90 million. While the parties agree on the cost for training a rank-and-file employee,[145] they disagree on the number of employees that would need to be hired (see our discussion of operating personnel, *infra*) and trained. BNSF would also include recruiting costs (e.g., costs paid to recruitment agencies).

TMPA argues that recruiting costs should be excluded as a barrier-to-entry. We disagree. BNSF incurs recruiting costs for skilled employees and TMPA has not explained how the TMPA could avoid such costs. We also reject TMPA's argument that the GCRR could draw upon a pool of experienced BNSF employees that would be displaced by the GCRR's replacement of a portion of the BNSF, obviating the need for the GCRR to pay recruiters to find qualified employees. It would be entirely inappropriate and inconsistent with the purpose of the SAC test to assume the existence of the defendant railroad so as to relieve a SARR of a cost which the defendant carrier incurred and which the SARR would otherwise need to incur. Thus, we treat the SARR as if it were the initial entrant in the market,[146] and we do not assume that there would be displaced BNSF employees available for hiring.

We do agree with TMPA, however, that it is inappropriate to include both training costs for rank-and-file personnel and recruiting costs for the same people. Recruiting costs are generally incurred to find skilled personnel who would not need extensive training. Because training costs are included, we find it unnecessary to include recruiting costs as well. After factoring in training costs for rank-and-file employees and recruiting costs for skilled employees, we find that training and recruiting costs for the GCRR would be $29.51 million.

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[145] We note that, while BNSF accepts TMPA's training costs per employee, its workpapers inflate those costs by inappropriately treating training costs as a weekly expense rather than a per-employee cost.

[146] For example, we do not permit a SARR to avoid including a contingency fund (for unforeseen complications) by referring to the existence of the incumbent's plant. *See, e.g., WPL*, 5 S.T.B. at 1038.

4. Operating Personnel

The number of employees the GCRR would need for daily train operations is in dispute. The parties divide the operations staff into two major categories: (1) personnel employed directly with train operations, including field supervision, and (2) mechanical personnel responsible for supervising the maintenance of locomotives and freight cars by contractors, and the inspection of freight cars. We discuss each component below.

a. Train Operations

Table C-4 below shows the staffing levels for train operations.

Table C-4
Operating Personnel

	BNSF	**TMPA**	**STB**
Train crews	879	810	688
Switch crews	51	28	28
Hostlers	20	0	0
Dispatchers	40	36	36
Crew callers	10	5	5
TOTAL	**1000**	**879**	**757**

i. Train crews

There is no dispute as to crew change points and crew districts, with the exception of the Madill, OK, to Teague, TX crew district. BNSF contends that the length of the crew district (260 miles) and delays incurred in crossing two non-GCRR facilities, make it infeasible for a single crew to traverse the district without exceeding the 12-hour on-duty period permitted under the Federal hours of service laws.[147] BNSF would therefore divide the Madill-to-Teague crew district into a Madill-to-Waxahachie district and a Waxahachie-to-Teague district.

However, as noted by TMPA, BNSF's own route-mile data show that the distance between Madill and Teague is 216.5 miles, not 260 miles. TMPA calculates that GCRR trains could cover this distance in approximately 8.5 hours (an average speed of 25 miles per hour).[148] Adding the maximum delay time of 1.5 hours for congestion at the UP Red River Bridge and the Dallas commuter line crossings yields a maximum transit time of approximately 11 hours. Thus, TMPA's evidence demonstrates that a crew could generally cover this district in under 12 hours, and there is no need to divide this territory into two crew districts.

There is also a difference in the parties' evidence as to the number of train shifts per year a crewman could work. BNSF assumed 250 shifts per year, based on a 5-day work week for 50 weeks. TMPA assumed that a crewman could work 270 shifts per year, based on a 6-day work week for 45 weeks.[149] TMPA states that its approach would ensure that the crew members would generally end up at their home terminal at the end of the week and thus avoid "deadheading" back;[150] it would also give each crew member 7 full weeks off each year. BNSF has not shown that this schedule is infeasible. Thus, we accept TMPA's schedule.

ii. Switching Personnel

Switch crews would be needed at the Guernsey yard and at the yard at PSO Junction, OK. The parties agree that the Guernsey yard would require three around-the-clock switch crews, while the yard at PSO Junction would only need a single crew, 7 days a week. Based on a three-person switch crew, BNSF asserts that 45 employees would be needed at Guernsey and 6 employees at PSO Junction. TMPA, on the other hand, assumes that the GCRR would use two-person switch crews, for which 25 employees would be sufficient at Guernsey and three at PSO Junction. TMPA notes that some other railroads use

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[147] *See* 49 U.S.C. 21101-21108; 49 CFR part 228.

[148] BNSF has accepted TMPA's cycle time south of Kansas City, which is based on an assumed average speed of 25 miles per hour.

[149] A shift schedule of 270 shifts per year was accepted in *FMC*, 4 S.T.B. at 833.

[150] Deadheading is the movement of crews without any work being performed. Crews are paid at a lower rate while they are transiting.

two-person switch crews. Accordingly, we find that TMPA's assumption is reasonable, and we use TMPA's switch crew personnel numbers.

iii. Hostlers at Guernsey

The parties disagree on the need for hostlers at Guernsey.[151] BNSF contends that two two-person crews would be needed around-the-clock at the Guernsey yard, for a total of 20 additional employees. TMPA argues that hostlers would not be needed at Guernsey. According to TMPA, hostling of locomotives would be performed by GCRR road engineers and by the servicing/maintenance contractor's employees.

There is no evidence that the hostling of locomotives would cause road crews to exceed their Federal service limits. Thus, it is not unreasonable to assume that road engineers could perform this function. In addition, BNSF has not explained why maintenance contractors could not move locomotives to maintenance shops. Indeed, the locomotive servicing cost used by the parties includes the cost of the hostling activities.[152] Therefore, we see no need to include a separate cost for hostlers.

iv. Crew Callers

TMPA would have the GCRR employ five crew callers to operate an automated system.[153] BNSF claims the number of train crews involved warrants doubling the number of crew callers assumed by TMPA. But BNSF has not refuted the information supplied by TMPA indicating that the automated system could perform as described. Therefore, we use TMPA's number of crew callers.

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[151] Hostlers transfer locomotives between the locomotive fueling, servicing and maintenance areas and the relay tracks where they are made available to road crews.

[152] The R-1 report schedule 410, used as a basis for calculating the locomotive servicing unit cost, includes all costs for moving locomotives within yards, including hostling activity.

[153] TMPA's workpapers contain a brochure describing the proposed system as being designed to handle virtually all basic crew interactions via automated response and calling systems. The system is assertedly capable of automatically identifying the proper crews for the proper job opening and of automatically routing calls from crews to their appropriate dispatchers.

v. Dispatchers

The parties agree on the number of dispatching districts (six) and dispatcher positions (eight) needed.[154] BNSF contends that five individuals would be required to staff each dispatcher position full time, for a total of 40 employees, whereas TMPA maintains that full around-the-clock coverage for the eight dispatcher positions could be achieved with only 36 dispatchers. Because mathematically 36 dispatchers working 250 shifts could cover eight positions, we accept TMPA's evidence.

b. Field Supervisors

The parties agree that the GCRR would need a director and five managers for operations control, a director and eight managers of train operations, a director of locomotive operations, a manager of operating rules, and a manager of terminal operations—a total of 18 positions. BNSF would include 42 additional field supervisory staff, whereas TMPA included only 23 more positions. We address this area of dispute below.

[154] Two of the dispatching desks would be for the PRB. Because of the number of trains originating from that area, each desk for the PRB would be manned with two dispatchers.

Table C-5
Field Supervision

Position	BNSF	TMPA	STB
Director Operations Control*	1	1	1
Manager Operations Control	5	5	5
Director of Train Operations*	1	1	1
Manager of Train Operations	8	8	8
Asst. Manager of Train Operations	24	17	23
Terminal Superintendent/Manager of Term. Ops.	1	1	1
Yardmaster	5	0	0
Director of Locomotive Operations*	1	1	1
Manager of Locomotive Operations	9	6	8
Manager of Operating Rules*	1	1	1
Administrative Assistant	1	0	1
Asst. Mgr. of Rules	1	0	1
Asst. Mgr. of Safety	1	0	1
Asst. Mgr. of Haz. Materials & Environmental	1	0	1
TOTAL	**60**	**41**	**53**

* In the spreadsheet used to develop operating expenses, costs for these personnel are included as general and administrative costs, rather than operating personnel costs.

i. Assistant Managers of Train Operations

The largest disagreement as to train and locomotive supervision involves the staffing for assistant managers of train operations (AMTO). BNSF argues that the GCRR would need 24 staff for these positions, whereas TMPA insists that only 17 would be needed. These positions would be allocated among eight GCRR yards. As discussed below, the disagreement relates to staffing at four of those yards.

Table C-6
Asst. Manager of Train Operations

Location	BNSF	TMPA	STB
Guernsey	5	3	5
South Logan	5	3	5
Thedford	3	1	3
Lincoln	5	5	5
Kansas City	2	2	2
PSO Junction	2	1	1
Madill	1	1	1
Teague	1	1	1
TOTAL	**24**	**17**	**23**

Thedford — Because there would be 60 trains requiring crew changes moving daily through Thedford, NE, BNSF argues that three AMTOs would be required. TMPA disagrees, claiming that, with the limited function that would be assigned to Thedford (crew change), one employee would be sufficient. Because we agree with BNSF as to the necessity for a larger yard at Thedford (*see* Appendix B, Section C—Yard and Other Track), we use BNSF's higher staffing level for this yard.

PSO Junction — TMPA asserts that, given the limited functions that would be performed at this yard (car inspections), a single AMTO would be sufficient. BNSF claims that these functions would require two AMTOs. Because of our decision to disallow some of the rerouting of traffic proposed by TMPA, the number of trains that would move through PSO Junction is reduced and the functions performed in this yard would be minimal. TMPA's staffing level would be sufficient to provide supervision for the single car inspection crew stationed there.

Guernsey and South Logan — Guernsey would be the principal yard on the GCRR and would function as both a crew-turn facility and a full-service maintenance yard. All GCRR trains would pass through South Logan, except those moving north to interchange with BNSF at Donkey Creek. Given these functions and the large number of trains that would move through these yards, BNSF argues that the GCRR would need five AMTOs at each yard to provide around-the-clock staffing. TMPA counters that the level of staffing that BNSF proposed for the Thedford yard would be appropriate for Guernsey and South

Logan, given the limited number of duties to be performed by AMTOs and the repetitive nature of those functions.

We disagree with TMPA. Unlike Thedford (a crew-change facility only), South Logan would coordinate the GCRR trains with the mines and Guernsey would serve as a full-service maintenance yard. Because of the significant activities that would be performed at Guernsey and South Logan, we use the higher staffing levels advocated by BNSF.

ii. Terminal Superintendent and Yardmasters

TMPA agrees with BNSF that operations at Guernsey would require an additional managerial position, and TMPA has added a manager of terminal operations (which we assume is equivalent to a terminal superintendent).

BNSF contends that five yardmaster positions would also be required at Guernsey to direct the movements of trains coming into and moving out of the yard, the switch engines working in the yard, the hostlers, and the mechanical inspectors. TMPA maintains that it would be unnecessary to have both a yardmaster and an AMTO on duty full-time. We agree. The GCRR's dispatchers would oversee the operations of trains between yards and crew-change points, leaving the AMTOs and Manager of Terminal Operations to manage the yard operations.[155]

iii. Managers of Locomotive Operations

These managers would be responsible for the safe and efficient handling of locomotives and trains by the GCRR's engineers. They would perform Federal Railroad Administration (FRA)-mandated training and observation of engineers and train handling, efficiency testing, and other assistance as needed. TMPA would have one manager of locomotive operations based at each of the following locations: South Logan, Guernsey, Lincoln, Kansas City, PSO Junction and Teague. BNSF claims that a second manager would be needed at South Logan and Guernsey and that a manager would also be needed at Thedford and Madill.

BNSF submits that 10 managers would constitute the minimum amount of supervision necessary for the number of engineers (820 to 878) that the GCRR

[155] The AMTO would coordinate movements of switch locomotives, trains, and mechanical inspectors in the yard. The terminal superintendent/manager terminal operations would supervise the car inspection foremen.

would require.[156] As noted, we have restated the number of engineers, and we therefore reduce the number of managers proportionately.[157]

iv. Manager of Operating Rules

BNSF would include four staff positions under the manager for operating rules: an administrative assistant and assistant managers for rules, for safety, and for hazardous materials and environmental matters. TMPA does not comment on these positions or argue that they would be unnecessary. Because TMPA has offered no response, we include these positions in our restatement of the GCRR's staffing levels.

c. Mechanical Personnel

BNSF and TMPA agree that a director and two managers of mechanical operations would be required for the GCRR. The parties also agree that the GCRR would need to have a staff of car inspectors. But they offered differing evidence on the number of car inspectors, assistant managers, and foremen for the locomotive service tracks. We discuss each of the disputed positions below.

[156] BNSF Reply Narr. III.D3 at 27.

[157] Because of the reduced traffic moving through Thedford and Madill, we assume that the additional two managers would be stationed at South Logan and Guernsey.

Table C-7
Mechanical Employees

Position	BNSF	TMPA	STB
Dir. of Mechanical Operations *	1	1	1
Mgr. of Mechanical Operations	2	2	2
Asst. Mgr. of Cars (Guernsey)	5	0	0
Asst. Mgr. of Locomotives (Guernsey)	5	0	0
Asst. Mgr. of Loco/Cars (Lincoln)	5	0	0
Car Inspectors	80	54	55
Locomotive Service Track Foremen	20	0	0
TOTAL	**118**	**57**	**58**

* In the spreadsheet used to develop operating expenses, costs for these personnel are included as general and administrative costs rather than operating personnel costs.

i. Assistant Managers of Cars and Locomotives

TMPA states that, because the GCRR would use contractors for equipment maintenance, it would not need assistant managers of cars and locomotives. We agree. BNSF has not disputed the cost of contractors or argued that the contractors could not perform all maintenance functions.

ii. Car Inspectors

The parties agree that an around-the-clock, four-person car inspection crew would be required at PSO Junction. (The number of employees required to man this crew at PSO Junction would be 19.) The parties disagree, however, on the number of car inspectors that would need to be assigned to perform 1,000-mile inspections at Guernsey. TMPA provided for 36 employees (two four-person car inspection crews, on duty around-the-clock). BNSF argues that a third crew should be added due to the number of trains that would pass through Guernsey (an average of 72 trains per day in the peak year and 94 trains on the peak day).

TMPA explains that the GCRR's inspectors would use motor vehicles to simultaneously inspect both sides of a train and that each four-person crew could inspect two trains per hour. As a result, two crews would be capable of inspecting 96 trains per day. BNSF has not shown that this would be infeasible. Therefore, we accept TMPA's staffing for car inspection at the Guernsey yard.

iii. Locomotive Service Track Foremen

BNSF would have the GCRR employ 20 foremen to work on the locomotive service tracks. But as TMPA points out, the GCRR's equipment maintenance would be performed by contractors. Therefore, we agree that no GCRR foremen would be needed.

5. General and Administrative (G&A) Personnel

Table C-8
General & Administrative Staff

Department	**BNSF[158]**	**TMPA**	**STB**
Executive	9	4	4
Operations	2	0	0
Transportation	39	14	15
Engineering/Mechanical	6	4	7
Accounting/Finance	59	21	23
Law & Administration	27	12	14
TOTAL	**142**	**55**	**63**

BNSF asserts that it is common practice in the railroad industry for each G&A department head to have an administrative assistant and that it is a practical necessity for all persons serving at a vice-president level or above to

[158] Four of the employees BNSF categorizes as G&A employees are discussed in our analysis of operating (transportation and mechanical) employees. These are the Directors of Train Operations, Locomotive Operations, and Operations Control, and the Manager of Operating Rules.

have such an assistant. TMPA does not counter (or even comment on) a need for administrative assistants (except with regard to the Executive and Operations departments, discussed below). Accordingly, we include administrative assistants for all department heads.

a. Executive

Table C-9
Executive Personnel

	BNSF	**TMPA**	**STB**
President/CEO	1	1	1
Admin. Assistant	1	1	1
Dir. Corp. Relations	1	1	1
Outside Board	5	1	5
Corporate Secretary	1	-	-
TOTAL	**9**	**4**	**8**

The parties agree that the GCRR would need a President/Chief Executive Officer, an Administrative Assistant, and a Director of Corporate Relations. Based on the structure of other large railroads, BNSF would include five outside directors and a corporate secretary. TMPA would assign the ministerial duties of a corporate secretary[159] to the Vice-President–Law and Administration, and it would have the GCRR employ only one outside director, who would be a representative of the GCRR's shipper group.

We agree with TMPA that BNSF has not shown the need for a corporate secretary and that the function could reasonably be performed by the Vice-President–Law and Administration. As for the GCRR's Board of Directors, TMPA's proposal would result in unconstrained managerial control and oversight of the railroad. We agree with BNSF that an organization of this scope would require significant independent oversight of its management, regardless

[159] TMPA notes the principal legal function performed by the Corporate Secretary is to keep minutes of Board of Directors' meetings.

of whether it is private or publicly traded. Consequently, we include five outside directors. However, BNSF has failed to substantiate a salary of $30,000 a year for directors. As TMPA notes, outside directors would likely have a direct interest in the GCRR's success (it assumes they would be shipper or investor representatives), and thus would be willing to serve on its board with only minimal compensation (for the expenses associated with attending board meetings).

b. Operations Department

BNSF would have the GCRR include an Operations Department headed by a senior vice-president, to whom assistant vice-presidents for transportation, engineering, and mechanical would report. BNSF's suggestion for an Operations Department is based on an organizational plan that includes three subordinate operating departments. As discussed *infra*, TMPA would combine two of these departments, and we agree that would be reasonable. Thus, the additional layer of management BNSF proposes would be unnecessary.

c. Transportation Department

Table C-10
Transportation Department

	BNSF	TMPA	STB
VP Transportation	0	1	1
Asst. VP Transportation	1	0	0
Director, Operations Control	1	1	1
Director, Train Operations	1	1	1
Director, Locomotive Operations	1	1	1
Manager, Operating Rules	1	1	1
Administrative Assistant	1	0	1
Director, Customer Service	1	1	1
Manager, Customer Service	5	0	0
Customer Service Representatives	10	8	8
Marketing Department	15	0	0
TOTAL	**37**	**14**	**15**

TMPA would have the GCRR's Transportation Department headed by a vice-president who would act as the GCRR's General Manager. BNSF would provide for an assistant vice-president instead. Because we have rejected the need for a senior vice-president of operations, we will assume that the transportation department would be headed by a vice-president.

The parties agree on the other staffing needs of the transportation department, except for the marketing and customer service functions. TMPA assumes that the GCRR would contract out the marketing function under the supervision of the Director of Customer Service. BNSF criticizes the idea of outsourcing the marketing function, asserting that unnamed shortline railroads have tried this in the past with "disappointing results."[160] BNSF would have the GCRR put both the marketing and customer service functions into a separate marketing/customer service department.

TMPA observes that BNSF's proposed marketing department for the GCRR replicates BNSF's own 15-person coal marketing staff, which includes separate "Economic Analysis" and "Equipment and Service" groups. Noting that the GCRR would have a single commodity and a stable customer base (utility customers interested only in pricing and service), TMPA argues that the marketing function could easily be outsourced. We agree, given the limited customer base that the GCRR would have. Therefore, we accept TMPA's evidence on staffing.

TMPA assumes eight customer service representatives, whereas BNSF would have the GCRR employ a customer service staff of 10 positions. However, BNSF has not shown why eight positions would not be sufficient. Given the limited number of customers to be served by the GCRR, TMPA's staffing for the GCRR appears reasonable.

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[160] BNSF Reply Narr. III.D.3 at 55-56.

d. Engineering/Mechanical Department

Table C-11
Engineering/Mechanical Staff

	BNSF	**TMPA**	**STB**
VP Engin/Mech Operations	0	1	1
Asst. VP Engineering	1	0	0
Asst. VP Mechanical Operations	1	0	0
Admin. Assistant	2	0	1
Dir. Mechanical Operations	2	0	0
Mgr. of Eng. & Mech. Services	0	2	2
Mgr. of Budgets & Purch.	0	1	1
TOTAL	**6**	**4**	**5**

TMPA would have locomotive, railcar, and other maintenance contracted out, allowing the engineering and mechanical staff to be combined into a single department. BNSF calls for two departments, with separate assistant vice-presidents and separate staffs. Given that many activities would be contracted out, we accept TMPA's proposal for a combined department headed by a vice-president, rendering BNSF's two assistant vice-president positions unnecessary. In addition, we accept TMPA's two managers of engineering and mechanical services, instead of BNSF's two directors of mechanical operations, because BNSF has not justified the higher level, higher salary positions. We also accept TMPA's manager of budgets and purchasing, yielding a staff of five.

e. Finance and Accounting Department

TMPA's would have the GCRR's Finance and Accounting Department consist of 21 employees,[161] while BNSF proposes a staff of 59 persons for this department.

[161] TMPA assumes that the vice-president would also act as the GCRR's treasurer and principal liaison with outside auditors.

Table C-12
Accounting/Finance Staff

	BNSF	**TMPA**	**STB**
VP-Finance/Accounting/Treas	1	1	1
Manager - Administration	0	1	1
Office Manager	1	0	0
Treasurer	1	0	0
Assistant Treasurer	1	0	0
Director Credit/Collections	1	0	0
Director Taxes	1	1	1
Manager - Fed Tax	1	0	0
Manager - State Tax	1	0	0
Manager - Property Tax	1	0	0
Manager - ERISA	1	0	0
Controller	1	1	1
Asst. Controller - Revenue	1	1	1
Asst. Controller - Corp. Accounting	1	0	0
Asst. Controller - Disbursement	1	1	1
Clerk Analyst	18	2	2
Director - Budgeting/Analysis	1	1	1
Manager Financial Reporting	0	1	1
Director Purchasing	1	0	0
Purchasing Agents	4	0	0
Clerk Analyst	4	0	0
Budget Analyst	2	0	0
Manager Internal Audit	1	0	0
Director IT	1	1	1
Manager - Operations	1	0	0
Manager - Systems	1	0	0
Systems Analysts	7	0	0
IT Specialists	2	10	10
Administrative Assistant	2	0	1
TOTAL	**59**	**21**	**22**

While BNSF asserts that TMPA's staffing levels for the GCRR would be inadequate, BNSF's proposal is based on comparisons with its own operations. This is not a meaningful comparison, as the GCRR would be a much different railroad than BNSF. Indeed, some of the positions proposed by BNSF relate to functions that the GCRR would have contractors perform. BNSF has not shown TMPA's proposal to be inadequate.

f. Law and Administration Department

TMPA assumes a combined legal and administrative department, headed by a vice-president. BNSF proposes separate departments for law and human resources, each headed by a vice-president. TMPA's proposal appears reasonable and BNSF has not shown why separate departments would be necessary.

Table C-13
Law and Administration Department

	BNSF	TMPA	STB
Law & Administration			
VP - Law and Administration	1	1	1
General Attorneys	3	2	2
Manager, Environmental	1	0	0
Paralegal	1	0	0
Director - Safety and Security	1	0	0
Managers of Safety	1	2	2
Director - Insurance	1	0	0
Director - Claims	1	1	1
Claims Agent	6	0	0
Administrative Assistant	2	0	1
Human Resources			
VP Human Resources	1	0	0
Director - Human Resources	0	1	1
Manager of Training	1	1	1
Director - Corp Recruitment	1	0	0
Director - Personnel	1	0	0
Manager Employee Benefits	1	0	0
Manager - Personnel	1	0	0
Personnel Analysts	2	0	0
Administrative Assistant	1	0	0
Secretary	0	4	4
TOTAL	**27**	**12**	**13**

BNSF would provide for a manager for environment and an environmental attorney; an attorney and a paralegal for real estate matters; and a general attorney.[162] TMPA provides only for two general attorneys. TMPA points out that no new facilities would need to be constructed after the GCRR's initial construction. Thus, there would be no need for additional land and no corresponding need for a legal staff to handle real estate matters.[163] Nor would there be any need for ongoing management of environmental work beyond routine cleanup of coal and diesel fuel spills.[164] TMPA's arguments are persuasive.

BNSF would provide for separate directors of Insurance, Claims, and Safety, plus six claims agents, one administrative assistant, and a Manager of Safety and Security. TMPA, however, contends that a large claims-processing staff would be unnecessary because the GCRR would outsource the claims function. TMPA would provide for only a Director of Safety and Claims and two managers of Safety, who would be responsible for overseeing the claims management contractor. TMPA's staffing level for safety and claims appears reasonable, and BNSF has not shown why it would be infeasible to contract out this function.

With respect to human resources, TMPA provides for a Director of Human Resources and a Manager of Training, plus a secretarial pool of four. BNSF proposes a larger human resources staff of nine, including directors of Recruitment, Personnel, and Training, managers of Benefits and Personnel, and two personnel analysts. TMPA maintains that BNSF's proposed human resources staffing does not take into account the outsourcing and computerized human resources management systems that TMPA has included. We agree, and we conclude that the human resources staffing proposed by TMPA would be adequate.

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[162] The parties agree that litigation would be handled by outside counsel.

[163] TMPA states that acquisition of right-of-way and other property is provided for in the GCRR's initial road property investment costs.

[164] TMPA points out that it is not necessary to provide for environmental compliance during initial construction, as BNSF's predecessors did not face such costs when originally constructing the lines to be replicated. It is well-settled policy that a SAC analysis should not include costs that the defendant carrier did not itself incur, as a SAC rate should not be designed to allow a defendant carrier to recover costs that it has not incurred. *See, e.g.*, *WPL*, 5 S.T.B. at 1019, 1024-25; *McCarty*, 2 S.T.B. at 504 n.81.

6. Wages and Salaries

a. Operating Personnel

Table C-14
Operating Personnel Salaries

Position	BNSF	TMPA	STB
Manager of Operations Control	$79,422	$71,212	$71,212
Crew Caller	$44,192	$43,058	$43,058
Dispatcher	$64,558	$62,901	$62,901
Manager of Train Operation	$79,422	$77,384	$77,384
Assistant Manager of Train Operations	$73,088	$77,384	$77,384
Train Crew Member	$79,058	$56,537	$70,741
Helper Crew Member	$79,058	$56,537	$70,741
Switch Crew Member	$79,058	$56,537	$70,741
Manager of Locomotive Operations	$79,422	$77,384	$77,384
Manager of Mechanical Operations	$96,692	$77,384	$77,384
Equipment Inspector	$44,922	$54,816	$54,816

Both parties use BNSF's 2000 Wage Forms A&B as the basis for developing salaries for GCRR's operating personnel. The difference in the compensation levels that they show is due to differences in the indexing procedures used and the amount of constructive allowances for train crew personnel that are included.[165]

BNSF indexed salaries from 2000 levels to the third quarter of 2001 (3Q01) using the change in the AAR Wage index. TMPA accepts the use of the AAR Wage index, but TMPA indexes the salaries to 2Q01, when the GCRR's operations would begin. We accept TMPA's indexation to 2Q01, because the DCF model indexes costs forward from that point. Furthermore, TMPA's

[165] Constructive allowances are all elements of employee compensation other than wages and fringe benefits. Both parties include a 40% fringe benefit additive in developing salaries.

indexation of wages (by 1.74%) can be verified, whereas BNSF's indexation (by 4.42%) cannot.

In its opening evidence, TMPA developed salary levels from the Wage Forms A&B by including the regular and overtime wages but excluding all constructive allowances. BNSF argues that all constructive allowance amounts shown on the forms should be included. In its rebuttal, TMPA acknowledged that it understated the salary levels on opening but maintains that BNSF's inclusion of all constructive allowances overstates salaries.

TMPA states that, upon reviewing the crew wage data for TMPA trains provided by BNSF in discovery, it found that certain constructive allowances (such as special pay differential, reduced crew allowance, guarantees, and deadheading) would be inappropriate for the non-unionized GCRR and that the inclusion of constructive allowances for training would result in a double count. TMPA contends that salary levels should be increased by 11.93% to reflect appropriate constructive allowances, such as vacations and meals.

TMPA provides no evidence that non-unionized railroads do not pay these allowances, or that the GCRR could avoid the payment of these allowances (other than deadheading) in the labor market.[166] Accordingly, we cannot accept TMPA's unsubstantiated argument that the GCRR's non-union status would somehow enable it to avoid payment of these allowances. We agree with TMPA, however, that the inclusion of a constructive allowances for initial (but not ongoing) training would constitute a double-count of the training expenses previously included. We also agree that deadheading would not be incurred, because the GCRR's crews would operate on a 6-day work week and, therefore, would be able to end the work week at the home terminal. We have adjusted BNSF's constructive allowances accordingly.

b. Non-Operating Personnel

BNSF disputes the compensation levels developed by TMPA for non-operating personnel[167] and argues that substantially higher salaries would be needed to attract qualified management personnel. BNSF does not directly rebut TMPA's salary proposal for upper management; it merely notes that some

[166] In fact, it seems that no railroad could avoid at least some excluded expense items, such as compensation for employees attending investigations and attending court.

[167] TMPA developed these based on the opinions of their expert witnesses and BNSF's 2000 Wage Forms A&B. Salaries for vice presidents and above were developed on a specific basis, as was TMPA's salary for the GCRR's controller.

railroads pay higher salaries than those suggested by TMPA's evidence. TMPA, on the other hand, offered evidence showing that other railroads comparable to the GCRR pay less than those identified by BNSF. Therefore, we accept TMPA's salary structure for the GCRR's non-operating personnel.

BNSF would also use a different index for adjusting the 2000 salaries to the second quarter of 2001 (4.42%, compared to 1.74% used by TMPA). We accept TMPA's index for adjusting salaries from 2000 to the second quarter of 2001 because, as noted above, BNSF inappropriately indexes salaries to the 3rd quarter of 2001.

Table C-15
Non-Operating Personnel Salaries

Position	BNSF	TMPA	STB
President/CEO	$799,185	$305,220	$305,220
Administrative Assistant	$67,823	$94,104	$94,104
Director of Corporate Relations	$96,583	$94,104	$94,104
VP-Transportation	$232,714	$94,104	$94,104
Director of Operations Control	$73,088	$77,384	$77,384
Director of Train Operations	$96,692	$94,210	$94,210
Director of Locomotive Ops.	$96,692	$94,210	$94,210
Director of Customer Service	$96,583	$80,420	$80,420
Customer Service Managers	$82,538	$80,420	$80,420
Manager of Operating Rules	$79,422	$77,384	$77,384
VP-Engineering/Mechanical	$232,714	$94,210	$94,210
Mgr. of Mechanical Services	$107,900	$94,210	$94,210
Clerk	$67,823	$41,864	$41,864
Mgr. of Budgets/Purchasing	$96,583	$94,104	$94,104
VP-Finance/Accounting/Treasurer	$291,462	$203,480	$203,480
Manager - Administration	$75,200	$94,210	$94,210
Director of Taxes	$96,583	$94,104	$94,104
Controller	$232,714	$114,457	$114,457
Asst. Controller-Revenue	$96,583	$94,104	$94,104
Asst. Controller-Disbursements	$96,583	$94,104	$94,104
Clerk-Analyst	$67,823	$41,864	$41,864
Mgr. Financial Reporting	$96,583	$94,104	$94,104
Director-Budgeting/Analysis	$96,583	$94,104	$94,104
Director-IT	$96,583	$73,270	$73,270
IT Specialists	$67,823	$66,083	$66,083
VP-Law and Administration	$321,618	$239,089	$239,089
General Attorney	$96,583	$73,270	$73,270
Director of Safety and Claims	$96,583	$94,104	$94,104
Manager of Safety	$73,088	$77,384	$77,384
Director of Human Resources	$96,583	$94,104	$94,104
Manager of Training	$75,200	$77,384	$77,384
Secretary	$72,804	$55,749	$55,749

7. Materials and Supplies

The GCRR would need to purchase operating materials and supplies, including office furniture and equipment, office supplies, utilities, automobiles with two-way radios for supervisory personnel, safety equipment, EOTDs, two-way radios for use by train crew personnel, car inspection trucks equipped with tools, and miscellaneous car parts. TMPA estimates that materials and supplies would cost the GCRR approximately $1.45 million, whereas BNSF estimates that they would cost $2.98 million.

There is no dispute regarding the costs for utilities and EOTDs. For all other items except automobiles,[168] BNSF estimated materials and supplies cost as a percentage of the operating personnel salaries reported in BNSF's 2000 R-1 report. TMPA, on the other hand, separately itemized the cost for each item that would be required. Because an examination of the cost of specific materials and supplies is superior to estimating such costs based on a percentage of operating personnel salaries, we accept TMPA's estimate as the better evidence of record.

8. Loss and Damage Expense

The parties agree that loss and damage expenses would be $0.33 million.

9. Insurance Expense

The parties agree that insurance expense can be estimated by multiplying operating expenses by 2.94%.

10. Ad Valorem Tax

Both parties estimated ad valorem taxes based on the undisputed GCRR route miles in each state and used BNSF's taxes for year 2000 as a starting base. BNSF estimated taxes of $10.1 million, while TMPA estimated $8.3 million. The difference arises from BNSF's failure to adjust its 2000 tax expense for taxes paid on equipment that would not be owned by the GCRR. Because the GCRR would not owe taxes on property that it would not own, we use TMPA's evidence on this expense.

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[168] TMPA accepts BNSF's unit price for a Jeep Liberty, but TMPA assumes that the vehicles would be purchased in Nebraska (where the GCRR would be headquartered) and factored in Nebraska's 5% sales tax, rather than the 6.5% sales tax used by BNSF.

11. Maintenance-of-Way Expense

The GCRR would have a MOW department to perform operating maintenance (preventive maintenance to keep the rail plant in operating condition). In their respective DCF calculations, the parties include the necessary funds to replace all of the GCRR's assets at the end of their asset lives, thereby obviating the need to provide MOW funds to replace worn-out assets (so-called program maintenance). Thus, while the SAC analysis reflects total (operating and program) MOW costs, only the costs for operating maintenance are included as an operating expense.

TMPA initially provided for limited operating maintenance. In response to BNSF's reply evidence that significantly more MOW staff and equipment would be needed, TMPA completely revised its proposed MOW operations but did not significantly change the estimated costs.[169] BNSF filed a motion to strike TMPA's rebuttal evidence on MOW.

BNSF contends in its motion to strike that TMPA's revisions reflect a significant methodological shift from TMPA's original attempt to cast the GCRR as a small railroad with the same MOW needs and organizational requirements as a shortline railroad. Specifically, TMPA's rebuttal evidence features a much larger managerial staff, an increased field labor force, and an organization that includes three new sub-departments, assertedly more in line with large-carrier operations. Nevertheless, BNSF notes that TMPA's cost estimates are essentially unchanged on rebuttal. BNSF argues that TMPA's rebuttal evidence reflects a "shell game," and urges that it be stricken.

TMPA's rebuttal evidence does not attempt to provide support for its case-in-chief presented in the opening evidence; nor does it accept BNSF's evidence.[170] Rather, TMPA attempts to introduce an entirely new plan for performing MOW on the GCRR.[171] Moreover, both TMPA's opening and rebuttal evidence suffer from a general lack of support; in most cases, TMPA

[169] While TMPA significantly increased the MOW staff, its overall cost estimate did not change significantly because TMPA claims that it included certain costs twice in its opening evidence.

[170] With little discussion, TMPA disregards BNSF's proposed staffing for telecommunication, electrical, and purchasing MOW activities.

[171] For example, with little explanation, TMPA would more than double the GCRR's MOW staff, to 215 employees.

merely asserts that its position is reasonable.[172] Because TMPA has inappropriately presented a new case-in-chief on rebuttal (thereby denying BNSF the opportunity to comment on the revised evidence), and because TMPA's evidence is unsupported, TMPA has failed to carry its burden of proof on the issue of the GCRR's MOW costs. As a result, we generally rely on the evidence submitted by BNSF to develop MOW expenses. However, because certain of BNSF's MOW cost estimates are based on the number of track miles the GCRR would have, we use our restated track-mile estimate (rather than BNSF's estimate) to develop those expenses.

[172] For example, without any support, TMPA asserts that weed control would cost $350 per track mile, that miscellaneous engineering costs would be $1 million, and that costs associated with derailments would be $1 million. Also, while TMPA agrees that costs for storm water monitoring would be required, it failed to include any costs for this activity. TMPA also did not explain how it developed costs for ultrasonic rail testing or rail geometry testing.

Table C-16
Comparison of Operating Expense Portion of
Normalized Maintenance Estimates

	BNSF	TMPA	STB
1. MOW Organization			
A. General Office	$1,144,839	$539,178	$1,144,839
B. Roadmasters & Supervisors	$1,796,183	$2,683,994	$1,796,183
C. Track Workers	$20,843,862	$2,348,926	$20,843,862
D. Bridge & Building	$4,083,175	$76,204	$4,083,175
E. Signal	$5,776,400	$2,458,155	$5,776,400
F. Telecommunications	$6,161,449	N/A	$6,161,449
G. Electrical	$602,440	N/A	$602,440
H. Purchasing & Stores	$376,789	N/A	$376,789
Total Organization	**$40,785,137**	**$8,106,457**	**$40,785,137**
2. Materials			
Track Material Costs	**$7,816,282**	**$3,253,681**	**$3,253,681**
3. Equipment			
MOW Equipment	$11,027,285	N/A	$11,027,285
Stores Department	$54,735	N/A	$54,735
Total Equipment	**$11,082,020**	**$3,496,091**	**$11,082,020**
4. Other Contract OE Services			
a. Regular and Noxious Weed Spray	$898,017	$783,475	$848,027
b. Ultrasonic Rail Testing	$1,207,506	$662,135	$1,207,506
c. Track Geometry Testing	$15,040,574	$4,538,530	$9,837,367
d. Rail Grinding	$3,462,853	$3,462,853	$3,462,853
e. Bridge Contract Work	$860,000	$0	$0
f. Yard Cleaning	$17,388	$0	$17,388
g. Ditching	$325,976	$325,976	$325,976
h. Misc. Engineering	$600,000	$1,000,000	$600,000
i. Building Maintenance	$400,000	$161,205	$400,000
j. Derailment Allowance	$4,730,000	$1,000,000	$4,730,000
k. Snow Removal Allowance	$800,000	$800,000	$800,000
l. Storm Water Prevention	$500,000	N/A	$500,000
m. Casualties	$4,500,000	$0	$3,375,000
n. Shoulder Ballast Cleaning	N/A	$686,158	$686,158
o Ballast	N/A	$1,385,432	$1,385,432
p. Contract Labor	$0	$4,230,895	$0
Total Contract Services	**$33,342,315**	**$19,036,659**	**$28,175,707**
TOTAL	**$93,025,753**	**$33,892,889**	**$83,296,545**

12. Easement Rental

As explained in Appendix D (Section A—Land), we accept TMPA's characterization of 563.51 acres of BNSF right-of-way as being used under perpetual easements rather than being owned in fee. Accordingly, we accept TMPA's proposed easement costs for the parcels (including the annual fee of $13,157 that we include as an operating expense).

13. Trackage Rights/Leased Facilities

Both parties computed the fees the GCRR would pay for operating over 0.25 miles of UP tracks, including a bridge over the Red River on the Oklahoma/Texas border. The costs are based on the number of GCRR trains that would use the facilities. Because we have disallowed certain rerouting of traffic, we recalculate the fee to account for the reduced number of trains that would use UP's property. We find that the GCRR would incur $17,000 in such fees.

14. Third-Party Expenses

TMPA assumes, and BNSF agrees, that the GCRR would need to pay a contractor $300,000 per year for unloading and inspecting trains terminating at Basin Electric's Laramie River Station at Moba, WY. BNSF argues that the GCRR would also need to pay for a contractor to move trains through the loading facilities at some mines in the PRB (for an additional cost of $1.9 million). TMPA contends that BNSF incurs this fee because its crews cannot complete loading in the allotted time owing to the configuration of BNSF's crew districts in relation to the PRB mines, and the fact that for BNSF it is cheaper to use a contractor crew than to pay a relief crew. TMPA maintains that the crew districts on the GCRR are designed so that the crews would have sufficient time to accompany the trains during the loading process. TMPA points out that empty GCRR trains would change crews at South Logan, WY, which is more than 90 miles closer to the mines than BNSF's last crew-change point for such trains.

We agree with TMPA that, because GCRR's crew change point would be significantly closer to the mines than BNSF's, the GCRR would not need to provide for contractors at the mines.

APPENDIX D — GCRR ROAD PROPERTY INVESTMENT

This appendix examines the evidence and arguments of the parties concerning construction of the GCRR. Table D-1 summarizes the cost estimates associated with completing various aspects of that construction process. We find that it would cost approximately $4 billion to build the GCRR.

Table D-1
GCRR Construction Costs

	BNSF	TMPA	STB
A. Land	$ 235,408,354	$ 99,881,659	$ 233,618,513
B. Roadbed Preparation	1,256,752,306	881,611,056	932,488,457
C. Track Construction	1,610,796,023	1,198,208,864	1,448,946,225
D. Tunnels	44,801,190	23,123,195	44,801,190
E. Bridges	480,951,831	288,063,403	421,681,222
F. Signals & Communications	126,491,985	118,229,902	121,298,640
G. Buildings and Facilities	82,692,904	32,290,520	53,168,235
H. Public Improvements	111,214,765	23,360,291	111,163,318
I. Mobilization	63,837,005	19,712,323	62,659,655
J. Engineering	350,468,892	174,335,791	316,044,885
K. Contingencies	412,800,690	205,100,931	351,225,183
TOTAL	**$4,776,215,946**	**$3,197,535,754**	**$4,097,095,523**

A. Land

Tables D-2 and D-3 summarize the parties' estimates of the amount of land that would be needed to construct the GCRR and the cost of acquiring that land, as well as our restatement of those estimates. Most of the difference between the parties' estimated real estate costs and our restatement arises from variances in the cost per acre, rather than the amount of land needed.

Table D-2
Real Estate Acreage

	BNSF	TMPA	STB
ROW-Fee Simple	19,373.45	18,827.24	18,809.94
ROW-Easements	0.00	563.51	563.51
ROW–Total	19,373.45	19,390.75	19,373.45
Yards	347.76	347.76	347.76
Facilities	19.04	13.53	19.04
Microwave Towers	242.92	128.00	138.00
TOTAL	**19,983.17**	**19,880.04**	**19,878.25**

Table D-3
Real Estate Costs

	BNSF	TMPA	STB
ROW Costs	$228,413,770	$98,773,780	$227,372,209
Yard Costs	5,035,700	190,573	5,035,700
Facilities	226,400	52,464	226,400
Microwave Towers	1,732,484	864,836	984,204
TOTAL	**$235,408,354**	**$99,881,653**	**$233,618,513**

1. Right-of-Way

a. Acreage

TMPA assumes that for its right-of-way (ROW) the GCRR would need 18,827.24 acres in fee simple and 563.51 acres of easements (based on existing

BNSF easements), for a total of 19,390.75 acres. BNSF, on the other hand, calculates that the GCRR would need to purchase 19,373.45 acres of land, all of it in fee simple.

The parties' methods of applying land values to specific line segments is sufficiently different that we cannot apply one party's land values to the other's evidence on the amount of land required. And, as explained below, we reject TMPA's method for estimating the cost of land. Therefore, because we use BNSF's valuation methodology, we necessarily use its total ROW land requirement of 19,373.45 acres. However, as discussed below, we assume that 563.51 of these acres would be obtained by easement.

b. Valuation

i. Easements

TMPA submitted unrebutted evidence that 563.51 acres of the BNSF ROW replicated by the GCRR were acquired by easement,[173] for a one-time payment of $281,896 plus an annual fee.[174] Because we do not require a stand-alone railroad to acquire greater title to property than the incumbent railroad,[175] we agree with TMPA that the GCRR could acquire the 563.51 acres by easement at that cost. Therefore, we use TMPA's easement evidence.

ii. Fee Simple Property

For purposes of land valuation, TMPA divided the GCRR into segments averaging 18 miles in length and valued each segment using generalized land values.[176] TMPA employed a "macro-level analysis," basing the value of ROW in a geographic area on the general value of unimproved land in that area. TMPA based its valuations on approximately 400 sales of unimproved land that occurred before April 1, 1999. BNSF argues that TMPA undervalued land in major metropolitan areas by considering only a limited number of transactions

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[173] BNSF in its evidence does not differentiate between parcels acquired by easements and those owned in fee simple.

[174] The annual payments for use of the easements are treated as an operating expense.

[175] *See WPL*, 5 S.T.B. at 1019.

[176] For instance, TMPA divided the Dallas Metropolitan area into three parcels: a 25.88-mile residential segment, a 13.1-mile commercial segment, and a 13.82-mile industrial segment. By comparison, BNSF valued ROW in the Dallas area by separately valuing 247 residential, 100 industrial, and 544 commercial segments.

and relying on sales of property located away from the ROW so as to minimize the price.[177]

In contrast, BNSF divided the ROW into two parts: inspected and uninspected areas. For the inspected areas, BNSF assigned values to each segment based upon a field inspection and an analysis of land sales. For uninspected areas, BNSF accepted TMPA's categorization of land use but adjusted the value of the land. BNSF's comparable sales are based on over 2,000 land transactions. For certain properties in Nebraska, BNSF substituted the price it recently paid for land to add to the existing ROW for TMPA's valuation.[178] For other areas, BNSF reduced TMPA's estimate because TMPA misclassified the property.[179]

We find that BNSF's more detailed procedure produces a better estimate of land values. Using a greater number of comparable properties gives a more complete and thus more accurate representation of market values. Moreover, BNSF's procedure of examining land directly along the ROW is superior to TMPA's procedure of valuing land in the general area. The land adjacent to the ROW is a prime indicator of the ROW's value and has been used in all prior SAC cases. Finally, TMPA's failure to apply the market value of land that would be on the ROW is inconsistent with its costing of grading and bridges based on the current BNSF route. Where it selects a route for the GCRR based on lowest earthwork costs or bridge construction costs, it must use the accompanying real estate values for parcels along that route.

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[177] For example, TMPA used only one residential sale ($12,455 per acre) in a floodplain to estimate residential real estate value for the entire Dallas area. Based on this one transaction, TMPA valued 180 acres (nearly 26 miles of ROW) in Dallas at $15,000 per acre. For industrial property, TMPA used only two sales (at $47,619 and $179,310 per acre) to conclude that industrial property in Dallas (an area of 126 acres, about 14 miles of ROW) could be acquired for $11,000 per acre. TMPA does not explain how it developed a figure of $11,000 per acre based on comparables of $47,619 and $179,319 per acre. TMPA valued commercial property in Dallas at $135,000 per acre based on 18 commercial sales transactions, only three of which were for less than $135,000. The remaining 15 commercial transactions ranged in value from $153,104 to $657,203 per acre.

[178] BNSF used these recent purchases not to argue that the GCRR would need additional land, as TMPA charges, but rather to better reflect the price of land along the ROW.

[179] BNSF reduces TMPA's valuation on much of the GCRR ROW from Wyoming to Northport, NE, due to TMPA's classification of the land as residential property rather than unbuildable wetlands.

2. Yards

The parties agree on the total acreage that would be needed for the GCRR yards, but they do not agree on the cost per acre for that land.[180] For the same reasons discussed above, we accept BNSF's valuation, which is based on a more detailed analysis of comparable land transactions.

3. Facilities and Microwave Towers

TMPA contends that the GCRR would require 13.53 acres for maintenance facilities and corporate buildings, and 128 acres for 64 microwave towers. BNSF would include 19.04 acres for buildings and facilities and 242.92 acres for 69 microwave towers. As discussed below in Section G—Buildings and Facilities, our restatement of the number and size of the buildings and facilities that we assume the GCRR would need more closely matches BNSF's evidence than TMPA's evidence. Therefore, we use BNSF's figure (of 19.04 acres) for the amount of land needed for these buildings and facilities.

According to TMPA, documents produced in discovery indicate that 2 to 5 acres of land are required for each microwave tower. TMPA would place part of the towers within the existing ROW and it claims that only an average of 2 additional acres would be needed per tower. BNSF assumes that an average area of 3.5 acres[181] would be needed for each microwave tower, with certain towers requiring as much as 10 acres, but BNSF has provided no explanation for these figures. Because TMPA's evidence shows that some of BNSF's microwave tower sites are as small as 2 acres, and BNSF does not explain the need for more acreage at any sites, we use TMPA's estimate on the amount of land needed per tower.

As discussed below in Section F—Signals & Communications, we agree with BNSF that its existing tower spacing is more appropriate than TMPA's estimated average distance of 25 miles between towers. Therefore, we accept BNSF's inclusion of 69 towers. Also, we conclude that, in addition to the ROW, a total of 138 acres would be needed for microwave towers (69 towers x 2 acres per tower) and 19.04 acres for buildings and facilities.

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[180] Most of the difference in the parties' yard land values results from TMPA's estimate that land for the Guernsey Yard could be purchased for $125 per acre, while BNSF estimates that it would cost $17,000 per acre.

[181] BNSF Reply e-W.P. "III F 6 Microwave Towers.xls/tower height."

B. Roadbed Preparation

Of the 13 categories of costs associated with roadbed preparation shown in Table D-4, the only undisputed costs are the unit costs for clearing, grubbing, and retaining walls.[182]

Table D-4
Roadbed Preparation Costs

Category	TMPA	BNSF	STB
Earthwork	$793,868,760	$1,037,924,491	$829,732,816
Clearing	15,571,331	15,580,382	15,402,236
Grubbing	5,536,303	5,554,575	5,538,793
Lateral Drainage	2,401,942	2,424,795	2,276,404
Culverts	48,504,479	49,132,518	48,504,479
Retaining Walls	330,971	321,571	330,971
Rip Rap	6,305,332	5,834,483	6,305,332
Relocation of Utilities	815,692	8,957,388	815,692
Placing Topsoil	2,532,925	26,047,034	2,532,925
Seeding	0	37,719,640	0
Water for Compaction	3,209,108	18,432,748	17,114,583
Road Surfacing	1,394,593	46,283,050	1,394,593
Environmental Compliance	1,139,619	2,539,633	2,539,633
TOTAL	**$881,611,055**	**$1,256,752,308**	**$932,488,457**

[182] The small difference in total cost for these items is due to differences in the track mile estimates discussed in Appendix B.

1. Earthwork

The parties agree on roadbed widths for single-track segments, the side slope of the roadbed, and the size of ditches.[183] They disagree on the width of double-track sections, the extent of access roads, the amount of grading needed for the Eagle Butte-to-Campbell line segment, tunnel daylighting, and earthwork equipment unit costs**.** We discuss these disputed elements below.

a. Center-to-Center Track Spacing

TMPA assumes that on double-track segments the centers of the tracks would be 15 feet apart. BNSF argues that TMPA's spacing on the higher volume sections north of Lincoln would lead to inefficient train operations. According to BNSF, on high-tonnage segments railroads maintain up to 30 feet between tracks to facilitate maintenance without jeopardizing either safety or train activities.[184] Assertedly, if there is less than 25 feet between track centers, trains must slow down to 20 mph in order to ensure the safety of maintenance workers.

To support its position, BNSF cites 49 CFR 214.7 (defining adjacent tracks), 214.327(b) (restricting the movement of trains and roadway maintenance machines on inaccessible track), and 214.335(c) (mandating warning of train approaches to roadway work groups for movements on adjacent tracks not within the maintenance working limits). These regulations, however, do not prohibit 15-foot center-to-center spacing, and BNSF has not provided evidence that 15-foot spacing is infeasible. Indeed, it acknowledges that such spacing is used on many double-track segments. Therefore, we accept TMPA's spacing for double track.

b. Access Roads

BNSF argues that an efficient railroad would construct access roads along any segment that could not be reached by existing and easily accessible parallel

[183] TMPA and BNSF agree that the GCRR could be built with 24- or 28-foot roadbed widths for single-track segments, depending on the density of traffic moving over the segment; a side slope of 1.5:1; and 2-foot-wide by 2-foot-deep ditches.

[184] BNSF states that, for all construction of double track in the past 6 years, it has used a 25-foot center-to-center spacing.

roads or service tracks.[185] TMPA claims that access roads are not generally necessary, because maintenance equipment can access the ROW over the line, and because the numerous road crossings along the GCRR route would permit crews to access the ROW by four-wheel drive vehicles. Therefore, TMPA includes costs (including earthwork) for access roads only where BNSF currently has access roads. TMPA used the earthwork associated with BNSF's access roads, as listed in the ICC Engineering Reports (*Engrg Rpts*) for older lines[186] and as documented by BNSF for the more recent Orin Line construction.

BNSF has not demonstrated that any access roads would be needed where it does not already have such roads itself, nor has it shown that maintenance costs would increase without additional access roads. Thus, we accept TMPA's assumption regarding access roads.

c. Eagle Butte-to-Campbell Segment

Three line segments that would be replicated by the GCRR did not exist when the *Engrg Rpts* were compiled. For two of the three segments, the parties agree on the methodology for estimating earthwork quantities.[187] For the Eagle Butte-to-Campbell segment, there is a dispute as to the amount of grading that would be required. TMPA estimated grading quantities based on the *Engrg Rpts* for the main-line section of track to which the Eagle Butte branch connects. BNSF argues that the *Engrg Rpts* are an inferior substitute for modern construction data. BNSF asserts that the Eagle Butte branch was built contemporaneously with, and to similar standards as, the Orin Line, so that grading quantities for this line segment should be based on the Orin Line construction.

BNSF has not shown, however, that the terrain of the Eagle Butte branch is comparable to that of the Orin Line. The adjacent line, on which TMPA based its grading quantities, is more likely to have similar terrain and thus reflect grading needs similar to those of the Eagle Butte branch. TMPA has accounted for the fact that the *Engrg Rpts* do not reflect present conditions by adjusting

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[185] BNSF acknowledges that it is feasible to operate a railroad without access roads but argues that the railroad would incur both higher operating and maintenance costs.

[186] The *Engrg Rpts* are compendia of data collected in the early part of the 20th century by the ICC. They detail the material quantities required to build most rail lines in place in the United States at the time. The data continue to be useful as a baseline for current earthwork quantities, subject to adjustments for modern engineering standards.

[187] The parties agree on earthwork for the Orin Line (Donkey Creek to Bridger Junction) and the Reno-to-Black Thunder segment, which connects to the center of the Orin Line.

those data to modern standards.[188] Therefore, we accept TMPA's estimates of grading quantity for the Eagle Butte-to-Campbell line segment.

d. Tunnel Daylighting

The parties agree that it would be necessary to daylight Tunnel No. 2 on the Canyon Subdivision, as was done by BNSF in 1998.[189] However, they disagree on the costs associated with this process. BNSF's Authority for Expenditure (AFE), supplied to TMPA in discovery, shows that it cost $10.5 million to daylight the existing BNSF tunnel.[190] Using topographic maps to calculate the amount of material that would need to be excavated, TMPA estimated a cost of only $5 million for daylighting the tunnel. TMPA assumes that the GCRR would only have single track at this location, whereas BNSF's tunnel was daylighted with a width sufficient to accommodate two tracks.[191] BNSF, on the other hand, claims that its expenditure was for daylighting a single-line tunnel and, because the GCRR would require double track through this area, the cost must be increased by a factor of 1.97.[192]

Because we use BNSF's track configuration for the GCRR in the area of the daylighted tunnel,[193] we conclude that the tunnel would need to accommodate a double-track operation. However, there is no need for any adjustment to BNSF's cost of daylighting the tunnel because the excavation was wide enough for double track.[194] Based on BNSF's AFE cost, indexed to 2001, we find that it would cost $11.32 million to daylight the tunnel.

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[188] For example, the cut and fill widths for modern railroad construction are wider than those found in the *Engrg Rpts*.

[189] Daylighting involves extensive excavating so that, rather than placing the roadbed in a tunnel, it is placed in an above-ground cut. Daylighting is performed when the cost of boring to expand a tunnel is greater than the cost to excavate for the roadbed.

[190] BNSF Reply W.P. at 05673-05675.

[191] TMPA claims that BNSF's AFE provided for a main line track and a siding. TMPA Reb. W.P. at 10336-10340.

[192] After indexing the costs to 2001, BNSF asserts that it would cost $22.3 million to daylight the double-track tunnel.

[193] *See* Appendix B.

[194] The photographs in TMPA's rebuttal workpapers clearly show that the tunnel was daylighted to accommodate two tracks. The text accompanying the photograph states "[w]ith the tunnel open, the existing siding from its terminus at East Stokes, was extended 9,147 feet through the cut to provide additional track capacity." TMPA Reb. W.P. at 10340.

e. Equipment

TMPA and BNSF disagree on the equipment that would be needed to spread and compact the soil into a suitable subgrade for the roadbed. TMPA relies on the U.S. Army Earthmoving Operations Field Manual (Army Field Manual) to support its claim that scrapers alone could spread the excavated material.[195] BNSF would add costs for bulldozers to spread the material, claiming that scrapers are only capable of dumping material into irregular piles, which must then be distributed and blended uniformly along the embankment before compacting.

BNSF has not provided support for its assertion that additional equipment would be needed to spread excavated material. Nor has it shown that TMPA's approach is infeasible. Because the Army Field Manual indicates that scrapers could perform the required work, we accept TMPA's equipment costs.

2. Clearing

The parties agree on the cost for clearing an acre of ground.

3. Grubbing

The parties agree on the cost for grubbing an acre of ground.

4. Lateral Drainage

Lateral drains are ditches along the side slopes of cuts and embankments that channel runoff away from the railbed. BNSF does not challenge TMPA's estimate of the amount of excavation that would be required, but would adjust TMPA's costs for the expense to conduct a second excavation to install lateral drainage using the R.S. Means Manual 2001 (*Means*).[196] TMPA claims that BNSF overstates costs by assuming that ditches would be excavated after all grading work was completed. TMPA argues that it is more efficient to excavate the drainage structures during the grading process. We agree with TMPA that it would be reasonable to do all earthwork at the same time. Therefore, we accept TMPA's cost estimate for lateral drainage.

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[195] TMPA Reb. W.P. at 10348-51.

[196] *Means* is a set of nationwide standardized unit costs, adjusted for localities, used to estimate the cost of construction.

5. Culverts

TMPA and BNSF agree on the number of culverts that would be needed and materials needed to construct the culverts. In developing its culvert costs, TMPA used an overhead and profit factor of 30%, recommended by *Means*.[197] BNSF would include 57% for overhead and 10% for profit, but it has provided no support for those profit and overhead cost factors. Therefore, we use TMPA's culvert estimate of $48.5 million.

6. Retaining Walls

TMPA would use gabions (wire mesh containers filled with stone), rather than retaining walls, and it used *Means* costs to develop its estimated cost for gabions of $330,971. BNSF does not dispute this estimate.

7. Rip Rap

Although the parties used different methods to calculate the amount of rip rap that would be needed,[198] BNSF does not contend that TMPA's cost estimate is too low. Therefore, we use TMPA's estimate of $6.3 million for rip rap.

8. Relocating and Protecting Utilities

TMPA included costs for relocating utilities for the sections of the GCRR from Eagle Butte to Bridger Junction and from Reno to Black Thunder Junction because, when the BNSF lines along these sections were built, the utility infrastructure was already in place. TMPA excluded relocation costs for other line segments because those segments pre-date the installation of the utilities.

BNSF contends that, because the GCRR would benefit from the existing utility grid system, it should pay relocation costs. Alternatively, if those costs are excluded, BNSF argues that the cost of utility poles should be included instead, because BNSF or its predecessors did incur those costs when the lines were originally built. TMPA responds that, while utility poles were necessary at the time the original lines were built, they are unnecessary today.

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[197] TMPA Reb. W.P. at 10354.

[198] Rip rap are large stones placed at the ends of drains and culverts to slow and deflect drainage.

We agree with TMPA that utility relocation costs should be included only where the incumbent railroad incurred these costs. It is well settled that a SAC analysis should not include costs that the incumbent railroad did not itself incur.[199] Moreover, we see no need to include utility pole costs for the older line segments, even if the incumbent railroad paid those costs, because more recent technology (encoded track circuitry) has rendered pole lines obsolete.[200] Therefore, we accept TMPA's cost estimate for relocating utilities.

9. Topsoil Placement and Seeding

TMPA included costs for topsoil placement for the same locations at which BNSF incurred these costs. For the Eagle Butte-to-Bridger Junction segment of the GCRR, TMPA based its cost estimate on the actual topsoil placement costs associated with the construction of that line—costs that included seeding costs. For the remaining line segments, TMPA used the *Engrg Rpts* ("embankment protection" quantities) to estimate topsoil and seeding costs of approximately $2.5 million.

BNSF argues that, without proper seeding and topsoil replacement, the GCRR would incur additional maintenance costs associated with controlling runoff. Therefore, BNSF would extrapolate to the entire GCRR the topsoil costs incurred in constructing the Orin Line. It estimates separate seeding costs of $63.8 million.

Again, it is inappropriate to include topsoil placement and seeding costs unless the incumbent railroad actually incurred such costs.[201] Therefore, we do not include any separate seeding costs, because BNSF has not shown that it incurred seeding costs for any line segment other than the Orin Line, the seeding costs for which are included in the topsoil placement costs.

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[199] *See WPL*, 5 S.T.B. at 1024-25.

[200] We included utility pole costs in *McCarty*, 2 S.T.B. at 518 & n.115, because the SARR in that case would have been constructed before encoded track circuitry was available.

[201] *See FMC*, 4 S.T.B. at 801-02; *WPL*, 5 S.T.B. at 1024.

10. Water for Compaction

The roadbed would have to be adequately compacted to withstand the stresses from the heavy coal trains that would traverse the GCRR. In arid areas, water must be added to the soil to ensure adequate compaction. TMPA included the cost of water for compaction only for the Orin Line,[202] on the ground that the *Engrg Rpts* do not indicate that water was used for compaction in the original construction of any of the other lines that would be replicated by the GCRR.[203] BNSF argues that the cost of water for compaction should be included for the entire GCRR ($18.43 million) because United States Department of Agriculture (USDA) Ecosystem Domain maps show that the majority of the GCRR would be located in arid areas.[204]

As we have observed in prior SAC cases,[205] engineering and construction methods have changed since the original railroad lines were constructed. Costs associated with modern construction practices are not regarded as barriers to entry. Just as we do not exclude costs that would be rendered unnecessary given modern technology (such as the cost of pole lines), we include construction costs that are required by modern techniques. Because the GCRR must ensure that the roadbed would be adequately compacted for its anticipated traffic, as was true of BNSF's predecessors for the original lines, we agree with BNSF that costs for water for compaction should be included for all segments of the GCRR.

Using the parties' agreed-on cost for water, and our revised grading quantities, we find that it would cost $17.1 million to add water to the roadbed.

11. Road Surfacing

TMPA included costs of $1.39 million to surface new roads and resurface existing roads that would be damaged during construction of the lines segments between Eagle Butte and Bridger Junction and between Reno and Black Thunder Junction—which replicate BNSF lines that were built within the last 25 years. TMPA excluded surfacing costs for road along the main line south of Bridger Junction because few paved roads existed when the BNSF line that it replicates was constructed. In contrast, BNSF would include costs for road surfacing along

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[202] TMPA estimates this cost at $5.1 million, using BNSF's rate of 20.3 gallons per cubic yard and BNSF's cost per gallon. TMPA Reb. III-F at 535.

[203] *See* TMPA Open. W.P. at 6765-68 & e-W.P. III-F-Grading.123.

[204] *See West Texas*, 1 S.T.B. at 706 (water for compaction used for entire SARR line).

[205] *See FMC*, 4 S.T.B. at 800; *Arizona*, 2 S.T.B. at 406.

the entire GCRR ($46.28 million) because it claims that these roads would be used after construction for the GCRR's maintenance operations.

We agree with TMPA that road surfacing costs for roads along the lines replicating older BNSF lines that predated the adjacent roads should be excluded in the absence of evidence that BNSF incurred the cost for surfacing such roads. Thus, we use TMPA's estimate of $1.39 million for road surfacing.

12. Environmental Compliance

TMPA included $1.1 million for environmental compliance on sections of the GCRR north of Bridger Junction. BNSF would include an additional $1.4 million for wetland protection, based on BNSF's actual costs at its Lincoln, NE facility. Because BNSF has shown that it incurred these costs,[206] we include the additional wetland protection costs.

C. Track Construction

A variety of materials would be needed to assemble the tracks of the GCRR. Below, we discuss each track component on which the parties disagree, as well as the cost of transporting and installing track material.[207] Generally, the parties used 2000 unit costs for track assets, indexed to the second quarter of 2001, to estimate track construction costs. TMPA used the ENR Construction Cost Index,[208] while BNSF used the Association of American Railroads' western region railroad cost recovery index (AAR Cost Index). We use the AAR Cost Index because it is specific to the rail industry and reflects the change in costs of various track components, whereas the ENR index is a general construction index not specifically focused on railroading. Table D-5 summarizes the track investment components.

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[206] BNSF Reply Albin V.S. at 29 (BNSF AFE detailing the costs associated with wetland mitigation).

[207] We note that TMPA's spreadsheets for track construction consist in large part of unreferenced (and thus undocumented) values. In contrast, most of BNSF's spreadsheets are "linked" so that references can be determined and restatements made where necessary. Because BNSF's spreadsheets are more easily manipulated, we use them to calculate our restated track costs.

[208] The ENR Construction Cost index, published in the Engineering News-Record (ENR) magazine, is a general index of costs in the construction industry.

Table D-5
Track Investment Costs

	TMPA	BNSF	STB
Geotextile Fabric	$4,585,153	$8,076,524	$6,697,835
Ballast	74,999,685	86,313,714	81,723,326
Sub-ballast	67,764,860	171,079,007	96,037,425
Timber Ties	225,913,713	229,950,000	228,711,318
Rail	296,153,488	318,940,796	300,312,449
Field Welds	445,731	946,246	892,931
Turnouts	39,245,801	67,550,027	53,682,451
Switch Stands	277,380	284,656	284,656
Insulated Joint	67,555	1,919,471	1,636,721
Electric Locks	0	1,929,677	0
Switch Heaters	4,596,900	9,378,600	5,659,500
Generators	0	1,552,937	1,540,588
Crossing Diamonds	195,924	783,696	195,924
Rail Lubricators	3,584,221	3,816,387	3,384,128
Tie Plates	63,672,648	70,555,366	66,732,800
Pandrol Plates with Clips	5,877,526	6,520,287	6,098,308
6-inch Spikes	10,472,475	15,734,778	14,873,360
Spike Screws	489,386	0	505,664
Rail Anchors	10,554,084	11,196,144	10,572,135
Transportation	65,410,387	254,999,516	239,015,362
Labor and Equipment	322,546,932	349,268,194	330,389,345
TOTAL	**$1,196,853,848***	**$1,610,796,023**	**$1,448,946,225**

* The difference between TMPA's total construction cost shown here and in Table D-1 is due to rounding, indexing, and adjustments to separate out transportation costs.

1. Geotextile Fabric

Geotextile fabric is a material that is placed between the earth and sub-ballast to keep the sub-ballast and ballast clean and to provide soil stability in areas of soft or fine-grained soils. The parties are in agreement on the unit cost of geotextile fabric.[209] The parties also agree on the placement and quantities of geotextile fabric required under turnouts, and the use of geotextile fabric under the lines that replicate the Orin Line. In its opening evidence, TMPA assumed that geotextile fabric would be placed under all grade crossings, and BNSF did not object. Nevertheless, on rebuttal, TMPA changed its position and would use geotextile fabric only on those lines that would replicate the Orin Line.

It is improper rebuttal to alter opening evidence that has not been challenged. Therefore, we use TMPA's opening evidence on this cost. Based on our restated track configuration, we calculate a geotextile fabric quantity of 3,751,769 square yards, for a total cost of $6,697,835.

2. Ballast and Sub-ballast

The parties agree on the amount of ballast and sub-ballast that would be needed for main-line and passing track.[210] However, as discussed below, the parties disagree on the ballast and sub-ballast requirements for yards; on whether ballast would be needed for bridges on the GCRR line north of Fort Scott, KS; and on the unit cost for ballast and sub-ballast. Table D-6 reflects the parties' positions and our restatement for ballast and sub-ballast requirements and costs.

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[209] TMPA's spreadsheet reflects a different, lower unit cost than the agreed-upon cost for geotextile. *Compare* TMPA Reb. Narr. at 541 n.486 *with* TMPA Reb. e-W.P. IIIF3Track_Other/IIIFTOTAL.xls.

[210] Sub-ballast is rock material that is spread on the graded roadbed to provide drainage, prevent frost upheaval, and distribute the load over the roadbed. Another layer of rock (ballast) is placed on top of the sub-ballast to hold the ties and track in place.

Table D-6
Ballast/Sub-Ballast Requirements and Cost

	TMPA	BNSF	STB
Mainline and Passing Track	8" ballast 12" sub-ballast	8" ballast 12" sub-ballast	8" ballast 12" sub-ballast
Yard Track	10" ballast 0" sub-ballast	8" ballast 6" sub-ballast	10" ballast 0" sub-ballast
Bridge Construction Fort Scott to Bridger Junction	Open Deck	Ballast Deck	Ballast Deck
Ballast			
Tons	10,121,415	11,327,259	10,724,846
Cost per Ton	$7.41	$7.62	$7.62
Total Cost	$74,999,685	$86,313,714	$81,723,326
Sub-ballast			
Tons	13,552,972	19,330,961	17,917,430
Cost per Ton	$5.00	$8.85	$5.36
Total Cost	$67,764,860	$171,079,007	$96,037,425
Ballast/Sub-Ballast Cost	**$142,764,545**	**$257,392,721**	**$177,760,751**

a. Yard Track

TMPA included 10 inches of ballast and no sub-ballast in yards. TMPA contends that ballast provides better drainage than sub-ballast, and that yards have little dynamic loading, making sub-ballast unnecessary. TMPA further argues that the American Railway Engineering and Maintenance-of-Way Association (AREMA) industry standards do not require sub-ballast in yards,[211] and that the subgrade in the GCRR yards would not require any additional support. BNSF argues that, in order to avoid subgrade failures under heavy loads, it is essential that there be a barrier between the ballast and the subgrade

[211] TMPA states that, while AREMA standards call for 10 inches of ballast in yards, they do not have a standard for sub-ballast. *See* TMPA Reb. Narr. at 543.

to drain the water and stabilize the entire track structure. Therefore, BNSF would include 8 inches of ballast and 6 inches of sub-ballast in yards.

Because AREMA specifies a ballast depth of 10 inches in yards but not a sub-ballast amount, we find that TMPA's approach is reasonable. Accordingly, we use its evidence on this issue.

b. Bridges

TMPA assumed open deck bridges between the PRB and Fort Scott.[212] BNSF argues that open deck bridge construction is inadequate where traffic is heavy, due to the dynamic loading caused when transitioning from the more flexible ballasted roadbed to the more rigid bridge structure. According to BNSF, this condition would cause severe damage and would require constant track repair in heavy traffic areas.[213] Thus, BNSF contends that ballast deck bridges would be needed on this line segment. As discussed in Section E, Subsection 2—Bridge Design, *infra*, we accept BNSF's bridge designs, based on current applicable AREMA standards. Accordingly, we use BNSF's cost for inclusion of ballast on bridges on the line north of Fort Scott.

c. Ballast Unit Cost

The parties agree on the unit cost ($7.41 per ton) for ballast in 2000. Based on our restated track miles (see Appendix B) and the indexing procedure discussed earlier, we find that ballast for the GCRR would cost $81,723,326.

d. Sub-ballast Unit Cost

TMPA used a unit cost of $5.00 per ton for sub-ballast. However, the only evidence supporting this figure is a reference in its electronic spreadsheet to "APAC-Oklahoma."[214] BNSF states that it contacted this supplier and found that its base price for sub-ballast was $5.25 per ton, with a maximum delivery radius of 75 miles from Tulsa, OK, and a minimum $2.00 per ton delivery charge or

[212] Although TMPA provided photographic evidence of an open deck bridge located at MP 357.6 on BNSF's Cherokee Subdivision, it has not provided evidence of such a bridge in a heavy traffic area. *See* TMPA Open. W.P. at 10643-47 (photograph of bridge without ballast).

[213] *See* BNSF Reply Narr. at III.F-60.

[214] TMPA Open. e-W.P. III-F Road Inv/III-F 3/Track Cost.123.

$0.15 per ton-mile.[215] BNSF argues that, given the GCRR's distance from Tulsa, basing the sub-ballast cost for the entire GCRR on this quotation would result in an excessively high price for delivered sub-ballast. TMPA does not attempt to rebut this argument. Based on its own experience, BNSF would use a unit cost of $8.85 per ton for sub-ballast, consisting of a base cost of $2.50 per ton, plus $2.86 per ton for work train costs, plus $3.49 per ton for loading, hauling, grading and compacting.

BNSF's evidence is well documented and unchallenged. Therefore, we use BNSF's base cost of $2.50 per ton for sub-ballast. We also use its $2.86 per ton cost for work-train-related activities, as TMPA does not challenge the costs or explain how sub-ballast would otherwise be distributed along the GCRR ROW. However, we reject BNSF's $3.49 per ton installation cost, as those costs are included in the parties' track construction costs.

3. Ties

The parties agree on the use of wood ties, the various grades of ties needed, the spacing of ties, and the use of 2000 unit costs. Based on our acceptance of BNSF's indexing method and our restated track miles, we find that the GCRR would need 7,233,122 ties, costing $228,711,318.

4. Rail and Field Welds

Table D-7 below shows the parties' positions on rail and field welds. The quantities of 136-lb. rail are presented in linear feet (LF).

[215] BNSF Reply Narr. III at 33.

Table D-7
Rail & Field Welds

	TMPA	BNSF	STB
136 lb. Standard Rail			
Unit Cost	$10.75	$11.05	$11.05
Quantity (LF)	8,812,426	8,714,539	8,718,985
Cost	$94,733,575	$96,295,654	$96,334,782
136 lb. Premium Rail			
Unit Cost	$12.44	$12.79	$12.79
Quantity (LF)	14,940,182	16,376,665	14,994,569
Cost	$185,855,869	$209,457,540	$191,780,538
119 lb. Relay Rail			
Unit Cost	$350.35	$351.66	$351.66
Quantity (Tons)	21,766	37,501	34,656
Cost	$7,625,670	$13,187,602	$12,187,129
Total Rail Cost	**$288,215,114**	**$318,940,796**	**$300,312,449**
Field Welding			
Number of Welds	8,795	18,671	17,619
Cost per Weld	$50.68	$50.68	$50.68
Total Field Weld Cost	**$445,731**	**$946,246**	**$892,931**

a. Rail

The GCRR generally would use standard 136-lb. CWR for main line and passing sidings, with premium 136-lb. CWR between Donkey Creek and Kansas City and on all curves of 3 degrees or greater. In yards 119-lb. rail would be used. The parties agree on the unit cost of rail in 2000. However, they disagree on whether CWR or jointed rail would be used in yards.

TMPA maintains that jointed rail is sufficient for yards because train speeds are very low and it is common among Class I railroads to use jointed rail in yards. BNSF disagrees, arguing that it is essential that welded rail be used in the yards to prevent joints from becoming battered and chipped, leading to broken rails. Because TMPA provided no evidence on the cost for jointed bars that would be needed to join the sections of 119-lb. rail together, we use BNSF's evidence, which is based on the use of CWR in yards.

The parties also disagree on the indexing procedures to use to develop the price of rail as of the 2nd quarter of 2001. As discussed earlier, we use BNSF's method of indexing. Accordingly, we find that the total rail cost for the GCRR would be $300,312,449.[216]

b. Field Welds

The parties agree on the cost of field welding ($50.68 per weld) and the need for welds every 1,440 feet.[217] TMPA assumes that 8,795 welds would be needed, while BNSF contends that 18,671 welds would be required. The large discrepancy between these figures is due to TMPA's failure to multiply its weld quantity by 2 (i.e., TMPA's evidence mistakenly provides funds for a weld on only one side of the track). Based on our restatement of track miles, we calculate a need for 17,619 field welds, at a total cost of $892,931.

5. Turnouts

Table D-8 below shows the parties' costs and our restatement for various types of turnouts.

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[216] This figure is based on 8,718,985 LF of 136-lb. standard rail at $11.05/LF; 14,994,569 LF of 136-lb. premium rail at $12.79/LF; and 34,656 tons of 119-lb. relay rail at $351.66 a ton.

[217] Track is welded into 1,440-foot-long strings at the rail plant. Field welding is required to weld the strings of track into CWR.

Table D-8
Turnouts

Type	TMPA	BNSF	STB
#20 Spring			
Unit Cost	$98,939	$103,801	$103,801
Quantity	63	30	33
Total Cost	$6,233,168	$3,114,030	$3,425,433
#20 Electric			
Unit Cost	$118,839	$96,548	$96,548
Quantity	157	413	257
Total Cost	$18,657,750	$39,874,234	$24,812,836
#14 Electric			
Unit Cost	$73,566	$76,971	$76,971
Quantity	61	43	37
Total Cost	$4,487,549	$3,309,735	$2,847,927
#14 Manual			
Unit Cost	$53,566	$75,421	$75,421
Quantity	6	10	9
Total Cost	$321,398	$754,213	$678,789
#10 Manual			
Unit Cost	$24,106	$56,781	$56,781
Quantity	396	361	386
Total Cost	$9,545,936	$20,497,815	$21,917,466
TOTAL	**$39,245,801**	**$67,550,027**	**$53,682,451**

The parties agree to the use of #20 turnouts between main-line tracks and certain sidings where trains travel at high speeds; #14 turnouts where trains maintain lower speeds and also at interchange tracks; and #10 turnouts for set-out tracks and yard tracks. However, the parties disagree on the unit costs for turnouts.

On opening, TMPA provided little or no explanation about how it developed its unit costs for turnouts.[218] In reply, BNSF calculated unit costs for turnouts (including costs for ties and geotextiles for each size turnout) based on vendor quotations it obtained.[219] (BNSF used TMPA's turnout installation costs.) On rebuttal, TMPA presented new evidence on tie costs for #20 spring turnouts, tie costs for #14 turnouts, and costs for #10 manual turnouts.[220]

TMPA's opening evidence on turnout costs is unsupported and cannot be verified. On rebuttal, TMPA did little to show that BNSF's estimates for turnout costs were unrepresentative; it simply provided new estimates of its own. Such new evidence, however, is not an appropriate use of rebuttal. Therefore, we use BNSF's unit costs for turnouts, which are verifiable and constitute the best evidence of record. Based on our restated track configuration, we calculate a total cost of $53,682,451 for the GCRR's turnouts.

6. Switch Stands

The parties agree that a total of 402 switch stands would be required at all non-powered turnouts,[221] and they agree on the cost for low-target switch stands. BNSF claims that the non-powered turnouts off of the main line and sidings would require high target switch stands.[222] TMPA disagrees, but provides no evidence to refute BNSF's evidence on the need for high-target switch stands. Therefore, we use BNSF's evidence on switch stand costs (amounting to $284,656).

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[218] TMPA Open. W.P. Vol. 1-1 at Exh. III-F-16 & at 6942, 6949, 6952.

[219] BNSF Reply W.P. at 05646-50.

[220] TMPA Reb. W.P. at 10423-29.

[221] *See* TMPA Reb. e-W.P. IIIF TOTAL.xls; BNSF Reply e-W.P. IIIF Summary of Total Construction.xls. Given the parties' differing track configurations and differing counts of switches needing switch stands, it is not clear why the parties agree on this figure. However, we accept their agreement.

[222] BNSF provided internal documentation (a 2000 AFE) showing the unit cost of high target switch stands.

7. Insulated Joints

While the parties agree on an insulated joint unit cost of $269.40,[223] TMPA estimated that the GCRR would use 229 such joints, whereas BNSF estimated that the GCRR would need 6,476. Because we are unable to determine from TMPA's evidence and workpapers how it developed its number, TMPA failed to meet its burden of proof on this issue. Therefore, we apply BNSF's procedure for developing the number of insulated joints that the GCRR would need.

Based on our restated track configuration, we include a total of 5,522 insulated joints at the agreed-upon unit cost of $296.40, for a total cost of $1,636,721.

8. Electric Locks

The parties disagree on whether electric locks would be required for the GCRR. BNSF argues that electric locks would be needed on all unpowered switches at sidings and set-out tracks. In contrast, TMPA cites 49 CFR 236.410, which states that so long as a part of the train remains on the main track when bad-order cars are being placed on the set-out track, locks are not required. Because the only manual turnouts on the GCRR main line would be for set-out track where a train cannot clear the main track, the installation of electric locks would not be required. We therefore include no costs for electric locks.

9. Switch Heaters

The parties agree on the unit cost of switch heaters.[224] Based on the number of switches in our restated track configuration, we calculate a total cost of $5,659,500 for switch heaters.

10. Generators

BNSF argues that generators would be required along the GCRR line north of Kansas City to ensure that switch heaters would remain operational during power outages. TMPA did not include any cost for generators, claiming that switch heaters could be supplied with auxiliary power from the same generating system used for the centralized traffic control (CTC) system. However, TMPA

[223] TMPA Reb. Narr. at 552; BNSF Reply Narr. Vol. III at 41.
[224] BNSF Reply Narr. Vol. III at 71; TMPA Reb. Narr. at 554.

offers no evidence that the generators used for CTC could also power the switch heaters or that any railroad uses its CTC generators to power heaters. Therefore, we accept BNSF's position that the separate generators would be required for switch heaters. Based on our restated track configuration and BNSF's unit costs for generators, the cost for switch heater generators would be $1,540,588.

11. Crossing Diamonds

The parties agree that a crossing diamond would cost $65,307.92.[225] TMPA identified 12 locations where crossing diamonds would be needed, but it only included the cost for three. It notes that BNSF was the first railroad at the other locations, and it concludes that the other railroad would have paid for the crossing diamond. Because BNSF has not shown that it paid for any of the other crossings, we include the cost for only three crossing diamonds.

12. Rail Lubricators

The parties agree that four automatic in-gauge rail lubricators would be installed at the entrance to all curves of 4 degrees or greater. The parties also agree on a unit cost of $5,260 in 2000. Applying the indexing method that we use throughout yields a unit cost of $5,566 per lubricator. Based on our restated track configuration, we calculate a total cost of $3,384,128 for 608 rail lubricators.

13. Tie Plates, Pandrol Plates and Clips, Spikes, and Screws

For all trackage with curves of less than 3 degrees, TMPA would use AREMA-specified 14-inch plates punched with eight holes to secure the rail to the ties. TMPA would use six spikes per tie—one plate-holding spike and two rail-holding spikes on each rail. In yards, TMPA would use tie plates and six spikes per tie. While BNSF agrees with the use of new standard eight-hole 14-inch tie plates for all trackage with less than 3 degrees of curvature, it claims that eight spikes per tie are necessary for pre-plated ties. TMPA, however, does not plan for the GCRR to use pre-plated ties, and BNSF has not argued that it would be necessary to do so. Therefore, we accept TMPA's tie plate configuration.

[225] Although TMPA agreed to use BNSF's indexed unit cost of $65,307.92, it failed to update its electronic files to reflect this cost.

For curves greater than 3 degrees, TMPA would follow the manufacturer's guidelines and use Pandrol tie plates with four screws on each plate and no spikes.[226] For curves greater than 3 degrees and less than 5 degrees, BNSF would use Pandrol plates with two clips per plate and five spikes per plate. For curves greater than 5 degrees, BNSF would use Pandrol plates with two clips per plate and six spikes per plate. Based on the Pandrol guidelines that TMPA submitted, however, we agree with TMPA that the GCRR could use four screws on each Pandrol plate for all curves greater than 3 degrees.

There is no dispute regarding the unit costs for these items. We index these costs using BNSF's indexing method. Based on our restated track configuration, the total cost for these items would be $88,210,132. Table D-9 below summarizes these costs.

[226] *See* TMPA Reb. W.P. at 10434-35.

Table D-9
Tie Plates, Pandrol Plates and Clips, Spikes and Screws

	TMPA	BNSF	STB
AREMA 14-inch Tie Plate			
Quantity	13,963,300	15,043,788	14,228,742
Unit Cost	$4.56	$4.69	$4.69
Total Cost	$63,672,648	$70,555,366	$66,732,800
AREMA Pandrol Plates with Clips			
Quantity	489,386	540,654	505,664
Unit Cost	$12.01	$12.06	$12.06
Total Cost	$5,877,526	$6,520,287	$6,098,308
Spikes			
Quantity	41,889,900	62,939,112	59,493,438
Unit Cost	$0.25	$0.25	$0.25
Total Cost	$10,472,475	$15,734,778	$14,873,360
Screws			
Quantity	1,957,544	0	2,122,656
Unit Cost	$0.25	$0	$0.25
Total Cost	$489,386	$0	$505,664
TOTAL	**$80,512,035**	**$92,810,431**	**$88,210,132**

14. Rail Anchors

The parties agree on the location and unit cost for rail anchors. Based on our acceptance of BNSF's indexing method, we calculate a unit cost for rail anchors of $0.75. Based on our restated track configuration, the GCRR investment in 14,096,180 rail anchors would be $10,572,135.

15. Transportation Cost

As explained below, TMPA included separate transportation costs for ballast, sub-ballast, ties, and rail. However, for the remaining track materials, TMPA either did not include transportation costs or mingled transportation costs with material costs.[227] Absent evidence, we assume that transportation costs are not included in any of TMPA's material costs. The parties' costs and our restatement are shown in Table D-10.

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[227] TMPA's workpapers show "Delivery Costs" for the remaining track materials as "N/A" or "Delivered." There is no discussion of transportation costs in the text of TMPA's submissions. TMPA Reb. e-W.P. "IIIF/IIIF3 Track_Other/Track Cost."

Table D-10
Materials Transportation Costs[228]

	TMPA	BNSF	STB
Ballast	$14,999,937	$114,585,552	$108,491,595
Sub-ballast	40,252,327	99,286,463	92,026,374
136 lb. Rail	7,938,374	11,420,976	10,931,526
119 lb. Rail (relay)	0	692,860	657,629
Ties	2,219,749	21,067,408	19,694,136
#20 Switch	0	822,636	500,086
#14 Switch	0	93,242	83,808
#10 Switch	0	429,649	386,000
Tie Plates	0	4,345,445	4,067,271
Pandrol Plates & Clips	0	137,225	113,323
Spikes & Screws	0	441,127	411,327
Anchors	0	318,664	294,019
Box Culvert	0	1,358,269	1,358,268
TOTAL	**$65,410,387**	**$254,999,516**	**$239,015,362**

a. Ballast

To account for transportation costs, TMPA applied a 20% markup to its base ballast cost. This markup was based on BNSF's average cost of transporting ballast. BNSF challenges the 20% figure, arguing that it represents BNSF's internal direct expense associated with moving track materials over its own line, not what BNSF or a third party would charge to transport materials.[229] During construction the GCRR would have to pay a third party to deliver materials to the

[228] Neither party included any transportation costs for switch stands, insulated joints, electric locks, switch heaters, generators, crossing diamonds, or rail lubricators.

[229] *See* BNSF Reply, Vol. III-III, Albin V.S. at 47.

construction sites. BNSF assigns a transportation cost of $0.035 per ton-mile for moving ballast from four materials source locations to 32 railheads or locations on the GCRR.[230] TMPA has not challenged this cost.

Because TMPA does not show that its markup has any relation to the distance the ballast would need to be transported, nor that it represents what a third party would charge to move ballast from a quarry to the GCRR construction sites, we use BNSF's $0.035 per ton-mile cost figure.

b. Sub-ballast

TMPA included a sub-ballast transportation cost of $2.97 per ton, but provided no explanation for that figure. BNSF developed a sub-ballast transportation cost of $0.035 ton-mile for transporting sub-ballast from six origin points to 32 railheads or locations along the GCRR. We reject TMPA's per-ton figure because it is unsupported and TMPA bears the burden of proof. Therefore, we use BNSF's per ton-mile cost.

c. Rail

In its opening evidence, TMPA included a 2% cost markup as the transportation cost for rail, based on BNSF's direct costs for transporting its own rail. We reject this markup for the same reasons we rejected TMPA's markup for ballast transportation. On rebuttal, TMPA submitted a new rail transportation cost of $30 per net ton for delivery of 136-lb. rail.

We will not consider new cost evidence submitted for the first time on rebuttal, as BNSF has not had an opportunity to respond to that evidence. Therefore, we use the transportation cost developed by BNSF, which is again $0.035 per ton-mile. Based on that unit cost, we find that the rail transportation cost would be $10,931,526 for 136-lb. rail, and $657,629 for 119-lb. relay rail.

d. Ties

TMPA included a transportation cost based on a 1% markup over the cost of ties. TMPA provided no explanation for how this figure was derived. Because TMPA's estimate is unsupported, we use BNSF's tie transportation cost figure of $0.035 per ton-mile. Based on BNSF's transportation cost estimate and

[230] The $0.035 per ton-mile is the charge BNSF assesses other railroads for moving track material over BNSF's lines.

our restated tie requirement, we find that tie transportation cost would be $19,694,136.

e. Turnouts/Switches

TMPA initially included no costs for transporting turnouts and switches, whereas BNSF included a $0.035 per ton-mile cost for transportation. In its rebuttal workpapers TMPA included $1,000 for shipping #10 turnouts, without explanation. TMPA has not shown why there would be no transportation costs, and we cannot accept new evidence on rebuttal to which the other party has not had an opportunity to respond. Therefore, we use BNSF's figure.

f. Other Track Material

TMPA did not provide a cost for shipping tie plates, pandrol plates and clips, spikes and screws, rail anchors, and box culverts. Our restatement reflects BNSF's figure of $0.035 per ton-mile.

16. Labor and Equipment

The parties agree on the cost for laying track.[231] Based on our restated track configuration, we calculate a labor and equipment cost of $330,389,345.

D. Tunnels

The parties agree on tunnel lengths and unit costs for constructing single-track tunnels.[232] TMPA included $23.12 million to construct two single-track tunnels on the line between Wendover, WY, and Guernsey. The two tunnels would be a combined 4,776 feet in length. BNSF argues that double-track tunnels would be needed at the two locations to accommodate the approximately 80 GCRR trains per day that would move through them in 2020. BNSF estimates that the cost of constructing double-track tunnels would be $44.8 million. Because we agree with a double-track configuration on the segment of the GCRR where these two tunnels would be located (*see* Appendix B), the

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[231] *See* TMPA Reb. e-W.P. "Track Cost.xls"; BNSF Reply e-W.P. "Track Cost.xls."

[232] They use the cost figures that we accepted in a prior SAC case involving BNSF, *see West Texas*, 1 S.T.B. at 706, indexed to 2nd quarter 2001.

tunnels would need to be double-track. We therefore use BNSF's cost estimate of $44.8 million.

E. Bridges

TMPA and BNSF included $288.1 and $481.0 million, respectively, for bridge construction. The differences in their estimates are due to disagreements on: (1) the number of bridges for which costs should be included; (2) the design criteria for bridges; (3) unit costs for bridges; (4) whether inner guardrails would be needed; and (5) whether the cost of a highway bridge over a rail tunnel in Guernsey State Park should be included.

1. Number of Bridges

TMPA included the costs for only 62 bridges south of Bridger Junction—those needed to cross natural barriers and rail lines that predated BNSF's original line—on the ground that BNSF's predecessors did not incur the cost to build the remaining bridges.[233] BNSF claims that funds should be included to replicate all of its existing bridges on the line, including bridges over highways, because BNSF has replaced or repaired most of these bridges in the last 20 to 30 years.[234] However, the costs of repairing or replacing bridges is more properly considered a maintenance expense. Thus, we accept TMPA's bridge count (except for the Guernsey State Park Bridge, discussed below).

2. Bridge Design

TMPA used newer bridge designs and different span specifications than the existing bridges to be replicated. BNSF argues that it is inappropriate to deviate from current bridge designs without a detailed examination of the requirements of each site. BNSF further argues that bridges must be built to current AREMA standards and that bridge design must take into account additional factors such as United States Army Corps of Engineers' requirements.

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[233] *See, e.g.*, *West Texas*, 1 S.T.B. at 672 (costs associated with grade crossings are excluded from a SAC analysis where the defendant railroad did not incur such costs itself).

[234] BNSF cites *WPL* (5 S.T.B. at 1030), but that case does not support its broad proposition. Our ruling in *WPL* was based on the fact that the complainant in that case had submitted contradictory and unsupported evidence as to whether the defendant had paid for all or any part of the original bridge construction.

While the GCRR need not follow BNSF's current bridge designs, it would need to meet current AREMA design standards. Because TMPA offers no evidence that its designs meet current construction standards, we do not accept its evidence. Accordingly, we rely on BNSF's bridge designs.

3. Unit Costs

Because we use BNSF's bridge designs, we use its unit cost evidence, which is based on those design specifications, with one exception. BNSF used a unit cost for concrete of $300 per cubic yard (CY), but, as TMPA observes, a BNSF AFE obtained during discovery shows that BNSF paid only $250/CY for concrete.[235] Because the record shows that concrete could be procured for that price, we use the $250/CY figure. The indexed price for 2001 would be $276.52/CY.

4. Guardrails

TMPA excluded any cost for installing inner guardrails on the GCRR bridges,[236] arguing that the FRA does not require such guardrails. BNSF claims that guardrails would be needed to protect bridges in case of an accident, but it has not provided evidence that guardrails are required or that installation of guardrails is an industry standard. We therefore do not include any cost for guardrails.

5. Guernsey State Park Bridge

The United States Department of the Interior required BNSF to build a 186-foot bridge over the excavated, daylighted tunnel that is located in the Guernsey State Park. Even though BNSF paid for that bridge, TMPA argues that it need not include the costs for that bridge in its SAC analysis because the BNSF line that would be replicated was constructed prior to the creation of the State Park. TMPA reasons that, had BNSF daylighted the tunnel when the line was first constructed, BNSF would not have been obligated to pay for the bridge.

Inclusion of the cost of this bridge would not result in the SARR incurring a cost that the defendant carrier has not incurred. As TMPA proposes a

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[235] TMPA Open. W.P. at 7104-05.

[236] Inner guardrails protect against damage to the bridge in the event of a derailment or other mishap.

daylighted tunnel, we include the cost of the bridge ($413,772), based on BNSF's evidence.

F. Signaling & Communications System

As shown in Table D-11, the costs for providing a signaling and communication system for the GCRR are in dispute. We discuss each element below.

Table D-11
Signals & Communications

	TMPA	BNSF	STB
Centralized Traffic Control	$91,797,728	$92,338,093	$92,338,093
Detectors	6,638,572	13,110,383	12,518,747
Communications System	19,793,602	21,043,509	16,441,800
TOTAL	**$118,229,902**	**$126,491,985**	**$121,298,640**

1. Centralized Traffic Control

The parties agree on the unit costs for a CTC system, but not on an appropriate configuration of such a system. The parties' evidence does not provide suitable data to allow us to match the CTC system to our restated configuration of the GCRR. Because the restated GCRR configuration more closely matches BNSF's proposal, we use BNSF's CTC cost evidence.

2. Failed Equipment Detectors

The parties disagree on the number of, and cost associated with, FEDs. TMPA and BNSF included 62 and 79 FEDs, respectively. The discrepancy between the parties' number of FEDs results primarily from differences in the track miles assumed by each party. Based on our revised track miles, we use an FEDs count of 73.

TMPA agrees with BNSF's installed cost of $98,606 for an FED. BNSF would use this unit cost for all FEDs, including second FEDs on double track sections. On rebuttal, and without providing any support, TMPA argued that the second FED on double track sections would cost only an additional $25,000.

TMPA may not introduce such new evidence on rebuttal, when BNSF has no opportunity to contest the evidence. In any event, TMPA did not provide any support for its claim regarding the incremental cost of a second FED. Therefore, we use BNSF's evidence.

3. Communication System

The GCRR would use a microwave-based communication system, and the parties agree that it would cost $364,800 for communications control. However, they dispute the number of towers that would be required and the unit cost of the towers. TMPA included 64 towers, spaced at intervals of 25 miles, with each tower costing $233,000. BNSF argues that 69 towers would be required for the GCRR, based on BNSF's existing configuration, and estimates the cost of each tower to be $299,691.

Because terrain affects the placement of towers, the actual placement on the current BNSF route that the GCRR would replicate is superior evidence to TMPA's average-distance estimate. Therefore, we use BNSF's count of 69 towers. Regarding the cost of towers, neither party provided evidence to support its cost estimate. Because TMPA is the party with the burden of proof on this issue and it has not met that burden, we use BNSF's cost estimate.

G. Buildings and Facilities

The parties included costs for a locomotive repair shop, fueling facilities, car repair shop, roadway buildings (crew change and MOW), a headquarters building, and wastewater treatment plants. As discussed below, they disagree on (1) the unit cost per square foot (SF) and equipment required for repair shops; (2) the number of platforms and costs of the three fueling facilities; (3) the size of roadway buildings; (4) the square footage of the headquarters building; and (5) the location and cost of the wastewater treatment plants. Table D-12 below summarizes the parties' estimates of the cost for these facilities and our restatement.

Table D-12
Building and Facilities

	TMPA	BNSF	STB
Locomotive Repair Shop	$2,402,829	$15,051,476	$8,983,497
Fueling Facility	19,250,000	37,800,000	19,250,000
Car Repair Shop	1,452,347	5,721,862	4,276,571
Roadway Buildings	2,660,570	9,691,620	7,128,680
Headquarters Facility	2,477,341	3,466,550	2,568,091
Wastewater Treatment Plant	458,474	7,438,582	7,438,582
Yard Site Development Cost	3,588,959	3,522,814	3,522,814
TOTAL	**$32,290,520**	**$82,692,904**	**$53,168,235**

1. Locomotive Repair Shop

A locomotive repair shop would be located at Guernsey. A variety of costs associated with that facility are in dispute.

Table D-13
Locomotive Repair Shop

	TMPA	BNSF	STB
Building	$990,844	$9,081,258	$3,055,000
Repair Equipment	704,717	5,637,000	5,637,000
Track (Embedded and Pit)	616,210	200,531	200,531
Site Development	90,966	132,687	90,966
TOTAL	**$2,402,829**	**$15,051,476**	**$8,983,497**

a. Building

TMPA would provide for a 47,000 SF locomotive repair shop capable of repairing 16 locomotives at one time. BNSF maintains that the GCRR would need a 100,800 SF locomotive repair shop that could repair 32 locomotives at any one time. As discussed in Appendix C, we find that the GCRR would need 261 locomotives with 5% of those locomotives out-of-service at any time. Hence, the locomotive repair shop would only need the capacity to repair 13 locomotives simultaneously (261 x .05). Therefore, we use TMPA's assumptions regarding the size and capacity of the building.

BNSF does not contest the unit cost used by TMPA in its opening evidence for construction of the locomotive repair shop ($65.00/SF).[237] However, BNSF would add a "Specialities" unit cost of $25.09/SF, for a total construction cost of $90.09/SF.[238] TMPA argues that there is no basis for a "Specialities" cost, and we agree that BNSF has not supported the need for such an additional cost. Based on the agreed-upon $65.00/SF unit cost and TMPA's square footage requirement, we find that a locomotive repair shop would cost $3,055,000.

b. Equipment

TMPA did not include any costs for equipment for the repair shops in its opening evidence. BNSF would include $5,637,000 for equipment.[239] On rebuttal, TMPA presented an equipment cost estimate of $704,717, based on a different combination of equipment types and costs than what BNSF had used in developing its estimate.[240] And even for the same types of locomotive repair equipment, TMPA reduced the unit costs without explanation.[241]

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[237] *See* TMPA Reb. Narr. at 584. On rebuttal, TMPA nevertheless attempted to substitute a new cost of $21.08/SF, based on the average of five independent bids for constructing a 45,800 SF building. However, it is improper for TMPA to seek to revise an uncontested cost estimate on rebuttal. We note that the five bids on which TMPA bases its cost figure are dated August 28, 2001, almost 2 months before it filed its opening evidence. TMPA could have included the evidence in its opening statement.

[238] BNSF does not explain, and there is no evidence in the record defining, what it means by "Specialities."

[239] *See* BNSF Reply e-W.P. Buildings.xls & W.P. at 05789.

[240] For example, TMPA's estimate relies upon 3-ton jib cranes, as opposed to the 5- and 25-ton cranes used in BNSF's estimate. TMPA has made no attempt to explain why different equipment should be used.

[241] *Compare* TMPA Reb. W.P. at 10474 *with* BNSF Reply W.P. at 05789.

We reject TMPA's evidence on repair equipment costs because it is unsupported and should have been submitted in TMPA's opening evidence, so that BNSF would have an opportunity to respond to it. Accordingly, we use BNSF's locomotive repair equipment cost estimate of $5,637,000.

c. Pit and Embedded Track

TMPA included $616,210 for the materials and installation associated with pit and embedded track,[242] while BNSF would include only $200,531. BNSF has thus conceded that this track would cost less than TMPA's estimate. We therefore use BNSF's estimate, as the purpose of the SAC test is to determine the least cost at which the SARR could construct and operate its system.

d. Site Development

TMPA included a site development cost of $90,966, based on a 47,000 SF building. BNSF would include a site development cost of $132,687, based on a 100,800 SF building. Because we use TMPA's building size, we use its site development cost evidence, which is supported.

2. Fueling Facilities

Fueling facilities would be located at Guernsey, Lincoln, and Madill. TMPA would install two fueling platforms at Guernsey, four at Lincoln, and one at Madill. BNSF would install two platforms at Guernsey, eight at Lincoln, and none at Madill. Because we use TMPA's yard track configurations for the Guernsey, Lincoln, and Madill sites, we use TMPA's number of platforms.

BNSF would use a cost per platform (including costs for fuel containment and fueling equipment) of $3,750,000. TMPA agrees with this cost estimate for the initial platform at each facility, but notes that BNSF's workpapers indicate that any additional platform at the same location would only cost $2 million.[243] Based on that evidence, we use a cost of $3,750,000 for the initial platform and $2,000,000 for any additional platforms at the same location.

[242] Pit tracks span a pit from which maintenance employees can make repairs to the underside of rolling stock. Embedded track is placed in the floor of a repair building to permit rolling stock to be moved into the building for servicing.

[243] BNSF Reply W.P. at 5759 (study of the costs of installing fueling platforms).

3. Car Repair Shop

In its case-in-chief, TMPA included the cost for a 24,000 SF repair building, but it failed to include any cost for equipment for that facility. BNSF would include the cost for a 57,600 SF car repair shop, based on a need to repair 109 cars at any one time.[244] On rebuttal, TMPA included the cost for a 48,000 SF car repair shop and for equipment for that shop.

By doubling the size of its proposed building on rebuttal, TMPA acknowledges that the evidence in its case-in-chief was deficient. Because we do not allow introduction of new evidence on rebuttal, when that evidence cannot be tested through the adversary process, we use BNSF's evidence on the size of the required building. As with locomotive repair shops (discussed above), we use a unit cost of $65.00/SF for the building. And because TMPA inappropriately waited until rebuttal to submit any evidence on equipment costs (and that evidence is unsupported in any event), we use BNSF's repair equipment cost estimate.

[244] *See* BNSF Reply, electronic file: III F 7 Buildings.xls. Our restated operating plan assumes 1,657 freight cars and a repair rate of 5%. Hence, the car repair shop must have the capacity to repair 82 cars at any given time.

Table D-14
Car Repair Shop

	TMPA	BNSF	STB
Building Square Footage	48,000 SF	57,600 SF	57,600 SF
Cost per SF	$21.08	$90.09	$65.00
Building Cost	$1,011,926	$5,189,290	$3,744,000
Repair Equipment	$77,966	$245,000	$245,000
Pit & Embedded Track	$272,912	$176,571	$176,571
Site Development	$89,454	$111,000	$111,000
TOTAL	**$1,452,258***	**$5,721,861**	**$4,276,571**

* The difference in TMPA's total cost shown here and in Table D-12 is due to rounding.

For pit and embedded track costs, BNSF and TMPA include cost estimates of $176,571 and $272,912, respectively. Because BNSF has conceded that the costs would be lower than TMPA's estimate, we use BNSF's evidence.

For site development costs, TMPA includes $98,300 in its opening evidence for a 24,000 SF building but, on rebuttal, reduced the cost to $89,454 while increasing the building size to 48,000 SF. BNSF provided a site development cost of $111,000 for a 57,600 SF building.
Given TMPA's unsupported and contradictory evidence (lower site development costs for a larger building), we accept BNSF's site development costs for the 57,600 SF building that we find appropriate for the car repair shop.

4. Roadway Buildings

Both parties included costs for a variety of roadway buildings (offices, work rooms, storage facilities, crew change facilities, and garages). With the exception of a crew change facility at Waxahatchie, TX, which we exclude,[245] the parties agree on the location of these buildings. However, as shown in Table D-15 below, the parties disagree on the unit cost and size of these facilities.

Table D-15
Roadway Buildings

	TMPA	**BNSF**	**STB**
Type 1 Buildings			
Cost Per SF	$70.00	$70.81	$70.00
Square Footage	26,128	86,508	81,772
Building Cost	$1,828,918	$6,126,018	$5,724,012
Type 2 Buildings			
Cost per SF	$14.23	$70.81	$14.23
Square Footage	20,839	36,960	36,960
Building Cost	$296,538	$2,617,303	$525,941
Site Development	$535,113	$948,299	$878,727
TOTAL	**$2,660,569***	**$9,691,620**	**$7,128,680**

* The difference in TMPA's total cost shown here and in Table D-12 is due to rounding.

For costing purposes, the parties grouped the various buildings into two categories. Type 1 buildings would have finished interiors suitable for use as office space. Type 2 buildings are shop and garage-type buildings. Because the electronic spreadsheets submitted by TMPA are not functional, and because TMPA's square footage requirement per person was nearly identical to that assumed by BNSF, we use BNSF's spreadsheets to determine that the GCRR would need 81,772 square feet (SF) of Type 1 buildings, based on our restated personnel requirements discussed in Appendix C. Because we generally use the

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[245] As discussed in Appendix C, we reject BNSF's contention that the Madill-to-Teague crew district should be divided into two separate districts requiring a crew change facility at Waxahatchie.

staffing, equipment, and contracting levels for MOW advocated by BNSF, as also discussed in Appendix C, we use BNSF's requirements for Type 2 MOW buildings.

BNSF agrees with the unit cost figures used by TMPA for Type 1 buildings ($70.00/SF).[246] Because Type 2 buildings are non-occupied buildings, we reject BNSF's assumption that they would be as expensive per square foot as Type 1 buildings. Accordingly, we use TMPA's unit cost of $14.23/SF for Type 2 buildings.

TMPA included a total of $535,113 for site development costs, based on smaller buildings and lower staffing requirements than we accept. BNSF estimated the total site development costs at $948,299, based on TMPA's site development costs, adjusted to reflect BNSF's building size specifications. Based on our restatement of the square footage requirements to reflect the number of personnel that would be housed in the buildings, we use a site development cost figure of $878,727.

Our restatement reflects a total cost of $5,724,012 for Type 1 buildings, $525,941 for Type 2 buildings, and a combined site development cost of $878,727. Our total roadway building cost is $7,128,680.

5. Headquarters Building

The GCRR's headquarters building would be located at Lincoln, NE. TMPA provided for a 15,650 SF headquarters building, whereas BNSF would provide for a 40,980 SF headquarters building. As discussed in Appendix C, we restate the GCRR's headquarters staffing requirements, as well as the number of general and administrative personnel that would be needed. Thus, we restate the square footage required for the headquarters building, using our restatement of the staffing requirements and BNSF's square footage per staff member.[247]

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[246] BNSF Reply V.S. Albin at 68. Nevertheless, BNSF without explanation applied a unit cost figure of $70.81/SF in its evidence. We use TMPA's uncontested figure.

[247] Without any support, TMPA merely assumes office space requirements for the GCRR's various employees. While BNSF generally accepts TMPA's space requirements, it does use a different square foot requirement for a few employees. Because TMPA offers no support for its estimate, we accept BNSF's evidence on this issue.

Table D-16
Headquarters Building

	TMPA	BNSF	STB
Square Footage	15,650 SF	40,980 SF	29,796 SF
Unit Cost	$81.00	$80.32	$80.32
Building Cost	$1,179,846	$3,291,674	$2,393,215
Site Development Cost	$1,297,495	$174,876	$174,876
TOTAL	**$2,477,341**	**$3,466,550**	**$2,568,091**

In its opening evidence TMPA included a construction cost of $81.00/SF. BNSF uses a cost of $80.32/SF. On rebuttal, while stating that it had not changed its unit costs,[248] TMPA presented evidence based on a unit cost of $79.19/SF. Again, TMPA may not present new evidence on rebuttal (to which BNSF has had no opportunity to respond). Because BNSF has conceded that the construction cost could be less than TMPA originally estimated, we use BNSF's estimate as the least cost. Our restated building cost is thus $2,393,215. Similarly, regarding site development costs, we use BNSF's cost estimate as the least-cost evidence.

6. Wastewater Treatment Plants

In its case-in-chief, TMPA did not include any costs for wastewater treatment. BNSF argues that wastewater treatment plants are an integral part of fueling facilities. BNSF would provide for wastewater treatment plants to be located at Guernsey, Lincoln, and Madill, at a cost of $2,479,527 per site. BNSF bases this cost on expenditures it was required to make in Clovis, NM, for compliance with its discharge permit.

On rebuttal, TMPA asserts that BNSF did not provide sufficient detail or justification for these expenditures; but, recognizing a need for sewage disposal, TMPA included $458,474 for such purposes at Guernsey. TMPA's inclusion of a sewage disposal facility at Guernsey is not responsive to BNSF's claim that wastewater treatment facilities are required at fueling locations or what the costs

[248] TMPA Reb. Narr. at 587.

would be. Thus, we find that TMPA has not carried its burden of proof on this issue. Accordingly, we use BNSF's evidence.

Table D-17
Wastewater Treatment Plants

Location	TMPA	BNSF	STB
Guernsey	$458,474	$2,479,527	$2,479,527
Lincoln	0	2,479,527	2,479,527
Madill	0	2,479,527	2,479,527
TOTAL	**$458,474**	**$7,438,582**	**$7,438,582**

7. Yard Site Development Costs

The parties also included general site development costs at the Guernsey and PSO Junction yards. Because TMPA provided no support for its estimates, it has failed to carry its burden of proof. We therefore use BNSF's numbers.

H. Public Improvements

Table D-18 lists the type of public improvements and the cost of such improvements that the parties estimate would be necessary along the GCRR ROW.

Table D-18
Public Improvements

	TMPA	BNSF	STB
Fences	$7,905,726	$41,566,252	$41,566,252
At-Grade Crossings	578,526	33,376,823	33,376,558
Crossing Protection	1,578,348	8,932,382	8,932,382
Signs at Crossings	0	3,139,300	3,139,300
Roadway Signs	366,379	891,772	840,589
Grade Separations	12,931,312	23,308,237	23,308,237
TOTAL	**$23,360,291**	**$111,214,766**	**$111,163,318**

1. Fences

The parties agree that 90% of the Campbell Subdivision would need to be fenced and that snow fences would be needed on 20% of the Orin Line. They disagree on the amount of fencing that would be needed for the remainder of the GCRR.

Based on our finding in *WPL* (5 S.T.B. at 1035)[249] and on its own inspection of the line,[250] TMPA included costs for fencing 100% of the line. BNSF provides evidence showing that it fenced 103.3% of the Orin Line, as it was obligated to install wing fences and cattle lanes for the adjacent landowners.[251] BNSF argues that the GCRR would be subject to those same requirements. We agree, and our restatement reflects fencing for 103.3% of the Orin Line.

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[249] Our finding in *WPL* was case specific and based on the evidence presented in that proceeding. Here, BNSF has presented evidence that was not before us in *WPL*.

[250] TMPA has not shown that it inspected all of the Orin Line. A partial inspection would not necessarily reveal the difference at issue here.

[251] BNSF Reply W.P. at 5798-5801.

For the Bridger Junction-to-Iola segment, TMPA contends that there is little evidence of fencing along the line.[252] TMPA claims that, at most, 20% of the BNSF lines south of Bridger Junction are fenced. In contrast, BNSF's fencing quantities are taken from *Engrg Rpts*, which indicates that 75% of the line between Bridger Junction and Iola was fenced. TMPA argues that, while these lines might have originally been built with the fencing quantities reflected in *Engrg Rpts*, there is much less fencing today. However, as BNSF notes, TMPA's rejection of *Engrg Rpts* here is inconsistent with its reliance on that source for developing grading quantities.

We agree with BNSF that TMPA has not supported its fencing estimate for that section of the line. The only evidence to support fencing requirements is *Engrg Rpts*. Therefore, we use BNSF's estimate of fencing quantities for that section of the line.

To develop the cost of installing fences, TMPA relied on the Wyoming Department of Transportation (WYDOT) price for 5-strand barbed wire fence. BNSF also used WYDOT prices for a variety of fences that it claims would be needed on the GCRR. We use BNSF's evidence on fencing costs because it is more reflective of the different types of fencing that would be required along the ROW.[253] We also use BNSF's quantities and unit costs for fence gates, fence panels, and cattle crossings, because TMPA did not provide any costs or quantities.

Table D-19 shows the fencing cost estimates.

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[252] *See* TMPA Open. W.P. at 7263-65. TMPA claims that numerous photographs taken along the way show and that visual inspection confirmed that ROW fencing was sparse. Reb. Narr. at 491. However, TMPA offers no reference to where these photographs or its experts' personal observations can be found in the record.

[253] TMPA's presentation assumes that a barbed wire fence could be used as a snow fence.

Table D-19
Fencing

	TMPA	BNSF	STB
Permanent Fencing	$5,904,886	$17,869,841	$17,869,841
Panels	0	117,760	117,760
Gates	0	1,273,790	1,273,790
Cattle Guards	0	11,465,754	11,465,754
Snow Fence	2,000,840	10,839,107	10,839,107
TOTAL	**$7,905,726**	**$41,566,252**	**$41,566,252**

2. At-Grade Highway Crossings

The parties agree on the unit costs for materials for construction of at-grade highway crossings, but not on the number of crossings that would be necessary. North of Bridger Junction, WY, they agree that there would be nine public at-grade crossings. But TMPA did not include the cost of any private at-grade crossings in its opening evidence. BNSF included the cost of 72 private crossings, based on the FRA's Grade Crossing Inventory. On rebuttal, TMPA included costs for 71 private crossings. Because TMPA offered no explanation as to why it excluded one private crossing, we use BNSF's crossing count for this segment of the GCRR.

TMPA does not include any costs for crossings south of Bridger Junction, on the ground that the BNSF line preceded the existing roads and BNSF was not responsible for the costs of later-constructed crossings. BNSF would include costs for all crossings south of Bridger Junction, arguing that *Engrg Rpts* show that BNSF's predecessor railroads incurred investment for a substantial amount of at-grade crossing materials. TMPA argues that *Engrg Rpts* are not helpful in determining whether BNSF or its predecessors paid for these crossings because the rules governing the data collection for those reports allowed the railroads to include the cost of construction, even when their contribution to construction costs might have been minimal or non-existent.

We accept BNSF's argument that its predecessor railroads did in fact incur crossing costs south of Bridger Junction, based on *Engrg Rpts*. In *West Texas*, 1 S.T.B. at 672, we determined that, if the defendant railroad incurred the cost of separating its ROW from other rights-of-way, then the SARR likewise should incur that cost. Therefore, we accept BNSF's crossing count south of Bridger Junction.

Table D-20
At-Grade Crossings

	TMPA	BNSF	STB
Timber	$473,839	$10,460,670	$10,460,555
Asphalt	104,688	2,778,201	2,778,201
Concrete	0	19,034,334	19,034,334
Rubber	0	1,103,618	1,103,618
TOTAL	**$578,526**	**$33,376,823**	**$33,376,823**

3. Crossing Protection

TMPA agrees with BNSF's unit costs for gates and signals, and includes costs for crossing protection north of Bridger Junction. However, TMPA excluded all costs for crossing protection south of Bridger Junction because of its position that the BNSF predecessor lines preceded the roadways. Based on *Engrg Rpts*, which show that the predecessor railroads were responsible for a proportion of the crossing protection costs south of Bridger Junction, BNSF estimates that the railroad incurred 10% of those costs. Given our acceptance of BNSF's at-grade crossing counts and TMPA's agreement with BNSF's unit costs, we accept BNSF's total cost of $8,932,382 representing 10% of what it would cost to install crossing protection on the GCRR.

4. Crossing Signs

TMPA did not include any costs for signs at public and private crossings, nor explain why signs would not be required. BNSF would include costs of $3,139,300 for signs at 688 private and 1,240 public crossings. Because signs are generally required at crossings, we accept BNSF's cost estimate for such signs as the only evidence of record.

5. Roadway Signs

In its case-in-chief, TMPA included no cost for roadway signs. In contrast, BNSF includes $891,772 to install over 10,000 speed restriction signs, station signs, advance warning signs, yard limit signs, and resume speed signs. On rebuttal, TMPA claims that it discussed the need for signs in its opening evidence but inadvertently failed to include the costs for such signs.[254] TMPA's rebuttal evidence includes $366,379 for signs.

We accept BNSF's evidence as we find that TMPA failed to meet its burden of proof by providing for any signs in its case-in-chief.[255] As we have noted, it is inappropriate to wait until rebuttal to submit evidence that should be submitted in opening evidence.

Table D-21
Roadway Signs

TMPA	BNSF	STB
$366,379	**$891,772**	**$891,772**

6. Grade Separations

TMPA estimates grade separation (highway overpass) costs north of Bridger Junction at $12.9 million, but excludes the cost of grade separations on the remainder of the GCRR because the BNSF predecessor lines preceded the roads. BNSF includes costs of $23.3 million for 15 grade separations north of Bridger Junction and 13 grade separations south of Bridger Junction, at an average cost of $832,437 for each grade separation. BNSF's resulting grade separation cost estimate for north of Bridger Junction is $12.5 million.

To support its inclusion of costs for grade separations south of Bridger Junction, BNSF relies on *Engrg Rpts*, which show that a number of highway overpasses south of Bridger Junction were paid for by BNSF's predecessor railroads. However, BNSF would not include the total cost of the 137 separations south of Bridger Junction because a railroad is normally assessed

[254] TMPA Reb. Narr. at 592 (incorrectly noting that signs were discussed on page 311 of its opening evidence).

[255] While TMPA claims that the need for signs was discussed in its opening evidence, we find no such discussion on the page cited by TMPA.

only a portion of the cost of each grade separation constructed. Rather, BNSF would include approximately 10% of the cost of these 137 separations (the equivalent of 13 separations).

Again, TMPA argues that *Engrg Rpts* are not a reliable source. We disagree. Because *Engrg Rpts* show that the railroad incurred some of the costs associated with investment for grade separations, and because BNSF includes its assessed portion of the costs the railroad incurred, we use its estimate of $23.3 million for grade separations.

I. Mobilization

Mobilization involves the marshaling and movement of people, equipment, and supplies to the various construction sites. TMPA included $19.71 million for initial mobilization (1% of those construction costs estimates that TMPA claims do not already include mobilization costs).[256] BNSF would include $63.84 million to cover mobilization costs, a performance bond, and demobilization costs.

TMPA advances the same arguments for limiting mobilization costs and excluding costs for both a performance bond[257] and demobilization that have been considered and rejected in prior cases.[258] *See*, *e.g.*, *WPL*, 5 S.T.B. at 1036-37; *Arizona*, 2 S.T.B. at 401. As we stated in those cases, it is reasonable to assume that the costs for a performance bond and demobilization costs would be incurred when constructing a major railroad. Therefore, we use BNSF's estimate of mobilization costs and the cost of procuring a performance bond.[259] However, because we accept TMPA's assumption that some of the locomotives and train sets purchased for construction would be reused for maintenance purposes (see Appendix C, Section B, Subsection 1), we adjust BNSF's demobilization estimate to reflect the fact that this equipment would be

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[256] As noted above, we are unable to confirm from TMPA's evidence that mobilization costs were included in any of its construction cost estimates.

[257] TMPA argues that we erred in *WPL* by including the cost of a performance bond in mobilization costs, because the contractor would post the bond rather than the railroad. However, regardless of who would actually procure the bond, the railroad would ultimately incur the cost for that bond, and TMPA has not shown that the bids it uses to estimate the GCRR's construction costs include the cost for such a bond.

[258] In *SAC Procedures*, 5 S.T.B. at 446, we cautioned parties in SAC cases not to relitigate issues that have been resolved in prior cases.

[259] BNSF bases its bond cost on the United States Army Corps of Engineers' bond rates for grading and track-laying projects.

retained by the GCRR. We conclude that the GCRR would incur $62.7 million in expenses for mobilization, demobilization and performance bonds.

J. Engineering

Engineering costs are associated with planning, designing, and managing a construction project. Table D-22 shows the parties' estimates and our restatement of engineering costs for the GCRR.

Table D-22
Engineering Costs

	TMPA	BNSF	STB
Mapping & Subsurface	$6.7	$14.3	$14.3
Design	$128.2	$185.7	$156.7
Construction Management	$46.1	$150.5	$145.0
TOTAL	**$181.0**	**$350.5**	**$316.0**

The parties disagree on the costs that would be associated with the preliminary (mapping and subsurface inspection) and final design costs associated with the GCRR, as well as the costs for managing the construction project. In its opening evidence TMPA assumed that preliminary and final design costs would amount to 5% of total construction costs and that construction management would add an additional 1.8% to total construction costs. BNSF agrees that design of the GCRR could be accomplished for 5% of overall construction costs, but it argues that additional preliminary costs would be needed for mapping and surveying the GCRR route and for subsurface investigations.[260] In addition, BNSF argues that TMPA's 1.8% ($46.1 million) estimate for construction management would be insufficient, given TMPA's assumption that construction would be broken into 12 separate track laying projects and several bridge projects, with work on each project to be done simultaneously.

[260] On rebuttal, TMPA included an additional $6.7 million for subsurface investigation.

We find that TMPA's evidence is not adequately supported. In its opening evidence, TMPA relied on an unexplained graph, entitled "Farmer Home Administration Engineering Fee Guideline, Pennsylvania Jan. 1994," taken from a publication entitled *Water and Waste Disposal Handbook*.[261] But as BNSF notes, TMPA provides no evidence to show the comparability between a water project and a larger-scale railroad project. Moreover, because TMPA submitted only that single page from the handbook, we have no way to evaluate what engineering services were included in the percentages shown on the graph or whether the percentages have any applicability to construction of the GCRR. On rebuttal, TMPA referenced a USDA form contract that supposedly indicates the services that an engineering firm is expected to provide (including mapping, surveying, review of contractor work, etc.), but TMPA established no link between this form contract and the graph submitted in its opening evidence.

In the absence of any support for TMPA's estimates, we use BNSF's procedures to develop engineering costs. We assume that design costs for the GCRR would amount to 5% of construction costs (exclusive of land, engineering, mobilization and contingency costs), that mapping and subsurface inspections would cost $14.3 million, and that construction management costs would be $145.1 million (BNSF's estimate adjusted to reflect our restatement of the cost of materials on which BNSF's estimate was based).

K. Contingencies

A contingency account provides funds to address unforeseen costs that may arise during construction. TMPA asserts that a contingency factor of 8% of construction costs is appropriate based on the "unique aspects" of the "building of a stand-alone railroad,"[262] and that the 10% figure we have used in prior SAC cases—the Army Corps of Engineers' standard 10% minimum contingency factor—is unrealistically high. TMPA argues that modern construction practice has introduced critical path project management and risk management techniques; that proper implementation of risk management would reduce the costs and construction time; and that material shortages are inappropriately included in contingencies. BNSF argues that we should continue to apply the 10% figure.

We reject TMPA's request that we revisit this issue, which has been settled in prior SAC cases. TMPA has not shown that the implementation of risk

[261] USDA Rural Utilities Service, June 1997. TMPA Open. W.P. 7334-7335.

[262] TMPA Open. Narr. at 320.

management techniques can reduce contingency costs to 8%, nor that materials shortages are improperly included in contingencies. Therefore we use 10% as the appropriate additive for contingencies.

APPENDIX E — DISCOUNTED CASH FLOW COMPUTATION

In applying the SAC test, we compare the estimated revenues that the GCRR would earn over the 20-year analysis period to the estimated costs of constructing and operating the hypothetical rail system. As in prior cases, a DCF analysis is used to discount the GCRR's 20-year stream of estimated revenues and costs to a common point in time. In this appendix, we discuss various issues affecting the DCF calculation not addressed elsewhere in this decision.

The results of the DCF calculation are shown in Table E-1 below. Column 8 shows that, under the current rate structure, the GCRR's total revenues over the 20-year SAC analysis period would be $208.1 million more than the GCRR would need in order to recover all its costs, including a reasonable return on its investment. Column 10 shows the amount by which the GCRR's total revenues would need to be reduced in the period 2001 through 2011 so as to avoid any over- or under-recovery in the full 20-year SAC analysis period, while column 11 expresses that amount as a percentage reduction. We base our rate prescription and award of reparations for TMPA on that percentage reduction.

Table E-1
GCRR CASH FLOW
(millions of dollars)

Year (1)	Capital Costs & Taxes (2)	Annual Operating Costs (3)	Total Annual Costs (4)	Annual Revenues (5)	Annual Over/ Under Payment (current) (6)	Annual Over/ Under Payment (present value) (7)	Cumula-tive Over/ Under Payment (present val.) (8)	Required Revenue Reduc-tion (present val.) (9)	Required Revenue Reduc-tion (current) (10)	Percent Rate Reduc-tion (11)
2001*	$339.4	$309.8	$649.2	$694.5	$45.4	$45.4	$45.4	$30.6	$30.6	4.40%
2002	460.1	390.8	851.0	926.9	75.9	66.8	112.2	45.0	51.2	5.52%
2003	469.0	402.1	871.2	916.9	45.7	36.3	148.5	24.4	30.8	3.36%
2004	478.1	413.4	891.6	931.0	39.4	28.3	176.8	19.1	26.6	2.85%
2005	487.5	428.1	915.5	970.8	55.3	35.8	212.7	24.1	37.3	3.84%
2006	497.0	437.9	934.9	978.6	43.8	25.6	238.2	17.2	29.5	3.01%
2007	506.7	453.7	960.4	1,006.4	46.0	24.3	262.5	16.3	31.0	3.08%
2008	516.7	468.8	985.6	1,027.7	42.1	20.1	282.6	13.5	28.4	2.76%
2009	526.9	483.7	1,010.6	1,043.9	33.3	14.3	296.9	9.7	22.4	2.15%
2010	537.4	499.4	1,036.7	1,059.8	23.1	9.0	305.8	6.0	15.5	1.47%
2011	548.0	515.5	1,063.6	1,072.5	9.0	3.2	309.0	2.1	6.1	0.56%
2012	559.0	532.0	1,091.0	1,084.9	(6.1)	(1.9)	307.1	0.0	0.0	0.00%
2013	570.2	549.2	1,119.4	1,099.0	(20.4)	(5.8)	301.2	0.0	0.0	0.00%
2014	581.6	566.5	1,148.1	1,110.2	(38.0)	(9.8)	291.4	0.0	0.0	0.00%
2015	593.3	584.1	1,177.4	1,126.6	(50.8)	(11.8)	279.6	0.0	0.0	0.00%
2016	605.3	604.7	1,210.1	1,149.7	(60.3)	(12.7)	266.9	0.0	0.0	0.00%
2017	617.6	624.4	1,242.0	1,170.8	(71.2)	(13.5)	253.4	0.0	0.0	0.00%
2018	630.1	643.8	1,273.9	1,192.0	(81.8)	(14.0)	239.3	0.0	0.0	0.00%
2019	643.0	664.2	1,307.2	1,217.4	(89.9)	(13.9)	225.4	0.0	0.0	0.00%
2020	656.1	685.9	1,342.0	1,246.8	(95.2)	(13.3)	212.1	0.0	0.0	0.00%
2021**	166.1	174.7	340.8	311.7	(29.1)	(4.0)	208.1	0.0	0.0	0.00%

* 2001 data is for the 2nd, 3rd, and 4th quarters of the year.

** 2021 data is for only the 1st quarter of the year.

NOTE: The DCF model limits the revenue reductions in 2001through 2011 to 67% of the overpayments in order to offset the underpayments that would occur in 2012 through 2021.

A. Inflation Indices

Inflation indices are used in the DCF model to account for changes in the value of the GCRR road property assets and operating costs over the 20-year analysis period.

1. Road Property Assets

The parties agree on the inflation indices that should be used to account for changes in the value of the road property assets over the 20-year analysis period. We use the agreed-upon indices.

2. Operating Expenses

The RCAF is an index of railroad costs developed on a quarterly basis. There are several versions of the RCAF. The version of the RCAF that does not take into account changes in railroad productivity is referred to as the unadjusted RCAF, or the RCAF-U, whereas the RCAF that does take these changes into account is referred to as the adjusted RCAF or RCAF-A.[263]

For operating expenses, TMPA argues that the RCAF-A is more appropriate to use as an index because the GCRR "necessarily will adopt the same practices and productivity enhancements that drive the RCAF-A."[264] BNSF would use the RCAF-U, arguing that applying the RCAF-A to operating expenses when calculating SAC is "contrary to Board precedent and to logic."[265]

The RCAF-A considers productivity adjustments for the railroads based on all of their business operations, but the GCRR would handle only unit coal trains. We have no evidence, and we find it unrealistic to assume, that projected industry-wide productivity adjustments would result primarily from the transportation of coal. In the absence of any evidence showing specific productivity improvements for unit coal train operations that would affect the GCRR,[266] we use the RCAF-U to index the operating expenses for the GCRR.[267]

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[263] *See* 49 U.S.C. 10708 (requiring publication of the RCAF-U and RCAF-A).

[264] TMPA Reb. Narr. at 606.

[265] BNSF Reply Narr. Vol III - III at III-G-3 n5.

[266] *Cf. WPL*, 5 S.T.B. at 1039-40 (indexing operating expenses based on a forecast of expected cost increases for moving coal).

[267] We use DRI-WEFA projections of RCAF-U, the source used by both BNSF (for RCAF-U) and TMPA (for RCAF-A).

B. Investment Allocation

The DCF model develops the pattern of capital recovery for the GCRR. As explained in *FMC*, 4 S.T.B. at 740-41, we believe that it is more appropriate to allocate an equal share of capital costs to each year of the analysis period than to allocate a pro rata share of capital recovery to each ton of traffic. *Accord*, *WPL*, 5 S.T.B. at 982. TMPA would prefer to use a pattern of capital recovery that is based on tonnage rather than time, but we decline to do so for the same reasons set forth in *FMC* and *WPL*.

Here, as was true in *FMC* and *WPL*, applying a tonnage-based procedure would result in a larger share of the capital charges being assigned to the latter part of the 20-year period, when more traffic (tonnage) would be projected to move. As we have explained in prior cases, such a procedure places undue weight on the accuracy of traffic forecasts extending out 20 years. Traffic projections are inherently uncertain and we do not believe our maximum rate reasonableness findings should be driven by these projections any more than necessary. And, as we noted in *FMC*, even if we could be sure that all of the forecasts here would ultimately be realized, it would not be fair or proper to set current rates based on economies of density and revenue contributions that do not yet exist. Therefore, we allocate the capital carrying charges here using the time-based procedure used in *FMC* and *WPL*.

C. Capital Flotation Costs

BNSF argues that the costs associated with financing the GCRR should reflect an equity flotation fee of 4% and a debt placement fee of 1% as part of the capital start-up costs for the GCRR. BNSF argues that such fees would be necessary to cover the cost of raising new capital, and offers a statement by a BNSF witness that such financing/flotation fees are required.[268] In *WPL*, 5 S.T.B. at 1040, we rejected a similar railroad suggestion as unsupported, and we reject it here for the same reason.

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[268] BNSF Reply V.S. Gilbertson at 34.