John T. Gray
Senior Vice President - Policy & Economics

March 5, 2021

The Honorable Cynthia T. Brown
Chief, Section of Administration
Office of Proceedings
Surface Transportation Board
395 E Street, SW
Washington, DC 20423-0001

This submission is the AAR forecast of the second quarter 2021 All-Inclusive Index and Rail Cost Adjustment Factor, filed in Ex Parte No. 290 (Sub-No. 5) (2021-2) *Quarterly Rail Cost Adjustment Factor.* The versions of RCAF-related indices covered in this filing are: the All-Inclusive Index (initiated in the second quarter of 1985), the Unadjusted RCAF (produced since October 1982), the Adjusted RCAF (first published in the second quarter of 1989), and the RCAF-5 (created by the STB in its Ex Parte No. 290 (Sub-No. 7) decision served October 3, 1996). The table below summarizes the second quarter 2021 results and compares to the previous quarter. Both quarters are shown on a 4Q\2017=100 base.

	2021Q1	2021Q2	% Change
All-Inclusive Index	102.7	106.7	3.9
Preliminary RCAF	1.027	1.067	3.9
Forecast Error Adjustment	0.013	-0.008	
RCAF (Unadjusted)	1.040	1.059	1.8
Productivity Adjustment Factor	2.3943	2.3991	
RCAF (Adjusted)	0.434	0.441	1.6
PAF-5	2.5343	2.5406	
RCAF-5	0.410	0.417	1.7

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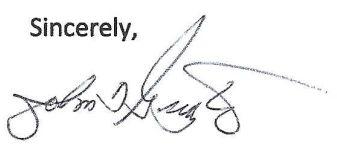
In its October 3, 1996 decision in Ex Parte No. 290 (Sub-No. 7), *Productivity Adjustment - Implementation,* the STB noted its intent to publish, in addition to the RCAF (Unadjusted) and RCAF (Adjusted), an RCAF-5 (i.e., a calculation of the productivity adjusted RCAF values as if the agency had always used a 5-year rolling average to calculate the productivity adjustment). In response to a request by STB staff, the AAR is including a calculation of the RCAF-5 in its quarterly RCAF filing. The AAR and its members, however, do not believe the publication of a third RCAF index is required or permitted by the applicable statute (49 U.S.C. § 10708) and do not endorse its publication.

Our quarterly non-proprietary work papers underlying this submission are e-filed herewith, in accordance with the ICC's order in Ex Parte No. 290 (Sub-No. 2), *Railroad Cost Recovery Procedures,* served February 8, 1990. We have notified Pedro Ramirez, in the STB office handling this proceeding, of our plan to e-file the submission and non-proprietary work papers. A second copy of the submission and non-proprietary work papers, plus selected highly confidential work papers, will be provided to Mr. Ramirez's Data Collection and Auditing Team. All work papers are available for STB inspection. Questions should be directed to me or Tiffany Placker (202 639-2381) of this office.

Sincerely,



John T. Gray

Attachments

Second Quarter 2021
All-Inclusive Index

Ex Parte No. 290 (Sub-No. 5) (2021-2)

Quarterly Rail Cost Adjustment Factor
Surface Transportation Board

Policy and Economics Department
Association of American Railroads

March 5, 2021

Table of Contents

Introduction

On January 2, 1985, the Interstate Commerce Commission (ICC) adopted the All-Inclusive Index as the basis for the Rail Cost Adjustment Factor (RCAF). The quarterly projection of railroad costs, as documented herein, employs the All-Inclusive Index as required by the regulations. Also presented in this submission is the RCAF, both Adjusted and Unadjusted, as required by the ICC in its decision in Ex Parte No. 290 (Sub-No. 4), Rail Cost Recovery Procedures - Productivity Adjustment, served March 24, 1989. In addition, the AAR has included the RCAF-5, which was instituted by a Surface Transportation Board decision served October 3, 1996 in Ex Parte No. 290 (Sub-No. 7), *Productivity Adjustment - Implementation* . The AAR and its members do not believe the additional productivity-adjusted index is required or permitted by the applicable statute, and do not endorse its publication.

This quarter's projection of railroad costs is for the second quarter 2021. The Productivity adjustment decision, served February 19, 2021, has been utilized to update productivity adjustment factors listed on page 5 herein.

Index Weights

In the Ex Parte No. 290 (Sub-No. 2) final rules, issued in April 1981, the Interstate Commerce Commission mandated that the weights of each major cost component be updated annually. These "external" weights are calculated using expense data from Schedules 410 and 210 of the R-1 annual report filed with the Surface Transportation Board by the Class I railroads. The weights are typically updated with the fourth quarter projection.

The 2019 (current) and 2018 (previous) weights are shown below. Weights calculated from 2018 data were used for the fourth quarter of 2019 through the third quarter of 2020. Beginning with the fourth quarter of 2020, weights calculated using 2019 data are used. The component with the biggest change in weight was Fuel, which decreased by 1.7 percentage points. Labor, Materials & Supplies, and Equipment Rents also decreased. The weight for Depreciation, Interest, and Other all increased by 0.9, 0.4, and 1.1 percentage points, respectively.

Weights for RCAF's All-Inclusive Index

	2019	2018
Labor	32.6 %	33.0 %
Fuel	14.2	15.9
Materials & Supplies	4.9	5.1
Equipment Rents	5.2	5.3
Depreciation	15.9	15.0
Interest	2.5	2.1
Other	24.7	23.6
Total	100.0	100.0

Reweighting of the index is accomplished by calculating both the current quarter (normally the fourth) and prior (normally the third) quarter indexes with the new weights. The relative change between the two quarters is then multiplied times the prior quarter (usually the third) *linked* index. Use of this method ensures that the weight change, by itself, does not cause a change in the level of the All-Inclusive Index.

Internal weights in the labor and equipment rents components are updated at the same time as the external weights. When these weights are changed, they are also linked using the procedure described above in order to eliminate the effect of the change in weighting.

All-Inclusive Index

Second Quarter 2021

The components and values of the current and previous All-Inclusive Indexes are shown below. Details of the construction of each component of the index are contained in the Appendices.

	2019 Weights	Forecast Previous 2021Q1	Forecast Current 2021Q2	Percent Change
1. Labor	32.6%	448.9	446.6	-0.5 %
2. Fuel	14.2%	164.7	221.1	34.2
3. M&S	4.9%	264.9	275.0	3.8
4. Equipment Rents	5.2%	236.4	238.4	0.8
5. Depreciation	15.9%	226.2	226.5	0.1
6. Interest	2.5%	55.7	55.7	0.0
7. Other	24.7%	237.0	251.0	5.9
8. Weighted Average				
a. 1980 = 100		290.9	302.3	
b. 1980 = 100 (linked)		271.7	282.3 [1]	
c. 4Q17 = 100		102.7	106.7 [2]	3.9

[1] Index80 = (Current Index / Previous Index) * the Previous Quarter Linked Index

= (302.3 / 290.9) x 271.7

= 282.3

[2] To calculate the 4Q17 = 100 index:

Index4Q17 = (Current Linked Index / 4Q17 Basing Factor) * 100

= 282.3 divided by 264.5 times 100

= 106.7

Indexes based on other periods:
4Q12 based index = 282.3 / 297.6 x 100 = 94.9
4Q07 based index = 282.3 / 245.9 x 100 = 114.8
4Q02 based index = 282.3 / 192.1 x 100 = 147.0
4Q97 based index = 282.3 / 173.2 x 100 = 163.0
4Q92 based index = 282.3 / 156.9 x 100 = 179.9

Forecast vs. Actual All-Inclusive Index

Fourth Quarter 2020

Because of data availability, the forecast error adjustment has a two-quarter lag from each filing. As shown below, the fourth quarter actual index of 100.3 is 0.8 index points below the forecast value of 101.1. Therefore, the forecast error adjustment for second quarter 2021 is -0.8 index points.

	2019 Weights	Fourth Quarter 2020 Forecast	Fourth Quarter 2020 Actual	Amt Difference
1. Labor	32.6%	437.1	437.1	
2. Fuel	14.2%	171.2	154.9	
3. M&S	4.9%	258.8	258.8	
4. Equipment Rents[1]	5.2%	234.1	236.1	
5. Depreciation	15.9%	226.1	226.2	
6. Interest	2.5%	55.7	55.7	
7. Other	24.7%	232.1	235.1	
8. Weighted Average				
a. 1980 = 100		286.3	284.9	
b. 1980 = 100 (linked)		267.4	265.3 [2]	
c. 4Q17 = 100[3]		101.1	100.3	-0.8

Forecast error ⟶ -0.8 index points

Notes: New weights have been utilized. The standard linking procedure has been used to eliminate any changes to indexes that would be caused by updating weights. The Q3 unlinked weighted averages for the All-Inclusive Indexes (forecast and actual) and for Equipment Rents (forecast and actual) were recalculated using the new (2019) weights.

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[1]

	2019 Weights	Fourth Quarter 2020 Forecast	Fourth Quarter 2020 Actual
Car-Hire	61.4%	215.9	216.3
Lease Rentals	38.6%	232.1	235.1
Weighted Average		222.2	223.6
Weighted Average (linked)		234.1	236.1

[2] Linked actual index = (actual index / previous actual index) x previous linked actual index.

265.3 = 284.9 / 286.9 x 267.2

[3] The 4Q17 based indexes are 1980 based indexes divided by the 4Q17 basing factor (264.5/100). Other basing factors are: 4Q12 = 297.6; 4Q07 = 245.9; 4Q02 = 192.1; 4Q97 = 173.2; and 4Q92 = 156.9.

Productivity

On February 19, 2021, the Surface Transportation Board served a decision which proposed to adopt 0.8 percent as the geometric average productivity change for the five most recent years available. Their five year rolling geometric average calculation added the year 2019 and removed the year 2014. The components of this average annual value are shown on the following table in ratio format – therefore, 1.008 is the same as an increase of 0.8 percent. Productivity changes are calculated by multiplying each of the five productivity changes together and taking the result to the one-fifth power. The productivity adjustment factors (PAF) for each quarter are calculated by increasing the previous quarter's PAF by quarterly versions of the annual rate, which are the fourth root of the geometric average annual growth rate. The difference between the PAF and the PAF-5 is the timing of the five-year productivity trend.

Comparison of Output, Input, & Productivity

2015 - 2019

Year	Output Index (1)	Input Index (2)	Productivity Changes (3)
2015	0.913	0.972	0.939
2016	0.955	0.941	1.015
2017	1.045	0.992	1.053
2018	1.032	1.004	1.028
2019	0.968	0.961	1.007
Average			**1.008**
Previous Average (2014-2018)			1.010

Calculation of PAF and PAF-5

For 2015-2019, use fourth root of avg. productivity change = 1.0020
For 2014-2018, use fourth root of avg. productivity change = 1.0025

Quarter	Year	PAF	PAF-5
Q1	2021	2.3943	2.5343
Q2	2021	2.3991	2.5406
Q3	2021	2.4039	2.5470
Q4	2021	2.4087	2.5534
Q1	2022	2.4135	2.5585

2014-2018

2015-2019

Rail Cost Adjustment Factor

Second Quarter 2021

Four RCAF values are presented in this filing. Two are not modified for productivity (Preliminary RCAF and RCAF Unadjusted), and two incorporate a productivity calculation (RCAF Adjusted and RCAF-5). The All-Inclusive Index and all four RCAF values, plus the percent change for each, are shown below. Note that beginning with the 2018Q1 index, the All-Inclusive Index was rebased to a 2017Q4=100 basis as required in the applicable statute.

	Previous 2021Q1	Current 2021Q2	Percent Change
All-Inclusive Index[1]	102.7	106.7	3.9
Preliminary RCAF[2]	1.027	1.067	3.9
Forecast Error Adjustment[3]	0.013	-0.008	
RCAF (Unadjusted)[4]	1.040	1.059	1.8
Productivity Adjustment Factor[5]	2.3943	2.3991	
RCAF (Adjusted)[6]	0.434	0.441	1.6
PAF-5[7]	2.5343	2.5406	
RCAF-5[8]	0.410	0.417	1.7

[1] See All-Inclusive Index on page 3.

[2] All-Inclusive Index divided by the All-Inclusive Index in the base period (100.0).

[3] The current figure is from Forecast vs. Actual All-Inclusive Index in this filing (page 4). The previous quarter figure is shown in a similar section of the previous quarter's filing.

[4] Preliminary RCAF plus the forecast error adjustment.

[5] See Productivity on page 5.

[6] RCAF (Unadjusted) divided by the Productivity Adjustment Factor (PAF).

[7] See Productivity on page 5.

[8] RCAF (Unadjusted) divided by the PAF-5.

Appendixes

Labor

Second Quarter 2021

The second quarter 2021 Labor Index is 0.5 percent lower than the previous quarter. A decrease in the lump sum rate and the Other (401k) rate contributed the most towards this decrease.

Wage Rate Index

The Wage Rate Index portion of the Labor Index decreased by 0.5%.

Wage Increases: There are no national or independent agreement wage increases currently scheduled for the second quarter.

Lump Sums: The second quarter lump sum rate fell 22.2 cents. Four amounts (three annual and one quarterly) were fully amortized and removed, but they were replaced by only three new amounts (two annual and one quarterly). One of the annual performance-based lump sums was quite a bit smaller than it was the prior year.

Back Pay: The back pay rate is unchanged this quarter. One small amount was fully amortized and removed, and it was replaced by a similarly small new amount.

Other: In wages, "Other" contains the amortization of incentive compensation payments (similar to lump sums) that one railroad makes each year to its dispatchers, yardmasters, and locomotive engineers. The second quarter rate is unchanged from the prior quarter.

Labor

Second Quarter 2021

Supplements Index

The Supplements Index decreased 0.5 percent due to a decrease in the Railroad Retirement rate and the Other (401k) rate.

Health & Welfare: The Health & Welfare rate is unchanged this quarter.

Railroad Retirement: The Railroad Retirement rate fell 0.4 percent due to lower taxable wages.

Unemployment Insurance: The Unemployment Insurance rate is unchanged this quarter.

Other: The "Other" category is a reflection of all other fringe benefits, and currently contains known employer contributions to employee 401(k) accounts and employer contributions to employee stock plans that are recorded as fringe benefits. The second quarter rate is 34.5 percent (7 cents) lower than last quarter.

Labor Index Calculation

As shown in Table A-1 on the next page, the 0.5 percent decrease in the Wage Rate Index and the 0.5 percent decrease in the Supplements Index combined to cause the Labor Index to be 0.5 percent lower than the previous quarter. The linked second quarter 2021 Labor index is 446.6, which is 1.1 percent higher than one year ago.

Labor

Second Quarter 2021

Table A-1 Labor Index

	2021Q1	2021Q2	Change Percent	Change Amount
Base Wage – Straight Time & Pay For Time Not Worked	$44.476	$44.476	0.0%	$0.000
Adjustments:				
Lump Sum	0.349	0.127	-63.6%	-$0.222
Back Pay	0.017	0.017	0.0%	$0.000
Other	0.172	0.172	0.0%	$0.000
Total Wages	45.014	44.792	-0.5%	-$0.222
Health & Welfare Benefits	8.522	8.522	0.0%	$0.000
RR Retirement & Medicare	9.054	9.022	-0.4%	-$0.032
Unemployment Insurance	0.569	0.569	0.0%	$0.000
Other	0.203	0.133	-34.5%	-$0.070
Total Supplements	$18.348	$18.246	-0.6%	-$0.102
Total Labor (as info only)	$63.362	$63.038		
Wage Index[1]	385.2	383.3	-0.5%	
Supplements Index[2]	678.0	674.3	-0.5%	
Total labor Index, 2019 Weights[3]	469.8	467.4		
Labor Index (linked)[4]	**448.9**	**446.6**	-0.5%	

[1] 1980 wage rate $11.685

[2] 1980 supplements rate $2.706

[3] 2019 weights: wages, supplements 71.1% 28.9%

[4] 2021Q2 linked Index = 2021Q1 linked x (2021Q2 / 2021Q1)

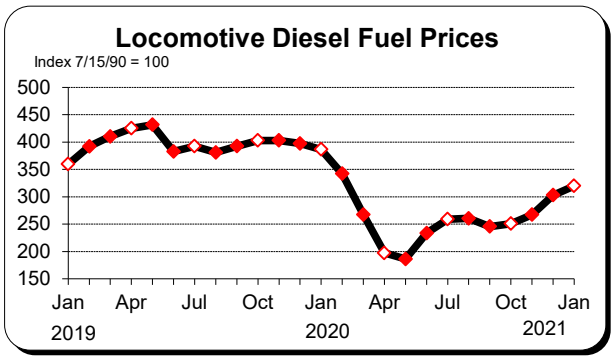
= 448.9 x 467.4 / 469.8

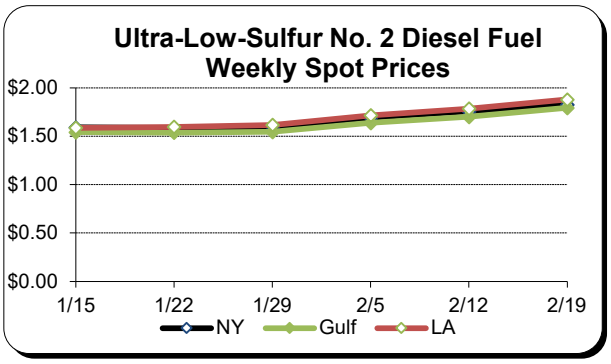
Fuel

Second Quarter 2021

The forecast for fuel is based on: (1) a survey of railroad fuel purchasing officers concerning current price and volume levels, (2) expectations of railroad purchasing officers based on their own forecast models and discussions with their major suppliers, and (3) a consensus of petroleum industry experts and general business publications. Fuel purchases are assumed to remain in inventory for 30 days before the fuel is consumed (and therefore expensed). Therefore, prices *paid* in the first month of each quarter are for fuel *expensed* in the second (or middle) month of the quarter, and the middle month expensed is used to represent each quarter.

The average locomotive diesel fuel price hit a low point in May 2020 but has, for the most part, risen in the months after. While average prices for locomotive diesel fuel are available only through January 2021, data through four weeks of February are available for related fuel types. According to the Energy Information Administration, the daily spot price as of February 22 for Ultra-Low-Sulfur Diesel Fuel* is an average of 20 percent higher than the average for January. The chart below (on left) shows the AAR's Monthly Locomotive Diesel Fuel Price Index through January 2021. The second chart (on right) shows recent spot prices for Ultra-Low-Sulfur No. 2 Diesel Fuel as reported by the Energy Information Administration.





Using information from the EIA, prices towards the end of February are higher than prices that actually occured in January. Railroads that responded to the AAR's forecast survey expect prices to continue to increase by April (Q2) compared to prices that actually occurred for January (Q1). The second quarter 2021 forecast is 34.2 percent higher than the previous quarter forecast, and 12.1 percent higher than the prior quarter actual.

Forecast Fuel Index (1980 = 100)	221.1
Change from previous quarter forecast	34.2%
Change from previous quarter actual	12.1%

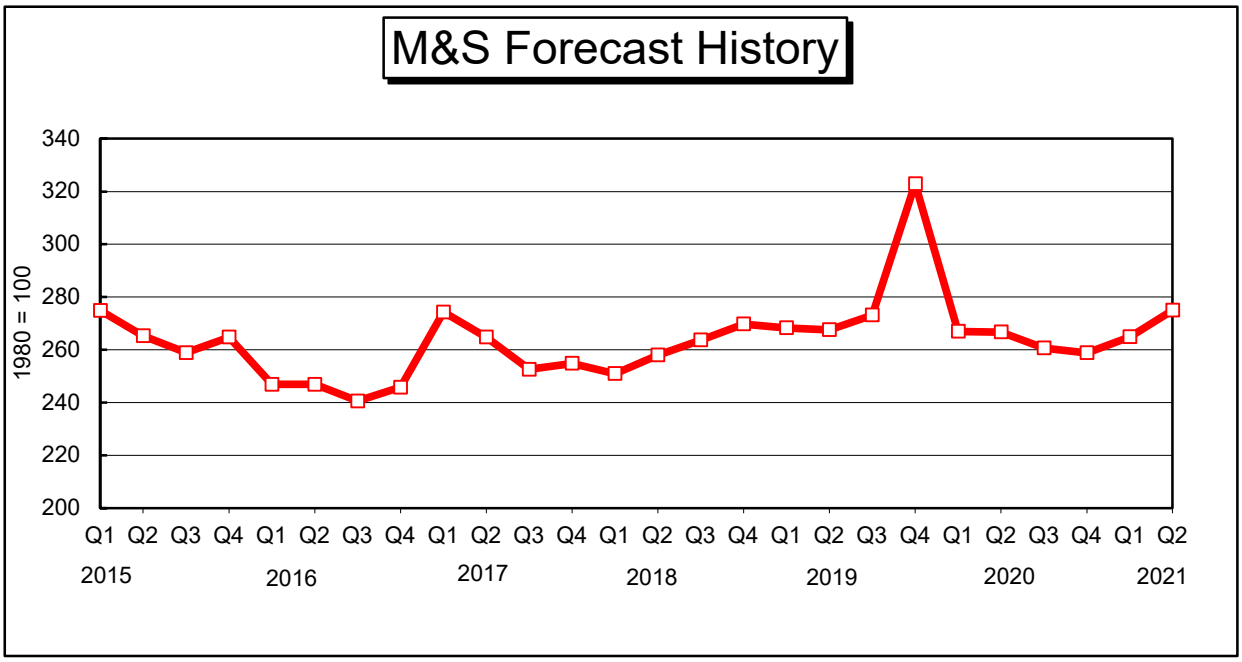
* Heating oil, Ultra-Low-Sulfur No. 2 Diesel Fuel, and locomotive diesel fuel are part of a group of closely related products, commonly labeled as distillates, that differ mostly by their sulfur content. Because of these similarities, these fuels are produced together and have similar pricing trends.

Materials & Supplies

Second Quarter 2021

The second quarter 2021 Materials & Supplies Index increased 3.8 percent from the previous quarter. Prices increased for Miscellaneous Products and Metal Products.

2021Q2	Materials & Supplies Index =	275.0
2021Q1	Materials & Supplies Index =	264.9
	Difference	10.1 basis points
		or
		3.8 %



Equipment Rents

Second Quarter 2021

The Equipment Rents Index consists of two components – car hire and lease rentals. The methodologies used to create these two components, and the final Equipment Rents Index, are explained below.

Car Hire

The car hire component is indexed using data from the Car Hire Accounting Rate Master (CHARM) file. Car hire rates for the forecast quarter are estimated based on data for active freight cars using the most recent data available. For the first quarter, December 1 of the previous year is typically used. For the second, third and fourth quarters; March 1, June 1, and September 1 are usually used, respectively. Using data retrieved from the latest CHARM file, an average rate per car is developed. Next, those average rates are grouped into four car type categories to create an overall summary of car hire rates. The summary rates are then compared from quarter to quarter, and weighted, to determine the Car Hire Index.

Lease Rentals

The lease rentals portion of the Equipment Rents Index uses the Producer Price Index for Industrial Commodities less Fuel and Related Products and Power (PPI-LF). The Commission adopted this surrogate in its decision served March 13, 1987. The AAR uses six years of historical data to derive its forecast for the PPI-LF. The forecast is used not only for lease rentals, but also for the "Other" component of the All-Inclusive Index. Appendix G discusses the forecast in more detail.

Equipment Rents Index Calculation

The table below shows the results of the Equipment Rents Index calculation. The second quarter Car Hire portion of the Index decreased 2.6 percent because of lower rates for privately owned cars and auto racks. A 5.9 percent increase for the projected PPI-LF (See Appendix G) used as a proxy for Lease Rentals, combined with the 2.6 percent decrease for Car Hire, caused the Equipment Rents Index to rise 0.8 percent.

	2019 Weight	2021Q1	2021Q2	Percent Change
Car Hire	61.4%	216.5	210.8	-2.6 %
Lease Rentals	38.6%	237.0	251.0	5.9
Weighted Average		224.4	226.3	0.8
Weighted Average (Linked)		236.4	238.4	0.8

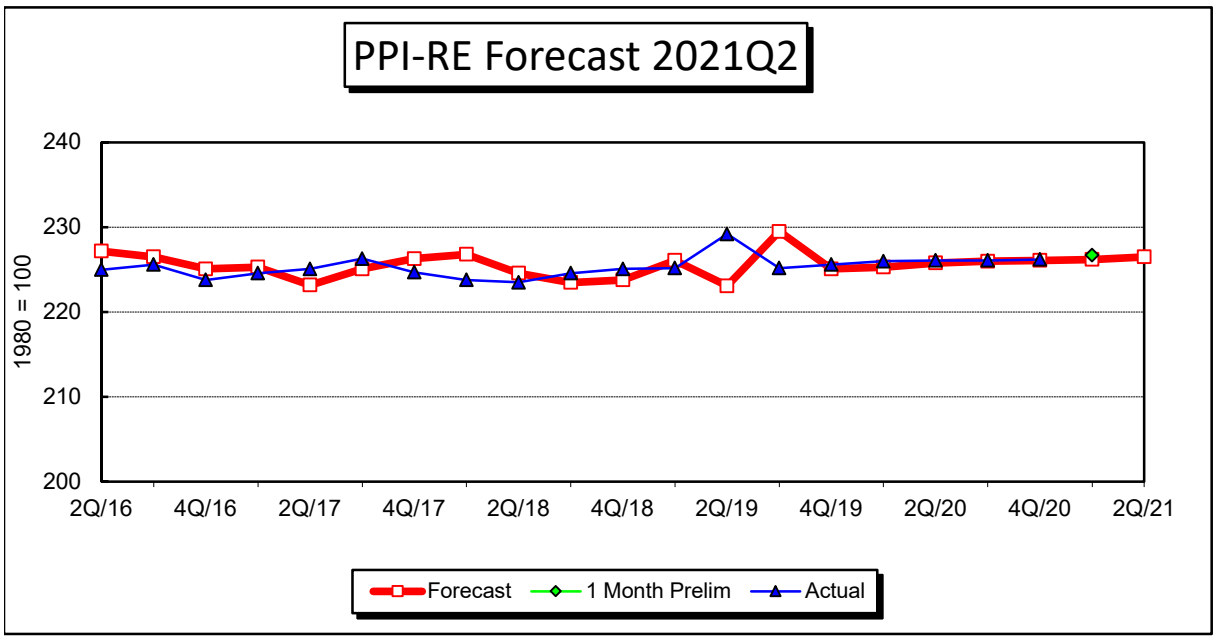
Depreciation

Second Quarter 2021

The Producer Price Index for Railroad Equipment (PPI-RE) is used to index depreciation expense. The PPI-RE is forecast using an ARIMA (Auto-Regressive Integrated Moving Average) process where a statistical package picks the model that best fits the historical data set (see next page), and that model is then used for the forecast. The historical data set contains 6 years of monthly data (a sample size of 72), where the most recent available data point is the first month of the quarter prior to the forecast quarter. For a first quarter forecast, the most recent month of data available would be for October of the prior year. For a second quarter forecast, January would normally be the most recent period available. April and July would be the most recent months available for third and fourth quarter forecasts, respectively. The output from the forecast model is shown on page 2 of this appendix on a 1982=100 basis. The figure forecast by the model is 0.1% higher than the previous quarter's forecast.

Forecast of Depreciation Index (1982=100)	204.8
Forecast of Depreciation Index (1980=100)	226.5

Change from previous quarter forecast	0.1% = 0.13%
Change from actual first month of previous quarter	0.0% = 0.00%
Change from same quarter of prior year (actual)	0.2%



Depreciation

Second Quarter 2021

PPI RAILROAD EQUIPMENT

Expert Analysis

Using rule-based logic I have narrowed down the choice to exponential smoothing or Box-Jenkins.
I will perform an out-of-sample test to select between these two approaches.

The cumulative MAD for Exponential smoothing was 0.45 and for Box-Jenkins was 1.16.
The rolling out-of-sample test used a maximum horizon of 12 and generated 78 forecasts for each method.

Based on the lower MAD, I will use Exponential Smoothing.

Model Details

Expert selection

Exponential smoothing: No trend, Additive seasonality

NA(0.697, 0.331)

Component	**Smoothing Wgt**		**Final Value**
Level	0.6968		205
Seasonal	0.3309		
Seasonal Indexes			
Jan - Mar	-0.129	0.2636	0.2833
Apr - Jun	-0.1961	-0.2191	0.0025
Jul - Sep	0.07767	0.4111	-0.1094
Oct - Dec	0.1071	-0.2844	-0.2073

Within-Sample Statistics

Sample size	72	No. parameters	2
Mean	203.17	Std. deviation	1.34
R-square	0.56	Adj. R-square	0.55
Durbin-Watson	1.91	Ljung-Box(18)	18.6 P=0.58
Forecast error	0.9	BIC	0.94
MAPE	0.29	SMAPE	0.29
RMSE	0.89	MAD	0.59
MAD/Mean Ratio	0		

Actual Values for the Most Recent 6 Periods:

Actual	
2020-Aug	204.4
2020-Sep	204.4
2020-Oct	204.4
2020-Nov	204.4
2020-Dec	204.6
2021-Jan	204.9

Forecasted Values

2.5 Lower	**Forecast**	**97.5 Upper**	
Date	**2.5 Lower**	**Forecast**	**97.5 Upper**
2021-Feb	203.389	205.232	207.076
2021-Mar	203.005	205.252	207.499
2021-Apr	202.185	204.773	207.361
2021-May	201.860	204.750	207.639
2021-Jun	201.809	204.971	208.133
QTR AVG	201.951	204.831	207.711

Interest

Second Quarter 2021

The Interstate Commerce Commission, in its decision served February 28, 1989, revised the All-Inclusive Index methodology to include a specific interest component, which is to track changes in the average interest rate from year to year. The interest rate is essentially the embedded cost of debt, i.e., total interest expense divided by average total long term debt.

The interest rate is calculated for the most recent year and used until the next year's figures are finalized. The source data are from a summary of the annual reports (Form R-1) submitted by each of the Class I railroads. Although the data set is received at the end of March, it is not used until the September filing. This enables data to be entered into a database and reviewed – and any revisions made, if necessary, before the data are used in the Index. The current Interest Index is based on 2019 data, and was updated in the Q4 filing submitted on September 4, 2020. The Interest Index based on 2019 decreased to 55.7 from 57.2 in 2018, and is the lowest in recent history.

The R-1 source for interest expense is Schedule 210, column b. The lines currently used are listed below. The source for average total debt is Schedule 200. The sums of data from columns b and c (ending and beginning balances) are combined and divided by 2 to compute an average balance. The line numbers listed below account for the line number changes effective beginning with the 2016 annual report.

Interest Expense (Schedule 210)

Line	
42	Total Fixed Charges
44	Contingent Interest
less	
22	Release of Premium on Funded Debt

Average Total Debt (Schedule 200)

Line	
29	Current Liabilities, Loans and Notes Payable
38	Equipment Obligations and Other Long Term Debt Due Within One Year
40	Non-Current Liabilities: Funded Debt Unmatured
41	Non-Current Liabilities: Equipment Obligations
42	Non-Current Liabilities: Capitalized Lease Obligatons
43	Non-Current Liabilities: Debt in Default
44	Non-Current Liabilities: Accounts Payable: Affiliated Companies
45	Non-Current Liabilities:Unamortized Debt Premium

2019	Interest Rate	4.37%
1980	Interest Rate	7.85%
2021Q2	**Interest Index**	**55.7**
2021Q1	Interest Index	55.7
	Percent Change	0.0%

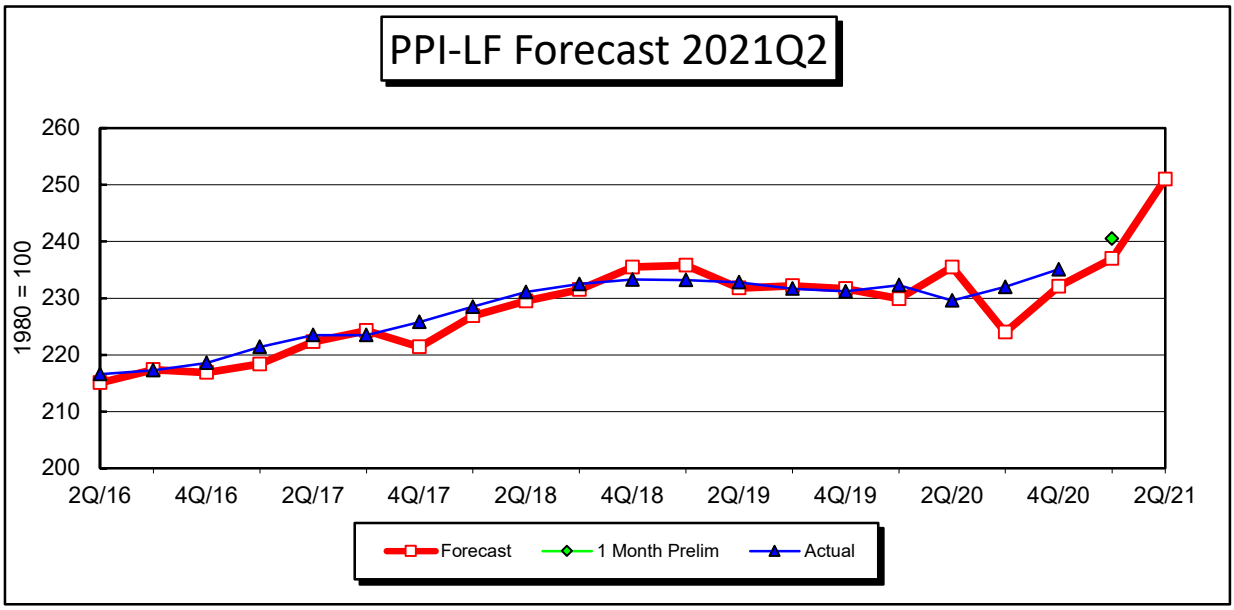
Other Expenses

Second Quarter 2021

The Producer Price Index for Industrial Commodities less Fuels and Related Products and Power (PPI-LF) is used to index purchased services, casualties and insurance, loss and damage, taxes (other than income and payroll), general and administrative expenses, and lease rentals. These expenses, when grouped together, are usually called "Other" expenses.

Like the PPI-RE, the PPI-LF is forecast using an ARIMA process on 6 years of monthly data (a sample size of 72) with the most recent available monthly data being the first month of the quarter prior to the forecast quarter. For a first quarter forecast, the most recent month of data available would be for October of the prior year. For a second quarter forecast, January would normally be the most recent month available. April and July would be the most recent months available for third and fourth quarter forecasts, respectively. The output from the forecast model is shown on page 2 of this appendix for 1982=100. The figure forecast by the model is 5.9 percent higher than the prior quarter forecast.

Forecast of Other Expense Index (1982=100)	223.9
Forecast of Other Expense Index (1980=100)	251.0
Change from previous quarter forecast	5.9%
Change from actual first month of previous quarter	0.0%
Change from same quarter of prior year (actual)	9.3%



Other Expenses

Second Quarter 2021

PPI INDUSTRIAL COMMODITIES LESS FUEL AND RELATED PRODUCTS AND POWER

Expert Analysis

Using rule-based logic I have narrowed down the choice to exponential smoothing or Box-Jenkins.
I will perform an out-of-sample test to select between these two approaches.

The cumulative MAD for Exponential smoothing was 3.68 and for Box-Jenkins was 3.53.
The rolling out-of-sample test used a maximum horizon of 12 and generated 78 forecasts for each method.

Based on the lower MAD, I will use Box-Jenkins.

Model Details

Expert selection

Box-Jenkins

ARIMA(0, 2, 0)*(1, 0, 0)

Term	Coefficient	Std. Error	t-Statistic	Significance
A[12]	0.7752	0.1233	6.286	1

Within-Sample Statistics

Sample size	72	No. parameters	1
Mean	201.61	Std. deviation	6.3
R-square	0.99	Adj. R-square	0.99
Durbin-Watson	1.95	Ljung-Box(18)	21.2 P=0.73
Forecast error	0.52	BIC	0.53
MAPE	0.18	SMAPE	0.18
RMSE	0.52	MAD	0.37
MAD/Mean Ratio	0		

Actual Values for the Most Recent 6 Periods:

	Actual
2020-Aug	207.0
2020-Sep	208.1
2020-Oct	208.8
2020-Nov	209.2
2020-Dec	211.0
2021-Jan	214.5

Forecasted Values

Date	2.5 Lower	Forecast	97.5 Upper
2021-Feb	216.200	217.225	218.25
2021-Mar	217.735	220.027	222.319
2021-Apr	217.521	221.357	225.192
2021-May	217.924	223.539	229.153
2021-Jun	219.204	226.806	234.408
QTR AVG	218.216	223.901	229.584

Railroad and Union Abbreviations

Second Quarter 2021

Railroads

BLE	Bessemer & Lake Erie Railroad (Part of CN's Grand Trunk Corp.)
BNSF	BNSF Railway Company
CC	Chicago, Central & Pacific (Part of CN's Grand Trunk Corp. Sometimes noted as CC&P.)
CN	Canadian National Railway (Commonly known as CN, owns Grand Trunk Corporation.)
CNGT	AAR's abbreviation for Grand Trunk Corporation (Almost all of CN's U.S. operations.)
CP	Canadian Pacific (Also noted as CPR. Owns the U.S. Class I railroad Soo Line.)
CPSL	AAR's abbreviation for Soo Line Corporation (CP's U.S. operations including SOO, D&H, and DME.)
CSX	CSX Transportation
D&H	Delaware & Hudson (Part of Canadian Pacific's U.S. operations, included beginning 2011Q4.)
DME	Dakota, Minnesota & Eastern (Part of Canadian Pacific's U.S. operations, included beginning 2011Q4.)
GTW	Grand Trunk Western Railroad (Part of CN's Grand Trunk Corp.)
IC	Illinois Central Railroad (Part of CN's Grand Trunk Corp.)
KCS	Kansas City Southern Railway
NS	Norfolk Southern Combined Railroad Subsidiaries (a.k.a. Norfolk Southern Railway or NS Rail)
SOO	Soo Line Railroad (The largest part of Canadian Pacific's U.S. operations.)
UP	Union Pacific Railroad
WC	Wisconsin Central and subsidiaries (Part of CN's Grand Trunk Corp.)

Major Unions Involved with Railroads

ATDA	American Train Dispatchers Association
BLET	Brotherhood of Locomotive Engineers and Trainmen Div. of the International Brotherhood of Teamsters
BMWED	Brotherhood of Maintenance of Way Employees Division of the International Brotherhood of Teamsters
BRS	Brotherhood of Railroad Signalmen
IAM	International Association of Machinists and Aerospace Workers
IBBM	International Brotherhood of Boilermakers, Iron Ship Builders, Blacksmiths, Forgers & Helpers
IBEW	International Brotherhood of Electrical Workers
NCFO	National Conference of Firemen and Oilers
SMART-TD	International Association of Sheet Metal, Air, Rail, and Transportation Workers - Transportation Division*
SMART-MD	International Association of Sheet Metal, Air, Rail, and Transportation Workers - Mechanical Division**
TCU	Transportation Communication International Union
TCU-Carmen	Brotherhood of Railway Carmen Division of the Transportation Communications International Union

Predecessor Unions (Some AAR databases use these old abbreviations.)

BLE	Brotherhood of Locomotive Engineers (predecessor to BLET)
BMWE	Brotherhood of Maintenance of Way Employees (predecessor to BMWED)
BRC	Brotherhood of Railway Carmen (predecessor to TCU-Carmen)
IBFO	International Brotherhood of Firemen and Oilers (predecessor to NCFO)
SMW	Sheet Metal Workers' International Association (see SMART-MD)
UTU	United Transportation Union (merged into SMART)
UTU-YMD	United Transportation Union Yardmaster Department (see SMART-TD)

* Represents employees formerly represented by the UTU (conductors and brakemen) and also has a separate yardmasters department.

** Represents employees formerly represented by the SMW (steel workers)