ASSOCIATION
OF AMERICAN
RAILROADS

John T. Gray
Senior Vice President - Policy & Economics

December 5, 2018

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

Dear Ms. Brown:

This submission is the AAR forecast of the first quarter 2019 All-Inclusive Index and Rail Cost Adjustment Factor, filed in Ex Parte No. 290 (Sub-No. 5) (2019-1) *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 first quarter 2019 results and compares to the previous quarter. Both quarters are shown on a 4Q\2017=100 base.

	2018Q4	2019Q1	% Change
All-Inclusive Index	108.1	107.1	-0.9
Preliminary RCAF	1.081	1.071	-0.9
Forecast Error Adjustment	-0.002	-0.013	
RCAF (Unadjusted)	1.079	1.058	-1.9
Productivity Adjustment Factor	2.3617	2.3593	
RCAF (Adjusted)	0.457	0.448	-2.0
PAF-5	2.5260	2.5235	
RCAF-5	0.427	0.419	-1.9

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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 hand-delivered 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

First Quarter 2019
All-Inclusive Index

Ex Parte No. 290 (Sub-No. 5) (2019-1)

Quarterly Rail Cost Adjustment Factor
Surface Transportation Board

Policy and Economics Department
Association of American Railroads

December 5, 2018

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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 first quarter 2019. Each year's first quarter calculation utilizes new health and welfare rates, which are listed in Appendix A on page 5. New payroll tax rates and maximum taxable earnings (Tier I, Tier II, and Unemployment Insurance) also become effective January 1, and are listed in Appendix A on page 4.

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 2017 (current) and 2016 (previous) weights are shown below. Weights calculated from 2016 data were used for the fourth quarter of 2017 through the third quarter of 2018. Beginning with the fourth quarter of 2018, weights calculated using 2017 data are used.

The weight for Fuel increased 2.3 percentage points, and Depreciation's was up 0.2 percentage points. The remaining component weights all decreased by 0.1 to 1.0 percentage points. Although expenses were higher in every category except Equipment Rents, Fuel and Depreciation had the highest percentage increases in expenses. Traffic and fuel prices were up in 2017, causing fuel expenses to be 27 percent higher. Depreciation expenses increased 6.2 percent, possibly caused by higher capital expenditures in recent years and spending on positive train control. Labor expenses were up 3.4 percent, but Labor's weight decreased.

Weights for RCAF's All-Inclusive Index

	2017	2016
Labor	35.0 %	35.6 %
Fuel	13.0	10.7
Materials & Supplies	4.9	5.0
Equipment Rents	5.2	5.9
Depreciation	15.8	15.6
Interest	2.1	2.2
Other	24.0	25.0
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

First Quarter 2019

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.

	2017 Weights	Forecast Previous 2018Q4	Forecast Current 2019Q1	Percent Change
1. Labor	35.0%	439.2	440.3	0.3 %
2. Fuel	13.0%	283.9	256.8	-9.5
3. M&S	4.9%	269.8	268.3	-0.6
4. Equipment Rents	5.2%	236.4	236.7	0.1
5. Depreciation	15.8%	223.8	226.1	1.0
6. Interest	2.1%	62.4	62.4	0.0
7. Other	24.0%	235.5	235.8	0.1
8. Weighted Average				
a. 1980 = 100		309.3	306.6	
b. 1980 = 100 (linked)		285.8	283.3 [1]	
c. 4Q17 = 100		108.1	107.1 [2]	-0.9

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

= (306.6 / 309.3) x 285.8

= 283.3

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

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

= 283.3 divided by 264.5 times 100

= 107.1

Indexes based on other periods:

4Q12 based index = 283.3 / 297.6 x 100 = 95.2
4Q07 based index = 283.3 / 245.9 x 100 = 115.2
4Q02 based index = 283.3 / 192.1 x 100 = 147.5
4Q97 based index = 283.3 / 173.2 x 100 = 163.6
4Q92 based index = 283.3 / 156.9 x 100 = 180.6

Forecast vs. Actual All-Inclusive Index

Third Quarter 2018

Because of data availability, the forecast error adjustment has a two-quarter lag from each filing. As shown below, the third quarter actual index of 105.9 is 1.3 index points below the forecast value of 107.2. Therefore, the forecast error adjustment for first quarter 2019 is -1.3 index points.

	2016 Weights	Third Quarter 2018 Forecast	Third Quarter 2018 Actual	Amt Difference
1. Labor	35.6%	434.3	434.3	
2. Fuel	10.7%	291.0	274.0	
3. M&S	5.0%	263.7	263.7	
4. Equipment Rents[1]	5.9%	230.5	231.8	
5. Depreciation	15.6%	223.5	224.6	
6. Interest	2.2%	60.5	60.5	
7. Other	25.0%	231.5	232.5	
8. Weighted Average				
a. 1980 = 100		306.6	305.3	
b. 1980 = 100 (linked)		283.6	280.2 [2]	
c. 4Q17 = 100[3]		107.2	105.9	-1.3

Forecast error → -1.3 index points

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[1]

	2016 Weights	Third Quarter 2018 Forecast	Third Quarter 2018 Actual
Car-Hire	58.3%	210.4	211.2
Lease Rentals	41.7%	231.5	232.5
Weighted Average		219.2	220.1
Weighted Average (linked)		230.5	231.8

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

280.2 = 305.3 / 298.8 x 274.2

[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 8, 2018, the Surface Transportation Board (STB) served a decision in Ex Parte 290 (Sub-No. 4) which proposed to adopt -0.4 percent as the geometric average productivity change for the five most recent years available. Their five year rolling geometric average calculation added the year 2016 and removed the year 2011. The components of this average annual value are shown on the following table in ratio format – therefore, 0.996 is the same as a decrease of 0.4 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

2012 - 2016

Year	Output Index (1)	Input Index (2)	Productivity Changes (3)
2012	1.007	0.999	1.008
2013	1.022	1.018	1.003
2014	1.055	1.036	1.018
2015	0.913	0.972	0.939
2016	0.955	0.941	1.015
Average			**0.996**
Previous Average (2011-2015)			0.994

Calculation of PAF and PAF-5

For 2012-2016, use fourth root of avg. productivity change = 0.9990
For 2011-2015, use fourth root of avg. productivity change = 0.9985

Quarter	Year	PAF	PAF-5
Q1	2018	2.3689	2.5374
Q2	2018	2.3665	2.5336
Q3	2018	2.3641	2.5298
Q4	2018	2.3617	2.5260
Q1	2019	2.3593	2.5235

2011-2015

2012-2016

Rail Cost Adjustment Factor
First Quarter 2019

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 2018Q4	Current 2019Q1	Percent Change
All-Inclusive Index[1]	108.1	107.1	-0.9
Preliminary RCAF[2]	1.081	1.071	-0.9
Forecast Error Adjustment[3]	-0.002	-0.013	
RCAF (Unadjusted)[4]	1.079	1.058	-1.9
Productivity Adjustment Factor[5]	2.3617	2.3593	
RCAF (Adjusted)[6]	0.457	0.448	-2.0
PAF-5[7]	2.5260	2.5235	
RCAF-5[8]	0.427	0.419	-1.9

[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
First Quarter 2019

The first quarter 2019 Labor Index increased 0.3 percent from the previous quarter. Although 1 new national labor agreement was added to the index, most of the increase was caused by an increase in supplements, such as Health and Welfare and fringe benefits.

Wage Rate Index

The Wage Rate Index portion of the Labor Index is lower by 0.4 percent. This was caused by a decrease in the amounts for lump sums and back pay.

New National Agreements: The IAM ratified their new national agreement, which has been added to this index.[1] It includes retroactive wage increases of 2 percent in July 2016 and July 2017, as well as 2.5 percent in July 2018.

Wage Increases: There are no national union wage increases scheduled for the first quarter 2019; however, non-union employees are being assigned a 2.5 percent general wage increase in January 2019, following past index procedure.[2] This matches the July 2018 wage increase received by unions that participate in national agreements.

Lump Sums: The first quarter lump sum rate is down by 0.1 cent. One amount was fully amortized and removed, and it was replaced by a bonus of a slightly smaller size for the new quarter.[3]

Back Pay: The back pay rate decreased 51 cents. Five amounts were fully amortized and removed, while only one new amount was added. This new amount was for retroactive wage increases due to the new IAM contract. As always, back pay amounts will be removed from the index after they have been amortized over four quarters.[3]

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. This rate is unchanged from the previous quarter.

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[1] See Appendix H for union abbreviations.

[2] The Interstate Commerce Commission decided in 1987 that "it is appropriate" to assign a wage increase, similar to unionized employees, to employees not covered by a labor contract

[3] Index procedure, decided by the Interstate Commerce Commission in 1988, is to amortize lump sums and/or back pay over four quarters using the rates for 13-week U.S. Treasury bills.

Labor
First Quarter 2019

Supplements Index

The Supplements Index increased 1.1 percent. Factors affecting supplements such as health and welfare premiums, payroll tax rates, and maximum taxable earnings, are typically adjusted on January 1. Increases in Health and Welfare, as well as fringe benefits, caused the increase.

Health & Welfare: The Health & Welfare rate increased 7.3 cents (0.9 percent). New employer contributions (premiums) will go into effect January 1. (See pages 4 and 5 of this appendix.) Although there were some small declines for early retirement major medical and supplemental sickness rates, the overall Group Health and Welfare rate increased.

Railroad Retirement: The Railroad Retirement rate increased 5.5 cents (or 0.6 percent). Taxable wages decreased slightly, but the maximum taxable earnings for Railroad Retirement's Tier I and Tier II increased for 2019. Tax rates (for employers) did not change. Page 4 of this appendix lists tax rates and maximum taxable earnings for 2017 through 2019.

Unemployment Insurance: The Unemployment Insurance rate is 7.5 percent lower than the previous quarter. Although maximum taxable earnings increased, the unemployment insurance tax rate went down. Basic tax rates range from a minimum of 0.65 percent to a maximum of 12 percent. However, if the Railroad Unemployment Insurance Account balance falls below a certain threshold, a surcharge can be imposed. For 2019 (like 2016 through 2018), a surcharge of 1.5 percent will be used - meaning that no railroad will have a tax rate less than 2.15 percent. The weighted average Class I railroad rate for 2019 is 3.38%, compared to 3.76% for 2018. Page 4 of this appendix lists tax rates and maximum taxable earnings for 2017 through 2019.

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 first quarter rate is 8.8 cents higher than last quarter. The higher rate was caused mostly by one railroad's annual stock awards.

Labor Index Calculation

As shown in Table A-1 on the next page, the 0.4 percent decrease in the Wage Rate Index and the 1.1 percent increase in the Supplements Index combined to cause the Labor Index to rise 0.3 percent from the previous quarter. The linked first quarter 2019 Labor index is 440.3, which is 3.9 percent higher than one year ago.

Labor

First Quarter 2019

Table A-1 Labor Index

	2018Q4	2019Q1	Change Percent	Change Amount
Base Wage – Straight Time & Pay For Time Not Worked	$42.473	$42.813	0.8%	$0.340
Adjustments:				
Lump Sum	0.400	0.399	-0.2%	-$0.001
Back Pay	1.283	0.773	-39.8%	-$0.510
Other	0.182	0.182	0.0%	$0.000
Total Wages	44.338	44.167	-0.4%	-$0.171
Health & Welfare Benefits	8.229	8.302	0.9%	$0.073
RR Retirement & Medicare	9.069	9.124	0.6%	$0.055
Unemployment Insurance	0.360	0.333	-7.5%	-$0.027
Other	0.146	0.234	60.3%	$0.088
Total Supplements	$17.804	$17.993	1.1%	$0.189
Total Labor (as info only)	$62.142	$62.160		
Wage Index[1]	379.4	378.0	-0.4%	
Supplements Index[2]	657.9	664.9	1.1%	
Total labor Index, 2017 Weights[3]	464.3	465.5		
Labor Index (linked)[4]	**439.2**	**440.3**	0.3%	

[1] 1980 wage rate $11.685

[2] 1980 supplements rate $2.706

[3] 2017 weights: wages, supplements 69.5% 30.5%

[4] 2019Q1 linked Index = 2018Q4 linked x (2019Q1 / 2018Q4)

= 439.2 x 465.5 / 464.3

Labor

First Quarter 2019

Supplement Comparisons

Health and Welfare Rates

Plan	Railroad Payment Per Employee Per Month 2017	2018	2019	Change '17-'18	'18-'19
Group Health & Welfare	$1,693.72	$1,584.71	$1,607.55	-6.4%	1.4%
Early Retirement Major Medical	166.75	135.96	129.38	-18.5%	-4.8%
Group Dental	65.12	63.67	63.67	-2.2%	0.0%
Group Vision	8.44	8.44	8.44	0.0%	0.0%
Supplemental Sickness					
Maintenance of Way	40.00	51.63	44.82	29.1%	-13.2%
Shop Crafts	60.00	75.48	67.87	25.8%	-10.1%
Signalmen	37.00	44.34	41.32	19.8%	-6.8%
Yardmasters	34.22	34.22	45.75	0.0%	33.7%

Railroad Retirement and Medicare

	Earnings Base 2017	2018	2019	Employer Rate 2017	2018	2019
Tier I	$127,200	$128,400	$132,900	6.20%	6.20%	6.20%
Tier II	94,500	95,400	98,700	13.10%	13.10%	13.10%
Medicare	no limit	no limit	no limit	1.45%	1.45%	1.45%

Unemployment Insurance

Monthly Taxable Earnings Base 2017	2018	2019	Weighted Avg. Class I Rate 2017	2018	2019
$1,545	$1,560	$1,605	3.37%	3.76%	3.38%

Labor

First Quarter 2019

NATIONAL RAILWAY LABOR CONFERENCE

EMPLOYEE BENEFITS DEPARTMENT

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November 1, 2018

Ms. Tiffany Placker
Economist
Association of American Railroads
425 Third Street, SW, Suite 1000
Washington, D.C. 20024

Dear Ms. Placker:

The revised employer Payment Rates which are effective January 1, 2019 are as follows:

Railroad Employees National Health & Welfare Plan & National Railway Carriers/United Transportation Union H&W Plan	
Non-Hospital Road	$1,607.55
Railroad Employees National Early Retirement Major Medical Benefit Plan	
Non-Hospital Road	$ 129.38
Aetna - National Dental Plan	$ 63.67
Aetna - Supplemental Sickness Plans	
ShopCrafts	$ 67.87
Signalmen	$ 41.32
Maintenance of Way	$ 44.82
Trustmark - Supplemental Sickness Plans	
Yardmasters	$ 45.75
EyeMed - National Vision Plan	$ 8.44

If you have any questions or need clarification, please contact me.

Very truly yours,

Susan E. Parks

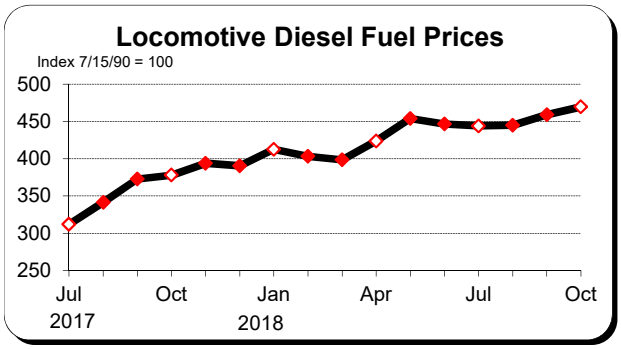
cc: Glen Williams

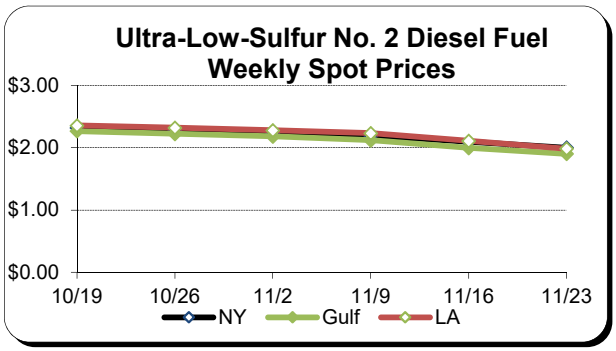
Fuel

First Quarter 2019

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 has been trending upward since June 2017, with increases in the last three months in a row. While average prices for locomotive diesel fuel are available only through October 2018, data through four weeks of November are available for related fuel types. According to the Energy Information Administration, the daily spot price as of November 26 for Ultra-Low-Sulfur Diesel Fuel* is about 20 percent lower than the average for October. The chart below (on left) shows the AAR's Monthly Locomotive Diesel Fuel Price Index from July 2017 through October 2018. The second chart (on right) shows recent spot prices for Ultra-Low-Sulfur No. 2 Diesel Fuel as reported by the Energy Information Administration.





In its *This Week in Petroleum* report released November 28, the U.S. Energy Information Administration said that U.S. average regular gasoline and diesel fuel prices have decreased in all U.S. regions. Railroads expect price decreases by January (Q1) compared to prices that actually occurred for October (Q4). The first quarter 2019 forecast is 9.5 percent lower than the previous quarter forecast, and 11.4 percent below the previous quarter actual.

Forecast Fuel Index (1980 = 100)	256.8
Change from previous quarter forecast	-9.5%
Change from previous quarter actual	-11.4%

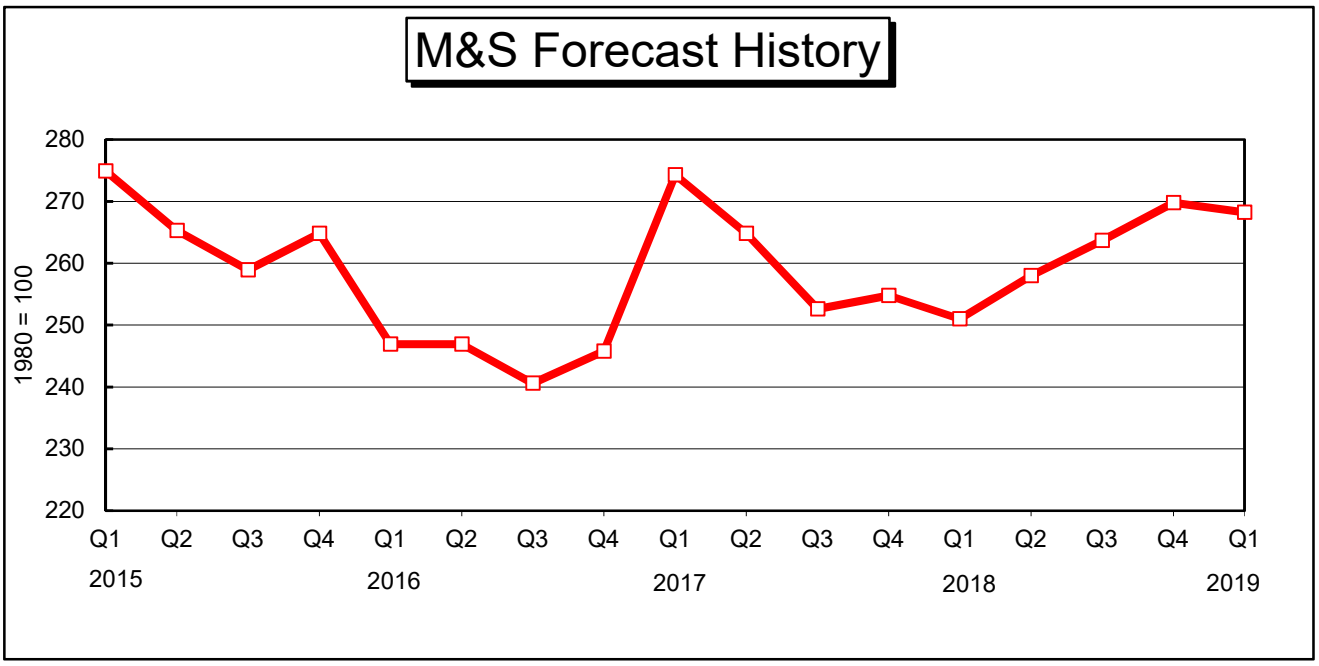
* Heating oil, Ultra-Low-Sulfur No. 2 Diesel Fuel, and locomotive diesel fuel are part of a group of closely related products, commonly labeled as distillates, that differ mostly by their sulfur content. Because of these similarities, these fuels are produced together and have similar pricing trends.

Materials & Supplies

First Quarter 2019

The first quarter 2019 Materials & Supplies Index is down 0.6 percent from the previous quarter. Prices decreased for Metal Products and Miscellaneous Products.

2019Q1	Materials & Supplies Index =	268.3
2018Q4	Materials & Supplies Index =	269.8
	Difference	-1.5 basis points or -0.6 %



Equipment Rents
First Quarter 2019

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 first quarter Car Hire portion of the Index rose 0.1 percent because of higher rates for tank cars. The projected PPI-LF (See Appendix G) used as a proxy for Lease Rentals, also rose 0.1 percent. Combined, these increases caused the Equipment Rents Index to rise 0.1 percent.

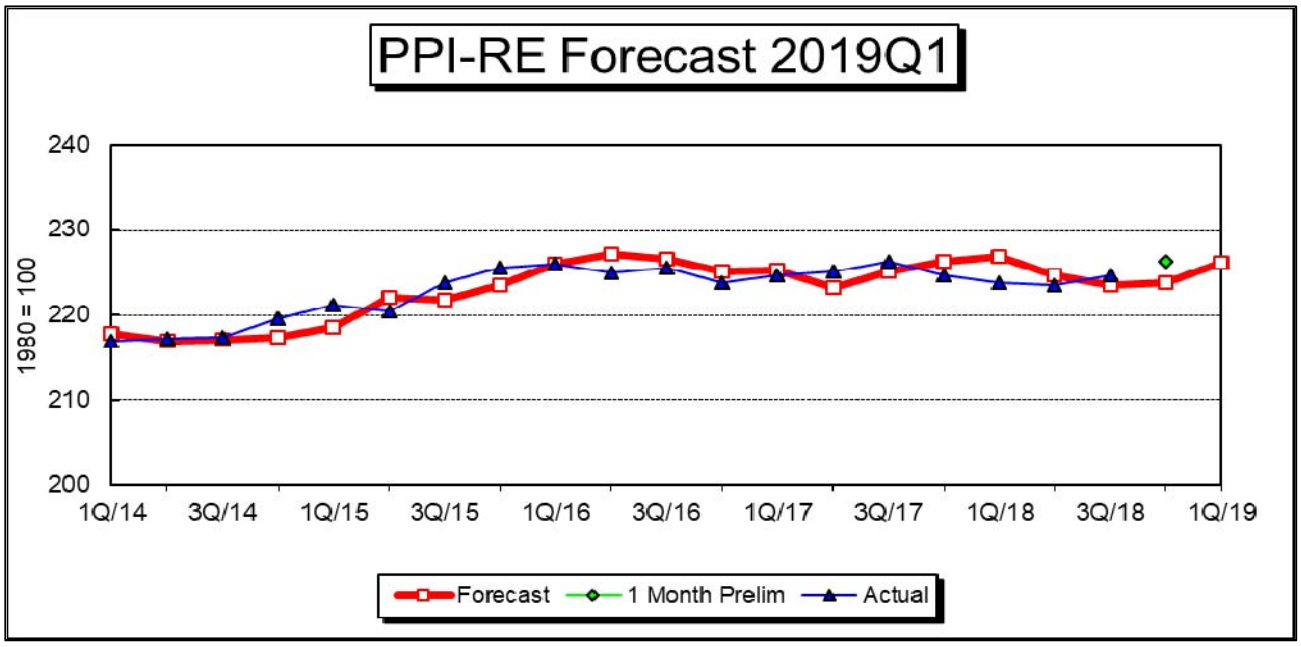
	2017 Weight	2018Q4	2019Q1	Percent Change
Car Hire	61.5%	216.9	217.2	0.1 %
Lease Rentals	38.5%	235.5	235.8	0.1
Weighted Average		224.1	224.4	0.1
Weighted Average (Linked)		236.4	236.7	0.1

Depreciation

First Quarter 2019

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 a 1.0 percent increase from the previous quarter's forecast.

Forecast of Depreciation Index (1982=100)	204.4
Forecast of Depreciation Index (1980=100)	226.1
Change from previous quarter forecast	1.0%
Change from actual first month of previous quarter	-0.1% = -0.09%
Change from same quarter of prior year (actual)	1.0%



Depreciation
First Quarter 2019

PPI RAILROAD EQUIPMENT

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 0.89 and for Box-Jenkins was 0.90.
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
Simple exponential smoothing: No trend, No seasonality
NN(0.806)

Component	Smoothing Wgt	Final Value
Level	0.8062	204.4

Within-Sample Statistics

Sample size	72	No. parameters	1
Mean	200.51	Std. deviation	3.36
R-square	0.93	Adj. R-square	0.93
Durbin-Watson	2.05	Ljung-Box(18)	19.1 P=0.61
Forecast error	0.9	BIC	0.93
MAPE	0.33	SMAPE	0.33
RMSE	0.9	MAD	0.66
MAD/Mean Ratio	0		

Actual Values for the Most Recent 6 Periods:

Actual	
2018-May	202.1
2018-Jun	202.1
2018-Jul	202.4
2018-Aug	202.4
2018-Sep	204.1
2018-Oct	204.6

Forecasted Values

Date	2.5 Lower	Forecast	97.5 Upper
2018-Nov	202.625	204.439	206.252
2018-Dec	202.109	204.439	206.768
2019-Jan	201.689	204.439	207.189
2019-Feb	201.324	204.439	207.554
2019-Mar	200.998	204.439	207.880
QTR AVG	201.337	204.439	207.541

Interest

First Quarter 2019

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 2017 data, and was updated in the Q4 filing submitted on September 5, 2018. The Interest Index based on 2017 increased slightly from 2016's all-time low. Interest rates for 10- and 30-year U.S. Treasury Bonds, and Corporate AAA bonds, also increased from 2016 to 2017. Changes in the mix of maturities for the debt portfolio can also cause changes in the railroad average.

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

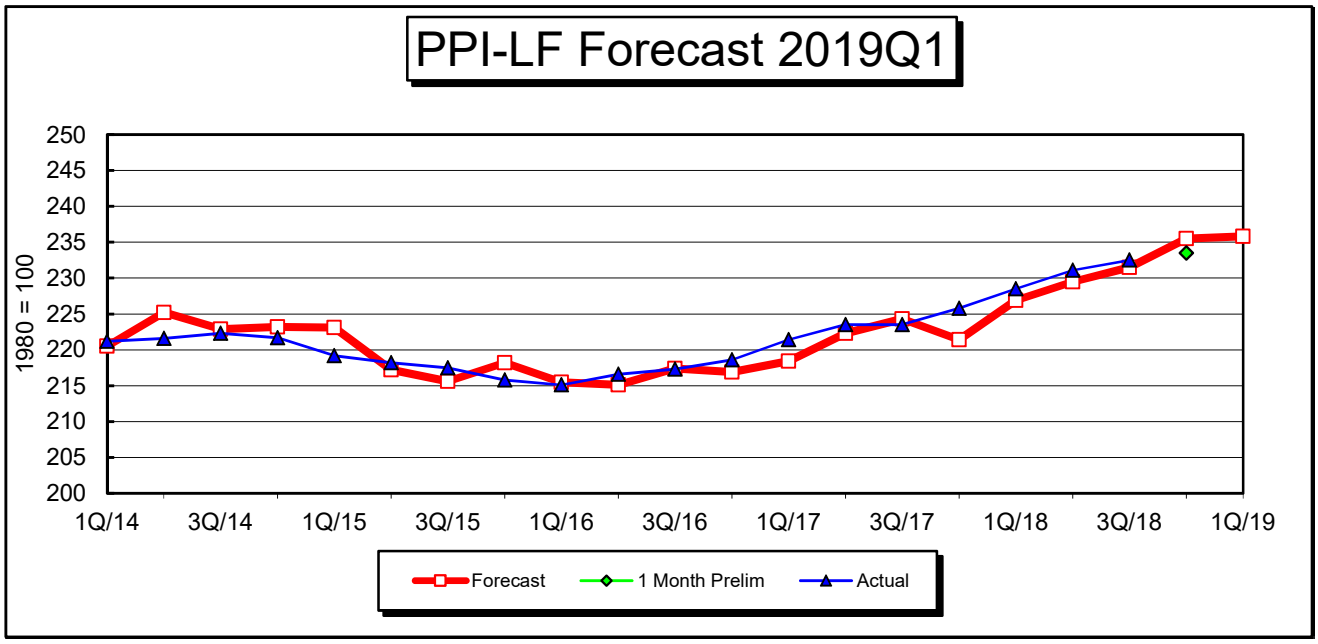
2017	Interest Rate	4.90%
1980	Interest Rate	7.85%
2019Q1	**Interest Index**	**62.4**
2018Q4	Interest Index	62.4
	Percent Change	0.0%

Other Expenses
First Quarter 2019

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 up only 0.1 percent from the prior quarter forecast.

Forecast of Other Expense Index (1982=100)	210.3
Forecast of Other Expense Index (1980=100)	235.8
Change from previous quarter forecast	0.1%
Change from actual first month of previous quarter	1.0%
Change from same quarter of prior year (actual)	3.2%



Other Expenses

First Quarter 2019

PPI INDUSTRIAL COMMODITIES LESS FUELS AND RELATED PRODUCTS AND POWER

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 1.34 and for Box-Jenkins was 1.97.
The rolling out-of-sample test used a maximum horizon of 12 and generated 78 forecasts for each metho
Based on the lower MAD, I will use Exponential Smoothing.

Forecast Model for PPILF

Multiplicative Winters: Linear trend, Multiplicative seasonality
LM(0.925, 0.870, 0.999)
Confidence limits proportional to indexes

Component	Smoothing Wgt		Final Value
Level	0.9255		208.1
Trend	0.87		0.557
Seasonal	0.9993		
Seasonal Indexes			
Jan - Mar	1.001	0.9999	0.9995
Apr - Jun	0.9996	0.9995	0.9998
Jul - Sep	0.9998	1	0.9996
Oct - Dec	1.001	1.001	0.9999

Within-Sample Statistics

Sample size	72	No. parameters	3
Mean	197.43	Std. deviation	4.22
R-square	0.99	Adj. R-square	0.99
Durbin-Watson	1.7	Ljung-Box(18)	19.8 P=0.65
Forecast error	0.4	BIC	0.43
MAPE	0.16	SMAPE	0.16
RMSE	0.39	MAD	0.32
MAD/Mean Ratio	0		

Actual Values for the Most Recent 6 Periods:

Date	Actual
2018-May	206.3
2018-Jun	207.0
2018-Jul	207.5
2018-Aug	207.4
2018-Sep	207.4
2018-Oct	208.3

Forecasted Values

Date	2.5 Lower	Forecast	97.5 Upper
2019-Jan	207.696	209.934	212.172
2019-Feb	207.644	210.318	212.993
2019-Mar	207.734	210.783	213.832
QTR AVG	207.691	210.345	212.999

Railroad and Union Abbreviations

First Quarter 2019

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)