

ASSOCIATION  
OF AMERICAN  
RAILROADS

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September 4, 2020

The Honorable Cynthia T. Brown  
Chief, Section of Administration  
Office of Proceedings  
Surface Transportation Board  
395 E Street, SW  
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This submission is the AAR forecast of the fourth quarter 2020 All-Inclusive Index and Rail Cost Adjustment Factor, filed in Ex Parte No. 290 (Sub-No. 5) (2020-4) *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 fourth quarter 2020 results and compares to the previous quarter. Both quarters are shown on a  $4Q\backslash 2017=100$  base.

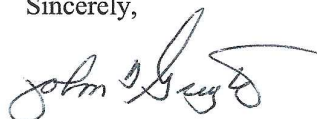
	<u>2020Q3</u>	<u>2020Q4</u>	<u>% Change</u>
All-Inclusive Index	99.7	101.1	1.4
Preliminary RCAF	0.997	1.011	1.4
Forecast Error Adjustment	-0.008	-0.070	
RCAF (Unadjusted)	0.989	0.941	-4.9
Productivity Adjustment Factor	2.3823	2.3883	
RCAF (Adjusted)	0.415	0.394	-5.1
PAF-5	2.5250	2.5280	
RCAF-5	0.392	0.372	-5.1

Page 2  
September 4, 2020

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,

A handwritten signature in cursive script, appearing to read "John T. Gray". The signature is written in black ink and is positioned above the printed name.

John T. Gray

Attachments

**Fourth Quarter 2020  
All-Inclusive Index**

**Ex Parte No. 290 (Sub-No. 5) (2020-4)**

**Quarterly Rail Cost Adjustment Factor  
Surface Transportation Board**

**Policy and Economics Department  
Association of American Railroads**

**September 4, 2020**

# Table of Contents

<b>Subject</b>	<b>Page</b>
Introduction.....	1
Index Weights.....	2
All-Inclusive Index - Fourth Quarter 2020 .....	3
Forecast vs. Actual All Inclusive Index - Second Quarter 2020.....	4
Productivity.....	5
Rail Cost Adjustment Factor - Fourth Quarter 2020 .....	6
 Appendices	
A Labor	
B Fuel	
C Materials & Supplies	
D Equipment Rents	
E Depreciation	
F Interest	
G Other Expenses	
H Railroad and Union Abbreviations	

## 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 fourth quarter 2020. The All-Inclusive Index utilizes new weights (see page 2), which are based on 2019 Annual Report Form R-1 data. New annual report and wage statistics data have also been utilized to rebenchmark labor (see Appendix A), and the annual report data have also been used to update the Interest Index (see Appendix F).

The ongoing coronavirus pandemic has affected the RCAF, primarily through the fuel component. The uncertainty inherent in this pandemic has made it very difficult to predict from one quarter to the next how much fuel prices may change. For the fourth quarter, the fuel forecast is higher than what was forecasted for the prior quarter. Another layer is added to the RCAF in the form of the forecast error adjustment. This adjustment compares what was forecasted two quarters ago to what the numbers actually were two quarters ago. At the time the second quarter fuel forecasts were due at the end of February, it was entirely unknown how much fuel prices were about to plummet. Unfortunately, fuel prices did plummet in a major way, causing the difference between the forecast and actual for fuel to be very large. This is clearly seen in the unusually large forecast error adjustment for the fourth quarter.

## 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.

<b>Weights for RCAF's All-Inclusive Index</b>		
	<b>2019</b>	<b>2018</b>
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
<b>Total</b>	<b>100.0</b>	<b>100.0</b>

Reweightings 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 Fourth Quarter 2020

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		Percent Change
		Previous 2020Q3	Current 2020Q4	
1. Labor	32.6%	442.8	437.1	-1.3 %
2. Fuel	14.2%	142.8	171.2	19.9
3. M&S	4.9%	260.7	258.8	-0.7
4. Equipment Rents	5.2%	235.0	234.1	-0.4
5. Depreciation	15.9%	226.0	226.1	0.0
6. Interest	2.5%	57.2	55.7	-2.6
7. Other	24.7%	224.0	232.1	3.6
8. Weighted Average				
a. 1980 = 100		282.3	286.3	
b. 1980 = 100 (linked)		263.7	267.4 <sup>1</sup>	
c. 4Q17 = 100		99.7	101.1 <sup>2</sup>	1.4

Note: New weights are utilized. The linked index is always unchanged in this linking procedure. However, the 282.3 weighted average for 2020Q3 has been recalculated with 2019 weights to eliminate any changes in the fourth quarter index that would be caused by changing weights. The original Q3 weighted average with 2018 weights was 282.5.

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$$\begin{aligned}
 {}^1 \text{ Index80} &= (\text{Current Index} / \text{Previous Index}) * \text{the Previous Quarter Linked Index} \\
 &= (286.3 / 282.3) \times 263.7 \\
 &= 267.4
 \end{aligned}$$

<sup>2</sup> To calculate the 4Q17 = 100 index:

$$\begin{aligned}
 \text{Index4Q17} &= (\text{Current Linked Index} / \text{4Q17 Basing Factor}) * 100 \\
 &= 267.4 \text{ divided by } 264.5 \text{ times } 100 \\
 &= 101.1
 \end{aligned}$$

Indexes based on other periods:

- 4Q12 based index = 267.4 / 297.6 x 100 = 89.9
- 4Q07 based index = 267.4 / 245.9 x 100 = 108.7
- 4Q02 based index = 267.4 / 192.1 x 100 = 139.2
- 4Q97 based index = 267.4 / 173.2 x 100 = 154.4
- 4Q92 based index = 267.4 / 156.9 x 100 = 170.4

## Forecast vs. Actual All-Inclusive Index Second Quarter 2020

Because of data availability, the forecast error adjustment has a two-quarter lag from each filing. As shown below, the second quarter actual index of 98.7 is 7.0 index points below the forecast value of 105.7. Therefore, the forecast error adjustment for fourth quarter 2020 is -7.0 index points.

	2018 Weights	Second Quarter 2020		Amt Difference
		Forecast	Actual	
1. Labor	33.0%	441.9	441.9	
2. Fuel	15.9%	231.2	121.7	
3. M&S	5.1%	266.7	266.7	
4. Equipment Rents <sup>1</sup>	5.3%	239.4	237.9	
5. Depreciation	15.0%	225.8	226.1	
6. Interest	2.1%	57.2	57.2	
7. Other	23.6%	235.5	229.6	
8. Weighted Average				
a. 1980 = 100		299.5	280.7	
b. 1980 = 100 (linked)		279.6	261.0 <sup>2</sup>	
c. 4Q17 = 100 <sup>3</sup>		105.7	98.7	-7.0

**Forecast error** → **-7.0 index points**

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1	2018 Weights	Second Quarter 2020	
		Forecast	Actual
Car-Hire	59.1%	221.8	222.7
Lease Rentals	40.9%	235.5	229.6
Weighted Average		227.4	225.5
Weighted Average (linked)		239.4	237.9

<sup>2</sup> Linked actual index = (actual index / previous actual index) x previous linked actual index.  

$$261.0 = 280.7 / 300.6 \times 279.5$$

<sup>3</sup> 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 6, 2020, the Surface Transportation Board served a decision which proposed to adopt 1.0 percent as the geometric average productivity change for the five most recent years available. Their five year rolling geometric average calculation added the year 2018 and removed the year 2013. The components of this average annual value are shown on the following table in ratio format – therefore, 1.010 is the same as an increase of 1.0 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.

<b>Comparison of Output, Input, &amp; Productivity</b>			
<b>2014 - 2018</b>			
Year	Output Index (1)	Input Index (2)	Productivity Changes (3)
2014	1.055	1.036	1.018
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
<b>Average</b>			<b>1.010</b>
Previous Average (2013-2017)			1.005

<b>Calculation of PAF and PAF-5</b>			
For 2014-2018, use fourth root of avg. productivity change = 1.0025			
For 2013-2017, use fourth root of avg. productivity change = 1.0012			
Quarter	Year	PAF	PAF-5
Q1	2020	2.3705	2.5190
Q2	2020	2.3764	2.5220
Q3	2020	2.3823	2.5250
Q4	2020	2.3883	2.5280
Q1	2021	2.3943	2.5343

2013-2017

2014-2018

## Rail Cost Adjustment Factor

### Fourth Quarter 2020

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 2020Q3	Current 2020Q4	Percent Change
All-Inclusive Index <sup>1</sup>	99.7	101.1	1.4
Preliminary RCAF <sup>2</sup>	0.997	1.011	1.4
Forecast Error Adjustment <sup>3</sup>	-0.008	-0.070	
RCAF (Unadjusted) <sup>4</sup>	<u>0.989</u>	<u>0.941</u>	-4.9
Productivity Adjustment Factor <sup>5</sup>	<u>2.3823</u>	<u>2.3883</u>	
RCAF (Adjusted) <sup>6</sup>	0.415	0.394	-5.1
PAF-5 <sup>7</sup>	2.5250	2.5280	
RCAF-5 <sup>8</sup>	0.392	0.372	-5.1

<sup>1</sup> See All-Inclusive Index on page 3.

<sup>2</sup> All-Inclusive Index divided by the All-Inclusive Index in the base period (100.0).

<sup>3</sup> 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.

<sup>4</sup> Preliminary RCAF plus the forecast error adjustment.

<sup>5</sup> See Productivity on page 5.

<sup>6</sup> RCAF (Unadjusted) divided by the Productivity Adjustment Factor (PAF).

<sup>7</sup> See Productivity on page 5.

<sup>8</sup> RCAF (Unadjusted) divided by the PAF-5.

# Appendixes

## Labor

### Fourth Quarter 2020

The fourth quarter 2020 Labor Index is 1.3 percent lower than the previous quarter.

**Rebenchmarking and Reweighting:** Each year in the fourth quarter, the index is rebenchmarked to newer annual data. The internal weights used to determine the proportion of labor costs represented by wages and supplements are also updated in the fourth quarter. The Labor rate is basically a group of benchmarks from annual data that are updated each quarter using additional information such as labor agreements, payroll taxes, health & welfare rates, and other data. By rebenchmarking the index to newer annual data, the distance between the benchmark year and the current quarter becomes smaller, making the index a more accurate picture of the current reality. The impact of rebenchmarking is captured in the Labor Index, and by itself can cause a change in the index.

The new benchmark year is 2019, and this replaces data for 2018. One of the major data sources underlying the fourth quarter rebenchmarking is the Annual Report Form R-1 submitted to the Surface Transportation Board (STB) by each Class I Railroad. The other major data source is the 112-Class Wage Statistics report received by the AAR from each Class I railroad. The totals in each of the 112-Class Wage Statistics Report matches the corresponding total in the less-detailed Wage Form A&B submitted to the STB. The extra detail allows the AAR to divide the wage statistics by labor union, which enables wage rate updates to be more accurate. Data from the two major sources are used for labor benchmarks, and the annual report data are also used to calculate index weights.

The source for the wage and supplements internal weights, like the external weights, is the Annual Report Form R-1 Summary. Unlike rebenchmarking, reweighting by itself is prevented from causing a change in the index. A linking procedure, where the previous quarter unlinked index is recalculated using the new weights, eliminates changes that would be caused solely by changing weights.

### Wage Rate Index

The Wage Rate Index portion of the Labor Index increased by 0.1%.

**Wage Increases:** There are no national agreement wage increases currently scheduled for the fourth quarter. There were several wage increases for independent groups, but they were too small to have an impact on the index.

**Lump Sums:** The fourth quarter lump sum rate increased by 5.1 percent. One amount was fully amortized and removed, but it was replaced by one new similar amount. The change in the lump sum rate was solely caused by rebenchmarking to newer wage statistics data.

## Labor

### Fourth Quarter 2020

**Back Pay:** The back pay rate was unchanged in the fourth quarter. There is currently only one small back pay amount included in the index, and it is so small that it rounds to zero.

**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 fourth quarter rate is 4.9 percent higher than last quarter, and this change is solely due to rebenchmarking.

### Supplements Index

The Supplements Index decreased by 3.3 percent, mostly the result of the "Other" fringe benefits category.

**Health & Welfare:** The Health & Welfare rate fell by 0.6 percent, and this was solely due to rebenchmarking.

**Railroad Retirement:** The Railroad Retirement rate decreased by 3.7 percent, also the result of rebenchmarking.

**Unemployment Insurance:** The Unemployment Insurance rate fell 1.0 percent due to rebenchmarking.

**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 fourth quarter rate is 19.1 cents (58.2 percent) lower than last quarter. Rebenchmarking was not the cause of this drop.

### Labor Index Calculation

As shown in Table A-1 on the next page, the 0.1 percent increase in the Wage Rate Index and the 3.3 percent decrease in the Supplements Index combined to cause the Labor Index to fall 1.3 percent from the previous quarter. The linked fourth quarter 2020 Labor index is 437.1, which is 1.5 percent lower than one year ago. The linked fourth quarter 2020 index of 437.1 is determined by multiplying the third quarter linked index of 442.8 times the change between the fourth quarter Labor Index (457.5) and the original third quarter Labor Index recalculated using the original third quarter Wage Rate and Supplements indexes weighted with the new 2019 weights (463.5). This method eliminates changes caused by the new weights, but captures changes caused by rebenchmarking. The purpose of the "Updated to Reflect..." column in Table A-1 is only to enable the reader to discern the impact of rebenchmarking.

**Labor**  
**Fourth Quarter 2020**  
**Table A-1 Labor Index**

	2020Q3		2020Q4	
	Used in Previous Index Filing	Updated to Reflect New Benchmarks	Based on 2019 Data	Pct Chg From Prev. Filing
<u>Base Wage</u> – Straight Time & Pay For Time Not Worked	\$44.457	\$44.468	\$44.468	0.0%
Adjustments:				
Lump Sum	0.333	0.350	0.350	5.1%
Back Pay	0.000	0.000	0.000	#DIV/0!
Other	0.164	0.172	0.172	4.9%
<b>Total Wages</b>	44.954	\$44.990	44.990	0.1%
Health & Welfare Benefits	8.078	8.030	8.030	-0.6%
RR Retirement & Medicare	9.290	8.945	8.945	-3.7%
Unemployment Insurance	0.097	0.096	0.096	-1.0%
Other	0.328	0.345	0.137	-58.2%
<b>Total Supplements</b>	\$17.793	\$17.416	\$17.208	-3.3%
Total Labor (a check sum only)	\$62.747	\$62.406	\$62.198	
<b>Wage Rate Index<sup>1</sup></b>	384.7	385.0	385.0	0.1%
<b>Supplements Index<sup>2</sup></b>	657.5	643.6	635.9	-3.3%
Total labor Index, 2018 Weights <sup>3</sup>	463.8			
Total labor Index, 2019 Weights <sup>4</sup>	463.5	459.7	457.5	
<b>Labor Index (linked)<sup>5</sup></b>	442.8		<b>437.1</b>	-1.3%

<sup>1</sup> 1980 wage rate \$11.685

<sup>2</sup> 1980 supplements rate \$2.706

<sup>3</sup> 2018 weights: wages, supplements 71.0% 29.0%

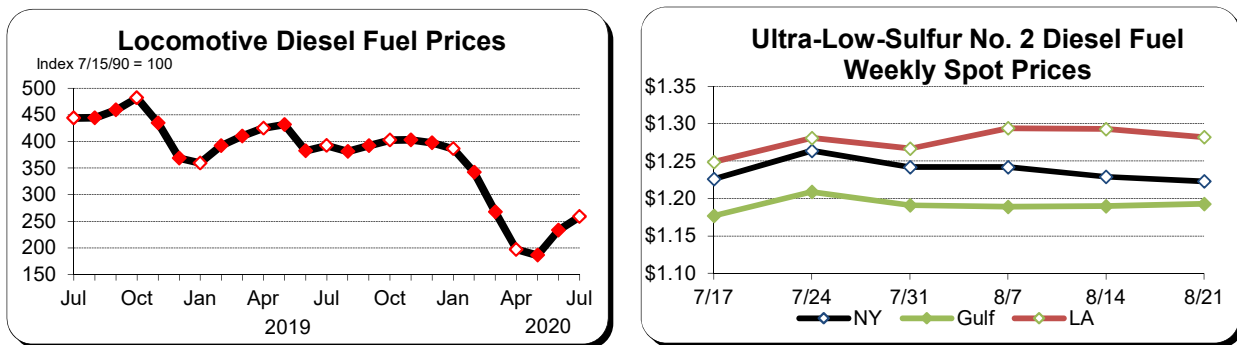
<sup>4</sup> 2019 weights: wages, supplements 71.1% 28.9%

<sup>5</sup> 2020Q4 linked Index = 2020Q3<sub>linked</sub> x (2020Q4<sub>WT2019</sub> / 2020Q3<sub>WT2019</sub>)  
 = 442.8 x 457.5 / 463.5

## Fuel Fourth Quarter 2020

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 but has risen in the most recent two months. While average prices for locomotive diesel fuel are available only through July 2020, data through four weeks of August are available for related fuel types. According to the Energy Information Administration, the daily spot price as of August 24 for Ultra-Low-Sulfur Diesel Fuel\* is less than 1 percent higher than the average for July. The chart below (on left) shows the AAR's Monthly Locomotive Diesel Fuel Price Index through July 2020. 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 have not changed much in August compared to July. Railroads that responded to the AAR's forecast survey expect prices to increase by October (Q4) compared to prices that actually occurred for July (Q3). The fourth quarter 2020 forecast is 19.9 percent higher than the previous quarter forecast, and 7.2% higher than the prior quarter actual.

Forecast Fuel Index (1980 = 100)	171.2
Change from previous quarter forecast	19.9%
Change from previous quarter actual	7.2%

\* 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.

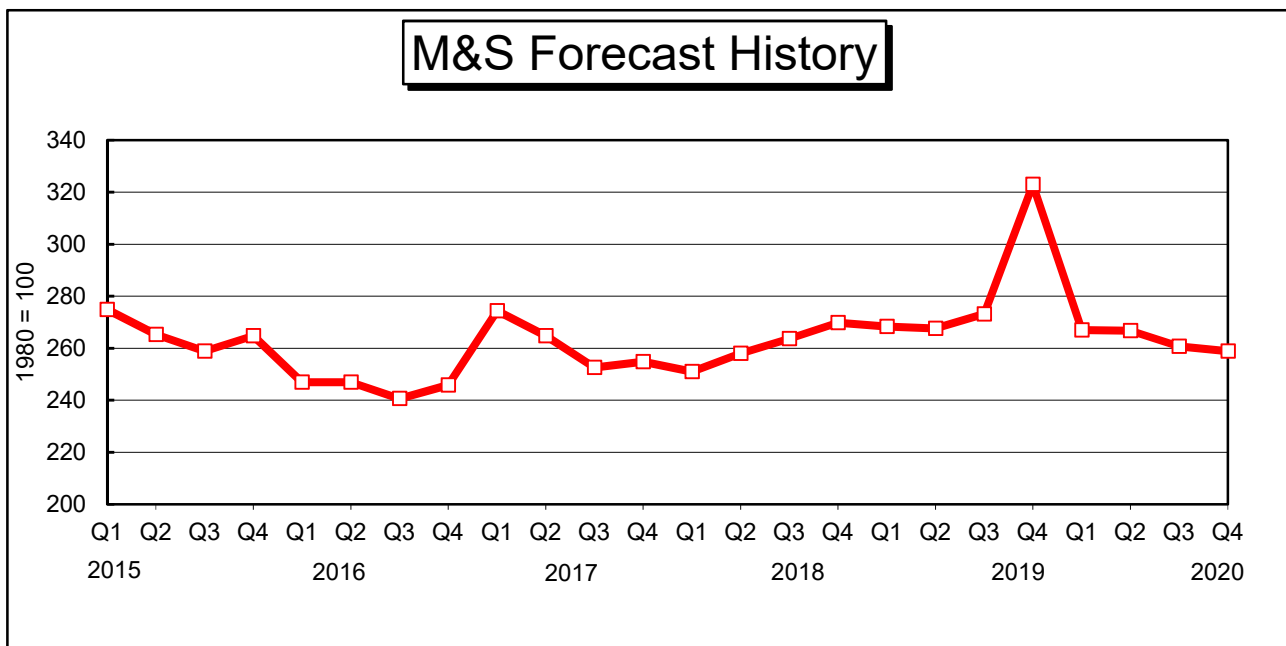
## Materials & Supplies Fourth Quarter 2020

The fourth quarter 2020 Materials & Supplies Index fell 0.7 percent from the previous quarter. Prices decreased for Miscellaneous Products and Metal Products.

2020Q4 Materials & Supplies Index = 258.8

2020Q3 Materials & Supplies Index = 260.7

Difference	-1.9 basis points
	or
	-0.7 %





## Equipment Rents Fourth Quarter 2020

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

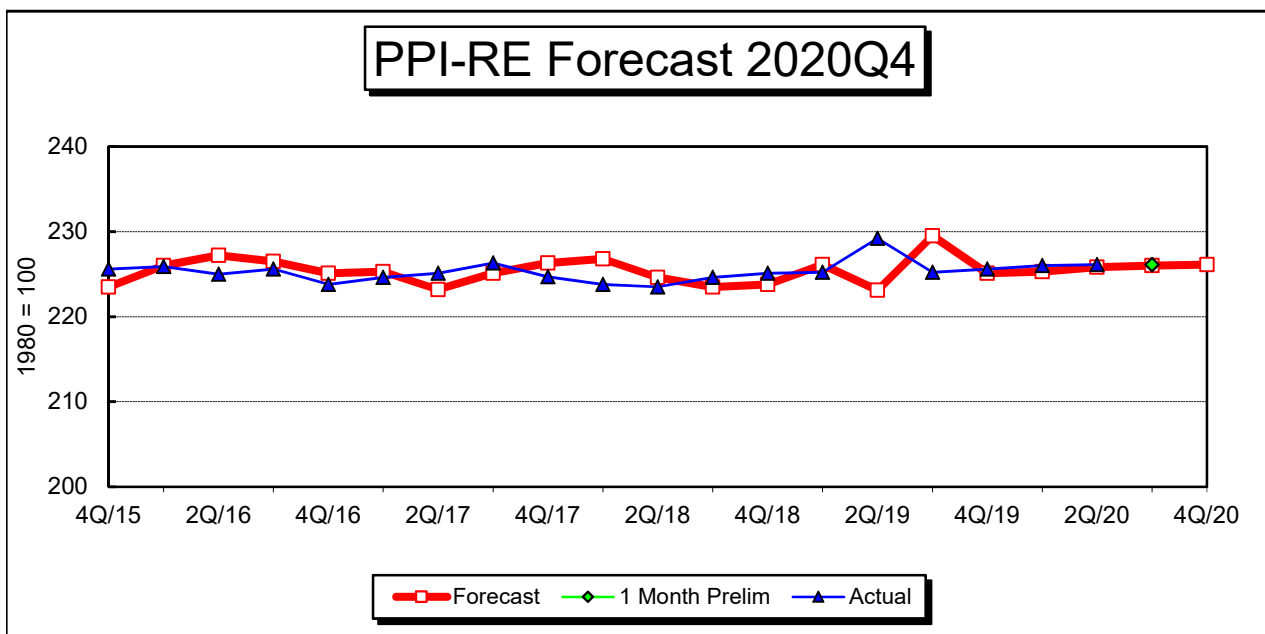
The table below calculates the Equipment Rents Index, and features new weights based on 2019. To eliminate any changes caused by the new weights, the third quarter weighted average (but not the linked value) has been recalculated using the new weights. The original third quarter weighted average using 2018 weights was 223.2. The fourth quarter Car Hire portion of the Index decreased 3.0 percent because of lower rates for tank cars. A 3.6 percent increase for the projected PPI-LF (See Appendix G) used as a proxy for Lease Rentals, combined with the 3.0 percent decrease for Car Hire, caused the Equipment Rents Index to fall 0.4 percent.

	2019 Weight	2020Q3	2020Q4	Percent Change
Car Hire	61.4%	222.6	215.9	-3.0 %
Lease Rentals	38.6%	224.0	232.1	3.6
Weighted Average		223.1	222.2	-0.4
Weighted Average (Linked)		235.0	234.1	-0.4

## Depreciation Fourth Quarter 2020

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 0.04% (rounds to 0.0%) higher than 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	0.0% = 0.04%
Change from actual first month of previous quarter	0.0% = 0.00%
Change from same quarter of prior year (actual)	0.2%



## Depreciation Fourth Quarter 2020

**PPI RAILROAD EQUIPMENT**

**Expert Analysis**

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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 0.54 and for Box-Jenkins was 1.08. 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**

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**Expert selection**

**Simple exponential smoothing: No trend, No seasonality  
NN(0.781)**

Component	Smoothing Wgt	Final Value
Level	0.7812	204.4

**Within-Sample Statistics**

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Sample size	72	No. parameters	1
Mean	202.73	Std. deviation	1.67
R-square	0.67	Adj. R-square	0.67
Durbin-Watson	1.98	Ljung-Box(18)	19.8 P=0.66
Forecast error	0.95	BIC	0.98
MAPE	0.3	SMAPE	0.3
RMSE	0.95	MAD	0.6
MAD/Mean Ratio	0		

**Actual Values for the Most Recent 6 Periods:**

**Actual**

2020-Feb	204.3
2020-Mar	204.3
2020-Apr	204.3
2020-May	204.4
2020-Jun	204.4
2020-Jul	204.4

**Forecasted Values**

	2.5 Lower	Forecast	97.5 Upper
<b>Date</b>	<b>2.5 Lower</b>	<b>Forecast</b>	<b>97.5 Upper</b>
2020-Aug	202.484	204.399	206.314
2020-Sep	201.969	204.399	206.829
2020-Oct	201.546	204.399	207.252
2020-Nov	201.177	204.399	207.62
2020-Dec	200.847	204.399	207.951
<b>QTR AVG</b>	201.190	204.399	207.608

## Interest Fourth Quarter 2020

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 Obligations
43	Non-Current Liabilities: Debt in Default
44	Non-Current Liabilities: Accounts Payable: Affiliated Companies
45	Non-Current Liabilities: Unamortized Debt Premium

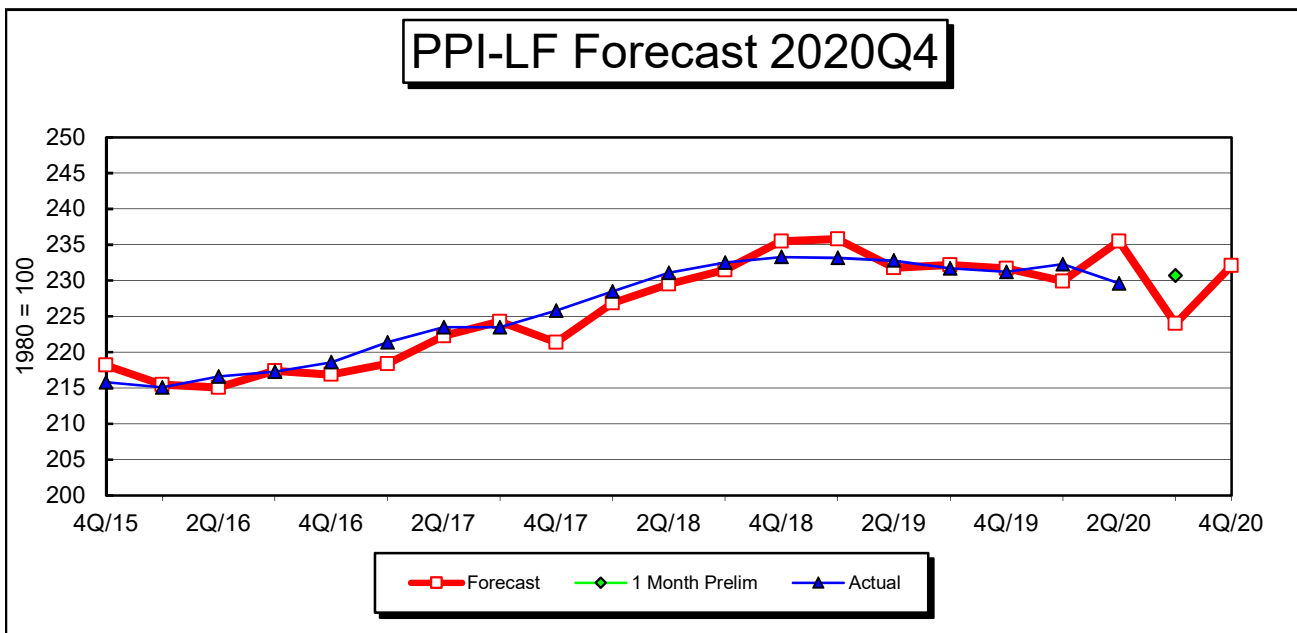
2019	Interest Rate	4.37%
1980	Interest Rate	7.85%
<b>2020Q4</b>	<b>Interest Index</b>	<b>55.7</b>
2020Q3	Interest Index	57.2
	Percent Change	-2.6%

## Other Expenses Fourth Quarter 2020

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 3.6 percent higher than the prior quarter forecast.

Forecast of Other Expense Index (1982=100)	207.0
Forecast of Other Expense Index (1980=100)	232.1
Change from previous quarter forecast	3.6%
Change from actual first month of previous quarter	0.6%
Change from same quarter of prior year (actual)	0.4%



## Other Expenses Fourth Quarter 2020

### PPI INDUSTRIAL COMMODITIES LESS FUEL AND RELATED PRODUCTS AND POWER

#### Expert Analysis

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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 1.57 and for Box-Jenkins was 1.41.  
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

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##### Expert selection

**Box-Jenkins**  
**ARIMA(1, 1, 0)\*(1, 0, 0)**

Term	Coefficient	Std. Error	t-Statistic	Significance
a[1]	0.6694	0.09052	7.395	1
<b>A[12]</b>	<b>0.6462</b>	<b>0.1271</b>	<b>5.084</b>	1

#### Within-Sample Statistics

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Sample size	72	No. parameters	2
Mean	200.58	Std. deviation	5.83
R-square	0.99	Adj. R-square	0.99
Durbin-Watson	1.9	Ljung-Box(18)	8.9 P=0.04
Forecast error	0.44	BIC	0.46
MAPE	0.16	SMAPE	0.16
RMSE	0.44	MAD	0.32
MAD/Mean Ratio	0		

#### Actual Values for the Most Recent 6 Periods:

##### Actual

2020-Feb	207.1
2020-Mar	207.1
2020-Apr	205.1
2020-May	204.4
2020-Jun	205.0
2020-Jul	205.8

#### Forecasted Values

Date	2.5 Lower	Forecast	97.5 Upper
2020-Aug	205.301	206.164	207.026
2020-Sep	204.643	206.321	208
2020-Oct	204.378	206.859	209.339
2020-Nov	203.74	206.98	210.22
2020-Dec	203.092	207.041	210.990
<b>QTR AVG</b>	<b>203.737</b>	<b>206.960</b>	<b>210.183</b>

## Railroad and Union Abbreviations

### Fourth Quarter 2020

#### ***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)