September 24, 2024

This version dated September 24, 2024, of the quarterly RCAF filing has been modified to correct a few instances in the September 10, 2024 submission in which dates were incorrect. For example, in the September 10 submission, a sentence in Appendix A said "The new benchmark year is 2023, and this replaces data for 2021" but should have said, "…and this replaces data for 2022."

The numerical calculations and results have not changed in this version from the September 10 version.

The following pages have been modified.

- Submission: Appendix A, Page 1 of 3 (Labor Section), Appendix C (Materials & Supplies), Appendix D (Equipment Rents), and Appendix F (Interest)

- Workpapers: PPI-RE Forecast, PPI-LF Forecast, and Forecast Error Calculation

Previous Revision:

The version dated September 10, 2024, of the quarterly RCAF filing has been modified to correct the previous quarter linked weighted average (page 3) stated in the September 5, 2024, submission.

Rand Ghayad
Senior Vice President - Policy & Economics

September 24, 2024

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 fourth quarter 2024 All-Inclusive Index and Rail Cost Adjustment Factor, filed in Ex Parte No. 290 (Sub-No. 5) (2024-4) *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 2024 results and compares to the previous quarter. Both quarters are shown on a 4Q\2022=100 base.

	2024Q3	2024Q4	% Change
All-Inclusive Index	98.3	97.3	-1.0
Preliminary RCAF	0.983	0.973	-1.0
Forecast Error Adjustment	-0.033	-0.012	
RCAF (Unadjusted)	0.950	0.961	1.2
Productivity Adjustment Factor	2.5568	2.5637	
RCAF (Adjusted)	0.372	0.375	0.8
PAF-5	2.6934	2.7120	
RCAF-5	0.353	0.354	0.3

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 Kiara Carter (202 639-2327) of this office.

Sincerely,

Rand Ghayad

Attachments

Fourth Quarter 2024
All-Inclusive Index

Ex Parte No. 290 (Sub-No. 5) (2024-4)

Quarterly Rail Cost Adjustment Factor
Surface Transportation Board

Policy and Economics Department
Association of American Railroads

September 24, 2024

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 fourth quarter 2024. The All-Inclusive Index utilizes new weights (see page 2), which are based on 2023 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).

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 2023 (current) and 2022 (previous) weights are shown below. Weights calculated from 2022 data were used for the fourth quarter of 2023 through the third quarter of 2024. Beginning with the fourth quarter of 2024, weights calculated using 2023 data are used. The component with the biggest change in weight was Fuel, which decreased by 4.0 percentage points. The second biggest change in weight was Other, which increased 2.3 percentage points. Labor and Depreciation increased by 0.8 and 0.5 percentage points, respectively. Materials & Supplies and Interest both increased by .3 percentage points. Equipment Rents decreased by .2 percentage points,

Weights for RCAF's All-Inclusive Index		
	2023	**2022**
Labor	30.2 %	29.4 %
Fuel	16.4	20.4
Materials & Supplies	5.0	4.7
Equipment Rents	4.2	4.4
Depreciation	15.7	15.2
Interest	2.4	2.1
Other	26.1	23.8
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
Fourth Quarter 2024

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.

	2023 Weights	Forecast Previous 2024Q3	Forecast Current 2024Q4	Percent Change
1. Labor	30.2%	546.6	534.3	-2.3 %
2. Fuel	16.4%	329.8	320.5	-2.8
3. M&S	5.0%	352.8	372.1	5.5
4. Equipment Rents	4.2%	281.3	292.7	4.1
5. Depreciation	15.7%	240.6	240.3	-0.1
6. Interest	2.4%	51.0	55.0	7.8
7. Other	26.1%	295.7	295.0	-0.2
8. Weighted Average				
a. 1980 = 100		364.8	360.9	
b. 1980 = 100 (linked)		336.5	332.9 [1]	
c. 4Q22 = 100		98.3	97.3 [2]	-1.0

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

$$= \quad (360.9 \quad / \quad 364.8) \quad x \quad 336.5$$

$$= \quad 332.9$$

[2] To calculate the 4Q22 = 100 index:

Index4Q22 = (Current Linked Index / 4Q22 Basing Factor) * 100

$$= \quad 332.9 \quad \text{divided by} \quad 342.3 \quad \text{times 100}$$

$$= \quad 97.3$$

Indexes based on other periods:
4Q17 based index = 332.9 / 264.5 x 100 = 125.9
4Q12 based index = 332.9 / 297.6 x 100 = 111.9
4Q07 based index = 332.9 / 245.9 x 100 = 135.4
4Q02 based index = 332.9 / 192.1 x 100 = 173.3
4Q97 based index = 332.9 / 173.2 x 100 = 192.2
4Q92 based index = 332.9 / 156.9 x 100 = 212.2

Forecast vs. Actual All-Inclusive Index
Second Quarter 2024

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 96.6 is 1.2 index points below the forecast value of 97.8. Therefore, the forecast error adjustment for fourth quarter 2024 is -1.2 index points.

	2022 Weights	Second Quarter 2024 Forecast	Second Quarter 2024 Actual	Amt Difference
1. Labor	29.4%	527.0	527.0	
2. Fuel	20.4%	350.4	335.3	
3. M&S	4.7%	367.1	367.1	
4. Equipment Rents[1]	4.4%	279.8	275.9	
5. Depreciation	15.2%	240.2	240.0	
6. Interest	2.1%	51.0	51.0	
7. Other	23.8%	292.4	291.4	
8. Weighted Average				
a. 1980 = 100		363.2	359.6	
b. 1980 = 100 (linked)		334.8	330.6 [2]	
c. 4Q22 = 100[3]		97.8	96.6	-1.2

Forecast error ⟶ **-1.2 index points**

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[1]

	2022 Weights	Second Quarter 2024 Forecast	Second Quarter 2024 Actual
Car-Hire	68.1%	244.2	244.3
Lease Rentals	31.9%	292.4	291.4
Weighted Average		259.6	259.3
Weighted Average (linked)		279.8	275.9

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

330.6	=	359.6	/	353.0	x	324.5

[3] The 4Q22 based indexes are 1980 based indexes divided by the 4Q22 basing factor (342.3/100).
Other basing factors are: 4Q22 = 264.5; 4Q12 = 297.6; 4Q07 = 245.9; 4Q02 = 192.1; 4Q97 = 173.2; and 4Q92 = 156.9.

Productivity

On January 18, 2024, the Surface Transportation Board served a decision which proposed to adopt 1.1 percent as the geometric average productivity change for the five most recent years available. Their five year rolling geometric average calculation added the year 2022 and removed the year 2017. The components of this average annual value are shown on the following table in ratio format – therefore, 1.011 is the same as an increase of 1.1 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			
2018 - 2022			
Year	Output Index (1)	Input Index (2)	Productivity Changes (3)
2018	1.032	1.004	1.028
2019	0.968	0.961	1.007
2020	0.923	0.904	1.021
2021	1.028	0.999	1.029
2022	0.992	1.020	0.972
Average			**1.011**
Previous Average (2017-2021)			1.028

Calculation of PAF and PAF-5			

For 2018-2022, use fourth root of avg. productivity change = 1.0027
For 2017-2021, use fourth root of avg. productivity change = 1.0069

Quarter	Year	PAF	PAF-5	
Q1	2024	2.5430	2.6566	2017-2021
Q2	2024	2.5499	2.6749	
Q3	2024	2.5568	2.6934	2018-2022
Q4	2024	2.5637	2.7120	
Q1	2025	2.5706	2.7193	

Rail Cost Adjustment Factor
Fourth Quarter 2024

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 2023Q1 index, the All-Inclusive Index was rebased to a 2022Q4=100 basis as required in the applicable statute.

	Previous 2024Q3	Current 2024Q4	Percent Change
All-Inclusive Index[1]	98.3	97.3	-1.0 %
Preliminary RCAF[2]	0.983	0.973	-1.0
Forecast Error Adjustment[3]	-0.033	-0.012	
RCAF (Unadjusted)[4]	0.950	0.961	1.2
Productivity Adjustment Factor[5]	2.5568	2.5637	
RCAF (Adjusted)[6]	0.372	0.375	0.8
PAF-5[7]	2.6934	2.7120	
RCAF-5[8]	0.353	0.354	0.3

[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
Fourth Quarter 2024

The fourth quarter 2024 Labor Index is 2.3 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 2023, and this replaces data for 2022. 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 decreased 1.0 percent.

Wage Increases: There are no wage increases currently reported for the fourth quarter, change is due to new wage statistics.

Lump Sums: The fourth quarter lump sum rate remained flat from the previous quarter. Fully amortized paymnets were removed, which were replaced by new payments at similar amounts. There was also an impact from a lower treasury bill and rebenching.[1]

Back Pay: Back pay decreased slightly due to a lower treasury bill and rebenching to newer wage statistics.[1]

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 slightly decreased from last quarter due to rebenching.

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 [1] 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 (a.k.a. 3-month) U.S. Treasury bills.

Labor
Fourth Quarter 2024

Supplements Index

The Supplements Index decreased 4.1 percent this quarter.

Health & Welfare: The Health & Welfare rate decreased 2.3 percent due to rebenching.

Railroad Retirement: The Railroad Retirement rate decreased 4.2 percent due to updated RRB data and rebenching.

Unemployment Insurance: The Unemployment Insurance rate increased from 4 cents to 8 cents, primarily due to rebenching to new statistics.

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 20 cents lower than last quarter. Benchmarking was not the cause of this drop.

Labor Index Calculation

As shown in Table A-1 on the next page, the 1.0 percent decrease in the Wage Rate Index and the 4.1 percent decrease in the Supplements Index combined to cause the Labor Index to be 2.3 percent lower than the previous quarter. The linked fourth quarter 2024 Labor index is 534.3, which is 8.6 percent lower than one year ago.

Labor
Fourth Quarter 2024
Table A-1 Labor Index

	2024Q3		2024Q4	
	Used in Previous Index Filing	**Updated to Reflect New Benchmarks**	**Based on 2023 Data**	**Pct Chg From Prev. Filing**
Base Wage – Straight Time & Pay For Time Not Worked	$55.256	$54.681	$54.681	-1.0%
Adjustments:				
Lump Sum	0.559	0.547	0.559	0.0%
Back Pay	0.100	0.098	0.098	-2.0%
Other	0.282	0.276	0.275	-2.5%
Total Wages	56.197	$55.602	55.613	-1.0%
Health & Welfare Benefits	9.263	9.047	9.047	-2.3%
RR Retirement & Medicare	11.902	11.406	11.405	-4.2%
Unemployment Insurance	0.038	0.076	0.076	100.0%
Other	0.390	0.378	0.187	-52.1%
Total Supplements	$21.593	$20.907	$20.715	-4.1%
Total Labor (a check sum only)	$77.790	$76.509	$76.328	
Wage Rate Index[1]	480.9	475.8	475.9	-1.0%
Supplements Index[2]	798.0	772.6	765.5	-4.1%
Total labor Index, 2022 Weights[3]	570.0			
Total labor Index, 2023 Weights[4]	571.6	560.7	558.7	
Labor Index (linked)[5]	546.6		**534.3**	-2.3%

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[1] 1980 wage rate $11.685

[2] 1980 supplements rate $2.706

[3] 2022 weights: wages, supplements   71.9%   28.1%

[4] 2023 weights: wages, supplements   71.4%   28.6%

[5] 2024Q4 linked Index = 2024Q3$_{linked}$ x (2024Q4$_{WT2023}$ / 2024Q3$_{WT2023}$)

               =   546.6   x   558.7   /   571.6

Association of American Railroads

Fuel
Fourth Quarter 2024

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 peak point in June 2022, but has trended downward with fluctuations. While average prices for locomotive diesel fuel are available only through July 2024, 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 26 for Ultra-Low-Sulfur Diesel Fuel* is an average of 6.3 percent lower than the average for July. The chart below (on left) shows the AAR's Monthly Locomotive Diesel Fuel Price Index through July 2024. The second chart (on right) shows recent spot prices for Ultra-Low-Sulfur No. 2 Diesel Fuel as reported by the Energy Information Administration.

Locomotive Diesel Fuel Prices — Index 7/15/90 = 100

Ultra-Low-Sulfur No. 2 Diesel Fuel Weekly Spot Prices — NY, Gulf, LA
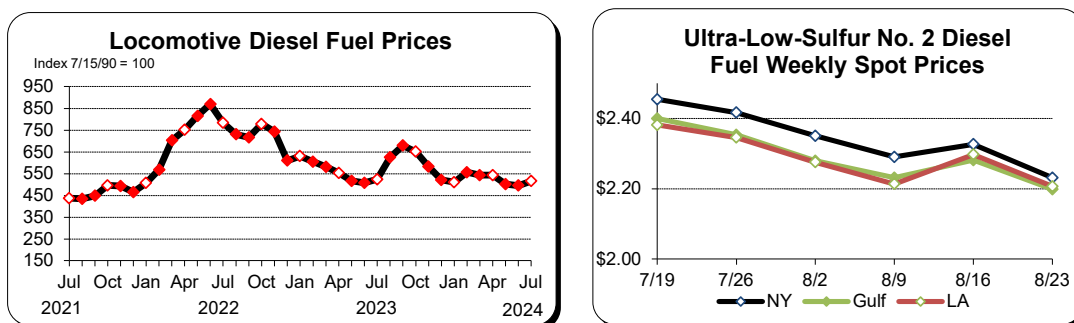
Using information from the EIA, prices towards the end of August are lower than prices that actually occurred in July. Railroads that responded to the AAR's forecast survey expect prices to decrease by October (Q4) compared to prices that actually occurred for July (Q3). The fourth quarter 2024 forecast is 2.8 percent lower than the previous quarter forecast, and 0.6 percent higher than the prior quarter actual.

Forecast Fuel Index (1980 = 100)	320.5
Change from previous quarter forecast	-2.8%
Change from previous quarter actual	0.6%

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* 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 2024

The fourth quarter 2024 Materials & Supplies Index increased 5.5 percent from the previous quarter. Prices increased for Forest Products and Miscellaneous Products, while decreasing for Metal Products.

2024Q4	Materials & Supplies Index =	372.1
2024Q3	Materials & Supplies Index =	352.8
	Difference	19.3 basis points
		or
		5.5 %

M&S Forecast History
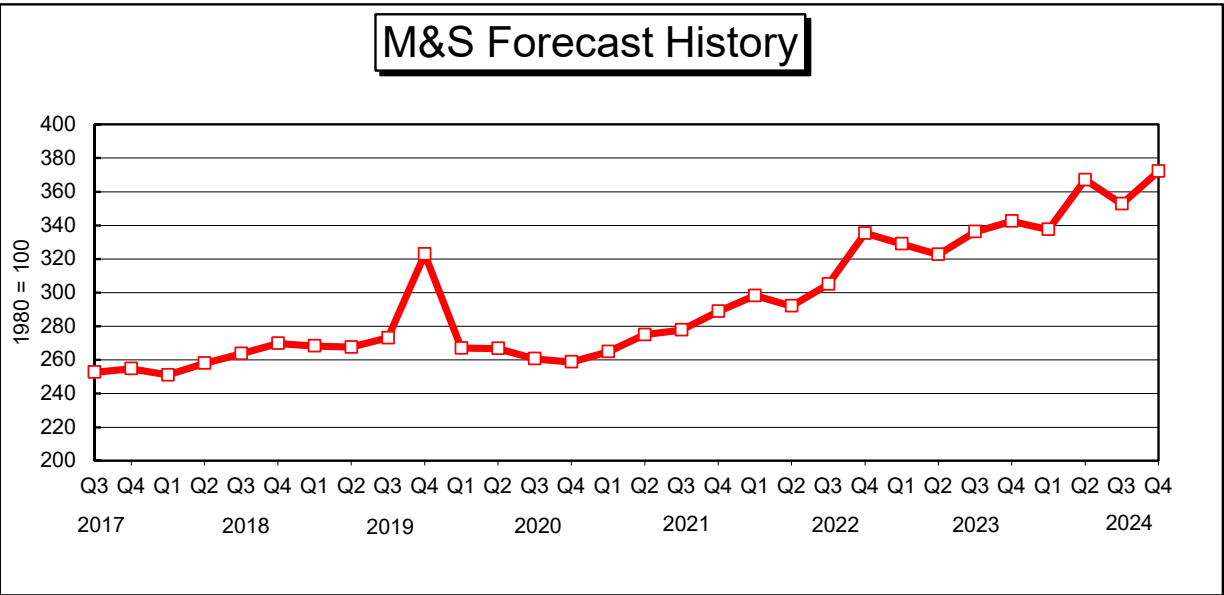
Equipment Rents
Fourth Quarter 2024

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 Rent Index, and features new weights based on 2023. 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 2022 weights is 261.0, which remained unchanged. The fourth quarter Car Hire portion of the Index increased 6.6 percent . A 0.2 percent decrease in the projected PPI-LF (See Appendix G) used as a proxy for Lease Rentals, combined with the 6.6 percent increase for Car Hire, caused the Equipment Rents Index to increase by 4.05 percent – rounded to 4.1 percent in the table below.

|	2023 Weight	2024Q3	2024Q4	Percent Change
Car Hire	67.1%	244.8	260.9	6.6 %
Lease Rentals	32.9%	295.7	295.0	-0.2
Weighted Average		261.5	272.1	4.1
Weighted Average (Linked)		281.3	292.7	4.1

Depreciation
Fourth Quarter 2024

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 decreased 0.1 percent from the previous quarter's forecast.

Forecast of Depreciation Index (1982=100)	217.2
Forecast of Depreciation Index (1980=100)	240.3
Change from previous quarter forecast	-0.1% = -0.12%
Change from actual first month of previous quarter	0.0% = 0.00%
Change from same quarter of prior year (actual)	0.4%

PPI-RE Forecast 2024 Q4
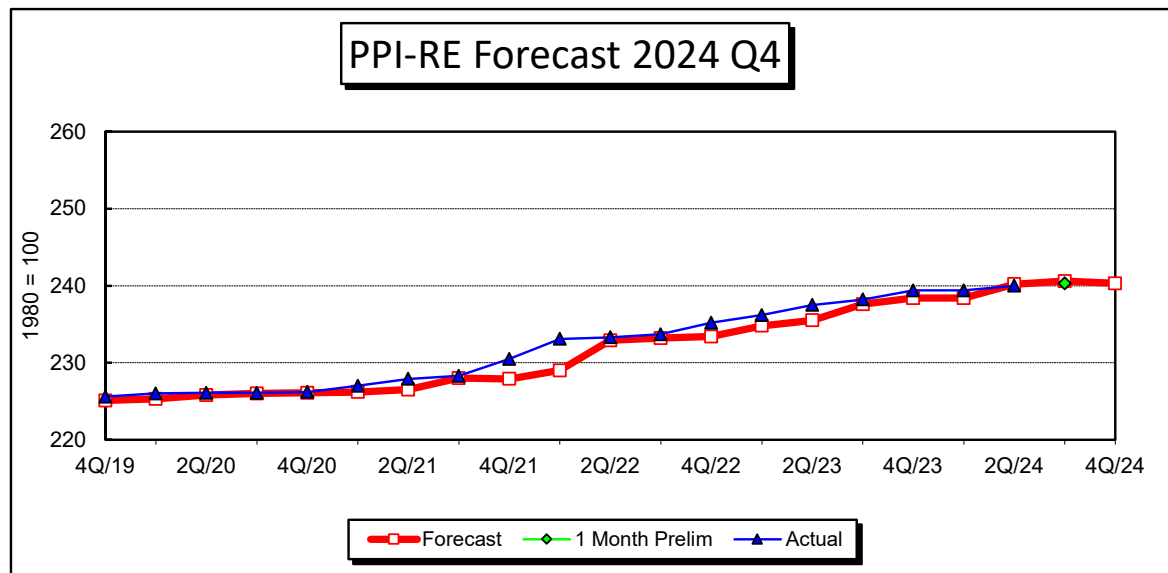
Depreciation
Fourth Quarter 2024

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 0.83 and for Box-Jenkins was 0.82.
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, 1, 0)

Within-Sample Statistics

Sample size	72	No. parameters	0
Mean	208.58	Std. deviation	5.14
R-square	0.98	Adj. R-square	0.98
Durbin-Watson	2.13	Ljung-Box(18)	15.7 P=0.39
Forecast error	0.77	BIC	0.77
MAPE	17.00%	SMAPE	17.00%
RMSE	0.77	MAD	0.36
MAD/Mean Ratio	0		

Actual Values for the Most Recent 6 Periods:

Actual

2024-Feb	216.4
2024-Mar	216.7
2024-Apr	216.7
2024-May	217.1
2024-Jun	217.1
2024-Jul	217.2

Forecasted Values

Date	2.5 Lower	Forecast	97.5 Upper
2024-Aug	215.675	217.200	218.725
2024-Sep	215.043	217.200	219.357
2024-Oct	214.558	217.200	219.842
2024-Nov	214.150	217.200	220.25
2024-Dec	213.79	217.200	220.610
QTR AVG	214.166	217.200	220.234

Interest
Fourth Quarter 2024

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 2023 data, and was updated in the Q4 filing submitted on September 24, 2024. The Interest Index based on 2023 increased from 51.0 in 2022 to 55.0 in 2023.

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

|		
2023	Interest Rate	4.32%
1980	Interest Rate	7.85%
2024Q4	**Interest Index**	**55.0**
2024Q3	Interest Index	51.0
	Percent Change	7.8%

Other Expenses
Fourth Quarter 2024

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 0.2 percent lower than the prior quarter forecast.

Forecast of Other Expense Index (1982=100)	263.1
Forecast of Other Expense Index (1980=100)	295.0
Change from previous quarter forecast	-0.2%
Change from actual first month of previous quarter	1.1%
Change from same quarter of prior year (actual)	2.6%
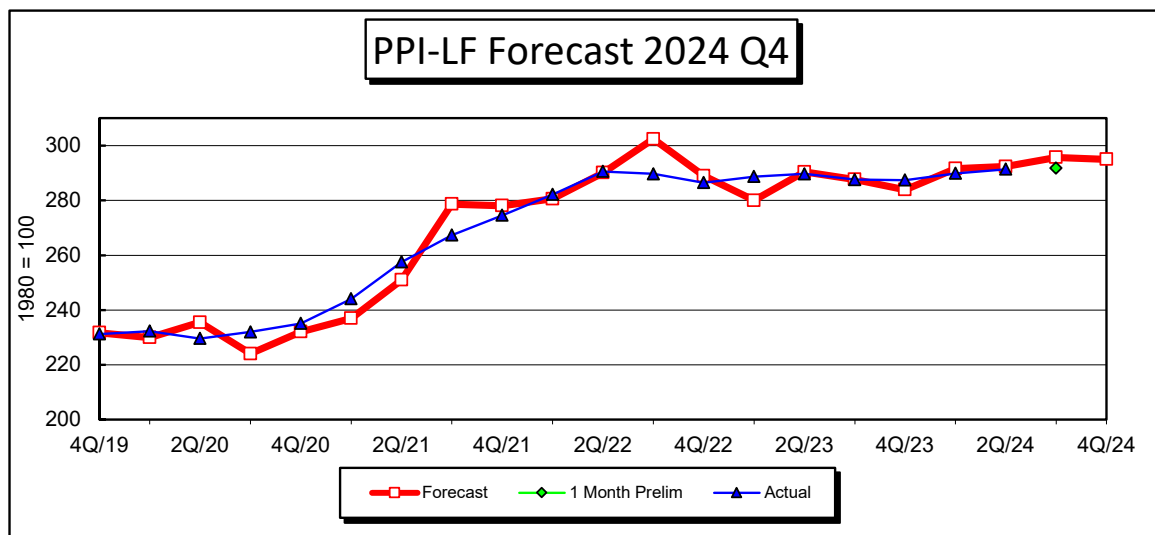
Other Expenses
Fourth Quarter 2024

**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 3.67 and for Box-Jenkins was 2.45.
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)*(0, 0, 1)

Term	Coefficient	Std. Error	t-Statistic	Significance
B[12]	-0.4809	0.1057	-4.551	1

Within-Sample Statistics

Sample size	72	No. parameters	1
Mean	233.14	Std. deviation	23.43
R-square	1	Adj. R-square	1
Durbin-Watson	2.25	Ljung-Box(18)	22.6 P=0.79
Forecast error	0.87	BIC	0.89
MAPE	0.28	SMAPE	0.28
RMSE	0.86	MAD	0.66
MAD/Mean Ratio	0		

Actual Values for the Most Recent 6 Periods:

Actual

2024-Feb	259.1
2024-Mar	258.7
2024-Apr	259.5
2024-May	260.1
2024-Jun	260.0
2024-Jul	260.3

Forecasted Values

Date	2.5 Lower	Forecast	97.5 Upper
2024-Aug	259.107	260.823	262.539
2024-Sep	257.787	261.625	265.462
2024-Oct	256.146	262.567	268.989
2024-Nov	253.678	263.078	272.479
2024-Dec	250.939	263.668	276.396
QTR AVG	253.588	263.104	272.621

Railroad and Union Abbreviations
Fourth Quarter 2024

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.)
CMQ	Central Maine & Quebec (Part of Canadian Pacific's U.S. operations, included beginning 2021Q4.)
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)