BEFORE THE
SURFACE TRANSPORTATION BOARD

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RAILROAD COST OF CAPITAL — 2024	)	STB Docket No. EP 558 (Sub-No. 28)

COMMENTS OF THE ASSOCIATION OF AMERICAN RAILROADS AND ITS MEMBER RAILROADS

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April 14, 2025

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VERIFIED STATEMENT

Witness*	Subject
Dr. Rand Ghayad	The railroads' market value capital structure, overall cost of capital, cost of common and preferred equity, and cost of all types of debt.

*Verified statements are referenced in these comments by witness name –
viz., Ghayad V.S. at _____

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COMMENTS OF THE ASSOCIATION OF AMERICAN RAILROADS
AND ITS MEMBER RAILROADS

By a decision served on January 10, 2025, the Surface Transportation Board ("STB" or "Board") instituted this proceeding to determine the railroad industry's cost of capital for the year 2024. The Board noted that this determination will enable it to make the required annual individual railroad revenue adequacy determination for 2024. 49 U.S.C. § 10701(d)(2), § 10704(a)(2). The Board noted further that the cost of capital determination may also be used in various other STB railroad proceedings. *See Railroad Cost of Capital – 2024*, EP 558 (Sub-No. 28) (STB served Jan. 10, 2025) ("*Cost of Capital – 2024*"), slip op. at 1.

The railroads, through the Association of American Railroads ("AAR"), are submitting their calculation of: (1) the railroads' 2024 cost of common equity capital; (2) the railroads' 2024 current cost of preferred equity capital; (3) the railroads' current 2024 cost of debt capital; and (4) the 2024 capital structure mix of the railroad industry on a market value basis.

The AAR's calculations are discussed in the attached verified statement of Dr. Rand Ghayad, Senior Vice President, Policy and Economics of the AAR. Dr. Ghayad's statement establishes the following:

1. The 2024 cost of common equity capital is 11.82 percent.
2. The 2024 cost of preferred equity capital is 0.00 percent.
3. The 2024 cost of debt capital is 5.24 percent.
4. The capital structure of the railroad industry is 17.26 percent debt, 0.00 percent preferred equity,[1] and 82.74 percent common equity.

From these data, Dr. Ghayad concludes that the overall railroad industry cost of capital for 2024 is 10.68 percent.[2]

I. Introduction

The sole purpose of this proceeding is to determine the railroad industry's cost of capital for 2024. The cost of capital will be computed using the current cost of debt and equity and market value weights. *See Standards for Railroad Revenue Adequacy*, 3 I.C.C.2d 261 (1986), *aff'd sub nom., Consolidated Rail Corporation v. United States*, 855 F.2d 78 (3rd Cir. 1988). The Board has adopted a composite railroad approach to computing an industry-wide cost of capital. This approach relies upon data from a sample of railroads meeting criteria established by the Board and its predecessor, the Interstate Commerce Commission, in Ex Parte No. 458, *Railroad Cost of Capital — 1984,* 1 I.C.C.2d 989, 1003-04 (1985), and *Revisions to the Cost-of- Capital Composite Railroad Criteria*, EP 664 (Sub-No. 3) (STB served Oct. 25, 2017). Those criteria are:

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[1] There is no preferred equity in 2024.

[2] Ghayad V.S. at 2

(1) the company is a Class I line-haul railroad; (2) if the Class I railroad is controlled by another company, the controlling company is primarily a railroad company (at least 50 percent of its total assets are devoted to railroad operations), and it is not already included in the study frame; (3) the company's bonds are rated at least BBB by Standard & Poor's and Baa by Moody's; (4) the company's stock is listed on either the New York Stock Exchange or the NASDAQ; and (5) the company has paid dividends throughout the year (2024).[3]

This year there are three railroad corporations or holding companies in the sample meeting the Board's criteria: CSX Corporation, Norfolk Southern Corporation, and Union Pacific Corporation. These are the same companies included in the 2023 sample.

II. The Cost of Common Equity Capital

In its January 10, 2025 order instituting this proceeding, the Board directed that the cost of capital components be calculated "using the methodology followed in Railroad Cost of Capital – 2023." *See Cost of Capital – 2024*, slip op. at 2. In *Railroad Cost of Capital – 2023*, the Board calculated the cost of equity component in its annual cost of capital proceeding using a simple average of the estimates produced by the Capital Asset Pricing Model ("CAPM") adopted in *Methodology to be Employed in Determining the Railroad Industry's Cost of Capital,* EP 664 (STB served Jan. 17, 2008) and the Morningstar/Ibbotson Multi-Stage Discounted Cash Flow Model ("MSDCF") adopted in *Use of a Multi-Stage Discounted Cash Flow Model in Determining the Railroad Industry's Cost of Capital,* EP 664 (Sub-No. 1) (STB served Jan. 28, 2009).[4] *See*

[3] Effective November 24, 2017, the Board modified the fourth screening criterion to require a company's stock to be listed on either the NYSE or NASDAQ.

[4] The Morningstar/Ibbotson MSDCF model adopted by the Board is a modified version that includes only the railroads that pass the screening criteria set forth in *Railroad Cost of Capital—1984*, 1 I.C.C.2d 989 (1985), for inclusion in the sample of railroads used for the annual cost of capital determination.

Railroad Cost of Capital – 2022, EP 558 (Sub-No. 25), slip op. at 7-11 (STB served Aug. 2, 2022).[5] Dr. Ghayad used a simple average of the CAPM and Morningstar/Ibbotson MSDCF models adopted by the Board in his calculation of the cost of common equity in this proceeding.

A. <u>The CAPM Methodology</u>

Under the CAPM methodology as applicable to the annual cost of capital proceeding, the cost of common equity is calculated by determining the return an investor would receive on a risk-free investment and by adding to the risk-free return a premium associated with the risk of railroad stocks. The premium is calculated by multiplying the market risk premium of the stock market as a whole by a factor, known as beta, that represents the non-diversifiable risk of holding railroad stocks. In formulaic terms, the CAPM can be expressed as:

K = RF + beta (MRP)

Where K = the firm's cost of equity,
RF = the risk-free rate,
MRP = the market's risk premium, and
beta = coefficient of systematic, non-diversifiable risk of the stock.

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[5] The Board determined that using a simple average of CAPM and the commercially accepted Morningstar/Ibbotson multi-stage DCF model to calculate the cost of equity yields a more precise determination than relying on CAPM alone. As noted by the Board, "By using an average of the results produced by both models, we harness the strengths of both models while minimizing their respective weaknesses. The result should be a stable yet precise estimate of the cost of equity that we can use in future regulatory proceedings and to gauge the financial health of the railroad industry." *Use of a Multi- Stage Discounted Cash Flow Model in Determining the Railroad Industry's Cost of Capital*, EP 664 (Sub- No. 1), slip op. at 15 (STB served Jan. 28, 2009).

Since the 2006 cost of capital determination, the well-regarded and widely accepted Ibbotson Equity Risk Premium has been used for the market risk premium, as found in the *Ibbotson SBBI Valuation Yearbook* published by Morningstar.[6] Though that publication was discontinued after the 2013 edition, much of the same data could be found in the *Ibbotson SBBI Classic Yearbook.* Beginning in 2016, Morningstar stopped publishing its *Ibbotson SBBI Classic Yearbook.* For the 2015 cost of capital calculation, the AAR utilized the Duff & Phelps *2016 Valuation Handbook – Guide to Cost of Capital* as a source for the Ibbotson Equity Risk Premium (a.k.a. market risk premium), because this figure is calculated using the same sources and methodology as Ibbotson.[7] Ghayad V.S. at 31-32. For the 2016 calculation, the same source was used: the Duff & Phelps *2017 Valuation Handbook – Guide to Cost of Capital.* Though that publication was discontinued in hardcover form, the publication is available through the Duff & Phelps online *Cost of Capital Navigator*. For the 2024 calculation, the same source was used (the Duff & Phelps *Valuation Handbook – U.S. Guide to Cost of Capital*), but it was obtained through the online *Cost of Capital Navigator*. The calculation for beta was made using the S&P 500 Price Index and the same methodology approved by the Board in previous cost of capital proceedings, including but not limited to the 2020, 2021, 2022, and 2023 cost of capital proceedings.

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[6] Ibbotson Associates is a wholly owned subsidiary of Morningstar, Inc. "SBBI" stands for "Stocks, Bonds, Bills, and Inflation."

[7] Duff and Phelps notes that this premium is "[c]alculated as the average annual return of the S&P 500 total return index minus the average annual return of the SBBI long-term (20-year) government bond income return series over the 1926-2016 time period. The long-horizon historical equity risk premium was previously published on the "back page" of the Morningstar/Ibbotson *SBBI Valuation Yearbook* (discontinued)."

The values determined by Dr. Ghayad for the elements of the CAPM methodology were 4.50 percent for the risk-free rate, 7.31 percent for the market risk premium, and 0.9478 for beta. Ghayad V.S. at 37.

Based on the three-railroad composite described above and the procedures used by the STB in the last cost of capital proceeding, Dr. Ghayad estimates that under the CAPM methodology the cost of common equity capital for 2024 is 11.43 percent. Ghayad V.S. at 37.

B. <u>The Morningstar/Ibbotson MSDCF Methodology</u>

The Morningstar/Ibbotson MSDCF methodology, as adopted by the Board, calculates the cost of common equity capital as follows:

> The cost of equity in a DCF model is the discount rate that equates a firm's market value to the present value of the stream of cash flows that could affect investors. These cash flows are not presumed to be paid out to investors; instead, it is assumed investors will ultimately benefit from these cash flows through higher regular dividends, special dividends, stock buybacks, or stock price appreciation. The incorporation of these cash flows and the expected growth of earnings are the essential aspects of the multi-stage DCF we are adopting here.
>
> The Morningstar/Ibbotson model defines cash flows (CF), for the first two stages, as income before extraordinary items (IBEI) minus capital expenditures (CAPEX) plus depreciation (DEP) and deferred taxes (DT), or
>
> $$CF = IBEI – CAPEX + DEP + DT.$$
>
> An average cash flow figure is used as the starting point of the analysis under the Morningstar/Ibbotson model. To find the average cash flow, the model uses the 5-year period leading up to the year being analyzed, and the total cash flows for that time period are divided by total sales, which determine the 5-year cash-flow-to-sales ratio. The ratio is then multiplied by the total sales for the year being analyzed to obtain the average cash flow estimate for that year. For the third (and final) stage of the Morningstar/Ibbotson multistage DCF model stage, Morningstar/Ibbotson uses two additional assumptions: that there is no depreciation or deferred taxes. Therefore, in the third stage, cash flows are based solely on income before extraordinary items.

> Growth of earnings is also calculated in three stages. In the first stage (years 1-5), the firm's annual earnings growth rate is assumed to be the median value of the qualifying railroad's 3- to 5-year growth estimates as determined by railroad industry analysts and published by Institutional Brokers Estimate System (IBES). In the second stage (years 6-10), the growth rate is the simple average of all growth rates in stage 1. In stage three (years 11 and onwards), the growth rate is the average long-run nominal growth rate of the U.S. economy. This long-run nominal growth rate is estimated by using the historical growth in real GDP and the long-run expected inflation rate.

Use of a Multi-Stage Discounted Cash Flow Model in Determining the Railroad Industry's Cost of Capital, EP 664 (Sub-No. 1), slip. op. at 5-6 (STB served Jan. 28, 2009).

The cost of common equity capital using the Morningstar/Ibbotson MSDCF model adopted by the Board is also calculated and explained in the attached Verified Statement of Dr. Ghayad. Consistent with the methodology approved by the Board in *Railroad Cost of Capital – 2008*, EP 558 (Sub-No. 12), slip op. at 9-10 (STB served Sept. 25, 2009), Dr. Ghayad's calculations used only IBES growth estimates (distributed by Refinitiv) available as of the end of 2024, and stock market values were based on shares outstanding and stock prices as of the last trading day of the last full week for 2024 – January 3, 2025 (Friday). Ghayad V.S. at 43-44.[8]

Dr. Ghayad calculates the cost of common equity capital for 2024, using STB's version of the Morningstar/Ibbotson MSDCF model, as 12.20 percent. Ghayad V.S. at 51.

[8] Consistent with the methodology approved by the Board in *Railroad Cost of Capital – 2017,* EP 558 (Sub-No. 21), slip op. at 11-12, Dr. Ghayad's calculations used data inputs in the cash flow formula as retrieved from the railroads' 2020-2024 10-K filings with the SEC (and used restated data where set forth in any subsequently filed 10-K filings with the SEC). *See* Ghayad V.S. at 42.

C. Conclusion as to the Cost of Common Equity Capital

Under the Board's methodology, the cost of common equity capital is the simple average of the results using the CAPM and Morningstar/Ibbotson MSDCF models. The simple average produces a cost of common equity capital of 11.82 percent for 2024. Ghayad V.S. at 51-52.

III. The Cost of Preferred Equity Capital

Preferred stock is a hybrid security which has some characteristics of debt and some characteristics of equity. Its cost depends on its specific features. The methodology used by the Board applies the following criteria:

(a) Where the preferred is not convertible into common stock, and where the corporation is not required to redeem the preferred at specific times, the cost of preferred equity is equal to its current dividend yield.

(b) Where the preferred is not convertible but is subject to mandatory redemption providing holders of the instrument with a premium, the cost is equal to the current dividend yield, plus the present value of the premium.

(c) Where the preferred is convertible at the option of the holder, and the market values of the preferred and common indicate that conversion is likely to occur or that the conversion right controls the price of the preferred, the preferred has the same cost as common equity.

From 2002 until 2012, no railroads in the composite had preferred stock outstanding. Beginning in 2013, one of the railroad companies comprising the railroad sample had preferred stock outstanding, and this continued through 2020. The estimated cost of preferred equity is 0.00 percent for 2024. Ghayad V.S. at 52.

IV. The Cost of Debt

According to the Board's well-established methodology, the cost of debt includes costs for three categories (bonds, equipment trust certificates, conditional sales agreements) of debt instruments, plus flotation costs. *See, e.g., Railroad Cost of Capital – 1997,* EP 558 (Sub-No. 1), slip op. at 2-3 (STB served July 16, 1998); *Railroad Cost of Capital – 2021*, EP 558 (Sub-No. 25), slip op. at 4. To determine the cost of debt for bonds,[9] Dr. Ghayad has computed the average current bond yield for 135 bonds from the sample railroads for which data were available during 2024 according to the Board's well-established methodology. Under this approach, the bond yield is based on a sample representing 99 percent of the book value of the bonds issued by the railroads in the sample.[10] As the Board has recognized, equipment trust certificates ("ETCs") and conditional sales agreements ("CSAs") are not actively traded in secondary markets. Their costs were therefore estimated by comparing them to the yields on Treasury securities that are actively traded.[11] The composite current cost of debt is the market-weighted average cost of bonds, ETCs, and CSAs (if there were any), plus a small flotation

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[9] The term "bonds" is used to describe bonds, notes, debentures, and other similar types of debt.

[10] Bond data were retrieved from a Bloomberg database. Ghayad V.S. at 8-9.

[11] Ghayad V.S. at 12-13. No CSAs were modeled because none are outstanding.

cost.[12] Using the Board's established methodology, the railroads' 2024 cost of new debt is 5.24 percent. Ghayad V.S. at 24.

V. The 2024 Capital Structure of the Railroad Industry and the Overall Cost of Capital

Pursuant to the Board's January 10, 2025 decision, the market values of debt, preferred equity, and common equity were compiled to compute the 2024 capital structure of the railroad industry. The railroads' market value capital structure on a market value basis is 17.26 percent debt, 82.74 percent common equity capital, and 0.00 percent preferred equity capital. Ghayad V.S. at 2. Based upon this capital structure, the overall 2024 cost of capital is 10.68 percent. Ghayad V.S. at 2.

Conclusion

The Board should determine that the railroads' cost of capital for 2024 is 10.68 percent.

Respectfully submitted,

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April 14, 2025

[12] In this proceeding, the AAR calculated bond flotation costs by using data reported by the sample railroads to the Securities and Exchange Commission (SEC) regarding new debt offerings in 2024. Ghayad V.S. at 19-24.

CERTIFICATE OF SERVICE

I hereby certify that on this 14th day of April 2025, I caused to be served by electronic mail a copy of the foregoing on the following:

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Amber L. McDonald

BEFORE THE

SURFACE TRANSPORTATION BOARD

EX PARTE NO. 558 (Sub-No. 28)

RAILROAD COST OF CAPITAL — 2024

VERIFIED STATEMENT

OF

DR. RAND GHAYAD

SENIOR VICE PRESIDENT — POLICY AND ECONOMICS

ASSOCIATION OF AMERICAN RAILROADS

April 14, 2025

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Verified Statement

of

Dr. Rand Ghayad

I. Introduction

My name is Dr. Rand Ghayad. I am the Chief Economist and Senior Vice President of Policy and Economics at the Association of American Railroads (AAR), headquartered at 425 Third Street, SW, Suite 1000, Washington, DC 20024. The AAR is the trade association of the Nation's major railroads, as well as the railroads of Canada and Mexico. The AAR's United States railroad members, which include all Class I railroads plus about 180 additional Class II and III freight railroads, account for approximately 98 percent of our Nation's total railroad freight operating revenue.

When appropriate, the AAR represents the railroad industry before government bodies, including economic regulatory proceedings before the Surface Transportation Board ("STB" or "Board"). In particular, the AAR has participated in all of the STB proceedings addressing revenue adequacy standards and the annual cost of capital determinations.

Aside from other responsibilities, I've provided economic analyses and consulting services to clients across diverse industries such as aviation, railroads, postal and shipping, addressing a wide range of policy and business matters. A summary of my qualifications and experience appears at the end of this statement.

In this submission, I am responding to the Board's decision of January 6, 2025 (served January 10), instituting a proceeding to determine the railroad industry's 2024 cost of capital — Ex Parte No. 558 (Sub-No. 28), *Railroad Cost of Capital — 2024* ("Ex Parte 558 Decision"). In my

statement, I calculate the cost of debt for the railroad industry using the procedures accepted in previous STB proceedings. I also calculate the cost of common equity using a simple average of the estimates produced using the following methods: (1) the Capital Asset Pricing Model used by the Board in Ex Parte No. 558 (Sub-No. 27); and (2) the STB's version of the Morningstar/Ibbotson Multi-Stage Discounted Cash Flow Model as used by the Board in Ex Parte No. 558 (Sub-No. 27). In addition, I calculate a cost of preferred equity using the dividend yield method, as used in Ex Parte No. 558 (Sub-No. 27). Finally, I calculate the market value capital structure and the overall cost of capital using the procedures accepted in previous Cost of Capital proceedings. This statement presents the details for calculating the necessary components for the overall cost of capital: the market value capital structure, the cost of debt, the cost of common equity capital using the Capital Asset Pricing Model and the Multi-Stage Discounted Cash Flow Model, and, as applicable, the cost of preferred equity capital.

I conclude that the 2024 cost of capital for the railroad industry is 10.68 percent. This estimate is based on a current cost of debt of 5.24 percent, a cost of common equity capital of 11.82 percent; a cost of preferred equity of 0.00 percent; and market value weights for debt, common equity, and preferred equity of 17.26 percent, 82.74 percent, and 0.00 percent, respectively.

II. Determining the Cost of Capital

A. Defining the Cost of Capital

The cost of capital represents the *expected* return on investment that the providers of capital require to make them indifferent between investments with equivalent risk profiles. The cost of capital necessarily incorporates long-term investor expectations for a company's performance. Investment funds flow to companies where the expected returns, over the investors' investment horizons, are thought to at least equal the expected returns available from other investment opportunities, giving consideration to the relative (or commensurate) risk of investment. Similarly within a company, limited capital resources flow to projects where the expected returns are anticipated to be highest, giving consideration to the relative (or commensurate) risk, uncertainty and timing of investment. Because it is challenging to precisely ascertain these expectations of long-term investors, it is standard in the literature to estimate the parameters associated with the cost of capital using modern finance techniques. Such financial models are inherently imprecise, and the results provide only an estimate of an expected value of the cost of invested capital at a particular point in time. For some types of capital, such as traded bonds, investor expectations can be readily observed. For other types of capital, such as common equity, modeling is necessary. Using multiple models to estimate the cost of equity is crucial. Two widely employed methods for regulatory purposes include the Capital Asset Pricing Model (CAPM) and a Discounted Cash Flow (DCF) model.

B. The Composite Railroad Approach

The STB has adopted a composite railroad approach to computing an industry-wide cost of capital. This approach relies upon data from a sample of railroads meeting criteria established by the Board's predecessor, the Interstate Commerce Commission, in Ex Parte No. 458, *Railroad Cost of Capital — 1984,* 1 I.C.C. 2d 989, 1003–1004 (1985), and modified by the STB in Ex Parte No. 664 (Sub-No. 3) served October 25, 2017.

C. Selection of Railroads for Analysis

Under the criteria established by the Board for individual firm inclusion in the composite railroad sample, a company must meet certain criteria. (Ex Parte 558 Sub-No. 28 Decision) Those criteria are:

- The company is a Class I line-haul railroad.
- If the Class I railroad is controlled by another company, the controlling company is primarily a railroad company (at least 50 percent of its total assets are devoted to railroad operations), and it is not already included in the study frame.
- The company's bonds are rated at least BBB by Standard & Poor's and Baa by Moody's.
- The company's stock is listed on either the NYSE or the NASDAQ.
- The company has paid dividends throughout the year (2024).

Table 1 lists the AAR's evaluation of railroad companies that may meet the STB's criteria.

Table No. 1
Evaluation of Class I Railroads
Under Surface Transportation Board Selection Criteria
2024

Class I Railroad	Parent	Stock Symbol	Dividends Throughout 2024	Rail Assets Account For At Least 50% of Parent	Adequate Debt Rating	NYSE or NASDAQ
BNSF	Berkshire Hathaway	BRK-A	No	No	Yes	Yes
CSX	CSX Corporation	CSX	Yes	Yes	Yes	Yes
CNGT*	Canadian National Railway Co.	CNI	---	Non-U.S. company	---	
NS	Norfolk Southern Corporation	NSC	Yes	Yes	Yes	Yes
CPKC*	Canadian Pacific Kansas City	CP	---	Non-U.S. company	---	
UP	Union Pacific Corporation	UNP	Yes	Yes	Yes	Yes

* CNGT is Grand Trunk Corporation, and consists of almost all of the U.S. railroad operations of Canadian National Railway (a.k.a. CN). CPKC is KCS and Soo Line Corporation, and consists of the U.S. operations of Canadian Pacific Kansas City (CPKC). Following STB precedent, CN and CPKC were not included in the sample because both CN and CPKC are Canadian corporations – and the cost of capital proceeding is concerned with determining costs for U.S. railroads under STB jurisdiction.

This year there are three railroad corporations or holding companies in the sample that meet the Board's criteria: CSX Corporation, Norfolk Southern Corporation, and Union Pacific Corporation. Consistent with past proceedings, the two Canadian-owned railroads have been excluded from the sample.[1] Berkshire Hathaway, owner of BNSF Railway Company, did not pay dividends throughout 2024, and the railroad is less than 50% of the company's assets.[2] Based

[1] *See* STB Ex Parte No. 558, decided July 2, 1997, page 2, and verified statement of Craig F. Rockey on behalf of the Association of American Railroads in Ex Parte No. 558, submitted March 19, 1997, Table 1 on page 6. Accounting methods, differences in the treatment of taxes, and currency conversion could also be issues if foreign companies were added to the composite railroad. The railroad parents (CN and Canadian Pacific Kansas City) are still more Canadian than USA. Comparing operating revenues for 2022 as reported in the AAR's *Railroad Facts* book, 2023 edition: CNGT was 22 percent of CN, and KCS and SOO combined was 25 percent of Canadian Pacific Kansas City.

[2] The rail operations of BNSF Railway Company are the principal operating subsidiary of Burlington Northern Santa Fe, LLC – which is a subsidiary of Berkshire Hathaway, Inc. For 2024, BNSF accounted for 8.3 percent of Berkshire Hathaway assets. Among the many other diverse subsidiaries of Berkshire Hathaway are GEICO, Fruit of the Loom, Helzberg Diamonds, and Dairy Queen. The company also owns pipelines, manufacturers, numerous automobile dealerships, real estate companies, and newspapers.

on data from the Revenue, Expense, & Income (RE&I) and Condensed Balance Sheet (CBS) Forms from Q4 2024, the three-firm composite accounts for nearly 50 percent of the operating revenues and assets of all Class I railroads.

D. Types of Railroad Capital

The total capital of a firm may include various forms of debt and two types of equity: common stock and preferred stock. Each of these three sources of capital has different expected rates of return (reflecting different levels of perceived risk of the particular debt or equity instrument), and the overall cost of capital is calculated as the market value weighted average of the costs of common equity, preferred equity, and debt. Different approaches are used to estimate the costs of each of the types of capital. In this statement, 99 percent of the cost of debt is calculated using bonds and similar instruments (including notes and debentures). The remaining 1 percent – in the form of Equipment Trust Certificates – is calculated with a long-used model that permits comparison of market-determined yields for government debt, and the historical relationship between government debt and the type of railroad debt modeled.[3] No Conditional Sales Agreements were used to calculate the 2024 cost of debt because they have all been retired. The estimate of the cost of common equity is a simple average of the results from two estimation methods. One method is calculated using the backward-looking Capital Asset Pricing Model (CAPM) following the methodology prescribed by the Board and used in the 2023 Cost of Capital decision. The other method is calculated using the somewhat more forward-looking Multi-Stage Discounted Cash Flow model (MSDCF)

[3] There are currently four Equipment Trust Certificates modeled.

methodology prescribed by the Board and also used in the 2023 Cost of Capital Decision. It is the combined return on equity estimate—rather than the outcomes of any single model—that matters for evaluating the cost of equity in the railroad industry. The cost of preferred equity capital would have been calculated using a simple dividend yield method, as also used in the 2023 Cost of Capital Decision; however, none of the participating railroads have any preferred equity this year. Calculations for all three types of capital are based on data through 2024. The industry's overall cost of capital is computed as a weighted average of the three costs — debt, common equity, and preferred equity — based upon the market value for each type of capital.

III. Debt Capital in 2024

The current cost of debt is determined from the current market-determined yields on all debt outstanding. This approach is necessary, and in past Board Cost of Capital decisions has been accepted as appropriate, because of the reasons listed below.[4]

(1) There is a lack of sufficient new debt issues from which to develop a representative, and statistically reliable, current cost.

(2) The stated rate of interest/dividend payment to the investor is not always the same as the cost to the railroad. For example, when securities are issued, the total amount paid by investors is seldom received by the railroad. Administrative fees, such as compensation paid to investment bankers, reduce

[4] *See* Ex Parte Nos. 415, 436, 452, 458, 464, 466, 473, 478, 486, 491, 506, 513, 518, 523, 523 (Sub-No. 1), 558, and 558 (Sub-No. 1) through (Sub-No. 27).

the proceeds to the railroad. The effect of this is to increase the cost of the securities to the railroad.

(3) The maturity mix and the type of instrument (equipment trust certificates, conditional sales agreements, long-term debt) of new security issues may be different from the average of existing securities. Because of the effect that length of maturity and type of security has on its current cost, the use of only new issues would not accurately measure the current cost.

(4) The quantity and quality of existing debt has an impact on the yield of new issues.

A. Bonds, Notes and Debentures

As in previous Cost of Capital determinations, calculations relating to the bond market value use market data for the composite railroad whenever possible, and calculations for the cost of bond debt rely entirely on market data.[5] Multiple sources for market data are available, and each source has its own criteria for including a financial instrument in its database. However, no market data will be available in any database for bonds that do not trade.[6] For 2024, yields and prices of the sample railroads' bonds, notes and debentures were obtained

[5] The terms "bonds" and "bonds, notes, and debentures" are used interchangeably herein.

[6] In some cases, a comparable bond method could be used, where yields for traded bonds could be used for non-traded bonds with similar qualities (maturity date and type of instrument), enabling the calculation of a probable market price. Another approach would be to construct a yield curve for a railroad. We have not recommended these approaches because the supply of bonds with market data is adequate.

from Bloomberg.[7] This source is the same data source used since the 2011 cost of capital determination. We were able to find data for 135 unique CUSIPs (bond identifiers).[8] The 135 bonds represent 99 percent of the book value of all railroad bonds belonging to the composite railroad. The bonds not included in the market value calculation are those that are either not in Bloomberg's database or were in the database but did not trade.

1. Market Value of Bonds, Notes, and Debentures

The average market value for traded bonds, notes, and debentures is calculated using the methodology employed in previous Cost of Capital proceedings. For each of the 130 bonds with market data in 2024, an average price is calculated based on the simple average of monthly prices. The prices represent what the investor is willing to pay for the bond given its coupon rate and maturity date. The market value is the average market price (stated as a price per hundred dollars of principal) times the amount of debt outstanding as of December 31, 2024.[9] Where market prices are not available (i.e., for instruments that did not trade or were not found in the Bloomberg database), the "face value" of the bond is assumed to be the price investors would pay. This assumption may slightly overstate the market value of some issues and understate the value of others, depending upon the relationship of the instruments' coupon rate and the current market rate. However, this possible variation is not likely to

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[7] Bloomberg's product is called Bloomberg Professional, and it is available as a subscription service. https://www.bloomberg.com/professional/

[8] A CUSIP number is a 9-character identification code used to identify a security. CUSIP is an abbreviation for Committee on Uniform Securities Identification Procedures.

[9] Securities that were newly issued during the year were prorated by the ratio of the number of months outstanding (rounded to the nearest half month) to the twelve-month year, as done in past proceedings.

significantly affect the overall estimate of the cost of debt capital, since the differences are likely to be both small and offsetting – and, most importantly, since 99.1 percent of the book value of bonds is priced at market. Table 2 summarizes the results of the market value calculations for 2024. The market value for bonds, notes, and debentures that traded is $55.82 billion, which is 99 percent of the total market value of $56.4 billion.

Table No. 2
Bonds, Notes and Debentures
Average Market Value

Railroad Co.	Traded Value ($000)	Non-Traded Value ($000)	Total Value ($000)	Weight Based on Traded
CSX	$16,122,984	$591,679	$16,714,664	28.88 %
NSC	$15,451,066	$0	15,451,066	27.68
UNP	$24,246,936	$0	24,246,936	43.44
Total	$55,820,986	$591,679	$56,412,666	100.00 %
Prior Year	$54,207,251	$591,679	$54,798,930	
Change	3.0%	0.0%	2.9%	

Although the number of bond offerings decreased in 2024, the total market value for bonds is up 2.9 percent from the previous year. Among the causes of this increase are existing debt offerings increasing in market value, as average yields decline.

Appendix A lists details for each of the 130 bonds, notes, and debentures belonging to the composite railroad that have trading data available for 2024 in the Bloomberg database. As footnoted earlier, there are a few cases where a similar series of bonds has been assigned two CUSIPs because a privately-placed portion trades among qualified institutional buyers instead of through an exchange, as allowed under the Securities and Exchange Commission's Rule

144A. All instruments are summarized for each sample railroad in the front of the Appendix. Book values for non-traded debt are also listed.

2. Current Cost of Bonds, Notes, and Debentures

Table 3 summarizes the yield or cost of each railroad's debt (bonds, notes, and debentures), which, when weighted by the market value of the traded debt (as shown in Table 3), determines the sample composite cost of bonds, notes and debentures. The weighted average is 5.176 percent, which is 0.074 percentage points lower than 2023's figure of 5.250 percent.

Table No. 3
Bonds, Notes and Debentures
Weighted Current Cost

Railroad Co.	Weight		Current Cost	
CSX	28.88	%	5.146	%
NSC	27.68		5.303	
UNP	43.44		5.115	
Total	100.00	%	5.176	%

As noted earlier, the current cost for bonds, notes, and debentures is based on traded instruments issued by the sample railroads. Appendix A contains the average yield for each of the 130 securities that traded according to Bloomberg's database. The average yield for each security is a simple average of the twelve month-end yields. The traded portion of Appendix A (in the front section) summarizes the yield, or cost of each railroad's debt, which, when weighted by the market value of the traded debt, determines the sample composite cost of bonds, notes and debentures of 5.176 percent. The weights used in Table 3, as derived from

the calculations in Table 2, are also based on the traded portion of bonds, notes and debentures listed in Appendix A.

B. Equipment Trust Certificates

Equipment Trust Certificates (ETCs) are debt obligations that are secured by the particular equipment which is acquired with the instrument's proceeds. In the event of default, creditors may repossess and resell or lease the equipment to pay off the debt obligations. This type of security has declined in popularity. In the 1990 cost of capital determination, ETCs accounted for 17.70 percent of the market value for the sum of bonds, ETCs, and conditional sales agreements.[10] For 2024, this percentage is 1.25 percent. Because entire ETCs are not actively traded in secondary markets, it is necessary to determine their cost by examining the return on other debt securities that are actively traded.

An ETC is generally serially issued. As such, each year during its life an equal amount (typically 1/15th) of the original amount must be retired. Consequently, an ETC may be thought of as a series of individual, annually-retiring bonds. In fact, when ETCs are issued, each of the maturities is sold independently from the others. A serially issued debt instrument provides an investor with the ability to purchase only those maturities of particular interest. To correctly compute the composite yield on a serially issued bond, the internal rate of return on the bond's principal and interest payments must be calculated.

[10] See Table 1 in ICC Ex Parte No. 491, decided June 12, 1991. Conditional Sales Agreements accounted for an additional 2.46 percent of debt in the market value calculation.

To compare ETCs to other debt instruments, the yields to maturity (as detailed in Appendix B) for government bills, notes, and bonds having the same range of maturities as current ETCs were obtained from Federal Reserve data. The yield curve for these government securities (also in Appendix B) shows the relationship between the current costs, or yields to maturity, and maturity dates for government bonds (which, unlike ETCs, are actively traded in secondary markets).

These yield data have been adjusted by the Federal Reserve Board to reflect constant maturities, such that the data accurately reflect the 2024 relationships between yields and maturities. After determining the yields to maturity for government bonds of maturities similar to those of an ETC, those yields are adjusted to reflect the risk associated with the ETCs as compared to government bonds. This adjustment is the risk premium for railroad ETCs, which is the spread between ETCs and government securities.

In 2014, 2015, and 2016, a railroad issued new ETCs with interest rate spreads above government bonds of 76, 44, and 70 basis points, respectively. Since there were no new ETCs issued between 2016 and 2024, the 70 basis point spread is our most recent calculation, and I have used that difference for 2024. For comparisons, Table 4 lists historical spreads used since 2003 and the spread proposed for 2024.[11] Other than the spread for data year 2015, which appears to be an anomaly, the spread of 70 basis points is the lowest spread used in this century.

[11] The 70 basis point spread was calculated using the same method that was used in 2008, 2010, 2014, 2015, and 2016, and calculations were included in work papers submitted with each verified statements.

Table No. 4
History of Premiums for
Equipment Trust Certificates (ETC)

Data Year	Proceeding	Basis Points
2003	Ex Parte No. 558 (Sub-No. 7)	114
2004	Ex Parte No. 558 (Sub-No. 8)	114
2005	Ex Parte No. 558 (Sub-No. 9)	114
2006	Ex Parte No. 558 (Sub-No. 10)	114
2007	Ex Parte No. 558 (Sub-No. 11)	125
2008	Ex Parte No. 558 (Sub-No. 12)	125
2009	Ex Parte No. 558 (Sub-No. 13)	80
2010	Ex Parte No. 558 (Sub-No. 14)	80
2011	Ex Parte No. 558 (Sub-No. 15)	80
2012	Ex Parte No. 558 (Sub-No. 16)	80
2013	Ex Parte No. 558 (Sub-No. 17)	80
2014	Ex Parte No. 558 (Sub-No. 18)	76
2015	Ex Parte No. 558 (Sub-No. 19)	44
2016	Ex Parte No. 558 (Sub-No. 20)	70
2017	Ex Parte No. 558 (Sub-No. 21)	70
2018	Ex Parte No. 558 (Sub-No. 22)	70
2019	Ex Parte No. 558 (Sub-No. 23)	70
2020	Ex Parte No. 558 (Sub-No. 24)	70
2021	Ex Parte No. 558 (Sub-No. 25)	70
2022	Ex Parte No. 558 (Sub-No. 26)	70
2023	Ex Parte No. 558 (Sub-No. 27)	70
2024	Proposed for EP 558 (Sub-No. 28)	70

Source for 2003-2024: STB Cost of Capital Decisions.

The methodology used to determine the cost of ETC debt is the same as the method employed and approved in previous proceedings. Risk-adjusted yields provide the basis to value each ETC. Using formulae suggested by *Standard Security Calculation Methods,* the market value of each maturity comprising an ETC is determined. In effect, these formulae make it possible to determine the price investors would pay in 2024 for the contractual interest payments and price appreciation for holding the instrument. It is the most accurate way to

compute the current cost of ETCs to the firm for the defined period. Computing the internal rate of return of the ETC prices and their associated cash flow streams establishes the current cost for ETCs. The weighted-average cost for all modeled Equipment Trust Certificates is shown in Table 5.[12]

Table No. 5
Summary of Equipment Trust Certificates Modeled for 2024
($000)

Railroad	Amount Outstanding Beg.	Ending	Average	Yield	Current Market Value	Current Interest Amount	No. ETC
CSX	$0	$0	$0	--	$0	$0	0
NS	0	0	0	--	0	0	0
UP	768,144	731,873	750,009	5.069%	716,483	36,322	4
Total	$768,144	$731,873	$750,009	5.069%	$716,483	$36,322	4

Weighing railroad yield (there was only one railroad) by its current market value for modeled ETCs results in a current cost of 5.069 percent. The average rate is higher than the

[12] The formulae used to value these bonds are standards of the security industry. They are:

For bonds with less than six months to maturity:

$$DP = \left[\frac{100 + C/2}{1 + DY/360}\right] - \left[C/2\ \frac{(180 - D)}{180}\right]$$

For bonds with six months or longer to maturity:

$$DP = \left[\frac{100}{(1 + Y/2)_{\text{EXP}}(N - 1 + D/180)}\right] + \left[\sum_{k=1}^{N} \frac{C/2}{(1 + Y/2)_{\text{EXP}}(K - 1 + D/180)}\right] - \left[C/2\frac{(180 - D)}{180}\right]$$

Where:
- DP = Dollar price of the bond
- C = Coupon rate as a percent per year
- D = Number of days from settlement date to coupon date
- Y = Yield to maturity as a decimal per year
- EXP = Raise the term on the left to the power indicated by the term on the right
- N = Whole number of coupons payable plus 13
- K = Compute for K, values 1 to N and sum the results

4.957 percent found for 2023. In this year's case, the premium used in the model is the same as last year – so the higher yield curve for 2024 reflects the higher interest rates on government securities (See Appendix B). Appendix C lists each ETC, and includes a market value and a current yield for those modeled. (Union Pacific is the only railroad using ETCs currently.) Appendix C also lists ETCs that were not modeled (and those current, which are not used). There were no current ETCs this year. ETCs can fail to be modeled for two reasons: (1) the ETC instrument does not have all of the characteristics typical of an ETC; or (2) the ETC has a floating rate (instead of fixed) making its rate for a particular future year uncertain. There were no non-modeled ETCs this year. The market value of all modeled ETCs is $750.0 million.

C. Conditional Sales Agreements

Conditional Sales Agreements (CSAs) are another form of railroad financing that is treated by investors as debt securities, because their interest obligations are essentially the same as interest obligations on ETCs. Like ETCs, CSAs are not generally traded in secondary markets. Accordingly, as in prior proceedings, their current cost can be determined from current yields on government bonds in a similar manner to ETCs, using a 1997 relationship between CSAs and ETCs to determine the yield spread over government bonds. As in other recent years, no CSAs were outstanding in 2024 – so none were modeled and none were added to Miscellaneous Debt. No CSAs have been modeled since 2010, and none have been outstanding (non-modeled or current) since 2014. There is no appendix for CSAs.

D. All Other Debt

Capital leases and miscellaneous debt, which are normally relatively small amounts outstanding, are listed as All Other Debt. To comply with past decisions of the Board, non-modeled Equipment Trust Certificates and Conditional Sales Agreements would have been listed in this category had there been any this year. Capital leases are the largest portion of the All Other Debt category.

Capital leases are contracts between two parties and as such take many forms.[13] Since capital leases are not traded in the marketplace, their current cost is not directly observable. The lack of complete information with respect to leases necessitates that many assumptions be made to estimate their current cost and their values. For market value purposes, capital leases are included at book value. Given the large number of these leases and the significant differences among their terms, this is the only practical option available. Because the cost of capital calculation assigns this debt a cost based on traded or modeled securities (bonds, notes, debentures, ETCs and CSAs) that typically have a lower cost, the cost used for capital leases will be somewhat understated. The book value (assumed market value) of capital leases for 2024 is $123.5 million.

Miscellaneous debt, such as floating rate loans, demand deposits, premiums/discounts, and various instruments with extremely small amounts outstanding are also excluded from the

[13] *See* generally 49 C.F.R. 1201, 2–20 for definitions.

current cost computations. However, miscellaneous debt is valued at negative $1,238.45 million because in 2024 it consists mostly of discounts and unamortized debt issuance costs.

Capital leases and miscellaneous debt, when combined, net to negative $1,114.9 million and there were zero non-modeled ETCs. Therefore, All Other Debt as a percent of the total market value of debt of the composite railroad is negative 1.99 percent. Miscellaneous debt is lower than it was for 2023, and much of the decrease was caused by capital leases and discounts. More detail on Miscellaneous Debt can be found in the Debt Reconciliation portion of my work papers. This treatment of All Other Debt is the same approach used in the previous cost of capital proceeding.[14]

E. Market Value of Debt

Table 6 summarizes the total market value for each debt category. The total market value for traded and non-traded debt is $56,014 million.

Table No. 6
Market Value of Debt ($000)

Type of Debt	Market Value	Percent of Total	Percent of Subtotal
Bonds, Notes & Debentures	$56,412,666	100.71 %	98.75 %
Equipment Trust Certificates	716,483	1.28	1.25
Conditional Sales Agreements	0	0.00	0.00
Subtotal	57,129,148	101.99	100.00 %
All Other Debt*	-1,114,946	-1.99	
Total	$56,014,202	100.00 %	

* If any ETCs or CSAs are not modeled, they are included in All Other Debt.

[14] Non-modeled ETCs and/or CSAs would also have been included in the All Other category if there had been any.

Bonds, Notes, and Debentures (Bonds) account for 100.7 percent of the total market value. More details can be found in Appendix D. As can be computed from that appendix, 99 percent of the Bonds' market value is determined by the results of trading throughout the year, while the remaining portion is based upon the book value of non-traded bonds.

Current costs can be determined for three of the four debt categories Bonds, Equipment Trust Certificates, and Conditional Sales Agreements, had there been any. Therefore, in 2024, the weighted average cost of debt is based upon these three (of the four) debt categories (see subtotal column). The total market value of debt, used to determine the weight for debt in the overall cost of capital calculation, includes all four categories.

F. Flotation Costs for Debt Capital

The cost of issuing new debt generally has two portions. First, when new debt is issued by a negotiated offering or a competitive bid, the issuing firm pays a fee to the investment banking firm or firms handling the offer. These fees cover the banker's administrative costs in handling the sale and profits. Second, the issuer incurs expenses such as legal, accounting, and printing. Those types of expenses are quantified in the Securities and Exchange Commission's Form 424(b)(5) or 424(b)(2), as are the investment banker's fee and other details of new debt offerings. Flotation costs generally vary by type of security. For ETCs and CSAs, the fees are extremely small, but costs increase as the administrative burden and underwriting risk increase (i.e., in order of increasing cost ETCs and CSAs, bonds and notes, convertible bonds, and preferred stock and common stock). As discussed below, flotation costs directly reduce the gross proceeds available to the issuing firm.

An example helps to illustrate how flotation costs permanently increase the cost of debt capital to the railroad. If a railroad sells a 10-year bond with an annual coupon of 15 percent and investors are willing to pay $98 for each $100 in face value, the effective yield on the bond is 15.40 percent. Because the investment banker requires compensation (flotation costs) for his work, the railroad does not receive the full $98 from the investors. In addition, the railroad will have its own internal costs such as legal and accounting. If flotation costs reduce the net proceeds to say $96, the effective cost to the railroad over the life of the bond is 15.82 percent. Therefore, flotation costs have increased the cost of debt from 15.40 to 15.82, or by 42 basis points. Proper accounting treatment requires the $4 per $100 ($100 - $96) to be amortized on a straight line basis over the life of the bond. In addition, the Uniform System of Accounts requires the annual amortization to be charged directly to Account No. 548, Amortization of Discount on Funded Debt, a fixed charge item. This results in fixed charges for the year totaling $15.40 ($15.00 coupon payment + amortization of $0.20 discount + $0.20 flotation costs). It is important to note that these flotation costs are not recovered through operating costs but are fixed charges each year during the life of the bond. Also, it is evident that in order to reflect the total current cost of debt, flotation costs must be included.

Any firm requires the opportunity to cover flotation costs before it will have an incentive to make future capital expenditures. Before creditors will lend their funds, they must be assured that the railroad will have the opportunity to earn returns sufficient to cover all costs.

Using the same methodology used since 2008, I calculated 2024 flotation costs for bonds using publicly available data from electronic filings with the Securities and Exchange

Commission (SEC).[15] The filing types are "Prospectus Rule 424(b)(2)" and "Prospectus Rule 424(b)(5)". In addition to standard bond information such as coupon and maturity date, these filings also provide the price to investors, underwriter's fee, and railroad expenses excluding the underwriter's fee. I have calculated a yield based on the price to investors and a yield that also included flotation costs. The difference between the two yields is the flotation cost expressed in percentage points. For 2024, only one new issue was reported with a flotation cost of 0.061 percentage points, which is .037 points lower than the average figure used by the Board for 2023. As before, debt exchanges have not been included. Page 1 of Appendix E contains a table with input data and calculations. Pages 2 and 3 of the same appendix contain, as an example, the pages from the SEC filing that were used as a source for one of the filings. The source filings for all of the new bond issues have been included in my work papers. I believe the new railroad debt issued, which was issued by CSX, provide the best information to determine flotation costs for 2024, and I have therefore used 0.061 percentage points for the flotation costs for bonds.

Flotation costs for ETCs have much less significance compared to bonds simply because ETCs are less than 2 percent of the market value of the debt used to determine the current cost of debt. I have calculated flotation costs for ETCs using the same methodology used in the previous Cost of Capital decision, although it has some flaws. See the testimony for 2012 for a discussion of the incorrect assumption used with the current method. Because ETCs are such a

[15] The SEC's EDGAR (Electronic Data Gathering, Analysis, and Retrieval) system is available on the internet at the following address: https://www.sec.gov/edgar.shtml .

small portion of total debt, this flawed method for estimating flotation costs for ETCs does not affect the cost of debt, so I have not expended resources with an alternative method.

The Securities and Exchange Commission (SEC) conducted a study of flotation costs using railroad ETC data for the years 1951, 1952 and 1955.[16] In that study, the SEC determined that ETC flotation costs averaged 0.89 percent of gross proceeds. My calculation uses this old study, the flawed assumption about average railroad yields, and assumes the duration is 15 years. This methodology, suggested by a third party in 2008, was first approved by the Board in its cost of capital for 2007 decision served September 26, 2008.

Table 7 below calculates flotation costs for ETCs using the flotation percent of gross proceeds discussed above. No flotation costs have been calculated for CSAs, as none have been modeled.

Table No. 7
Flotation Costs for
Equipment Trust Certificates

Given	**ETC**
Flotation Costs as Pct of Gross Proceeds	0.890%
Avg. Railroad Yields (Table 5)	5.069%
Assumed Duration of New Instrument (Yrs)	15
Calculated	
Price After Flotation Costs	$99.11
Effective Yield Including Flotation Costs	5.155%
Difference Between Yields With and Without Floatation Costs =	
Flotation Cost as Percentage Points	**0.086%**

[16] *Cost of Flotation of Corporate Securities 1951-1955,* Securities and Exchange Commission, June 1957.

In this calculation, current average yields on railroad ETCs are assumed to be equal to the yield resulting from the price to investors for a new issue (a flawed assumption because the current yields and new issues are on *different places in the yield curve*). Coupons are assumed to be paid twice per year. The duration for new ETCs is assumed to be 15 years. Given the input data, effective yields can be calculated, and the difference between the yields excluding flotation costs and the yields including flotation costs are the flotation costs measured in percentage points. The results are flotation costs for ETCs of 0.086 percent – which is the same as 2023.

To compute the overall effect of flotation cost on debt, the market value weight of the debt outstanding is multiplied by the respective flotation cost. The weights for each type of debt are based on market values for debt (excluding All Other Debt), as found in the Percent of Subtotal column in Table 6. All Other Debt is excluded from the weight calculation, since a current cost of debt for that category has not been determined. As shown in Table 8, flotation costs increase the cost of debt by 0.061 percentage.

Table No. 8
Flotation Costs For Debt

Type of Debt	Market Weight	Flotation Cost
Bonds, Notes & Debentures	98.75%	0.061%
Equipment Trust Certificates	1.25%	0.086%
Conditional Sales Agreements	0.00%	not calculated
Total	100.00%	0.061%

This flotation cost for 2023 is 0.037 percentage points lower than the number used by the Board in its 2023 Cost of Capital decision. Since bonds have a market weight of over 98

percent, flotation costs for total debt rounds to the same number as the flotation costs for bonds.

G. Conclusion as to the Cost of Debt Capital

To determine the overall composite current cost of debt, the current cost of each of three categories of debt (Bonds, ETCs and CSAs) is multiplied by its market value proportion. Market values are properly used in this connection, because they represent the amounts on which the current cost must be paid. Table 9 shows the results of this calculation.

Table No. 9
Composite Current Cost Of Debt

Type of Debt	Market Weight	Current Cost
Bonds, Notes & Debentures	98.75%	5.176%
Equipment Trust Certificates	1.25%	5.069%
Conditional Sales Agreements	0.00%	--
Subtotal	100.00%	5.175%
Flotation Costs		0.061%
Weighted Cost of Debt		5.236%
Weighted Cost of Debt (Rounded)		**5.24%**

The current weighted cost of debt before flotation costs is 5.175 percent. The addition of flotation costs results in a rounded cost of debt of 5.24 percent. This cost of debt is lower than the 2023 of 5.34 percent.[17] A summary for the 2024 calculation of the overall cost of debt

[17] The AAR's *Railroad Facts* book lists the cost of debt decided by the Board and its predecessor. The 2013 edition contains, on page 19, data from 1978 through 2012. The 2024 edition lists, on page 20, data from 1991 through 2023.

is provided in Appendix F. That appendix also has some historical costs of debt for comparisons.

IV Common Equity Capital In 2024

A. The Market Value of Common Equity Capital

The market value of common equity is based on stock prices and shares outstanding for 2024. Table 10 below summarizes the market value calculation. The Weight column, which is not used directly in our calculation, is provided as additional information.

Table No. 10
Average Market Value
For Common Equity in 2024

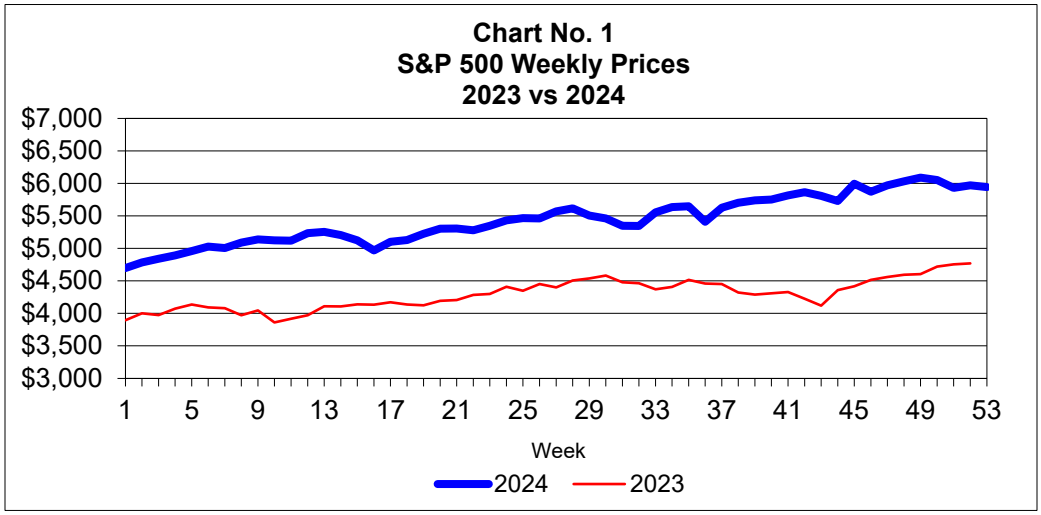
Railroad Co.	Value ($000)	Weight %	
CSX	67,455,124.8	25.13	
NSC	55,015,323.1	20.49	
UNP	146,012,884.2	54.38	
Total	$268,483,332.1	100.00	%
Prior Year	$241,768,248.0		
Change	11.0%		

Details of the calculation are presented in Appendix G. Weekly market values were calculated for each railroad using shares outstanding data from railroad 10-Q and 10-K reports multiplied by stock prices at the close of each week in 2024.[18] Note that the week beginning on March 25 ends on Thursday March 28 because of the Good Friday holiday. Thus, any railroad

[18] The 10-Q and 10-K reports are filed with the US. Securities and Exchange Commission (SEC) and are available from railroad web sites or the SEC web site.

shares outstanding change effective on March 29 would not happen until the following week because the market was closed on March 29. Page 5 of Appendix G lists all full-day stock market holidays. Page 4 of the appendix lists the holiday that caused any week to not begin trading on a Monday or end trading on a Friday. Calculations for 2024 included 53 weeks. Week 1 began on Tuesday January 2, 2024, and is the first week after 2023's week 52 used in last year's calculation. The week beginning Monday December 30, 2024, qualifies as the final week for 2024. Thus, 2024 is a 53-week year for the purpose of calculating the market value of common equity.

The 53-week average market capitalization of the composite railroad (the three railroads that comprise the composite sample), listed in Table 10 and on page 4 of Appendix G, is $268.5 billion. This is an 11.0 percent increase from last year's average.



As shown in Chart 1, the stock market in general, as represented by the Standard & Poor's 500, was higher in 2024 than it was in 2023. The S&P 500 finished the year 26.8 percent higher than it had been a year earlier.

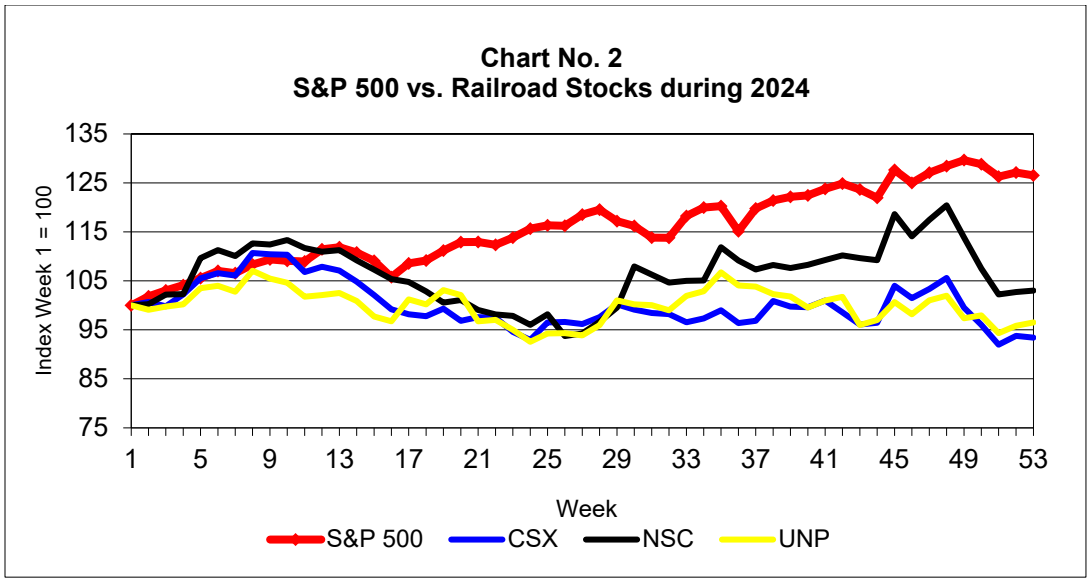


Chart 2 compares stock performance for 2024. In 2024, the railroads performed lower than the Standard & Poor's 500 index. Stocks with betas of approximately 1.0 (see more on betas in section 3) move with the market, as illustrated in the chart (especially shown in the first 17 weeks of the year).

B. The Capital Asset Pricing Model (CAPM)

The cost of equity is a measure of investor expectations, including the opportunity cost of investing in a share of a firm's stock; i.e., the expected rate of return that investors require on the market value (purchase price) of the stock in light of alternative investment opportunities of comparable risk. Because investor expectations are not directly observable, analysts have developed methods of inferring the cost of equity from available financial data. There are several methods available to estimate the cost of equity. Two of these methods, the Capital Asset Pricing Model (CAPM) and a Multi-Stage Discounted Cash Flow model (MSDCF) are used in this statement to compute an estimate for the cost of equity — in accordance with

STB Ex Parte No. 558 (Sub No. 28). The CAPM is discussed herein, and the MSDCF is discussed in the next section.

The CAPM relies on historical measurements of the risk and returns of assets in the market to forecast the likely future risk-return relationship governing the cost of capital. The theory underlying the CAPM is that an investor seeks a risk-free return plus a premium that is dependent upon risk. Since all of the principal elements of the CAPM (the risk-free rate, the market risk premium, and the beta) are estimated using historical data and relationships computed from that data, the CAPM is essentially a backward look at how equity markets have historically regarded a particular firm or group of firms. The backward-looking nature of the CAPM means that it may not fully capture contemporaneous changes in the market or reflect the impact of current operational, financial, political or economic trends and events on market valuations or risk perceptions. The CAPM is also sensitive to changes in the risk-free rate, which is determined as of the estimation date. In formulaic terms, the cost of equity as estimated by the CAPM may be expressed as:

$$K = RF + \text{beta}\ (MRP)$$

Where K = the firm's cost of equity,
RF = the risk-free rate,
MRP = the market's risk premium, and
beta = the coefficient of systematic, non-diversifiable risk of the stock.

Therefore, each firm's cost of equity above the risk-free rate depends on the market risk premium adjusted for the non-diversifiable risk of its common stock, with the adjustment factor represented in the model as beta. The risk-free rate (RF) is typically represented by the rate of a U.S. Government (Treasury) instrument. As the risk-free rate enters the CAPM linearly, the

impact of a change in the risk-free rate is one-for-one. Moreover, fluctuations in the risk-free rate might primarily reflect shifts in monetary policy rather than variations in the cost of capital for private firms. Consequently, during periods of significant financial uncertainty, the model may yield biased outcomes. The market risk premium (MRP) is the expected future difference between returns for the overall stock market and risk-free returns. That expected difference is typically estimated using historical differences. Beta is the coefficient of systematic, non-diversifiable risk of the stock, which depends on its volatility and its correlation with the overall stock market. The beta for the overall stock market is 1.0. Firms with higher risk will have a beta above 1.0, while firms with lower risk will have a beta below 1.0. As with the market risk premium, betas are also typically estimated using historical relationships. The methodology used for the CAPM calculation — including details for using certain inputs — follows the methodology prescribed and used by the STB in the 2023 Cost of Capital decision.[19]

1. Risk-Free Rate (RF)

In all decisions regarding the CAPM, the Board has specified a risk-free rate based on an average yield to maturity for a 20-year U.S. Treasury Bond. The average yield-to-maturities for U.S. Treasury Bonds are available from the Federal Reserve web site, and I have again utilized this resource to retrieve data for 2024.[20] A copy of the "download" from the Federal Reserve web site is included in my work papers. Table 11 lists a 10-year history of this bond. As the

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[19] *Railroad Cost of Capital – 2023,* EP 558 (Sub-No. 27) (STB served August 7, 2024).

[20] Federal Reserve's new web site is https://www.federalreserve.gov/datadownload/Choose.aspx?rel=H15. For Data set, choose Selected Interest Rates. For Instrument, select U.S. government securities/Treasury constant maturities/Nominal. For Maturity, select 20-year. For Frequency, select Annual.

table shows, the average rate for 20-Year U.S. Treasury Bonds in 2024 is an increase from the previous year. Appendix H lists all of the annual 20-Year U.S. Treasury Bond rates available since 1980. The 20-year rate for 2020 was the lowest rate during that period, and 2021 is the second-lowest.[21]

Table No. 11
20-Year U.S. Treasury Bonds 2015 - 2024

Year	Average Annual Rate
2015	2.55 %
2016	2.22
2017	2.65
2018	3.02
2019	2.40
2020	1.35
2021	1.98
2022	3.30
2023	4.26
2024	4.50

Source: Federal Reserve

Using the average yield to maturity in 2024 for a 20-year U.S. Treasury Bond, as directed in STB Ex Parte No. 558 (Sub No. 28), the CAPM's risk-free rate is 4.50 percent.

2. Market Risk Premium (MRP)

In previous decisions, the STB has required that the market risk premium (a.k.a. equity risk premium) calculation begin with year 1926, which is a standard approach. The Standard &

[21] The Federal Reserve Board has two series for 20-Year Treasury Bonds. The first data set is from 1962 through 1986. The second set has data from 1993 to current. Rates from the two data sets are listed in my work papers. There are no data for 1987 through 1992.

Poor's 500 Index is to be used as the representative of the market — also a standard approach. The STB's decision also stated that the "data are also available from a variety of commercial vendors, including Ibbotson."

In the 2006 through 2012 Cost of Capital determinations, the well-regarded and widely-accepted Ibbotson Equity Risk Premium was used. The premium was listed in the *Ibbotson SBBI Valuation Yearbook* published by Morningstar.[22] This premium is the long-horizon equity risk premium, using the S&P 500 and data beginning with 1926. Although Morningstar discontinued its *Ibbotson SBBI Valuation Yearbook,* it published the same long-horizon equity risk premium in the *Ibbotson SBBI Classic Yearbook.* This source was used for 2013 and 2014 equity risk premiums.

In 2015 and 2016, yet another source of data was needed, as Morningstar decided to discontinue its *Ibbotson SBBI Classic Yearbook.* The valuation and financial advisory firm Duff & Phelps maintains many of the same series formerly published by Ibbotson, and their *Valuation Handbook-U.S. Guide to Cost of Capital* included a page that listed the long-horizon expected equity risk premium.[23] The Duff & Phelps *Valuation Handbook-U.S. Guide to Cost of Capital* was the source used to obtain the 2015 and 2016 equity risk premiums. In 2018, however, Duff & Phelps decided to discontinue the publication of that book in hardcover form, which would

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[22] Ibbotson Associates is a wholly-owned subsidiary of Morningstar, Inc. "SBBI" stands for "Stocks, Bonds, Bills, and Inflation.

[23] The Duff & Phelps *2017 Valuation Handbook – Guide to Cost of Capital* was published by John Wiley & Sons. The handbook listed the premium on page 36 of chapter 3 (and page 14 of chapter 5). The last sentence of Footnote 5-16 (on page 14 of Chapter 5) in the Handbook says "The long-horizon historical equity risk premium was previously published on the "back page" of the Morningstar/Ibbotson SBBI Valuation Yearbook (discontinued)."

have been used as the source for the 2017 equity risk premium. Although the physical book is no longer be published, Duff & Phelps has developed an online tool called the *Cost of Capital Navigator*, and the data that would have been published in the *Valuation Handbook-U.S. Guide to Cost of Capital* are available in the online *Cost of Capital Navigator*.[24] The *Cost of Capital Navigator* contains the "Long-horizon expected equity risk premium (historical)", which is calculated using "large company stock total returns minus long-term government bond income returns", beginning 1926. This premium is calculated using the same method as that used by Ibbotson to calculate the market risk premiums used in previous cost of capital determinations. For 2024, the online Duff & Phelps *Cost of Capital Navigator* shows this premium as 7.31 percent (note that Duff & Phelps is now a Kroll company). There was no change from the figure used by the Board for 2023. (Page 1 of my Appendix H shows Equity Risk Premiums since 1980, and page 2 shows a screen shot of the on-line source for the 2024 equity risk premium.) Thus, I used 7.31 percent as the rate for the CAPM's market risk premium.

3. Beta

The STB Ex Parte No. 664 decision requires parties to calculate the CAPM's beta using a portfolio of weekly, merger-adjusted stock returns for the prior five years in the following equation:

[24] The References section of the online *Cost of Capital Navigator* contains the same data, in the same chapter format, that would have been published in the *Valuation Handbook – U.S. Guide to Cost of Capital*. It is essentially an online book, instead of a hardcover book.

$$R - SRRF = Alpha + beta\ (RM - SRRF) + E$$

Where:

R	= merger and dividend-adjusted stock returns for the portfolio of railroads;[25]
SRRF	= short-run risk-free rate represented by 3-mo. U.S. Treasury Bills;
alpha	= constant term;
beta	= coefficient of systematic, non-diversifiable risk;
RM	= return for the market, represented by the S&P 500; and
E	= random error term.

In its Railroad Cost of Capital – 2006 decision, the STB clarified its beta calculation methodology. The STB noted that "[t]he proper way to arrive at the weekly portfolio change is to calculate the weekly stock percentage change for each firm, weighted by that firm's share of the industry as a whole." The STB also determined that the Standard & Poor's 500 Price Index, which is publicly available, should be used as a proxy for the Standard & Poor's 500 Total Return Index, unless the Total Return Index is made available to the public.

Using the STB instructions, the value for beta can be solved for by using a linear regression. The railroad portfolio return less the short-term risk free rate is the dependent variable, while the market return less the risk free rate is the independent variable. The regression's random error term is unknown, the intercept is the alpha, and the coefficient for the explanatory variable is the beta.

The raw regression data set used in the AAR calculation has normally been derived from publicly available data from web sites on the internet (for further information, see the work

[25] Railroads must meet the screening criteria set forth in *Railroad Cost of Capital – 1984* and modified recently by the Board in Revisions to the *Cost-of-Capital Composite Railroad Criteria*.

papers). Due to Yahoo data quality concerns in the prior years, we used Bloomberg stock price data for 2024.

As instructed, I have used weekly stock price data for the prior five years. The raw data consists of weekly observations from the last week of 2019 (Week 0) through the last week of 2024 (Week 261). Bloomberg identifies each week in the data set by the last trading day of the week (typically Friday), which means that the stock price data and the identification of the week are the same.[26] Week 1 in the regression data set is the week ending Friday, January 10, 2020 (or beginning Monday January 6, 2020).[27] This week meets the Board's criterion to qualify as week 1 because it is the first week to contain 3 or more trading days in 2020. The last week of 2024, Week 261, began on Monday, December 30. Week 0 began in 2019 on Monday December 30, and it is *not* directly used in our regression for beta. The purpose of having a Week 0 is to be able to calculate the return for Week 1 and to have a weight for the beginning (instead of the end) of Week 1. This enables a Week 1 return to be included in the regression data set as clarified by the Board on page 7 of its 2008 cost of capital decision.[28]

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[26] In some cases, stock did not trade on Friday. For example, trading during Week 221 ended Thursday, March 28, 2024, because Friday, March 29, 2024, was the Good Friday holiday. There are also cases where the first trading day of the week was not Monday because of a holiday. For example, Week 210 began on Tuesday, January 16, because of the Martin Luther King Day holiday on January 15.

[27] Following the Board's clarification in Ex Parte No. 558 (Sub-No. 12), the week beginning January 6, 2020, is the first week in the relevant year that contains 3 or more trading days. The previous week had two trading days in 2020.

[28] EP 558 (Sub-No. 12), (STB served Sept. 25, 2009).

Three categories of data are necessary for the raw regression data set. First, weekly stock prices for CSX, NSC, and UNP are acquired.[29] The price index values for Standard & Poor's 500 Price Index were also downloaded. Stock prices adjusted for dividends and splits are used to calculate the regression's dependent variable, while prices that are only adjusted for splits are used for weighting.[30]

The second category of data is shares outstanding. Stock shares outstanding, and an effective date, were gathered from each railroad's 10-Q and 10-K reports. The shares outstanding data were adjusted for stock splits, if necessary. For each railroad, a shares outstanding value is assigned to each week based upon the latest available 10-Q or 10-K submissions by that railroad to the Securities and Exchange Commission.[31] In some cases, the last trading day of a week was actually a Thursday (Good Friday is always a holiday for the U.S. stock markets), and this can affect the shares outstanding used. All of the days stocks traded, and stock market holidays, are listed in my work papers.

The final category of raw data is the rate for 3-Month U.S. Treasury Bills. These securities are also known as 13-Week Treasury Bills or 90-Day Treasury Bills. The Treasury Bill

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[29] CSX Corporation has a stock symbol of CSX, Norfolk Southern Corporation is NSC, and Union Pacific Corporation is UNP.

[30] The dividend-adjusted values may differ for a given week if the data are downloaded at different times during the year, especially if dividends have been paid during the interim time. The difference typically affects the fourth digit after the decimal of the beta calculations. The current data sets were downloaded March 19, 2025, and the range of data was from 12/20/2019 through 1/10/2025.

[31] Shares outstanding are updated using the first Friday on (provided the stock traded that day), or after, the effective date listed in the 10-Q and 10-K reports – since Friday's (or the end of the week) stock price is used.

rates are acquired from the Federal Reserve web site, and the "download" is included in my work papers.

SAS statistical software was used to prepare the regression data set from the raw data.[32] The weekly stock percentage change for each railroad was calculated and weighted by that railroad's share of the industry as a whole to create a composite railroad return.[33] Weekly returns are also calculated for the Standard & Poor's 500 Price Index (the proxy for the market as a whole). Each week's three-month Treasury Bill rate, which is the measure employed for the short-run risk-free rate, is restated from an annual to a weekly rate to make it comparable to the weekly returns. The method used to convert from an annual rate to a weekly rate accounts for compounding. The weekly Treasury Bill rates are then deducted from the composite railroad portfolio returns and market returns as was done in the previous cost of capital submissions. The resulting regression data set has 261 observations (weeks 1 through 261), since week 0 of the raw data set was used only to calculate a weighted return for week 1.

The SAS General Linear Model procedure (Proc GLM) was used to calculate the regression, with composite railroad returns less the short-run risk-free rate as the dependent variable and the market returns less the short-run risk-free rate as the independent variable. As a check against our beta calculations, a spreadsheet has also been utilized to calculate the beta using a linear regression, and the results matched the SAS calculation. As specified by the STB decisions, the regression includes an intercept. Appendix I contains a summary of the

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[32] SAS Institute Inc., Cary, NC.

[33] Since the weight needs to be the weight at the beginning of the week instead of the end of the week, data from the end of the previous period are used to represent the beginning of the current period.

regression using SAS. The beta is the estimate of the parameter shown on the bottom of the Appendix page. The entire SAS printout and a spreadsheet version are included in my workpapers. The regression using the Bloomberg data resulted in a beta estimate of 0.947848176 using a spreadsheet, and 0.9478454593 using SAS – both round to .9478.[34]

The 2024 beta is lower than the beta for 2023 (0.9858) and is the lowest since 2009. We have evaluated our beta calculation by comparing it to previous years and expectations. The value of .9478 for beta is used as an input to the CAPM.

4. Cost of Common Equity Using the CAPM

A review of the Capital Asset Pricing Model (CAPM) is as follows:

K = RF + beta (MRP)

Where K = the cost of equity for the portfolio of railroads,
RF = the risk-free rate,
MRP = the market's risk premium, and
beta = coefficient of systematic, non-diversifiable risk.

Our CAPM used the methodology endorsed by the STB in the previous cost of capital determination, Ex Parte No. 558 (Sub-No. 27). Table 12 is a summary of our CAPM cost of common equity calculation, which resulted in an average 2024 cost of equity estimate for the composite railroad of 11.43 percent. This is an increase from 2023's 11.33 percent.

[34] Differences between the SAS regression and the spreadsheet regression were probably caused by the number of digits after the decimal allowed in the data sets by the two software packages.

Table No. 12
Cost of Common Equity
Using STB's Capital Asset Pricing Model

Inputs to Model	**2024**		**2023**		
Risk-Free Rate	4.50	%	4.26	%	Table No. 11
Market Risk Premium	7.31		7.17		Appendix H
Beta	0.9478		0.9858		Appendix I
Calculation					
Risk-Free Rate	4.50		4.26		Given
Plus: Beta Adj. Risk Premium	6.93		7.07		Beta x MRP
CAPM Cost of Equity	11.43	%	11.33	%	RF Rate + Prem.

C. The Multi-Stage Discounted Cash Flow Model

As stated earlier, there are several methods available to estimate the cost of equity. The Multi-Stage Discounted Cash Flow Model (MSDCF) is another model available. Using this model, the cost of equity is the discount rate that equates a firm's market value to the present value of the expected stream of free cash flow that is potentially available for distribution to equity investors. The multiple stage portion of the model accounts for the assumption that the firm will not experience a constant growth rate throughout its life. The MSDCF uses company-specific growth rates in stage 1 and long-term GDP growth in stage 3, because in the long-term, growth is expected to normalize to that of the economy. These features of the model make the MSDCF somewhat more forward looking in that it relies on the expectations of the equities markets as to the firm's future performance although its accounting treatment of cash flows remains grounded in historic relationships. Nonetheless, its theoretical basis contrasts dramatically with the historic view of the CAPM, and brings investor perceptions of the firm's

future into the process of estimating its cost of equity. Investor perceptions of a firm's future opportunities and potential difficulties will inevitably have a substantial impact on the level of risk that an investor associates with a firm. That risk level is, in turn, a major determinate of the rate of return that will be required to encourage acquisition or retention of an equity position in the company. Thus, estimations of the cost of equity using MSDCF more closely align with section 16 of the Surface Transportation Board Reauthorization Act of 2015, which directed the agency to consider current and future conditions when evaluating railroad revenue adequacy, a key function of the STB's cost of capital calculation.

The STB, in Ex Parte No. 664 (Sub No. 1), adopted the Morningstar/Ibbotson MSDCF model to use for estimating the cost of common equity capital.[35] This model assumes that investor cash flows do not all have to be in the form of dividends. Instead, investors benefit from regular dividends, special dividends, stock buybacks, or stock price appreciation.[36] Major inputs to the model include cash flows, expected growth rates, and market values. An equation for this model can be found in Appendix J. A firm's present value as determined by the market

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[35] The Morningstar/Ibbotson MSDCF model adopted by the Board in Ex Parte No. 664 (Sub-No.1) is a modified version that includes only the railroads that pass the screening criteria set forth in Railroad Cost of Capital – 1984, 1 I.C.C. 2d 989 (1985), for inclusion in the sample of railroads used for the annual cost of capital determination. See Ex Parte No. 664 (Sub-No.1), *Use of a Multi-Stage Discounted Cash Flow Model in Determining the Railroad Industry's Cost of Capital,* served January 28, 2009.

[36] One interested party believes that stock repurchases (buybacks) bias the MSDCF *upwardly*. However, stock repurchases have the opposite effect – they bias the MSDCF *downward*. The MSDCF does not fully reflect the reality that distributions to shareholders (buybacks) mean cash flows to investors are shifted forward in time, and earlier cash flows should raise cost of equity estimates since the present value of a dollar received today is always (unless we have deflation) greater than the present value of that same dollar received at some future date. Since the model cannot account for this shift forward in cash flows, it is likely to understate the cost of equity. See September 5, 2014, verified statement of Dr. Bente Villadsen on behalf of Association of American Railroads in Ex Parte No. 664 (Sub-No.2).

is therefore equal to the sum of the present value of three sets of future cash flows. This is the same formula that appeared in the Appendix to the Board's decision in Ex Parte No. 664 (Sub No.1) served August 11, 2008, and it is the same formula found in the AAR's submissions for the 2008 through 2023 cost of capital.

1. Cash Flows

The Morningstar/Ibbotson MSDCF model defines cash flows for the first two stages, as income before extraordinary items minus capital expenditures plus depreciation and deferred taxes. Income before extraordinary items (IBEI) is derived by deducting extraordinary items from net income. Thus, the model's formula for cash flows is as follows:

$$CF = (NI - EI) - CAPEX + DEP + DT$$

Where CF = cash flow,
NI = net income,
EI = extraordinary items,
CAPEX = capital expenditures,
DEP = depreciation, and
DT = deferred taxes.

The Morningstar/Ibbotson MSDCF model utilizes five-year moving averages for each railroad leading up to the year being analyzed. The years used in this case are 2020 through 2024. Data are copied from the Consolidated Cash Flow and Income Statement of each railroad's annual 10-K report, and any changes to prior years have been incorporated. The 10-K reports, which are filed with the Securities and Exchange Commission, are usually available each year around February. In addition to the data points listed above, sales (a.k.a. revenue) is used as part of a smoothing (or averaging) process. Table 13 illustrates the

Morningstar/Ibbotson process to calculate an average cash flow. Revenue, Net Income, and Extraordinary Items are sourced from the Income Statement. Depreciation, Deferred Taxes, and Capital Expenditures are sourced from the Statement of Cash Flows.

Table No. 13
Example Cash Flow Calculations for UNP in 2024
($ in millions)

	2020	2021	2022	2023	2024	Total
Net Income	$5,349	$6,523	$6,998	$6,379	$6,747	$31,996
Less Extraord. Items	0	0	0	0	0	0
Inc. Bef. Extraord. Items (+)	$5,349	$6,523	$6,998	$6,379	$6,747	$31,996
Capital Expenditures (-)	$2,927	$2,936	$3,620	$3,606	$3,452	$16,541
Depreciation (+)	2,210	2,208	2,246	2,318	2,398	11,380
Deferred Taxes (+)	340	154	262	117	28	901
Cash Flow	$4,972	$5,949	$5,886	$5,208	$5,721	$27,736
Revenue (a.k.a. "Sales")	$19,533	$21,804	$24,875	$24,119	$24,250	$114,581
Ratio of Cash Flow to Sales (Smoothed Ibbotson-style) = ($27,736 / $114,581) =						0.24206
Initial Cash Flow in 2024 (Smoothed Ibbotson-style) = (0.24206 x $24,250) =						**$5,870.07**
Ratio of IBEI to Sales (Smoothed Ibbotson-style) = ($31,996 / $114,581) =						0.27924
Terminal Cash Flow input (Smoothed Ibbotson-style) = (0.27924 x $24,250) =						**$6,771.65**

After the financial data are collected, they are combined (Total column in the example) into a five-year cash flow for the purpose of averaging or smoothing. The average cash flow for 2024, which is the initial cash flow in the model, is calculated by multiplying revenue for 2024 times the five-year average ratio of cash flow to revenue. In our example here, the model's input for the initial cash flow is $5,870.07 million. The ratio of cash flow to sales is calculated by dividing the five year total cash flow by the five year total revenue.

The model's terminal cash flow value is based on the assumptions that in the third stage of the model, capital expenditures will consist of just maintenance capital (no growth capital), so that capital expenditures and depreciation are equal. Moreover, since deferred taxes are associated with capital expenditure, this amount is anticipated to diminish as capital expenditure moves towards maintenance expenses in the long-term. Consequently, the adjustment to earnings before taxes (depreciation minus capital expenditures plus deferred taxes) will gradually approach zero over the long term. The remaining part of the equation for the model's terminal cash flow is income before extraordinary items (IBEI), which we calculate by subtracting extraordinary items from net income. In our Table 13 example, the model's input for the terminal cash flow is $6,771.65 million. The model's terminal cash flow input is calculated by multiplying revenue for 2024 times the five-year average ratio of income before extraordinary items to revenue. The ratio of income before extraordinary items to sales is calculated by dividing the five-year income before extraordinary items by the five-year total revenue.

All cash flow calculations herein have been calculated using the same procedure used by the STB for the previous cost of capital determination. Appendix K contains the cash flow calculations for all three railroads. The pages from the 2024 10-K reports that were used as data sources for cash flows are included in my work papers. Data for prior years (2020-2023) used in this year's calculation are unchanged from last year's submission[37] – unless restated/revised data were found in the 2024 10-K statements.

[37] Except where necessary to remove Kansas City Southern from prior year computations.

2. Growth Rates

The first stage of the Morningstar/Ibbotson MSDCF model applies to a period that is one to five years in the future. The current year (2024) is considered to be year 0. In each year of the first stage, a firm's annual earnings growth rate is assumed to be the median value of the firm's three- to five-year growth estimates that are made by railroad industry analysts after the release of the year-end financial statements. However, in Ex Parte No. 558 (Sub No. 12), the STB clarified their interpretation of the Morningstar/Ibbotson MSDCF model by specifying use of data in effect at the end of the current year as the date for growth rates, stock prices, and stock shares outstanding.[38] (Clearly, the Board's interpretation does not anticipate the use of growth estimates based on the release of audited year-end financial statements.) In Ex Parte No. 558 (Sub No. 16), the STB made another clarification in their interpretation of the Morningstar/Ibbotson MSDCF model by specifying the *last full week of the year* as the point from which stock prices should be used. Therefore, we have utilized growth rate projections that were in effect at the end of 2024, and stock prices as of January 3, 2025 – the prices at the end of the last full week for 2024.[39] Each growth rate projection was reviewed by the brokerage firm's analyst during 2024, and the stock prices were retrieved from Yahoo! Finance.

For many years, analyst growth rate estimates were collected, and distributed, by the Institutional Brokers Estimate System (a.k.a. IBES or I/B/E/S). In recent years, the IBES growth rates have been distributed by Thomson Financial (now called Refinitiv) through its Eikon

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[38] *Railroad Cost of Capital – 2008*, EP 558 (Sub-No. 12) (STB served Sept. 25, 2009).

[39] Friday, January 3, 2025 was the last trading day for the week.

service.[40] Although the term "IBES" is rarely used by Thomson, many users of the data still refer to these growth rates as "IBES" growth rates. Thomson Financial has also distributed medians of the IBES growth rate estimates on a historical basis through its Thomson ONE Banker service. The median estimates provided through the Thomson ONE Banker service did not always reflect the full set of growth rate estimates. Therefore, I have utilized all estimates available from the Refinitiv/Thomson Reuters Eikon service, and determined medians based on that data. These growth rates are described in the Thomson Financial Glossary as the expected annual increase in operating earnings over a company's next full business cycle. A worktable and the source data are included in Appendix L. Table 14 lists the median growth rate estimates.

Table No. 14
2024 Thomson Median Growth Rate Estimates

Company	Stock Symbol	Growth Rate	
CSX Corporation	CSX	7.35	%
Norfolk Southern Corporation	NSC	8.30	
Union Pacific Corporation	UNP	10.60	
Simple Average		8.75	

Thus, the median growth rate estimates have been retrieved using the same procedure and source used by the AAR last year. Each individual railroad's median growth rate is used in the first stage of the Morningstar/Ibbotson MSDCF model.

[40] In October 2018, we were notified that the Financial and Risk business of Thomson Reuters is now called Refinitiv.

The second stage of the Morningstar/Ibbotson MSDCF model applies to a period six to ten years in the future. This is *not a transition stage* where the growth rate should be smoothed between the first and third stages. Morningstar's model assumes "that over a middle horizon, growth of any particular company will lie more in line with the industry as a whole".[41] In other words, other companies "catch" their industry growth leaders, or the leaders fall back to the rate of the slower growth railroads. Therefore, in this stage, the cash flows at the end of year five are assumed to grow at the simple (not weighted) average of the individual firm medians used in the first stage. Any attempt to change the second stage to a transition stage is corrupting the intent of the model.

In Table 14, the average of the median growth rates is 8.75 percent, which is an increase from 2023 (5.02 percent). For all railroads in the Morningstar/Ibbotson MSDCF model, a second stage growth rate 8.75 percent is used.[42]

The third stage of the MSDCF model begins 11 years in the future and continues in perpetuity. Starting in year 11, the firm's growth rate is assumed to be the long-run nominal growth rate of the aggregate U.S. economy, which can be thought of as a combination of expected inflation plus the real growth rate in Gross Domestic Product (GDP). Until the 2013 Cost of Capital determination, the long-run nominal growth rate was supplied by Morningstar/Ibbotson in its *Ibbotson SBBI Valuation Yearbook*. In September 2013, customers subscribing to the *Ibbotson SBBI Valuation Yearbook* were notified that the publication was

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[41] *Ibbotson SBBI 2013 Valuation Yearbook*, page 51.

[42] The model used an average rounded to 2 digits after the decimal.

being discontinued. The *Ibbotson® SBBI® Classic Yearbook* (Classic Yearbook) was expanded and contained some of the data needed for the Stage 3 calculation, but it was discontinued after two years. Therefore, beginning with the 2013 determination, and then more so beginning with the 2015 determination, I have continued the original Ibbotson methodology by using data available from the Federal Reserve and Bureau of Economic Analysis. Work and data sources for this third stage of the MSDCF model are shown in Appendix M.

As summarized on page 1 of Appendix M, the long-run expected nominal growth rate of the U.S. economy (Stage 3 growth rate of the MSDCF) is the long-term expected growth rate for real GDP plus the long-term expected inflation rate. The real GDP growth rate is simply a historical compound growth rate calculated from Bureau of Economic Analysis data beginning in 1929, and it is illustrated on pages 2 through 4 of Appendix M. This procedure has been used, and accepted, since the 2013 Cost of Capital determination, and it is the same method used by Morningstar for 2008 through 2012. Page 2 of Appendix M has a replication of the Morningstar long-term real GDP growth rate calculation for 2009 through 2012, and AAR has continued this calculation (now using 2017 dollars) up to the latest year. Pages 3 and 4 of the same Appendix show data sources used on page 2. The calculation for 2024 is 3.13 percent – which is slightly lower than 2023 (3.17).

The second piece of our Stage 3 calculation, expected inflation, is calculated by subtracting Inflation Indexed 20-Year Treasury Bond rates from Long-Term Government Yields (which are not inflation indexed). Work for this second piece of Stage 3 is shown on page 5 of Appendix M. Using data from the Ibbotson and the Federal Reserve, I have replicated the 2011 and 2012 Ibbotson calculations for expected long-term inflation. Beginning with the 2013 Cost

of Capital determination, Ibbotson did not release a rate for Inflation-Indexed 20-Year Bonds. However, I have been able to replicate their source,[43] and Long-Term Government yields were available from Morningstar's Ibbotson SBBI Classic yearbook. This methodology to determine expected inflation was accepted every year since the 2013 cost of capital determination.

Beginning with the 2015 Cost of Capital determination, the SBBI long-term government yields are no longer available since Morningstar no longer publishes its *Ibbotson SBBI Classic Yearbook*. In lieu of the SBBI number used for part of the calculation (that is no longer available), I have used 20-Year U.S. Treasury Bond yields at the end of the year, which are very close to the numbers used by Ibbotson.[44] This addition to the methodology was accepted in the 2015 through 2023 cost of capital determinations, and has been used again for 2024. Comparing yields for long-term government bonds to inflation indexed bonds, I calculate an expected long-term inflation rate of 2.45 percent.

Page 1 of Appendix M summarizes my calculations shown on pages 2 through 5 (with source data) of the same Appendix. Because expected real growth in output is usually very stable, changes in the Stage 3 growth rate are usually determined by changes in inflation expectations. For comparison purposes, page 6 of Appendix M shows Stage 3 rates since 2008, including the two components: the expected real growth in output (as measured by Gross Domestic Product) and expected inflation. The Stage 3 rate for 2024 is 5.58 percent (3.13 +

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[43] See Appendix M, page 5, columns (d) and (e) for a comparison of Inflation Indexed 20-Year Treasury Bonds from the SBBI compared to 20-Year Treasury Bonds at the end of the year from the Federal Reserve web site.

[44] See Appendix M, page 5, columns (b) and (c) for a comparison of Long-Term Government Yields from the SBBI compared to 20-Year Treasury Bonds at the end of the year from the Federal Reserve web site.

2.45 as also shown on page 1 of Appendix M), which is higher than the 5.53 used for 2023. Although real growth is relatively the same as the previous year, expected inflation is higher, and this caused the increase in the Stage 3 Growth rate calculated for 2024. This is the same method I used for the previous year.

3. Market Values

The final inputs to the Morningstar/Ibbotson MSDCF model are the stock market values for the common equity of each railroad. The market values serve two purposes. First, a firm's market value is a necessary part of the MSDCF model. As stated earlier, each railroad's cost of equity in the MSDCF model is determined by solving for the discount rate that equates a firm's *market value* to the present value of the expected stream of free cash flow that is potentially available for distribution to equity investors.

Market values are also used to determine weights for combining the model's cost of equity for each individual railroad into the composite railroad mandated by the Board. Thus, Table 15 below calculates the market value for each railroad, and it uses the market values to calculate weights. Prices and shares outstanding are for common stock. Although weights are shown at three digits after the decimal, they have been left at full float for calculation purposes – and so they will total to exactly 100 percent.

Table No. 15
Equity Market Value on January 3, 2025

Company	Stock Price	Shares Outstanding	Market Value ($mil)	Weight	
CSX	$32.34	1,928,419,153	62,365.1	24.354	%
NSC	$235.88	226,239,662	53,365.4	20.839	
UNP	$231.50	606,256,627	140,348.4	54.807	
Total		2,760,915,442	$256,078.9	100.000	%

As directed by the Board, I have used stock prices (from Yahoo! Finance) for January 3, 2025, the last trading day of the week that qualifies as the last week of 2024 for cost of capital purposes. I have also used the shares outstanding for that day from the 2024 Q3 10-Q reports (the latest information available prior to January 3, 2025) filed with the Securities and Exchange Commission. Market value is simply each firm's stock price multiplied by its shares outstanding, and weights are based on the market values. Appendix N contains the stock price pages as retrieved from Yahoo! Finance, and it also contains the 10-Q pages used for shares outstanding.[45]

4. Cost of Common Equity Using the MSDCF Model

The equation found in Appendix J provides the mathematical formula that is used to generate the three-stage DCF cost of equity estimates for each railroad. The left side of this equation is the market value of the firm in year 0. The right side of the equation is the

[45] Although we found some errors in dividend-adjusted stock prices downloaded from Yahoo! Finance when examining the data set to be used for the CAPM's beta calculation in prior years, no problems were found with regular stock prices.

discounted value of the cash flows from the three stages of the firm's expected future growth. Essentially, this equation is solved for each firm by simply testing discount rates (cost of equity) in an effort to find one that causes the sum of the present values of the cash flows for the three stages to be equal to the market value at year 0. An iterative process can be used to narrow down the possible solutions to the ultimate answer, or Microsoft Excel's Solver function can be used to automate the process.[46]

Applying the methods described above, I have calculated a cost of common equity for each of the three railroads specified using a spreadsheet like the one utilized in the 2023 filing. Using an initial cash flow, an input for calculating the terminal cash flow, growth rates for each of the three stages, and a market value effective January 3, 2025, I have solved for the discount rate (cost of equity) that causes the sum of the present values of cash flows for each stage to equal the firm's market value. The spreadsheet used for the calculations is displayed in Appendix O.

The resulting costs of common equity for each railroad, using the Board's MSDCF, are shown in Table 16. In the same table, I have also calculated an MSDCF cost of common equity (using weights from Table 15 and the individual railroad cost of equities) for the composite railroad, which is the current cost of equity for this model.

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[46] A commonly used Excel user's manual describes the Solver function as follows: "Solver is an Excel add-in that goes several steps further than goal seeking. It uses the same basic trial-and-error approach (known to scientific types as an iterative approach), but it's dramatically more intelligent than goal seeking." See Matthew McDonald, Excel: *The Missing Manual*, O'Reilly Media, 2005, p. 519.

Table No. 16
Cost of Equity Using STB's Ibbotson MSDCF

Company	Weight	Cost of Equity		Weighted Calculation	
CSX	24.354%	12.88	%	3.14	
NSC	20.839%	11.56		2.41	
UNP	54.807%	12.14		6.65	
Total	100.000%				
Weighted Current Cost of Equity				**12.20**	**%**

Thus, the MSDCF produces a cost of common equity of 12.20 percent for 2024 – an increase from the 10.44 percent used by the Board for 2023 (2020 was the lowest ever calculated since the MSDCF began being used in 2008).

D. Conclusion as to the Cost of Common Equity Capital

In the STB's Ex Parte No. 558 (Sub-No. 28) decision served January 10, 2025, the Board specified that comments "should focus … using the methodology followed in *Railroad Cost of Capital – 2023",* which means that a simple average of the estimates produced by the CAPM adopted in STB Ex Parte No. 664 and the Morningstar/Ibbotson Multi-Stage DCF Model specified in STB Ex Parte 664 (Sub No. 1) should be used. Table 17 contains the cost of common equity estimated by each model, and a simple average of the estimates.[47] Once again, it should

[47] Although the CAPM is currently favored by groups that want a low cost of equity calculation, that has not always been true. In the 1981 Cost of Capital determination, Ex Parte No. 415 decided June 11, 1982, the Interstate Commerce Commission noted that "In general, the various shipper groups dislike the use of the CAPM methodology for determining the railroads' cost of equity capital."

be noted that each cost of equity model has its strengths and weaknesses, and this illustrates the Board's wisdom in using more than one model to estimate the cost of common equity.[48]

The cost of common equity for 2024 is 11.82 percent, which is higher than the 10.89 percent decided for 2023.

Table No. 17
Cost of Common Equity Capital

Model			
Capital Asset Pricing Model	11.43	%	From Table No. 12
Multi-Stage Discounted Cash Flow	12.20		From Table No. 16
Cost of Common Equity	11.82	%	Average

V. Preferred Equity Capital in 2024

There were no preferred stock shares outstanding for the composite railroad sample from 2002 through 2012. Beginning 2013, one of the railroad companies comprising the railroad composite sample had preferred stock outstanding, and this continued through 2020. However, that one railroad company no longer meets the criteria for inclusion in the sample, so there is no preferred stock in this year's calculation.

[48] Utility companies also believe multiple cost of equity models are appropriate, as noted in STB Ex Parte 664 (Sub-No. 2) testimony on behalf of the Association of American Railroads entered July 23, 2015.

VI. The Overall Cost of Capital In 2024

A. Determination of Market Value Weights

With more detail shown in Tables 6, 10, and 18, the average market value of debt, common equity, and preferred equity are $56.0 billion, $268.6 billion, and $0.0, respectively. More market value detail are provided in Appendixes D and G. The figure for the market value of debt includes market values of bonds, notes, debentures, equipment trust certificates, and conditional sales agreements (if there had been any). Other debt and capitalized leases are included at their book value, because market values are difficult to determine (in some instances book values correspond to market values) and because these other instruments are a minimal portion of all railroad debt.

Based on the market value calculations, the capital structure for 2024 has weights for debt, common equity, and preferred equity of 17.26 percent, 82.74 percent, and 0.00 percent, respectively. Table 19 contains the weights computation and a comparison to the previous year.

Table No. 18
Capital Structure and Weights

		2024			2023		
	Source Table	Market Value (mil)	Capital Structure Weight		Market Value (mil)	Capital Structure Weight	
Debt	6	$56,014.2	17.26	%	$54,472.2	18.39	%
Common Equity	10	268,483.3	82.74		241,768.2	81.61	
Preferred Equity		0.0	0.00		0.0	0.00	
Total		$324,497.5	100.00	%	$296,240.4	100.00	%

The market value for debt and common equity decreased from the prior year, while the market value for preferred equity remained at zero. Weights remained similar to their values for 2023. Debt decreased 1.13 percentage points from 2023, while common equity increased by that amount, and preferred remains at zero.

B. The Overall Cost of Capital

Multiplying the cost of debt, the cost of common equity capital, and the cost of preferred equity capital by their respective market value proportions results in a 2024 overall cost of capital of 10.68 percent, as shown in Table 19. This is higher than the cost of capital decision of 9.87 percent for 2023. The decrease was primarily driven by a lowered projected annual earnings growth rate, which reduced the current cost of common equity.

Table No. 19
Weighted Current Cost of Capital for 2024

	Source Table	Capital Structure Weight		Current Cost	
Debt	11	17.26	%	5.24	%
Common Equity	18	82.74		11.82	
Preferred Equity		0.00		0.00	
Total		100.000	%		
Weighted Current Cost of Capital				**10.68**	**%**

VII. Qualifications of Dr. Rand Ghayad

My name is Dr. Rand Ghayad and I am the Chief Economist and Senior Vice President of Policy and Economics at the Association of American Railroads (AAR), headquartered at 425 Third Street SW, Suite 1000, Washington, DC 20024. In my role, I oversee the collection, analysis, and presentation of economic and operational data pertaining to railroads and their broader economic landscape. A key aspect of my responsibilities involves conducting and supervising economic, financial, statistical, and cost studies that inform strategic decision-making within the rail industry.

Prior to joining the AAR, I served as the Head of Economics and Global Labor Markets at LinkedIn Corporation. In this role, I spearheaded thought leadership initiatives and conducted pioneering research on labor market dynamics, exploring the implications of current and emerging trends on the future of work and workers. My professional journey also includes senior positions at global institutions such as the International Monetary Fund (IMF) and the Brattle Group.

During my tenure at the IMF, I provided expert advice to member countries on a wide range of international economic policy and stabilization matters. I conducted innovative research in macroeconomics and finance, offering strategic insights and policy recommendations to both fragile and emerging market economies.

At the Brattle Group, I assisted corporations, regulators, and government agencies, including the U.S. Department of Justice and the Internal Revenue Service, in developing economic and financial testimony for various finance and tax litigation cases. Additionally, I

provided economic analyses and consulting services to clients across diverse industries such as aviation, railroads, postal and shipping, addressing a wide range of policy and business matters.

I began my career as a scholar with the Federal Reserve Bank of Boston and have also worked as an economic consultant at both the Brookings Institution and the International Labor Organization, where I published on economic growth, inequality, and tax policy. Currently, I serve as a Global Fellow at the Woodrow Wilson Center of Scholars and have been an adjunct faculty member at Harvard University since 2014. I hold a Ph.D. in Economics from Northeastern University, along with dual Master's degrees in Financial Economics and Multinational Commerce from Boston University.

VERIFICATION

I, Rand Ghayad, declare under penalty of perjury under the laws of the United States that the foregoing is true and correct. Further, I certify that I am qualified and authorized to file this statement.

Executed on this 14th day of April, 2025.

Rand Ghayad, Ph.D.

Appendix A
Bonds, Notes and Debentures

Summaries

CSX Corporation **A-2**

Norfolk Southern Corporation **A-5**

Union Pacific Corporation **A-8**

Individual Bonds, Notes, and Debentures

CSX Corporation **A-11**

Norfolk Southern Corporation **A-43**

Union Pacific Corporation **A-81**

CSX Corporation
12/31/2024

	Type	Description	No.	CUSIP	Coupon Rate	Maturity Date	Amt. Outstanding ($000) Year-End	Amt. Outstanding ($000) Used	Average Price	Market Value ($ 000)	Average Yield	Interest Cost ($ 000)
						Traded						
1	Notes	CSX Corp.	1	126408HE6	2.600%	11/1/2026	$700,000	$700,000	95.521	$668,647	4.670%	$31,226
2	Notes	CSX Corp.	2	126408BP7	7.250%	5/1/2027	$83,312	$83,312	105.412	$87,821	5.110%	$4,488
3	Notes	CSX Corp.	3	126408BM4	7.950%	5/1/2027	$64,266	$64,266	108.228	$69,554	4.750%	$3,304
4	Notes	CSX Corp.	4	126408HH9	3.250%	6/1/2027	$850,000	$850,000	96.221	$817,876	4.660%	$38,113
5	Notes	CSX Corp.	5	126408HJ5	3.800%	3/1/2028	$800,000	$800,000	97.222	$777,777	4.640%	$36,089
6	Notes	CSX Corp.	6	12641LBU6	6.800%	12/1/2028	$200,000	$200,000	107.930	$215,860	4.760%	$10,275
7	Notes	CSX Corp.	7	126408HM8	4.250%	3/15/2029	$950,000	$950,000	98.354	$934,361	4.640%	$43,354
8	Notes	CSX Corp.	8	126408HQ9	2.400%	2/15/2030	$400,000	$400,000	88.531	$354,126	4.770%	$16,892
9	Notes	CSX Corp.	9	126408HU0	4.100%	11/15/2032	$950,000	$950,000	94.831	$900,893	4.870%	$43,873
10	Notes	CSX Corp.	10	126408HW6	5.200%	11/15/2033	$600,000	$600,000	101.884	$611,301	4.950%	$30,259
11	Notes	CSX Corp.	11	126408GH0	6.000%	10/1/2036	$400,000	$400,000	107.642	$430,568	5.150%	$22,174
12	Notes	CSX Corp.	12	126408GK3	6.150%	5/1/2037	$700,000	$700,000	109.054	$763,381	5.180%	$39,543
13	Notes	CSX Corp.	13	126408GP2	7.450%	4/1/2038	$79,226	$79,226	113.932	$90,264	5.950%	$5,371
14	Notes	CSX Corp.	14	126408GS6	6.220%	4/30/2040	$660,000	$660,000	109.345	$721,674	5.340%	$38,537
15	Notes	CSX Corp.	15	126408GU1	5.500%	4/15/2041	$550,000	$550,000	101.561	$558,585	5.360%	$29,940
16	Notes	CSX Corp.	16	126408GW7	4.750%	5/30/2042	$600,000	$600,000	92.911	$557,468	5.380%	$29,992
17	Notes	CSX Corp.	17	126408GX5	4.400%	3/1/2043	$300,000	$300,000	88.981	$266,944	5.340%	$14,255
18	Notes	CSXT - Conrail	18	126410LL1	7.875%	5/15/2043	$99,989	$99,989	128.324	$128,310	5.480%	$7,031
19	Notes	CSX Corp.	19	126408GY3	4.100%	3/15/2044	$800,000	$800,000	84.714	$677,715	5.370%	$36,393
20	Notes	CSX Corp.	20	126408HF3	3.800%	11/1/2046	$800,000	$800,000	79.642	$637,135	5.380%	$34,278
21	Notes	CSX Corp.	21	126408HK2	4.300%	3/1/2048	$850,000	$850,000	85.641	$727,947	5.390%	$39,236
22	Notes	CSX Corp.	22	126408HN6	4.750%	11/15/2048	$650,000	$650,000	91.524	$594,909	5.380%	$32,006
23	Notes	CSX Corp.	23	126408HP1	4.500%	3/15/2049	$400,000	$400,000	87.905	$351,621	5.400%	$18,988
24	Notes	CSX Corp.	24	126408HR7	3.350%	9/15/2049	$600,000	$600,000	72.280	$433,678	5.380%	$23,332
25	Notes	CSX Corp.	25	126408HS5	3.800%	4/15/2050	$500,000	$500,000	78.454	$392,271	5.360%	$21,026
26	Notes	CSX Corp.	26	126408HC0	3.950%	5/1/2050	$600,000	$600,000	80.588	$483,531	5.350%	$25,869
27	Notes	CSX Corp.	27	126408HT3	2.500%	5/15/2051	$500,000	$500,000	60.837	$304,184	5.240%	$15,939
28	Notes	CSX Corp.	28	126408HV8	4.500%	11/15/2052	$900,000	$900,000	88.037	$792,334	5.330%	$42,231
29	Notes	CSX Corp.	29	126408HA4	4.500%	8/1/2054	$450,000	$450,000	87.441	$393,482	5.350%	$21,051
30	Notes (New)	CSX Corp.	30	126408HY2	4.900%	3/15/2055	$550,000	$550,000	93.907	$516,486	5.310%	$27,425
31	Notes	CSX Corp.	31	126408HG1	4.250%	11/1/2066	$700,000	$700,000	80.019	$560,134	5.470%	$30,639
32	Notes	CSX Corp.	32	126408HL0	4.650%	3/1/2068	$350,000	$350,000	86.329	$302,151	5.480%	$16,558
33												
34												
35												
37												
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39												
40												
41												
42												
43												
44												
45												
46												
47												
48												
49												
50												
Total							**$17,636,793**	**$17,636,793**		**$16,122,984**	**5.146%**	**$829,689**

CSX Corporation
12/31/2024

	Type	Description	No.	CUSIP	Coupon Rate	Maturity Date	Amt. Outstanding ($000) Year-End	Amt. Outstanding ($000) Used	Average Price	Market Value ($ 000)	Average Yield	Interest Cost ($ 000)
					Trading Data Not Available or Did Not Trade							
1	Notes	CSX Corp.			1.310%	12/17/2050	73,304	73,304	100.000	$73,304		
2	Conrail Tax Note	CSXT			1.310%	12/17/2050	368,375	368,375	100.000	$368,375		
3	Notes	CSX Corp.			4.650%	3/1/2068	150,000	150,000	100.000	$150,000		
4												
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24												
25												
26												
27												
28												
29												
30												
Total							**$591,679**	**$591,679**		**$591,679**		

CSX Corporation
12/31/2024

	Type	Description	No.	CUSIP	Coupon Rate	Maturity Date	Amt. Outstanding ($000) Year-End	Amt. Outstanding ($000) Used	Average Price	Market Value ($ 000)	Average Yield	Interest Cost ($ 000)
					Matures in 2025							
1	Notes	CSX Corp.		126408HD8	3.350%	11/1/2025	$600,000					
2												
3												
4												
5												
6												
7												
8												
9												
10												
Total							**$600,000**					

Grand Totals			
Total Traded and Trading Data Not Available	**$18,228,472**	**$18,228,472**	**$16,714,664**
Grand Total (for reconciliation to carrier data only)	**$18,828,472**		

From CSX:

Corporate Notes	$18,360,108
Convertible Debt	0
CSXT Notes	468,364
Secured Equipment Notes	0
Other Notes	0
Total	**$18,828,472**

Norfolk Southern Corporation

12/31/2024

	Type	Description	No.	CUSIP	Coupon Rate	Maturity Date	Amt. Outstanding ($000) Year-End	Amt. Outstanding ($000) Used	Average Price	Market Value ($ 000)	Average Yield	Interest Cost ($ 000)
						Traded						
1	Notes	Senior	33	655844BS6	2.900%	6/15/2026	$600,000	$600,000	96.469	$578,815	4.830%	$27,957
2	Conrail Notes	CR NSC 2027	34	655844AJ7	7.800%	5/15/2027	$319,135	$319,135	107.967	$344,559	4.740%	$16,332
3	Notes	Senior	35	655844BT4	3.150%	6/1/2027	$300,000	$300,000	95.800	$287,401	4.720%	$13,565
4	Notes	Senior	36	655844BZ0	3.800%	8/1/2028	$600,000	$600,000	96.832	$580,995	4.660%	$27,074
5	Notes	Senior	37	655844AX6	5.640%	5/17/2029	$210,316	$210,316	103.401	$217,470	4.830%	$10,504
6	Notes	Senior	38	655844CE6	2.550%	11/1/2029	$400,000	$400,000	89.577	$358,308	4.800%	$17,199
7	Notes	Senior	39	655844CR7	5.050%	8/1/2030	$600,000	$600,000	101.173	$607,038	4.820%	$29,259
8	Notes	Senior	40	655844AQ1	7.250%	2/15/2031	$284,028	$284,028	112.012	$318,145	5.070%	$16,130
9	Notes	Senior	41	655844CK2	2.300%	5/15/2031	$500,000	$500,000	85.460	$427,300	4.830%	$20,639
10	Notes	Senior	42	655844CM8	3.000%	3/15/2032	$600,000	$600,000	87.689	$526,136	4.950%	$26,044
11	Notes	Senior	43	655844CQ9	4.450%	3/1/2033	$500,000	$500,000	96.436	$482,179	4.970%	$23,964
12	Notes	Senior	44	655844CT3	5.550%	3/15/2034	$400,000	$400,000	103.758	$415,032	5.060%	$21,001
13	Conrail Notes	CR NSC 2037	45	655844AF5	7.050%	5/1/2037	$171,750	$171,750	113.932	$195,679	5.520%	$10,801
14	Notes	Senior	46	655844BH0	4.837%	10/1/2041	$595,504	$595,504	93.692	$557,941	5.410%	$30,185
15	Notes	Senior 144A	47	655844BE7	4.837%	10/1/2041	$0	$0	93.597	$0	5.420%	$0
16	Notes	Senior	48	655844BM9	3.950%	10/1/2042	$600,000	$600,000	82.744	$496,464	5.460%	$27,107
17	Debenture	Southern Railway	49	655855FB5	7.875%	5/15/2043	$138,085	$138,085	120.272	$166,078	6.050%	$10,048
18	Notes	Senior	50	655844BN7	4.800%	8/15/2043	$291,829	$291,829	89.459	$261,066	5.720%	$14,933
19	Notes	Senior	51	655844BQ0	4.450%	6/15/2045	$500,000	$500,000	87.278	$436,390	5.480%	$23,914
20	Notes	Senior	52	655844BR8	4.650%	1/15/2046	$600,000	$600,000	89.654	$537,926	5.480%	$29,478
21	Notes	Senior	53	655844BX5	3.942%	11/1/2047	$749,997	$749,997	79.689	$597,664	5.500%	$32,872
22	Notes	Senior	54	655844BY3	4.150%	2/28/2048	$700,000	$700,000	82.529	$577,701	5.480%	$31,658
23	Notes	Senior	55	655844CC0	4.100%	5/15/2049	$400,000	$400,000	81.226	$324,903	5.500%	$17,870
24	Notes	Senior	56	655844CD8	3.400%	11/1/2049	$400,000	$400,000	72.272	$289,089	5.430%	$15,698
25	Notes	Senior	57	655844CF3	3.050%	5/15/2050	$800,000	$800,000	67.208	$537,665	5.430%	$29,195
26	Notes	Senior	58	655844CL0	2.900%	8/25/2051	$600,000	$600,000	64.441	$386,648	5.420%	$20,956
27	Notes	Senior	59	655844BV9	4.050%	8/15/2052	$749,994	$749,994	79.995	$599,958	5.460%	$32,758
28	Notes	Senior	60	655844CN6	3.700%	3/15/2053	$400,000	$400,000	74.774	$299,094	5.460%	$16,331
29	Notes	Senior	61	655844CP1	4.550%	6/1/2053	$750,000	$750,000	86.812	$651,089	5.470%	$35,615
30	Notes	Senior	62	655844CS5	5.350%	8/1/2054	$1,000,000	$1,000,000	98.422	$984,222	5.460%	$53,739
31	Notes	Senior	63	655844CH9	3.155%	5/15/2055	$799,996	$799,996	65.855	$526,833	5.460%	$28,765
32	Notes	Senior 144A	64	655844CG1	3.155%	5/15/2055	$1	$1	65.888	$1	5.460%	$0
33	Notes	Senior	65	655844CU0	5.950%	3/15/2064	$600,000	$600,000	105.898	$635,386	5.590%	$35,518
34	Notes	CR NSC 2097	66	655844AK4	7.900%	5/15/2097	$196,302	$196,302	137.514	$269,943	5.730%	$15,468
35	Notes	Senior 2105	67	655844AV0	6.000%	3/15/2105	$157,780	$157,780	97.399	$153,676	6.170%	$9,482
36	Notes	Senior	68	655844BD9	6.000%	5/23/2111	$79,726	$79,726	97.383	$77,640	6.170%	$4,790
37	Notes	Senior	69	655844CB2	5.100%	8/1/2118	$350,521	$350,521	87.888	$308,067	5.820%	$17,930
38	Notes	Senior	70	655844CJ5	4.100%	5/15/2121	$600,000	$600,000	72.762	$436,570	5.650%	$24,666
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40												
41												
42												
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44												
45												
Total							**$17,544,964**	**$17,544,964**		**$15,451,066**	**5.303%**	**$819,442**

Norfolk Southern Corporation

12/31/2024

	Type	Description	No.	CUSIP	Coupon Rate	Maturity Date	Amt. Outstanding ($000) Year-End	Amt. Outstanding ($000) Used	Average Price	Market Value ($ 000)	Average Yield	Interest Cost ($ 000)
					Trading Data Not Available or Did Not Trade							
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Total							$0	$0		$0		

Norfolk Southern Corporation

12/31/2024

	Type	Description	No.	CUSIP	Coupon Rate	Maturity Date	Amt. Outstanding ($000) Year-End	Amt. Outstanding ($000) Used	Average Price	Market Value ($ 000)	Average Yield	Interest Cost ($ 000)
						Matures in 2025						
1	Notes	Norfolk Southern Corp		655844AW8	5.590%	5/17/2025	$251,172					
2	Notes	Norfolk Southern Corp		655844CA4	3.650%	8/1/2025	$300,000					
3												
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10												
Total							**$551,172**					

Grand Totals			
Total Traded and Trading Data Not Available	**$17,544,964**	**$17,544,964**	**$15,451,066**
Grand Total (for reconciliation to carrier data only)	**$18,096,136**		

From NSC:

Income Debentures	$138,085
Medium Term Notes & Conrail Notes	17,958,051
Other Debt (Poca Dev)	
Total	**$18,096,136**

Union Pacific Corporation
12/31/2024

	Type	Description	No.	CUSIP	Coupon Rate	Maturity Date	Amt. Outstanding ($000) Year-End	Amt. Outstanding ($000) Used	Average Price	Market Value ($ 000)	Average Yield	Interest Cost ($ 000)
						Traded						
1	Notes	UP Corp.	71	907818GE2	4.750%	2/21/2026	$498,819	$498,819	99.996	$498,800	4.720%	$23,543
2	Notes	UP Corp.	72	907818EH7	2.750%	3/1/2026	$649,500	$649,500	96.860	$629,105	4.750%	$29,882
3	Notes	UP Corp.	73	907818FJ2	2.150%	2/5/2027	$498,658	$498,658	94.090	$469,188	4.620%	$21,676
4	Notes	UP Corp.	74	907818EP9	3.000%	4/15/2027	$497,170	$497,170	95.893	$476,750	4.600%	$21,930
5	Debentures	UP Corp.	75	907818BY3	7.125%	2/1/2028	$161,174	$161,174	107.777	$173,709	4.710%	$8,182
6	Notes	UP Corp.	76	907818EY0	3.950%	9/10/2028	$1,050,401	$1,050,401	97.815	$1,027,452	4.530%	$46,544
7	Debentures	UP Corp.	77	907818CF3	6.625%	2/1/2029	$390,362	$390,362	108.206	$422,396	4.600%	$19,430
8	Notes	UP Corp.	78	907818FB9	3.700%	3/1/2029	$771,541	$771,541	96.274	$742,795	4.600%	$34,169
9	Notes	UP Corp.	79	907818FH6	2.400%	2/5/2030	$745,211	$745,211	88.764	$661,476	4.730%	$31,288
10	Notes	UP Corp.	80	907818FU7	2.375%	5/20/2031	$997,993	$997,993	86.394	$862,209	4.730%	$40,782
11	Notes	UP Corp.	81	907818FX1	2.800%	2/14/2032	$1,238,684	$1,238,684	87.533	$1,084,257	4.780%	$51,827
12	Notes	UP Corp.	82	907818GB8	4.500%	1/20/2033	$891,672	$891,672	97.778	$871,861	4.820%	$42,024
13	Debentures	UP Corp.	83	907818CS5	5.375%	6/1/2033	$143,209	$143,209	101.211	$144,943	5.200%	$7,537
14	Debentures	UP Corp.	84	907818CU0	6.250%	5/1/2034	$152,541	$152,541	108.939	$166,176	5.080%	$8,442
15	Notes	UP Corp.	85	907818EB0	3.375%	2/1/2035	$446,568	$446,568	87.211	$389,457	4.950%	$19,278
16	Notes (Exchange)	UP Corp.	86	907818FQ6	2.891%	4/6/2036	$615,756	$615,756	82.051	$505,233	4.930%	$24,908
17	Notes (Exchange)	UP Corp. 144A	87	907818FP8	2.891%	4/6/2036	$1,716	$1,716	82.109	$1,409	4.920%	$69
18	Debentures	UP Corp.	88	907818CX4	6.150%	5/1/2037	$89,942	$89,942	106.896	$96,145	5.400%	$5,192
19	Notes	UP Corp.	89	907818EQ7	3.600%	9/15/2037	$496,062	$496,062	86.041	$426,815	5.070%	$21,640
20	Notes	UP Corp.	90	907818EV6	4.375%	9/10/2038	$231,274	$231,274	91.835	$212,390	5.200%	$11,044
21	Notes	UP Corp.	91	907818FD5	3.550%	8/15/2039	$494,850	$494,850	83.388	$412,646	5.150%	$21,251
22	Notes	UP Corp. 144A	92	907818DE5	5.780%	7/15/2040	$10	$10	101.112	$10	5.680%	$1
23	Notes	UP Corp.	93	907818DF2	5.780%	7/15/2040	$65,368	$65,368	101.386	$66,274	5.650%	$3,744
24	Notes	UP Corp.	94	907818FT0	3.200%	5/20/2041	$992,086	$992,086	77.464	$768,512	5.230%	$40,193
25	Notes	UP Corp.	95	907818DJ4	4.750%	9/15/2041	$212,887	$212,887	90.747	$193,189	5.600%	$10,819
26	Notes	UP Corp.	96	907818FY9	3.375%	2/14/2042	$495,319	$495,319	78.641	$389,526	5.260%	$20,489
27	Notes	UP Corp.	97	907818DL9	4.300%	6/15/2042	$204,473	$204,473	86.074	$175,999	5.540%	$9,750
28	Notes	UP Corp.	98	907818DP0	4.250%	4/15/2043	$183,794	$183,794	84.076	$154,526	5.640%	$8,715
29	Notes	UP Corp.	99	907818DU9	4.750%	12/15/2043	$182,849	$182,849	89.922	$164,421	5.610%	$9,224
30	Notes	UP Corp.	100	907818DT2	4.821%	2/1/2044	$131,961	$131,961	90.614	$119,575	5.620%	$6,720
31	Notes	UP Corp. 144A	101	907818DS4	4.821%	2/1/2044	$1	$1	90.626	$1	5.620%	$0
32	Notes	UP Corp.	102	907818DX3	4.850%	6/15/2044	$83,386	$83,386	89.187	$74,369	5.780%	$4,299
33	Notes	UP Corp.	103	907818DZ8	4.150%	1/15/2045	$229,283	$229,283	82.827	$189,908	5.570%	$10,578
34	Notes	UP Corp.	104	907818EF1	4.050%	11/15/2045	$396,199	$396,199	83.040	$329,003	5.400%	$17,766
35	Notes	UP Corp.	105	907818EJ3	4.050%	3/1/2046	$516,244	$516,244	82.973	$428,341	5.400%	$23,130
36	Notes	UP Corp.	106	907818EK0	3.350%	8/15/2046	$296,597	$296,597	73.625	$218,371	5.420%	$11,836
37	Notes	UP Corp.	107	907818EN4	4.000%	4/15/2047	$490,084	$490,084	81.768	$400,731	5.410%	$21,680
38	Notes	UP Corp.	108	907818EW4	4.500%	9/10/2048	$386,171	$386,171	88.222	$340,689	5.380%	$18,329
39	Notes	UP Corp.	109	907818FC7	4.300%	3/1/2049	$627,349	$627,349	85.468	$536,181	5.380%	$28,847
40	Notes	UP Corp.	110	907818FK9	3.250%	2/5/2050	$1,697,242	$1,697,242	71.831	$1,219,138	5.280%	$64,371
41	Notes	UP Corp.	111	907818EM6	3.799%	10/1/2051	$720,269	$720,269	78.689	$566,770	5.290%	$29,982
42	Notes	UP Corp.	112	907818FW3	2.950%	3/10/2052	$841,614	$841,614	66.651	$560,941	5.260%	$29,505
43	Notes	UP Corp.	113	907818GC6	4.950%	9/9/2052	$590,252	$590,252	95.794	$565,429	5.240%	$29,628
44	Notes	UP Corp.	114	907818FZ6	3.500%	2/14/2053	$1,235,061	$1,235,061	74.122	$915,447	5.270%	$48,244
45	Notes	UP Corp.	115	907818GF9	4.950%	5/15/2053	$494,215	$494,215	95.628	$472,609	5.250%	$24,812
46	Notes	UP Corp.	116	907818EC8	3.875%	2/1/2055	$444,429	$444,429	78.059	$346,915	5.340%	$18,525
47	Notes	UP Corp.	117	907818EX2	4.800%	9/10/2058	$25,791	$25,791	85.259	$21,989	5.800%	$1,275
48	Notes	UP Corp.	118	907818FE3	3.950%	8/15/2059	$491,530	$491,530	77.423	$380,556	5.400%	$20,550
49	Notes	UP Corp.	119	907818FG8	3.839%	3/20/2060	$1,423,460	$1,423,460	75.674	$1,077,194	5.390%	$58,061
50	Notes	UP Corp. 144A	120	907818FF0	3.839%	3/20/2060	$184	$184	75.822	$140	5.370%	$7
51	Notes	UP Corp.	121	907818FV5	3.550%	5/20/2061	$640,539	$640,539	70.907	$454,184	5.380%	$24,435
52	Notes (Exchange)	UP Corp.	122	907818FN3	2.973%	9/16/2062	$719,489	$719,489	61.475	$442,306	5.360%	$23,708
53	Notes (Exchange)	UP Corp. 144A	123	907818FM5	2.973%	9/16/2062	$3,004	$3,004	61.569	$1,850	5.350%	$99
54	Notes	UP Corp.	124	907818GD4	5.150%	1/20/2063	$393,181	$393,181	95.616	$375,944	5.430%	$20,414

Union Pacific Corporation
12/31/2024

	Type	Description	No.	CUSIP	Coupon Rate	Maturity Date	Amt. Outstanding ($000) Year-End	Amt. Outstanding ($000) Used	Average Price	Market Value ($ 000)	Average Yield	Interest Cost ($ 000)
55	Notes	UP Corp.	125	907818EG9	4.375%	11/15/2065	$169,529	$169,529	78.775	$133,546	5.730%	$7,652
56	Notes	UP Corp.	126	907818ER5	4.100%	9/15/2067	$494,560	$494,560	78.027	$385,892	5.430%	$20,954
57	Notes	UP Corp.	127	907818FL7	3.750%	2/5/2070	$742,376	$742,376	72.166	$535,739	5.410%	$28,984
58	Notes (Exchange)	UP Corp.	128	907818FS2	3.799%	4/6/2071	$818,818	$818,818	72.839	$596,421	5.410%	$32,266
59	Notes (Exchange)	UP Corp. 144A	129	907818FR4	3.799%	4/6/2071	$7,274	$7,274	72.861	$5,300	5.400%	$286
60	Notes	UP Corp.	130	907818GA0	3.850%	2/14/2072	$493,600	$493,600	73.701	$363,788	5.400%	$19,645
61												
62												
63												
64												
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66												
Total							**$29,003,581**	**$29,003,581**		**$24,246,936**	**5.115%**	**$1,240,163**

Trading Data Not Available or Did Not Trade

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30												
Total							**$0**	**$0**		**$0**		

Union Pacific Corporation
12/31/2024

	Type	Description	No.	CUSIP	Coupon Rate	Maturity Date	Amt. Outstanding ($000) Year-End	Amt. Outstanding ($000) Used	Average Price	Market Value ($ 000)	Average Yield	Interest Cost ($ 000)
						Matures in 2025						
1	Notes	UP Corp.		907818DY1	3.250%	1/15/2025	$349,965					
2	Notes	UP Corp.		907818ES3	3.750%	7/15/2025	$499,652					
3	Notes	UP Corp.		907818ED6	3.250%	8/15/2025	$499,882					
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10												
Total							**$1,349,498**					

Grand Totals			
Total Traded and Trading Data Not Available	**$29,003,581**	**$29,003,581**	**$24,246,936**
Grand Total (for reconciliation to carrier data only)	**$30,353,080**		

From UNP:

Corporate Debentures, Notes, Floating Rate Loans, and Commercial Paper	$30,353,081
Removal of Floating Rate Loans & Commercial Paper	
UP RR Debt Securities Outstanding	233
Removal of unamortized SOR Fees	-233
Removal of Sale of Receivables	0
Total	**$30,353,081**

CSX Corporation

1

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408HE6
Coupon Rate:	2.600%
Maturity Date:	11/1/2026
Amount Outstanding ($ 000)	$700,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	95.284	4.44 %
February	94.353	4.89
March	94.537	4.88
April	93.835	5.27
May	94.445	5.08
June	94.486	5.14
July	95.705	4.63
August	96.503	4.31
September	97.237	4.00
October	96.525	4.44
November	96.670	4.43
December	96.672	4.51
Average	95.521	4.67 %

Source: Bloomberg

CSX Corporation

2

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408BP7
Coupon Rate:	7.250%
Maturity Date:	5/1/2027
Amount Outstanding ($ 000)	$83,312
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	106.584	5.02 %
February	105.098	5.47
March	104.910	5.49
April	103.531	5.95
May	104.373	5.60
June	105.345	5.19
July	105.748	4.98
August	106.272	4.71
September	106.568	4.53
October	105.370	4.94
November	105.733	4.71
December	105.411	4.77
Average	105.412	5.11 %

Source: Bloomberg

CSX Corporation

3

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408BM4
Coupon Rate:	7.950%
Maturity Date:	5/1/2027
Amount Outstanding ($ 000)	$64,266
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	109.325	4.81 %
February	108.004	5.17
March	108.414	4.97
April	107.636	5.17
May	108.275	4.86
June	108.462	4.72
July	108.934	4.46
August	108.833	4.39
September	109.019	4.23
October	107.699	4.65
November	107.420	4.66
December	106.712	4.86
Average	108.228	4.75 %

Source: Bloomberg

CSX Corporation

4

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408HH9
Coupon Rate:	3.250%
Maturity Date:	6/1/2027
Amount Outstanding ($ 000)	$850,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	96.089	4.53 %
February	95.006	4.93
March	95.250	4.89
April	94.261	5.29
May	94.957	5.09
June	95.374	4.97
July	96.745	4.49
August	97.561	4.20
September	98.229	3.96
October	97.096	4.45
November	97.191	4.45
December	96.890	4.63
Average	96.221	4.66 %

Source: Bloomberg

CSX Corporation

5

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408HJ5
Coupon Rate:	3.800%
Maturity Date:	3/1/2028
Amount Outstanding ($ 000)	$800,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	97.804	4.39 %
February	96.268	4.84
March	96.671	4.74
April	95.346	5.15
May	96.184	4.93
June	96.131	4.97
July	97.589	4.54
August	98.607	4.23
September	99.294	4.02
October	97.638	4.57
November	97.904	4.50
December	97.229	4.75
Average	97.222	4.64 %

Source: Bloomberg

CSX Corporation

6

Type:	Notes
Description:	CSX Corp.
CUSIP:	12641LBU6
Coupon Rate:	6.800%
Maturity Date:	12/1/2028
Amount Outstanding ($ 000)	$200,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	109.327	4.62 %
February	107.709	4.95
March	108.621	4.72
April	106.286	5.24
May	107.025	5.03
June	106.672	5.09
July	108.597	4.59
August	109.138	4.41
September	109.700	4.23
October	107.590	4.73
November	107.860	4.62
December	106.635	4.91
Average	107.930	4.76 %

Source: Bloomberg

CSX Corporation

7

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408HM8
Coupon Rate:	4.250%
Maturity Date:	3/15/2029
Amount Outstanding ($ 000)	$950,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	99.390	4.38 %
February	97.488	4.82
March	97.893	4.73
April	95.955	5.20
May	97.049	4.95
June	96.928	4.99
July	99.004	4.49
August	99.936	4.27
September	100.848	4.04
October	98.678	4.59
November	99.071	4.49
December	98.006	4.78
Average	98.354	4.64 %

Source: Bloomberg

$350,000
600,000
$950,000

same CUSIP

CSX Corporation

8

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408HQ9
Coupon Rate:	2.400%
Maturity Date:	2/15/2030
Amount Outstanding ($ 000)	$400,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	88.747	4.55 %
February	86.982	4.95
March	87.567	4.86
April	85.544	5.34
May	86.944	5.07
June	87.093	5.07
July	89.462	4.58
August	90.580	4.36
September	91.641	4.15
October	89.313	4.71
November	89.778	4.63
December	88.726	4.92
Average	88.531	4.77 %

Source: Bloomberg

CSX Corporation

9

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408HU0
Coupon Rate:	4.100%
Maturity Date:	11/15/2032
Amount Outstanding ($ 000)	$950,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	95.977	4.66 %
February	93.407	5.05
March	94.258	4.93
April	91.726	5.32
May	93.091	5.12
June	93.146	5.12
July	95.811	4.72
August	97.093	4.53
September	98.426	4.33
October	95.383	4.80
November	95.926	4.72
December	93.726	5.08
Average	94.831	4.87 %

Source: Bloomberg

CSX Corporation

10

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408HW6
Coupon Rate:	5.200%
Maturity Date:	11/15/2033
Amount Outstanding ($ 000)	$600,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	103.534	4.74 %
February	100.839	5.09
March	101.746	4.97
April	98.744	5.37
May	99.915	5.21
June	99.858	5.22
July	102.780	4.82
August	104.220	4.63
September	105.620	4.44
October	101.988	4.92
November	102.957	4.79
December	100.401	5.14
Average	101.884	4.95 %

Source: Bloomberg

CSX Corporation

11

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408GH0
Coupon Rate:	6.000%
Maturity Date:	10/1/2036
Amount Outstanding ($ 000)	$400,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	109.748	4.95 %
February	106.435	5.29
March	107.678	5.16
April	104.121	5.54
May	105.618	5.37
June	105.576	5.37
July	108.936	5.01
August	110.328	4.86
September	111.692	4.71
October	107.575	5.14
November	108.667	5.02
December	105.330	5.38
Average	107.642	5.15 %

Source: Bloomberg

CSX Corporation

12

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408GK3
Coupon Rate:	6.150%
Maturity Date:	5/1/2037
Amount Outstanding ($ 000)	$700,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	111.430	4.96 %
February	108.223	5.28
March	109.373	5.16
April	105.447	5.56
May	107.145	5.38
June	106.892	5.40
July	110.191	5.06
August	111.796	4.89
September	113.260	4.74
October	108.505	5.22
November	109.891	5.07
December	106.500	5.42
Average	109.054	5.18 %

Source: Bloomberg

CSX Corporation

13

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408GP2
Coupon Rate:	7.450%
Maturity Date:	4/1/2038
Amount Outstanding ($ 000)	$79,226
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	114.763	5.90 %
February	111.317	6.23
March	112.224	6.14
April	107.764	6.59
May	110.126	6.34
June	110.805	6.27
July	117.174	5.63
August	118.325	5.51
September	119.472	5.40
October	115.471	5.78
November	116.686	5.65
December	113.054	6.01
Average	113.932	5.95 %

Source: Bloomberg

CSX Corporation

14

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408GS6
Coupon Rate:	6.220%
Maturity Date:	4/30/2040
Amount Outstanding ($ 000)	$660,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	112.053	5.12 %
February	108.500	5.42
March	109.394	5.34
April	105.068	5.73
May	107.338	5.52
June	106.941	5.55
July	110.003	5.28
August	111.556	5.14
September	113.796	4.94
October	109.546	5.31
November	110.852	5.19
December	107.087	5.53
Average	109.345	5.34 %

Source: Bloomberg

CSX Corporation

15

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408GU1
Coupon Rate:	5.500%
Maturity Date:	4/15/2041
Amount Outstanding ($ 000)	$550,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	104.162	5.13 %
February	100.878	5.42
March	101.434	5.37
April	97.590	5.72
May	99.326	5.56
June	99.567	5.54
July	102.263	5.29
August	103.429	5.19
September	105.507	5.01
October	101.490	5.36
November	103.334	5.20
December	99.750	5.52
Average	101.561	5.36 %

Source: Bloomberg

$300,000
250,000
$550,000
same CUSIP

CSX Corporation

16

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408GW7
Coupon Rate:	4.750%
Maturity Date:	5/30/2042
Amount Outstanding ($ 000)	$600,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	95.205	5.16 %
February	92.134	5.43
March	93.183	5.34
April	89.059	5.73
May	90.898	5.56
June	90.940	5.55
July	93.530	5.32
August	95.161	5.17
September	97.014	5.01
October	92.888	5.38
November	94.421	5.24
December	90.502	5.61
Average	92.911	5.38 %

Source: Bloomberg

CSX Corporation

17

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408GX5
Coupon Rate:	4.400%
Maturity Date:	3/1/2043
Amount Outstanding ($ 000)	$300,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	91.271	5.12 %
February	88.516	5.37
March	89.649	5.27
April	85.421	5.67
May	87.194	5.50
June	86.838	5.54
July	89.414	5.30
August	90.810	5.18
September	92.474	5.03
October	88.913	5.36
November	90.669	5.20
December	86.606	5.58
Average	88.981	5.34 %

Source: Bloomberg

CSX Corporation

18

Type:	Notes
Description:	CSXT - Conrail
CUSIP:	126410LL1
Coupon Rate:	7.875%
Maturity Date:	5/15/2043
Amount Outstanding ($ 000)	$99,989
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	128.324	5.48 %
February	128.324	5.48
March	128.324	5.48
April	128.324	5.48
May	128.324	5.48
June	128.324	5.48
July	128.324	5.48
August	128.324	5.48
September	128.324	5.48
October	128.324	5.48
November	128.324	5.48
December	128.324	5.48
Average	128.324	5.48 %

Source: Bloomberg

CSX Corporation

19

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408GY3
Coupon Rate:	4.100%
Maturity Date:	3/15/2044
Amount Outstanding ($ 000)	$800,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	87.459	5.10 %
February	84.109	5.41
March	85.408	5.29
April	81.168	5.70
May	82.567	5.56
June	82.102	5.61
July	84.933	5.35
August	86.766	5.19
September	88.982	4.99
October	84.642	5.39
November	86.112	5.25
December	82.324	5.62
Average	84.714	5.37 %

Source: Bloomberg

CSX Corporation

20

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408HF3
Coupon Rate:	3.800%
Maturity Date:	11/1/2046
Amount Outstanding ($ 000)	$800,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	82.652	5.10 %
February	78.815	5.44
March	79.860	5.35
April	75.926	5.72
May	77.918	5.53
June	77.343	5.59
July	80.078	5.34
August	81.425	5.22
September	84.068	5.00
October	79.645	5.39
November	80.897	5.28
December	77.076	5.64
Average	79.642	5.38 %

Source: Bloomberg

CSX Corporation

21

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408HK2
Coupon Rate:	4.300%
Maturity Date:	3/1/2048
Amount Outstanding ($ 000)	$850,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	88.564	5.13 %
February	85.363	5.40
March	86.188	5.33
April	81.550	5.73
May	83.997	5.52
June	83.545	5.56
July	86.318	5.33
August	87.609	5.22
September	89.835	5.04
October	85.653	5.39
November	86.570	5.31
December	82.498	5.67
Average	85.641	5.39 %

Source: Bloomberg

CSX Corporation

22

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408HN6
Coupon Rate:	4.750%
Maturity Date:	11/15/2048
Amount Outstanding ($ 000)	$650,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	95.049	5.10 %
February	91.295	5.39
March	91.983	5.34
April	87.453	5.71
May	89.718	5.52
June	89.278	5.56
July	91.692	5.37
August	93.567	5.22
September	95.875	5.05
October	91.447	5.39
November	92.589	5.30
December	88.347	5.64
Average	91.524	5.38 %

Source: Bloomberg

CSX Corporation

23

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408HP1
Coupon Rate:	4.500%
Maturity Date:	3/15/2049
Amount Outstanding ($ 000)	$400,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	90.828	5.16 %
February	87.271	5.44
March	88.064	5.37
April	84.079	5.71
May	85.986	5.55
June	85.665	5.58
July	88.044	5.38
August	89.818	5.24
September	92.416	5.04
October	88.353	5.36
November	89.232	5.29
December	85.107	5.63
Average	87.905	5.40 %

Source: Bloomberg

CSX Corporation

24

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408HR7
Coupon Rate:	3.350%
Maturity Date:	9/15/2049
Amount Outstanding ($ 000)	$600,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	74.573	5.15 %
February	71.809	5.40
March	72.322	5.35
April	68.709	5.70
May	70.305	5.55
June	70.373	5.55
July	72.721	5.33
August	74.016	5.22
September	76.392	5.02
October	72.544	5.36
November	73.762	5.26
December	69.829	5.63
Average	72.280	5.38 %

Source: Bloomberg

CSX Corporation

25

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408HS5
Coupon Rate:	3.800%
Maturity Date:	4/15/2050
Amount Outstanding ($ 000)	$500,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	80.734	5.15 %
February	77.652	5.41
March	77.932	5.39
April	74.372	5.70
May	76.564	5.51
June	76.510	5.52
July	79.201	5.29
August	81.170	5.13
September	82.780	5.00
October	79.034	5.31
November	79.820	5.25
December	75.682	5.61
Average	78.454	5.36 %

Source: Bloomberg

CSX Corporation

26

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408HC0
Coupon Rate:	3.950%
Maturity Date:	5/1/2050
Amount Outstanding ($ 000)	$600,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	83.130	5.13 %
February	80.082	5.38
March	80.720	5.33
April	76.560	5.69
May	78.566	5.51
June	78.757	5.50
July	81.321	5.29
August	83.165	5.14
September	84.540	5.03
October	80.910	5.33
November	81.630	5.27
December	77.680	5.61
Average	80.588	5.35 %

Source: Bloomberg

CSX Corporation

27

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408HT3
Coupon Rate:	2.500%
Maturity Date:	5/15/2051
Amount Outstanding ($ 000)	$500,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	63.608	4.94 %
February	60.882	5.20
March	61.252	5.17
April	57.623	5.54
May	58.921	5.42
June	59.020	5.41
July	61.284	5.19
August	62.447	5.09
September	64.139	4.93
October	61.017	5.23
November	61.548	5.19
December	58.301	5.52
Average	60.837	5.24 %

Source: Bloomberg

CSX Corporation

28

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408HV8
Coupon Rate:	4.500%
Maturity Date:	11/15/2052
Amount Outstanding ($ 000)	$900,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	91.505	5.06 %
February	87.691	5.34
March	88.597	5.28
April	83.840	5.65
May	85.619	5.51
June	85.288	5.53
July	88.670	5.28
August	90.483	5.14
September	92.719	4.98
October	87.896	5.34
November	89.486	5.22
December	84.651	5.59
Average	88.037	5.33 %

Source: Bloomberg

CSX Corporation

29

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408HA4
Coupon Rate:	4.500%
Maturity Date:	8/1/2054
Amount Outstanding ($ 000)	$450,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	90.821	5.10 %
February	87.051	5.37
March	87.899	5.31
April	83.214	5.67
May	84.910	5.53
June	84.748	5.55
July	88.264	5.28
August	89.547	5.19
September	92.175	5.01
October	87.599	5.34
November	88.620	5.26
December	84.438	5.58
Average	87.441	5.35 %

Source: Bloomberg

CSX Corporation

30

Type:	Notes (New)
Description:	CSX Corp.
CUSIP:	126408HY2
Coupon Rate:	4.900%
Maturity Date:	3/15/2055
Amount Outstanding ($ 000)	$550,000
Months Outstanding	4.0

End of Month in 2024	Price	Yield
January	Not Traded	- %
February	Not Traded	-
March	Not Traded	-
April	Not Traded	-
May	Not Traded	-
June	Not Traded	-
July	Not Traded	-
August	Not Traded	-
September	98.299	5.01
October	93.254	5.35
November	94.429	5.27
December	89.644	5.62
Average	93.907	5.31 %

Source: Bloomberg

CSX Corporation

31

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408HG1
Coupon Rate:	4.250%
Maturity Date:	11/1/2066
Amount Outstanding ($ 000)	$700,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	83.930	5.19 %
February	79.870	5.47
March	80.539	5.43
April	75.827	5.78
May	77.342	5.67
June	77.416	5.66
July	80.785	5.41
August	82.605	5.28
September	84.930	5.13
October	79.893	5.48
November	81.267	5.38
December	75.826	5.79
Average	80.019	5.47 %

Source: Bloomberg

CSX Corporation

32

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408HL0
Coupon Rate:	4.650%
Maturity Date:	3/1/2068
Amount Outstanding ($ 000)	$350,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	90.552	5.20 %
February	86.032	5.50
March	86.841	5.44
April	81.813	5.80
May	83.927	5.64
June	83.860	5.65
July	87.022	5.43
August	89.315	5.28
September	91.443	5.14
October	85.835	5.51
November	87.207	5.42
December	82.099	5.78
Average	86.329	5.48 %

Source: Bloomberg

Norfolk Southern Corp.

33

Type:	Notes
Description:	Senior
CUSIP:	655844BS6
Coupon Rate:	2.900%
Maturity Date:	6/15/2026
Amount Outstanding ($ 000)	$600,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	96.194	4.61 %
February	95.330	5.09
March	95.527	5.07
April	95.101	5.38
May	95.530	5.25
June	95.503	5.35
July	96.625	4.80
August	97.321	4.48
September	97.929	4.17
October	97.356	4.61
November	97.531	4.58
December	97.683	4.57
Average	96.469	4.83 %

Source: Bloomberg

Norfolk Southern Corp.

34

Type:	Conrail Notes
Description:	CR NSC 2027
CUSIP:	655844AJ7
Coupon Rate:	7.800%
Maturity Date:	5/15/2027
Amount Outstanding ($ 000)	$319,135
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	109.804	4.55 %
February	108.319	4.95
March	108.317	4.89
April	106.874	5.32
May	107.285	5.11
June	107.212	5.07
July	108.188	4.63
August	108.545	4.40
September	109.016	4.13
October	107.613	4.59
November	107.459	4.55
December	106.967	4.66
Average	107.967	4.74 %

Source: Bloomberg

Norfolk Southern Corp.

35

Type:	Notes
Description:	Senior
CUSIP:	655844BT4
Coupon Rate:	3.150%
Maturity Date:	6/1/2027
Amount Outstanding ($ 000)	$300,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	96.097	4.42 %
February	94.749	4.92
March	94.694	4.98
April	93.692	5.40
May	94.571	5.13
June	94.822	5.08
July	96.189	4.60
August	96.909	4.36
September	97.567	4.12
October	96.566	4.57
November	96.943	4.46
December	96.803	4.56
Average	95.800	4.72 %

Source: Bloomberg

Norfolk Southern Corp.

36

Type:	Notes
Description:	Senior
CUSIP:	655844BZ0
Coupon Rate:	3.800%
Maturity Date:	8/1/2028
Amount Outstanding ($ 000)	$600,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	97.619	4.39 %
February	95.820	4.86
March	95.853	4.87
April	94.558	5.24
May	95.306	5.06
June	95.625	5.00
July	97.370	4.53
August	98.245	4.29
September	99.407	3.97
October	97.512	4.53
November	97.781	4.46
December	96.893	4.75
Average	96.832	4.66 %

Source: Bloomberg

Norfolk Southern Corp.

37

Type:	Notes
Description:	Senior
CUSIP:	655844AX6
Coupon Rate:	5.640%
Maturity Date:	5/17/2029
Amount Outstanding ($ 000)	$210,316
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	104.399	4.69 %
February	101.755	5.25
March	102.647	5.05
April	100.985	5.41
May	102.116	5.15
June	102.339	5.09
July	104.202	4.65
August	105.445	4.35
September	106.150	4.16
October	103.594	4.75
November	104.384	4.54
December	102.801	4.92
Average	103.401	4.83 %

Source: Bloomberg

Norfolk Southern Corp.

38

Type:	Notes
Description:	Senior
CUSIP:	655844CE6
Coupon Rate:	2.550%
Maturity Date:	11/1/2029
Amount Outstanding ($ 000)	$400,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	90.134	4.52 %
February	87.968	5.02
March	88.443	4.95
April	86.511	5.42
May	87.612	5.21
June	88.036	5.14
July	90.351	4.64
August	91.526	4.40
September	92.608	4.18
October	90.581	4.69
November	90.932	4.63
December	90.221	4.84
Average	89.577	4.80 %

Source: Bloomberg

Norfolk Southern Corp.

39

Type:	Notes
Description:	Senior
CUSIP:	655844CR7
Coupon Rate:	5.050%
Maturity Date:	8/1/2030
Amount Outstanding ($ 000)	$600,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	102.299	4.64 %
February	99.949	5.06
March	100.344	4.99
April	98.420	5.35
May	99.373	5.17
June	99.616	5.12
July	102.024	4.66
August	103.276	4.41
September	104.186	4.23
October	101.508	4.75
November	102.128	4.62
December	100.953	4.85
Average	101.173	4.82 %

Source: Bloomberg

Norfolk Southern Corp.

40

Type:	Notes
Description:	Senior
CUSIP:	655844AQ1
Coupon Rate:	7.250%
Maturity Date:	2/15/2031
Amount Outstanding ($ 000)	$284,028
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	113.516	4.95 %
February	110.763	5.37
March	111.651	5.21
April	109.210	5.60
May	110.606	5.34
June	110.640	5.32
July	112.830	4.93
August	113.832	4.74
September	114.878	4.53
October	112.648	4.89
November	113.046	4.79
December	110.522	5.22
Average	112.012	5.07 %

Source: Bloomberg

Norfolk Southern Corp.

41

Type:	Notes
Description:	Senior
CUSIP:	655844CK2
Coupon Rate:	2.300%
Maturity Date:	5/15/2031
Amount Outstanding ($ 000)	$500,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	85.875	4.60 %
February	83.620	5.04
March	84.543	4.90
April	82.529	5.31
May	83.499	5.16
June	83.783	5.13
July	86.310	4.68
August	87.614	4.46
September	88.681	4.28
October	86.285	4.77
November	87.151	4.63
December	85.629	4.96
Average	85.460	4.83 %

Source: Bloomberg

Prospectus supplement dated May 3, 2021
Interest accrues from May 12, 2021

Norfolk Southern Corp.

42

Type:	Notes
Description:	Senior
CUSIP:	655844CM8
Coupon Rate:	3.000%
Maturity Date:	3/15/2032
Amount Outstanding ($ 000)	$600,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	88.575	4.71 %
February	85.997	5.15
March	86.791	5.04
April	84.663	5.42
May	85.586	5.28
June	86.030	5.23
July	88.506	4.82
August	89.907	4.60
September	91.198	4.40
October	88.478	4.88
November	89.207	4.77
December	87.333	5.13
Average	87.689	4.95 %

Source: Bloomberg

Norfolk Southern Corp.

43

Type:	Notes
Description:	Senior
CUSIP:	655844CQ9
Coupon Rate:	4.450%
Maturity Date:	3/1/2033
Amount Outstanding ($ 000)	$500,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	98.521	4.65 %
February	95.257	5.12
March	95.966	5.02
April	93.403	5.40
May	94.255	5.28
June	94.345	5.27
July	97.086	4.87
August	98.723	4.63
September	99.872	4.47
October	96.927	4.90
November	97.596	4.81
December	95.279	5.17
Average	96.436	4.97 %

Source: Bloomberg

Norfolk Southern Corp.

44

Type:	Notes
Description:	Senior
CUSIP:	655844CT3
Coupon Rate:	5.550%
Maturity Date:	3/15/2034
Amount Outstanding ($ 000)	$400,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	105.955	4.80 %
February	102.748	5.20
March	103.979	5.04
April	100.487	5.49
May	101.554	5.34
June	101.884	5.30
July	104.666	4.93
August	105.952	4.77
September	107.325	4.59
October	103.972	5.01
November	104.512	4.94
December	102.062	5.26
Average	103.758	5.06 %

Source: Bloomberg

Norfolk Southern Corp.

45

Type:	Conrail Notes
Description:	CR NSC 2037
CUSIP:	655844AF5
Coupon Rate:	7.050%
Maturity Date:	5/1/2037
Amount Outstanding ($ 000)	$171,750
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	114.755	5.47 %
February	112.993	5.64
March	113.758	5.56
April	110.443	5.89
May	111.939	5.73
June	113.984	5.51
July	115.494	5.36
August	117.051	5.19
September	118.413	5.05
October	113.621	5.53
November	114.277	5.45
December	110.460	5.85
Average	113.932	5.52 %

Source: Bloomberg

Norfolk Southern Corp.

46

Type:	Notes
Description:	Senior
CUSIP:	655844BH0
Coupon Rate:	4.837%
Maturity Date:	10/1/2041
Amount Outstanding ($ 000)	$595,504
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	97.604	5.04 %
February	93.128	5.45
March	94.202	5.35
April	89.502	5.80
May	91.128	5.65
June	91.153	5.65
July	93.916	5.38
August	95.851	5.21
September	98.076	5.01
October	93.595	5.42
November	95.106	5.28
December	91.045	5.67
Average	93.692	5.41 %

Source: Bloomberg

Prospectus supplement dated May 3, 2021
Interest accrues from May 12, 2021

Norfolk Southern Corp.

47

Type:	Notes
Description:	Senior 144A
CUSIP:	655844BE7
Coupon Rate:	4.837%
Maturity Date:	10/1/2041
Amount Outstanding ($ 000)	$0
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	95.635	5.22 %
February	93.434	5.42
March	94.169	5.36
April	89.538	5.80
May	91.481	5.61
June	91.349	5.63
July	93.567	5.42
August	95.630	5.23
September	98.280	4.99
October	93.660	5.41
November	95.083	5.28
December	91.332	5.64
Average	93.597	5.42 %

Source: Bloomberg

Prospectus supplement dated August 16, 2021
Interest accrues from August 25, 2021

Norfolk Southern Corp.

48

Type:	Notes
Description:	Senior
CUSIP:	655844BM9
Coupon Rate:	3.950%
Maturity Date:	10/1/2042
Amount Outstanding ($ 000)	$600,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	85.979	5.13 %
February	82.010	5.51
March	82.867	5.43
April	78.960	5.83
May	80.368	5.69
June	80.175	5.71
July	83.038	5.43
August	84.840	5.26
September	86.773	5.08
October	82.901	5.46
November	84.538	5.30
December	80.478	5.71
Average	82.744	5.46 %

Source: Bloomberg

Norfolk Southern Corp.

49

Type:	Debenture
Description:	Southern Railway
CUSIP:	655855FB5
Coupon Rate:	7.875%
Maturity Date:	5/15/2043
Amount Outstanding ($ 000)	$138,085
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	Not Traded	- %
February	Not Traded	-
March	Not Traded	-
April	Not Traded	-
May	Not Traded	-
June	Not Traded	-
July	120.375	6.05
August	120.375	6.05
September	124.539	5.72
October	119.401	6.11
November	120.846	5.99
December	116.097	6.37
Average	120.272	6.05 %

Source: Bloomberg

Norfolk Southern Corp.

50

Type:	Notes
Description:	Senior
CUSIP:	655844BN7
Coupon Rate:	4.800%
Maturity Date:	8/15/2043
Amount Outstanding ($ 000)	$291,829
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	90.953	5.57 %
February	88.222	5.82
March	89.167	5.73
April	85.117	6.13
May	86.667	5.98
June	86.962	5.95
July	90.154	5.65
August	91.479	5.53
September	94.264	5.28
October	90.563	5.62
November	91.649	5.52
December	88.305	5.84
Average	89.459	5.72 %

Source: Bloomberg

Norfolk Southern Corp.

51

Type:	Notes
Description:	Senior
CUSIP:	655844BQ0
Coupon Rate:	4.450%
Maturity Date:	6/15/2045
Amount Outstanding ($ 000)	$500,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	90.824	5.16 %
February	86.111	5.57
March	87.351	5.46
April	82.943	5.87
May	85.030	5.68
June	84.828	5.70
July	87.852	5.43
August	89.556	5.28
September	91.860	5.09
October	87.442	5.47
November	88.990	5.34
December	84.548	5.74
Average	87.278	5.48 %

Source: Bloomberg

Norfolk Southern Corp.

52

Type:	Notes
Description:	Senior
CUSIP:	655844BR8
Coupon Rate:	4.650%
Maturity Date:	1/15/2046
Amount Outstanding ($ 000)	$600,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	94.292	5.08 %
February	88.805	5.54
March	89.745	5.46
April	85.008	5.88
May	86.951	5.71
June	87.276	5.68
July	89.766	5.47
August	91.928	5.28
September	94.271	5.09
October	89.724	5.47
November	91.205	5.35
December	86.880	5.73
Average	89.654	5.48 %

Source: Bloomberg

Norfolk Southern Corp.

53

Type:	Notes
Description:	Senior
CUSIP:	655844BX5
Coupon Rate:	3.942%
Maturity Date:	11/1/2047
Amount Outstanding ($ 000)	$749,997
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	83.598	5.15 %
February	79.164	5.53
March	80.107	5.45
April	75.593	5.87
May	77.338	5.71
June	77.055	5.74
July	80.200	5.45
August	81.495	5.34
September	83.672	5.16
October	79.833	5.50
November	81.304	5.37
December	76.907	5.78
Average	79.689	5.50 %

Source: Bloomberg

Norfolk Southern Corp.

54

Type:	Notes
Description:	Senior
CUSIP:	655844BY3
Coupon Rate:	4.150%
Maturity Date:	2/28/2048
Amount Outstanding ($ 000)	$700,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	86.319	5.15 %
February	82.363	5.48
March	83.067	5.42
April	78.311	5.85
May	79.798	5.72
June	79.477	5.75
July	82.969	5.44
August	84.838	5.28
September	86.399	5.16
October	82.962	5.45
November	84.296	5.34
December	79.546	5.76
Average	82.529	5.48 %

Source: Bloomberg

Norfolk Southern Corp.

55

Type:	Notes
Description:	Senior
CUSIP:	655844CC0
Coupon Rate:	4.100%
Maturity Date:	5/15/2049
Amount Outstanding ($ 000)	$400,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	85.100	5.16 %
February	80.936	5.51
March	81.351	5.48
April	76.924	5.87
May	78.665	5.72
June	78.893	5.70
July	81.402	5.48
August	83.085	5.34
September	84.938	5.19
October	81.680	5.46
November	82.875	5.37
December	78.860	5.72
Average	81.226	5.50 %

Source: Bloomberg

Norfolk Southern Corp.

56

Type:	Notes
Description:	Senior
CUSIP:	655844CD8
Coupon Rate:	3.400%
Maturity Date:	11/1/2049
Amount Outstanding ($ 000)	$400,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	75.701	5.11 %
February	72.092	5.43
March	73.315	5.32
April	68.749	5.75
May	69.943	5.64
June	70.072	5.63
July	72.324	5.43
August	74.045	5.28
September	75.575	5.14
October	72.523	5.42
November	73.424	5.34
December	69.503	5.71
Average	72.272	5.43 %

Source: Bloomberg

Norfolk Southern Corp.

57

Type:	Notes
Description:	Senior
CUSIP:	655844CF3
Coupon Rate:	3.050%
Maturity Date:	5/15/2050
Amount Outstanding ($ 000)	$800,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	70.940	5.06 %
February	66.983	5.43
March	67.727	5.36
April	63.203	5.81
May	64.808	5.65
June	65.024	5.63
July	67.744	5.38
August	69.186	5.25
September	70.564	5.13
October	67.276	5.44
November	68.418	5.33
December	64.625	5.71
Average	67.208	5.43 %

Source: Bloomberg

Norfolk Southern Corp.

58

Type:	Notes
Description:	Senior
CUSIP:	655844CL0
Coupon Rate:	2.900%
Maturity Date:	8/25/2051
Amount Outstanding ($ 000)	$600,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	68.304	5.04 %
February	64.377	5.40
March	65.220	5.33
April	60.988	5.75
May	62.113	5.64
June	62.159	5.64
July	64.660	5.40
August	65.959	5.28
September	67.660	5.13
October	64.749	5.40
November	65.476	5.34
December	61.630	5.72
Average	64.441	5.42 %

Source: Bloomberg

Norfolk Southern Corp.

59

Type:	Notes
Description:	Senior
CUSIP:	655844BV9
Coupon Rate:	4.050%
Maturity Date:	8/15/2052
Amount Outstanding ($ 000)	$749,994
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	85.102	5.04 %
February	79.887	5.45
March	80.592	5.39
April	75.522	5.83
May	76.864	5.71
June	76.902	5.71
July	80.270	5.43
August	82.169	5.28
September	83.808	5.15
October	80.181	5.44
November	81.425	5.34
December	77.219	5.70
Average	79.995	5.46 %

Source: Bloomberg

Norfolk Southern Corp.

60

Type:	Notes
Description:	Senior
CUSIP:	655844CN6
Coupon Rate:	3.700%
Maturity Date:	3/15/2053
Amount Outstanding ($ 000)	$400,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	79.190	5.08 %
February	74.658	5.45
March	75.199	5.40
April	70.576	5.82
May	72.000	5.69
June	72.220	5.67
July	74.824	5.45
August	76.657	5.30
September	78.777	5.13
October	75.133	5.43
November	76.092	5.35
December	71.956	5.71
Average	74.774	5.46 %

Source: Bloomberg

Norfolk Southern Corp.

61

Type:	Notes
Description:	Senior
CUSIP:	655844CP1
Coupon Rate:	4.550%
Maturity Date:	6/1/2053
Amount Outstanding ($ 000)	$750,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	91.526	5.11 %
February	86.856	5.45
March	87.392	5.41
April	82.769	5.78
May	83.732	5.70
June	83.910	5.69
July	86.871	5.46
August	88.928	5.30
September	90.909	5.16
October	86.806	5.47
November	88.146	5.37
December	83.898	5.70
Average	86.812	5.47 %

Source: Bloomberg

Note: These are Rule 144-A notes, which trade among qualified institutional buyers and have their own CUSIP. The exchange-traded notes similar to these are on the proceeding page.

61	Exchange traded	$750,000
62	Rule 144-A	0
		$750,000

This note has 3 CUSIPs, but one of them has no trading data available, and 595,504 is the amount submitted by NS

Norfolk Southern Corp.

62

Type:	Notes
Description:	Senior
CUSIP:	655844CS5
Coupon Rate:	5.350%
Maturity Date:	8/1/2054
Amount Outstanding ($ 000)	$1,000,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	103.731	5.11 %
February	97.867	5.50
March	99.359	5.39
April	93.400	5.82
May	95.018	5.70
June	95.008	5.70
July	98.472	5.45
August	101.079	5.28
September	103.135	5.14
October	98.610	5.44
November	100.076	5.34
December	95.311	5.68
Average	98.422	5.46 %

Source: Bloomberg

Norfolk Southern Corp.

63

Type:	Notes
Description:	Senior
CUSIP:	655844CH9
Coupon Rate:	3.155%
Maturity Date:	5/15/2055
Amount Outstanding ($ 000)	$799,996
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	70.388	5.05 %
February	65.621	5.46
March	66.485	5.39
April	62.053	5.81
May	63.019	5.72
June	63.265	5.70
July	66.168	5.43
August	67.395	5.32
September	69.336	5.16
October	66.148	5.44
November	67.102	5.36
December	63.274	5.72
Average	65.855	5.46 %

Source: Bloomberg

Note: This is the exchange-traded portion of these notes. The Rule 144-A notes similar to these have a different CUSIP, and are shown on the next page.

63	Exchange traded	**$799,996**
64	Rule 144-A	1
		$799,997

Norfolk Southern Corp.

64

Type:	Notes
Description:	Senior 144A
CUSIP:	655844CG1
Coupon Rate:	3.155%
Maturity Date:	5/15/2055
Amount Outstanding ($ 000)	$1
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	69.989	5.08 %
February	66.495	5.38
March	66.333	5.40
April	61.944	5.82
May	63.272	5.69
June	63.916	5.63
July	65.992	5.44
August	67.102	5.35
September	69.127	5.18
October	66.275	5.43
November	66.882	5.38
December	63.332	5.71
Average	65.888	5.46 %

Source: Bloomberg

Note: These are Rule 144-A notes, which trade among qualified institutional buyers and have their own CUSIP. The exchange-traded notes similar to these are on the proceeding page.

63	Exchange traded	$799,996
64	Rule 144-A	1
		$799,997

Norfolk Southern Corp.

65

Type:	Notes
Description:	Senior
CUSIP:	655844CU0
Coupon Rate:	5.950%
Maturity Date:	3/15/2064
Amount Outstanding ($ 000)	$600,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	111.937	5.24 %
February	105.391	5.61
March	106.718	5.53
April	100.428	5.92
May	102.049	5.82
June	101.815	5.83
July	106.060	5.57
August	108.857	5.41
September	111.097	5.28
October	105.924	5.58
November	107.879	5.46
December	102.616	5.78
Average	105.898	5.59 %

Source: Bloomberg

Norfolk Southern Corp.

66

Type:	Notes
Description:	CR NSC 2097
CUSIP:	655844AK4
Coupon Rate:	7.900%
Maturity Date:	5/15/2097
Amount Outstanding ($ 000)	$196,302
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	145.705	5.39 %
February	139.071	5.65
March	145.477	5.40
April	135.856	5.79
May	138.181	5.69
June	141.126	5.57
July	145.418	5.40
August	137.294	5.73
September	136.685	5.75
October	129.480	6.08
November	131.565	5.98
December	124.312	6.34
Average	137.514	5.73 %

Source: Bloomberg

Norfolk Southern Corp.

67

Type:	Notes
Description:	Senior 2105
CUSIP:	655844AV0
Coupon Rate:	6.000%
Maturity Date:	3/15/2105
Amount Outstanding ($ 000)	$157,780
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	99.721	6.02 %
February	97.157	6.18
March	97.937	6.13
April	92.116	6.52
May	93.983	6.39
June	95.939	6.26
July	98.299	6.10
August	100.044	6.00
September	102.667	5.84
October	97.288	6.17
November	99.134	6.05
December	94.504	6.35
Average	97.399	6.17 %

Source: Bloomberg

Norfolk Southern Corp.

68

Type:	Notes
Description:	Senior
CUSIP:	655844BD9
Coupon Rate:	6.000%
Maturity Date:	5/23/2111
Amount Outstanding ($ 000)	$79,726
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	100.973	5.94 %
February	95.382	6.29
March	100.031	6.00
April	92.052	6.52
May	93.562	6.42
June	95.816	6.26
July	98.343	6.10
August	99.918	6.00
September	102.577	5.85
October	97.525	6.15
November	98.884	6.07
December	93.536	6.42
Average	97.383	6.17 %

Source: Bloomberg

Norfolk Southern Corp.

69

Type:	Notes
Description:	Senior
CUSIP:	655844CB2
Coupon Rate:	5.100%
Maturity Date:	8/1/2118
Amount Outstanding ($ 000)	$350,521
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	92.398	5.52 %
February	86.852	5.88
March	88.142	5.79
April	83.092	6.14
May	84.681	6.03
June	84.263	6.06
July	88.064	5.80
August	90.256	5.65
September	93.174	5.48
October	87.842	5.81
November	90.690	5.63
December	85.206	5.99
Average	87.888	5.82 %

Source: Bloomberg

Norfolk Southern Corp.

70

Type:	Notes
Description:	Senior
CUSIP:	655844CJ5
Coupon Rate:	4.100%
Maturity Date:	5/15/2121
Amount Outstanding ($ 000)	$600,000
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	76.454	5.37 %
February	72.099	5.70
March	73.322	5.60
April	68.733	5.97
May	70.181	5.85
June	70.373	5.84
July	73.858	5.56
August	76.532	5.37
September	75.961	5.41
October	72.306	5.68
November	74.002	5.55
December	69.319	5.92
Average	72.762	5.65 %

Source: Bloomberg

Union Pacific Corp.

71

Type:	Notes
Description:	UP Corp.
CUSIP:	907818GE2
Coupon Rate:	4.750%
Maturity Date:	2/21/2026
Amount Outstanding ($ 000)	$498,819
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	100.463	4.51 %
February	99.776	4.87
March	99.851	4.83
April	99.135	5.26
May	99.358	5.14
June	99.280	5.21
July	100.018	4.74
August	100.488	4.40
September	100.748	4.19
October	100.328	4.48
November	100.234	4.55
December	100.276	4.49
Average	99.996	4.72 %

Source: Bloomberg

Union Pacific Corp.

72

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EH7
Coupon Rate:	2.750%
Maturity Date:	3/1/2026
Amount Outstanding ($ 000)	$649,500
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	96.437	4.56 %
February	95.849	4.96
March	96.046	4.94
April	95.497	5.36
May	95.912	5.23
June	96.127	5.20
July	97.055	4.70
August	97.624	4.41
September	98.157	4.10
October	97.776	4.48
November	97.866	4.53
December	97.973	4.56
Average	96.860	4.75 %

Source: Bloomberg

Union Pacific Corp.

73

Type:	Notes
Description:	UP Corp.
CUSIP:	907818FJ2
Coupon Rate:	2.150%
Maturity Date:	2/5/2027
Amount Outstanding ($ 000)	$498,658
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	93.783	4.38 %
February	92.764	4.84
March	93.048	4.80
April	92.083	5.27
May	92.887	5.03
June	93.116	5.01
July	94.417	4.53
August	95.245	4.24
September	95.832	4.03
October	95.216	4.40
November	95.349	4.42
December	95.341	4.51
Average	94.090	4.62 %

Source: Bloomberg

Union Pacific Corp.

74

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EP9
Coupon Rate:	3.000%
Maturity Date:	4/15/2027
Amount Outstanding ($ 000)	$497,170
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	95.734	4.44 %
February	94.720	4.85
March	95.105	4.75
April	94.148	5.16
May	94.951	4.91
June	95.021	4.93
July	96.241	4.49
August	97.011	4.22
September	97.644	3.98
October	96.648	4.46
November	96.756	4.46
December	96.734	4.52
Average	95.893	4.60 %

Source: Bloomberg

Union Pacific Corp.

75

Type:	Debentures
Description:	UP Corp.
CUSIP:	907818BY3
Coupon Rate:	7.125%
Maturity Date:	2/1/2028
Amount Outstanding ($ 000)	$161,174
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	110.590	4.22 %
February	108.348	4.76
March	108.038	4.80
April	105.825	5.38
May	106.549	5.14
June	106.595	5.09
July	107.902	4.65
August	108.972	4.27
September	109.130	4.16
October	107.356	4.66
November	107.628	4.51
December	106.392	4.86
Average	107.777	4.71 %

Source: Bloomberg

Union Pacific Corp.

76

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EY0
Coupon Rate:	3.950%
Maturity Date:	9/10/2028
Amount Outstanding ($ 000)	$1,050,401
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	98.774	4.25 %
February	97.016	4.69
March	97.497	4.58
April	95.661	5.07
May	96.518	4.86
June	96.707	4.83
July	98.489	4.36
August	99.315	4.14
September	99.973	3.96
October	97.968	4.53
November	98.385	4.42
December	97.480	4.70
Average	97.815	4.53 %

Source: Bloomberg

Union Pacific Corp.

77

Type:	Debentures
Description:	UP Corp.
CUSIP:	907818CF3
Coupon Rate:	6.625%
Maturity Date:	2/1/2029
Amount Outstanding ($ 000)	$390,362
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	110.100	4.35 %
February	108.108	4.75
March	108.373	4.67
April	106.127	5.15
May	106.995	4.93
June	106.786	4.95
July	108.746	4.46
August	109.695	4.19
September	110.240	4.02
October	107.814	4.58
November	108.491	4.37
December	107.000	4.72
Average	108.206	4.60 %

Source: Bloomberg

Union Pacific Corp.

78

Type:	Notes
Description:	UP Corp.
CUSIP:	907818FB9
Coupon Rate:	3.700%
Maturity Date:	3/1/2029
Amount Outstanding ($ 000)	$771,541
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	97.026	4.36 %
February	95.253	4.78
March	95.697	4.69
April	93.795	5.17
May	94.736	4.96
June	95.141	4.88
July	97.030	4.42
August	98.108	4.17
September	98.891	3.98
October	96.670	4.55
November	96.904	4.51
December	96.039	4.76
Average	96.274	4.60 %

Source: Bloomberg

Union Pacific Corp.

79

Type:	Notes
Description:	UP Corp.
CUSIP:	907818FH6
Coupon Rate:	2.400%
Maturity Date:	2/5/2030
Amount Outstanding ($ 000)	$745,211
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	88.857	4.54 %
February	87.105	4.94
March	87.702	4.84
April	85.979	5.25
May	86.847	5.10
June	87.443	5.00
July	89.729	4.53
August	91.040	4.27
September	91.843	4.12
October	89.606	4.65
November	90.023	4.59
December	88.989	4.87
Average	88.764	4.73 %

Source: Bloomberg

Union Pacific Corp.

80

Type:	Notes
Description:	UP Corp.
CUSIP:	907818FU7
Coupon Rate:	2.375%
Maturity Date:	5/20/2031
Amount Outstanding ($ 000)	$997,993
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	86.341	4.60 %
February	84.535	4.95
March	85.331	4.83
April	83.384	5.22
May	84.529	5.04
June	84.896	4.99
July	87.313	4.57
August	88.811	4.31
September	89.762	4.16
October	87.332	4.64
November	87.922	4.55
December	86.576	4.85
Average	86.394	4.73 %

Source: Bloomberg

Union Pacific Corp.

81

Type:	Notes
Description:	UP Corp.
CUSIP:	907818FX1
Coupon Rate:	2.800%
Maturity Date:	2/14/2032
Amount Outstanding ($ 000)	$1,238,684
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	88.036	4.60 %
February	85.900	4.97
March	86.605	4.87
April	84.482	5.25
May	85.669	5.07
June	86.144	5.01
July	88.633	4.60
August	89.860	4.41
September	91.030	4.23
October	88.276	4.72
November	88.801	4.65
December	86.960	5.00
Average	87.533	4.78 %

Source: Bloomberg

Union Pacific Corp.

82

Type:	Notes
Description:	UP Corp.
CUSIP:	907818GB8
Coupon Rate:	4.500%
Maturity Date:	1/20/2033
Amount Outstanding ($ 000)	$891,672
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	99.614	4.55 %
February	96.870	4.94
March	97.483	4.85
April	94.480	5.30
May	95.710	5.12
June	96.006	5.08
July	98.642	4.70
August	100.043	4.49
September	101.105	4.34
October	98.089	4.78
November	98.860	4.67
December	96.437	5.04
Average	97.778	4.82 %

Source: Bloomberg

Union Pacific Corp.

83

Type:	Debentures
Description:	UP Corp.
CUSIP:	907818CS5
Coupon Rate:	5.375%
Maturity Date:	6/1/2033
Amount Outstanding ($ 000)	$143,209
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	102.181	5.08 %
February	100.252	5.34
March	101.010	5.23
April	97.455	5.74
May	99.089	5.51
June	99.737	5.41
July	103.570	4.87
August	102.813	4.97
September	104.035	4.80
October	100.999	5.23
November	101.937	5.09
December	101.449	5.16
Average	101.211	5.20 %

Source: Bloomberg

Union Pacific Corp.

84

Type:	Debentures
Description:	UP Corp.
CUSIP:	907818CU0
Coupon Rate:	6.250%
Maturity Date:	5/1/2034
Amount Outstanding ($ 000)	$152,541
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	110.271	4.96 %
February	107.754	5.25
March	109.532	5.03
April	104.142	5.70
May	106.971	5.33
June	108.083	5.19
July	110.488	4.88
August	111.933	4.70
September	112.772	4.59
October	108.928	5.06
November	109.457	4.98
December	106.932	5.30
Average	108.939	5.08 %

Source: Bloomberg

Union Pacific Corp.

85

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EB0
Coupon Rate:	3.375%
Maturity Date:	2/1/2035
Amount Outstanding ($ 000)	$446,568
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	88.053	4.79 %
February	85.152	5.17
March	86.213	5.04
April	83.512	5.42
May	85.131	5.21
June	85.415	5.18
July	88.051	4.84
August	89.721	4.63
September	91.262	4.44
October	87.977	4.88
November	89.146	4.73
December	86.900	5.05
Average	87.211	4.95 %

Source: Bloomberg

Union Pacific Corp.

86

Type:	Notes (Exchange)
Description:	UP Corp.
CUSIP:	907818FQ6
Coupon Rate:	2.891%
Maturity Date:	4/6/2036
Amount Outstanding ($ 000)	$615,756
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	83.611	4.67 %
February	80.609	5.05
March	81.581	4.94
April	78.499	5.35
May	79.866	5.19
June	80.371	5.13
July	83.098	4.80
August	84.582	4.62
September	85.980	4.46
October	82.254	4.94
November	83.367	4.81
December	80.793	5.16
Average	82.051	4.93 %

Source: Bloomberg

Exchange Offer, 424B3, Prospectus Dated September 3, 2021
Note: This is the Exchange traded portion of the notes, the 144A portion is shown on the prior page

86	$615,756
87	1716
	$617,472

Union Pacific Corp.

87

Type:	Notes (Exchange)
Description:	UP Corp. 144A
CUSIP:	907818FP8
Coupon Rate:	2.891%
Maturity Date:	4/6/2036
Amount Outstanding ($ 000)	$1,716
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	83.804	4.65 %
February	80.714	5.04
March	81.643	4.94
April	78.288	5.38
May	79.893	5.18
June	80.243	5.15
July	83.104	4.80
August	84.554	4.63
September	86.062	4.45
October	82.653	4.89
November	83.381	4.81
December	80.963	5.14
Average	82.109	4.92 %

Source: Bloomberg

Exchange Offer, 424B3, Prospectus Dated September 3, 2021,
interest accrues from April 6, 2021

Note: These are Rule 144-A notes, which trade among qualified institutional buyers.

87	$1,716
86	615756
	$617,472

Union Pacific Corp.

88

Type:	Debentures
Description:	UP Corp.
CUSIP:	907818CX4
Coupon Rate:	6.150%
Maturity Date:	5/1/2037
Amount Outstanding ($ 000)	$89,942
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	108.582	5.24 %
February	105.605	5.54
March	107.106	5.39
April	102.825	5.84
May	104.363	5.67
June	105.437	5.55
July	108.095	5.27
August	108.848	5.19
September	110.859	4.98
October	107.360	5.34
November	107.980	5.27
December	105.692	5.51
Average	106.896	5.40 %

Source: Bloomberg

Union Pacific Corp.

89

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EQ7
Coupon Rate:	3.600%
Maturity Date:	9/15/2037
Amount Outstanding ($ 000)	$496,062
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	88.793	4.73 %
February	85.523	5.09
March	86.196	5.02
April	82.553	5.46
May	83.793	5.32
June	84.326	5.26
July	86.667	5.00
August	88.089	4.84
September	90.089	4.63
October	85.902	5.11
November	86.582	5.04
December	83.974	5.36
Average	86.041	5.07 %

Source: Bloomberg

Union Pacific Corp.

90

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EV6
Coupon Rate:	4.375%
Maturity Date:	9/10/2038
Amount Outstanding ($ 000)	$231,274
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	93.889	4.97 %
February	90.893	5.28
March	92.187	5.15
April	88.201	5.58
May	88.923	5.51
June	89.596	5.44
July	92.051	5.18
August	93.187	5.06
September	95.920	4.78
October	92.760	5.11
November	93.714	5.01
December	90.698	5.34
Average	91.835	5.20 %

Source: Bloomberg

Union Pacific Corp.

91

Type:	Notes
Description:	UP Corp.
CUSIP:	907818FD5
Coupon Rate:	3.550%
Maturity Date:	8/15/2039
Amount Outstanding ($ 000)	$494,850
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	85.923	4.85 %
February	82.100	5.26
March	83.494	5.11
April	79.341	5.58
May	81.076	5.39
June	81.308	5.37
July	84.498	5.03
August	86.050	4.88
September	87.681	4.71
October	83.208	5.19
November	84.525	5.05
December	81.454	5.40
Average	83.388	5.15 %

Source: Bloomberg

Union Pacific Corp.

92

Type:	Notes
Description:	UP Corp. 144A
CUSIP:	907818DE5
Coupon Rate:	5.780%
Maturity Date:	7/15/2040
Amount Outstanding ($ 000)	$10
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	101.824	5.61 %
February	100.202	5.76
March	102.057	5.59
April	97.411	6.03
May	99.144	5.86
June	100.331	5.75
July	102.156	5.57
August	103.394	5.46
September	104.249	5.38
October	100.659	5.72
November	103.242	5.47
December	98.678	5.91
Average	101.112	5.68 %

Source: Bloomberg

Note: These are Rule 144-A notes, which trade among qualified institutional buyers.

92	$10
93	65368
	$65,378

Union Pacific Corp.

93

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DF2
Coupon Rate:	5.780%
Maturity Date:	7/15/2040
Amount Outstanding ($ 000)	$65,368
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	106.107	5.22 %
February	100.959	5.69
March	101.566	5.63
April	97.278	6.05
May	98.842	5.89
June	99.449	5.83
July	102.233	5.57
August	104.308	5.37
September	104.133	5.39
October	100.710	5.71
November	102.444	5.54
December	98.598	5.92
Average	101.386	5.65 %

Source: Bloomberg

Note: This is the exchange-traded portion of these notes. The Rule 144-A notes similar to these have a different CUSIP, and are shown on the next page.

93	$65,368
92	10
	$65,378

Union Pacific Corp.

94

Type:	Notes
Description:	UP Corp.
CUSIP:	907818FT0
Coupon Rate:	3.200%
Maturity Date:	5/20/2041
Amount Outstanding ($ 000)	$992,086
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	79.618	4.97 %
February	76.969	5.25
March	78.050	5.14
April	74.335	5.55
May	75.670	5.41
June	75.613	5.42
July	78.045	5.17
August	79.335	5.04
September	81.061	4.88
October	77.249	5.28
November	78.575	5.15
December	75.051	5.54
Average	77.464	5.23 %

Source: Bloomberg

Prospectus supplement dated May 17, 2021
Interest accrues from May 20, 2021

Union Pacific Corp.

95

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DJ4
Coupon Rate:	4.750%
Maturity Date:	9/15/2041
Amount Outstanding ($ 000)	$212,887
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	92.206	5.44 %
February	89.206	5.73
March	90.301	5.63
April	86.250	6.04
May	87.965	5.87
June	89.014	5.76
July	91.466	5.53
August	94.060	5.28
September	95.285	5.17
October	91.731	5.51
November	92.728	5.41
December	88.755	5.81
Average	90.747	5.60 %

Source: Bloomberg

Union Pacific Corp.

96

Type:	Notes
Description:	UP Corp.
CUSIP:	907818FY9
Coupon Rate:	3.375%
Maturity Date:	2/14/2042
Amount Outstanding ($ 000)	$495,319
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	81.249	4.96 %
February	78.116	5.28
March	79.239	5.17
April	75.370	5.58
May	76.855	5.43
June	76.830	5.44
July	78.962	5.22
August	80.205	5.10
September	82.142	4.92
October	78.520	5.29
November	79.910	5.15
December	76.298	5.54
Average	78.641	5.26 %

Source: Bloomberg

Union Pacific Corp.

97

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DL9
Coupon Rate:	4.300%
Maturity Date:	6/15/2042
Amount Outstanding ($ 000)	$204,473
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	88.607	5.28 %
February	85.459	5.58
March	86.540	5.48
April	82.535	5.88
May	83.856	5.75
June	84.509	5.69
July	86.653	5.48
August	88.219	5.33
September	90.302	5.14
October	85.560	5.60
November	86.964	5.47
December	83.689	5.80
Average	86.074	5.54 %

Source: Bloomberg

Union Pacific Corp.

98

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DP0
Coupon Rate:	4.250%
Maturity Date:	4/15/2043
Amount Outstanding ($ 000)	$183,794
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	86.152	5.42 %
February	83.362	5.69
March	84.253	5.61
April	80.156	6.02
May	82.357	5.80
June	82.061	5.83
July	84.421	5.60
August	85.866	5.47
September	88.051	5.27
October	84.633	5.60
November	85.739	5.49
December	81.862	5.88
Average	84.076	5.64 %

Source: Bloomberg

Union Pacific Corp.

99

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DU9
Coupon Rate:	4.750%
Maturity Date:	12/15/2043
Amount Outstanding ($ 000)	$182,849
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	92.686	5.35 %
February	89.600	5.63
March	90.491	5.55
April	85.945	5.98
May	87.827	5.80
June	87.816	5.80
July	90.450	5.56
August	91.264	5.49
September	94.046	5.25
October	90.118	5.60
November	91.633	5.46
December	87.187	5.88
Average	89.922	5.61 %

Source: Bloomberg

Union Pacific Corp.

100

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DT2
Coupon Rate:	4.821%
Maturity Date:	2/1/2044
Amount Outstanding ($ 000)	$131,961
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	93.283	5.37 %
February	89.911	5.67
March	90.737	5.60
April	85.855	6.06
May	88.181	5.84
June	89.007	5.76
July	91.148	5.57
August	93.642	5.35
September	94.829	5.25
October	91.287	5.56
November	91.973	5.50
December	87.514	5.92
Average	90.614	5.62 %

Source: Bloomberg

Note: This is the exchange-traded portion of these notes. The Rule 144-A notes similar to these have a different CUSIP, and are shown on the next page.

100	$131,961
101	1
	$131,962

Union Pacific Corp.

101

Type:	Notes
Description:	UP Corp. 144A
CUSIP:	907818DS4
Coupon Rate:	4.821%
Maturity Date:	2/1/2044
Amount Outstanding ($ 000)	$1
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	92.446	5.45 %
February	90.470	5.62
March	90.542	5.62
April	85.981	6.05
May	88.772	5.78
June	89.269	5.74
July	91.216	5.57
August	93.346	5.38
September	95.044	5.23
October	90.966	5.59
November	91.797	5.52
December	87.665	5.91
Average	90.626	5.62 %

Source: Bloomberg

Note: These are Rule 144-A notes, which trade among qualified institutional buyers.

101	$1
100	131960.53
	$131,962

Union Pacific Corp.

102

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DX3
Coupon Rate:	4.850%
Maturity Date:	6/15/2044
Amount Outstanding ($ 000)	$83,386
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	89.342	5.74 %
February	86.479	6.01
March	87.974	5.87
April	83.487	6.31
May	85.177	6.15
June	86.929	5.98
July	90.887	5.62
August	93.067	5.43
September	95.058	5.26
October	90.928	5.62
November	92.058	5.52
December	88.852	5.81
Average	89.187	5.78 %

Source: Bloomberg

Union Pacific Corp.

103

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DZ8
Coupon Rate:	4.150%
Maturity Date:	1/15/2045
Amount Outstanding ($ 000)	$229,283
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	84.229	5.42 %
February	82.103	5.62
March	83.483	5.49
April	79.470	5.88
May	81.443	5.69
June	81.520	5.69
July	84.104	5.45
August	85.139	5.36
September	86.417	5.25
October	82.244	5.63
November	83.669	5.50
December	80.102	5.85
Average	82.827	5.57 %

Source: Bloomberg

Union Pacific Corp.

104

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EF1
Coupon Rate:	4.050%
Maturity Date:	11/15/2045
Amount Outstanding ($ 000)	$396,199
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	85.021	5.21 %
February	81.763	5.50
March	82.552	5.43
April	79.676	5.70
May	80.957	5.58
June	81.213	5.56
July	83.776	5.33
August	85.508	5.18
September	87.395	5.03
October	83.231	5.39
November	84.764	5.26
December	80.624	5.64
Average	83.040	5.40 %

Source: Bloomberg

Union Pacific Corp.

105

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EJ3
Coupon Rate:	4.050%
Maturity Date:	3/1/2046
Amount Outstanding ($ 000)	$516,244
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	85.242	5.18 %
February	82.109	5.46
March	82.973	5.38
April	78.896	5.76
May	80.669	5.60
June	81.354	5.54
July	83.702	5.33
August	85.056	5.21
September	87.250	5.03
October	83.309	5.37
November	85.014	5.23
December	80.097	5.68
Average	82.973	5.40 %

Source: Bloomberg

Union Pacific Corp.

106

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EK0
Coupon Rate:	3.350%
Maturity Date:	8/15/2046
Amount Outstanding ($ 000)	$296,597
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	75.122	5.25 %
February	72.211	5.53
March	73.422	5.41
April	69.769	5.78
May	71.469	5.61
June	72.250	5.54
July	74.249	5.35
August	76.007	5.20
September	78.025	5.02
October	74.036	5.39
November	75.420	5.26
December	71.524	5.65
Average	73.625	5.42 %

Source: Bloomberg

Union Pacific Corp.

107

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EN4
Coupon Rate:	4.000%
Maturity Date:	4/15/2047
Amount Outstanding ($ 000)	$490,084
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	83.912	5.20 %
February	81.140	5.44
March	82.521	5.33
April	77.775	5.76
May	79.591	5.59
June	79.924	5.57
July	82.246	5.36
August	83.910	5.22
September	85.931	5.05
October	81.938	5.40
November	83.450	5.27
December	78.877	5.68
Average	81.768	5.41 %

Source: Bloomberg

Union Pacific Corp.

108

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EW4
Coupon Rate:	4.500%
Maturity Date:	9/10/2048
Amount Outstanding ($ 000)	$386,171
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	90.836	5.16 %
February	87.368	5.44
March	88.584	5.34
April	84.214	5.71
May	85.684	5.58
June	86.218	5.54
July	88.941	5.32
August	90.834	5.17
September	92.746	5.02
October	88.570	5.35
November	89.691	5.27
December	84.981	5.66
Average	88.222	5.38 %

Source: Bloomberg

Union Pacific Corp.

109

Type:	Notes
Description:	UP Corp.
CUSIP:	907818FC7
Coupon Rate:	4.300%
Maturity Date:	3/1/2049
Amount Outstanding ($ 000)	$627,349
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	88.102	5.15 %
February	84.758	5.42
March	85.515	5.36
April	81.244	5.72
May	83.009	5.57
June	83.349	5.55
July	85.865	5.34
August	87.933	5.18
September	89.587	5.05
October	86.158	5.32
November	87.422	5.22
December	82.670	5.62
Average	85.468	5.38 %

Source: Bloomberg

Union Pacific Corp.

110

Type:	Notes
Description:	UP Corp.
CUSIP:	907818FK9
Coupon Rate:	3.250%
Maturity Date:	2/5/2050
Amount Outstanding ($ 000)	$1,697,242
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	75.350	4.95 %
February	71.668	5.27
March	72.611	5.19
April	68.507	5.57
May	69.695	5.46
June	69.612	5.47
July	72.491	5.21
August	73.905	5.09
September	75.515	4.96
October	71.440	5.32
November	72.715	5.21
December	68.458	5.61
Average	71.831	5.28 %

Source: Bloomberg

Union Pacific Corp.

111

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EM6
Coupon Rate:	3.799%
Maturity Date:	10/1/2051
Amount Outstanding ($ 000)	$720,269
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	82.460	4.97 %
February	78.843	5.26
March	79.494	5.21
April	75.082	5.59
May	76.502	5.46
June	76.562	5.46
July	79.339	5.23
August	80.673	5.13
September	82.347	5.00
October	78.436	5.31
November	79.492	5.23
December	75.034	5.61
Average	78.689	5.29 %

Source: Bloomberg

Union Pacific Corp.

112

Type:	Notes
Description:	UP Corp.
CUSIP:	907818FW3
Coupon Rate:	2.950%
Maturity Date:	3/10/2052
Amount Outstanding ($ 000)	$841,614
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	69.828	4.95 %
February	66.633	5.23
March	67.351	5.17
April	63.284	5.56
May	64.359	5.46
June	64.711	5.43
July	66.958	5.22
August	68.556	5.09
September	70.587	4.91
October	66.691	5.26
November	67.415	5.20
December	63.434	5.58
Average	66.651	5.26 %

Source: Bloomberg

Prospectus supplement dated September 7, 2021
Interest accrues from September 10, 2021

Union Pacific Corp.

113

Type:	Notes
Description:	UP Corp.
CUSIP:	907818GC6
Coupon Rate:	4.950%
Maturity Date:	9/9/2052
Amount Outstanding ($ 000)	$590,252
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	100.270	4.93 %
February	95.747	5.24
March	96.397	5.19
April	91.520	5.55
May	92.798	5.45
June	93.273	5.42
July	96.504	5.19
August	98.188	5.07
September	100.115	4.94
October	95.708	5.24
November	97.154	5.14
December	91.859	5.53
Average	95.794	5.24 %

Source: Bloomberg

Union Pacific Corp.

114

Type:	Notes
Description:	UP Corp.
CUSIP:	907818FZ6
Coupon Rate:	3.500%
Maturity Date:	2/14/2053
Amount Outstanding ($ 000)	$1,235,061
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	77.951	4.94 %
February	74.142	5.25
March	74.855	5.19
April	70.463	5.57
May	71.796	5.46
June	71.799	5.46
July	74.736	5.21
August	76.149	5.10
September	78.110	4.94
October	74.014	5.28
November	74.948	5.20
December	70.496	5.59
Average	74.122	5.27 %

Source: Bloomberg

Union Pacific Corp.

115

Type:	Notes
Description:	UP Corp.
CUSIP:	907818GF9
Coupon Rate:	4.950%
Maturity Date:	5/15/2053
Amount Outstanding ($ 000)	$494,215
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	99.939	4.95 %
February	95.461	5.26
March	96.333	5.20
April	91.324	5.56
May	92.773	5.45
June	93.314	5.41
July	96.266	5.20
August	98.180	5.07
September	100.173	4.94
October	95.423	5.26
November	96.833	5.16
December	91.519	5.55
Average	95.628	5.25 %

Source: Bloomberg

Union Pacific Corp.

116

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EC8
Coupon Rate:	3.875%
Maturity Date:	2/1/2055
Amount Outstanding ($ 000)	$444,429
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	81.006	5.10 %
February	77.665	5.36
March	78.483	5.30
April	74.485	5.63
May	75.861	5.52
June	75.655	5.54
July	78.678	5.29
August	80.137	5.18
September	82.162	5.03
October	78.126	5.34
November	79.490	5.23
December	74.956	5.61
Average	78.059	5.34 %

Source: Bloomberg

Union Pacific Corp.

117

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EX2
Coupon Rate:	4.800%
Maturity Date:	9/10/2058
Amount Outstanding ($ 000)	$25,791
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	88.974	5.52 %
February	85.530	5.77
March	86.217	5.72
April	81.027	6.13
May	82.952	5.97
June	83.029	5.97
July	85.447	5.78
August	87.390	5.64
September	89.792	5.46
October	84.964	5.82
November	86.492	5.71
December	81.292	6.12
Average	85.259	5.80 %

Source: Bloomberg

Union Pacific Corp.

118

Type:	Notes
Description:	UP Corp.
CUSIP:	907818FE3
Coupon Rate:	3.950%
Maturity Date:	8/15/2059
Amount Outstanding ($ 000)	$491,530
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	81.544	5.08 %
February	77.573	5.37
March	77.877	5.35
April	73.356	5.71
May	74.554	5.62
June	75.116	5.57
July	77.886	5.35
August	80.233	5.18
September	81.799	5.07
October	77.413	5.40
November	78.494	5.31
December	73.229	5.74
Average	77.423	5.40 %

Source: Bloomberg

Union Pacific Corp.

119

Type:	Notes
Description:	UP Corp.
CUSIP:	907818FG8
Coupon Rate:	3.839%
Maturity Date:	3/20/2060
Amount Outstanding ($ 000)	$1,423,460
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	80.268	5.03 %
February	75.799	5.36
March	76.561	5.31
April	71.637	5.71
May	72.979	5.59
June	73.295	5.57
July	76.435	5.32
August	77.803	5.22
September	79.736	5.08
October	75.188	5.42
November	76.613	5.31
December	71.778	5.71
Average	75.674	5.39 %

Source: Bloomberg

Note: This is the exchange-traded portion of these notes. The Rule 144-A notes similar to these have a different CUSIP, and are shown on the next page.

119	$1,423,460
120	184
	$1,423,644

Union Pacific Corp.

120

Type:	Notes
Description:	UP Corp. 144A
CUSIP:	907818FF0
Coupon Rate:	3.839%
Maturity Date:	3/20/2060
Amount Outstanding ($ 000)	$184
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	80.568	5.01 %
February	75.994	5.35
March	76.906	5.28
April	71.768	5.69
May	73.404	5.56
June	73.684	5.54
July	76.653	5.30
August	77.439	5.25
September	79.866	5.07
October	75.281	5.42
November	76.383	5.33
December	71.922	5.69
Average	75.822	5.37 %

Source: Bloomberg

Note: These are Rule 144-A notes, which trade among qualified institutional buyers.

120	$184
119	1423460.037
	$1,423,644

Union Pacific Corp.

121

Type:	Notes
Description:	UP Corp.
CUSIP:	907818FV5
Coupon Rate:	3.550%
Maturity Date:	5/20/2061
Amount Outstanding ($ 000)	$640,539
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	75.104	5.04 %
February	71.297	5.33
March	71.694	5.30
April	67.353	5.67
May	68.407	5.58
June	68.922	5.54
July	71.647	5.31
August	72.789	5.22
September	74.111	5.12
October	70.746	5.39
November	71.820	5.31
December	66.988	5.72
Average	70.907	5.38 %

Source: Bloomberg

Prospectus supplement dated May 17, 2021
Interest accrues from May 20, 2021

Union Pacific Corp.

122

Type:	Notes (Exchange)
Description:	UP Corp.
CUSIP:	907818FN3
Coupon Rate:	2.973%
Maturity Date:	9/16/2062
Amount Outstanding ($ 000)	$719,489
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	65.689	4.98 %
February	61.973	5.30
March	62.448	5.26
April	58.316	5.64
May	59.199	5.56
June	59.231	5.56
July	61.715	5.33
August	63.180	5.21
September	64.741	5.08
October	61.268	5.38
November	62.201	5.30
December	57.739	5.72
Average	61.475	5.36 %

Source: Bloomberg

Exchange Offer, 424B3, Prospectus Dated May 5, 2021,

Note: This is the Exchange traded portion of the notes, the 144A portion is shown on the next page

122	$719,489
123	3004
	$722,493

Union Pacific Corp.

123

Type:	Notes (Exchange)
Description:	UP Corp. 144A
CUSIP:	907818FM5
Coupon Rate:	2.973%
Maturity Date:	9/16/2062
Amount Outstanding ($ 000)	$3,004
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	65.994	4.96 %
February	62.179	5.28
March	62.525	5.25
April	58.478	5.62
May	59.282	5.55
June	59.543	5.53
July	61.789	5.33
August	62.686	5.25
September	64.461	5.10
October	61.930	5.32
November	61.994	5.32
December	57.962	5.69
Average	61.569	5.35 %

Source: Bloomberg

Note: These are Rule 144-A notes, which trade among qualified institutional buyers.

123	$3,004
122	719489.4694
	$722,493

Union Pacific Corp.

124

Type:	Notes
Description:	UP Corp.
CUSIP:	907818GD4
Coupon Rate:	5.150%
Maturity Date:	1/20/2063
Amount Outstanding ($ 000)	$393,181
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	100.308	5.13 %
February	95.551	5.43
March	96.964	5.34
April	90.573	5.76
May	92.347	5.64
June	92.434	5.63
July	95.946	5.40
August	98.016	5.27
September	100.822	5.10
October	95.734	5.42
November	97.527	5.30
December	91.170	5.72
Average	95.616	5.43 %

Source: Bloomberg

Note: These are Medium Term Notes, referred to as Series B.

Union Pacific Corp.

125

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EG9
Coupon Rate:	4.375%
Maturity Date:	11/15/2065
Amount Outstanding ($ 000)	$169,529
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	81.629	5.50 %
February	79.687	5.65
March	78.459	5.74
April	73.966	6.11
May	75.441	5.98
June	75.826	5.95
July	78.974	5.70
August	80.750	5.57
September	84.087	5.33
October	79.437	5.67
November	80.738	5.58
December	76.303	5.92
Average	78.775	5.73 %

Source: Bloomberg

Union Pacific Corp.

126

Type:	Notes
Description:	UP Corp.
CUSIP:	907818ER5
Coupon Rate:	4.100%
Maturity Date:	9/15/2067
Amount Outstanding ($ 000)	$494,560
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	82.658	5.09 %
February	78.629	5.38
March	79.013	5.35
April	74.269	5.71
May	75.260	5.63
June	75.677	5.60
July	78.682	5.38
August	80.513	5.25
September	82.257	5.13
October	77.749	5.45
November	78.495	5.39
December	73.125	5.81
Average	78.027	5.43 %

Source: Bloomberg

Union Pacific Corp.

127

Type:	Notes
Description:	UP Corp.
CUSIP:	907818FL7
Coupon Rate:	3.750%
Maturity Date:	2/5/2070
Amount Outstanding ($ 000)	$742,376
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	76.846	5.05 %
February	72.794	5.35
March	73.537	5.29
April	68.862	5.66
May	70.316	5.54
June	69.986	5.57
July	72.743	5.35
August	74.057	5.26
September	75.788	5.13
October	71.413	5.46
November	72.604	5.37
December	67.040	5.83
Average	72.166	5.41 %

Source: Bloomberg

Union Pacific Corp.

128

Type:	Notes (Exchange)
Description:	UP Corp.
CUSIP:	907818FS2
Coupon Rate:	3.799%
Maturity Date:	4/6/2071
Amount Outstanding ($ 000)	$818,818
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	77.340	5.07 %
February	73.257	5.36
March	74.144	5.30
April	69.416	5.67
May	70.497	5.58
June	70.246	5.60
July	73.586	5.34
August	74.998	5.24
September	76.844	5.11
October	72.344	5.44
November	73.433	5.36
December	67.966	5.80
Average	72.839	5.41 %

Source: Bloomberg

Exchange Offer, 424B3, Prospectus Dated September 3, 2021,

Note: This is the Exchange traded portion of the notes, the 144A portion is shown on the next page

128	$818,818
129	7274
	$826,092

Union Pacific Corp.

129

Type:	Notes (Exchange)
Description:	UP Corp. 144A
CUSIP:	907818FR4
Coupon Rate:	3.799%
Maturity Date:	4/6/2071
Amount Outstanding ($ 000)	$7,274
Months Outstanding	12.0

End of Month in 2024	Price	Yield
January	77.876	5.03 %
February	73.407	5.35
March	73.714	5.33
April	69.136	5.69
May	70.703	5.56
June	70.261	5.60
July	73.647	5.34
August	74.743	5.26
September	76.906	5.10
October	72.268	5.45
November	73.275	5.37
December	68.401	5.76
Average	72.861	5.40 %

Source: Bloomberg

Note: These are Rule 144-A notes, which trade among qualified institutional buyers.

129	$7,274
128	818817.9408
	$826,092

Union Pacific Corp.

130

Type:	Notes
Description:	UP Corp.
CUSIP:	907818GA0
Coupon Rate:	3.850%
Maturity Date:	2/14/2072
Amount Outstanding ($ 000)	$493,600
Months Outstanding	12.0

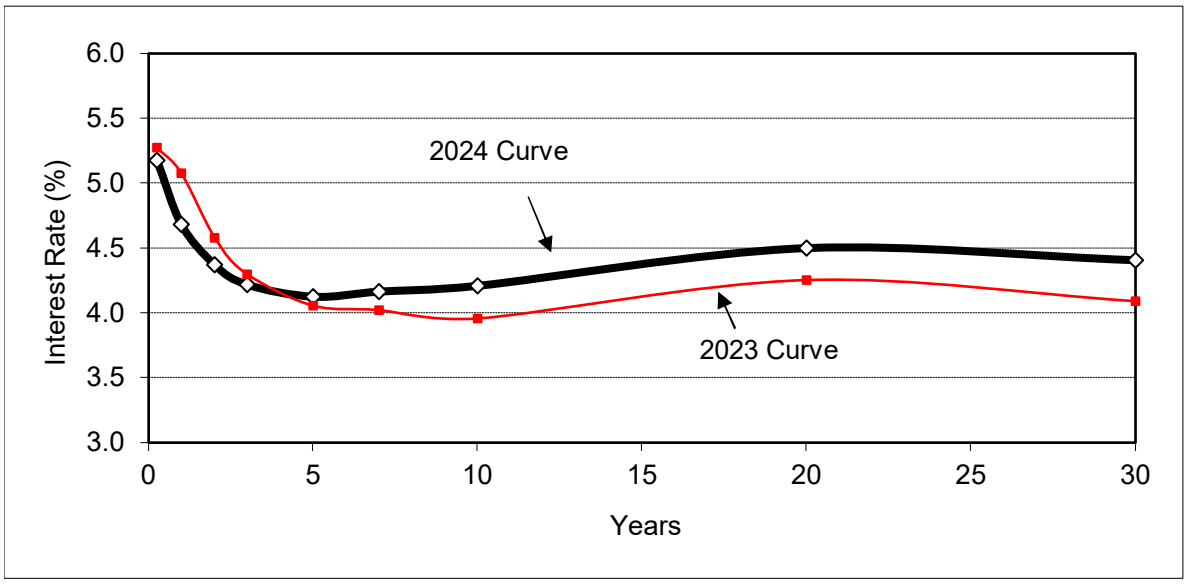
End of Month in 2024	Price	Yield
January	78.375	5.05 %
February	74.054	5.36
March	74.463	5.33
April	70.154	5.67
May	71.212	5.58
June	71.183	5.59
July	74.065	5.36
August	75.998	5.22
September	77.881	5.09
October	73.401	5.42
November	74.438	5.34
December	69.188	5.75
Average	73.701	5.40 %

Source: Bloomberg

Interest Rates on Selected Government Instruments

Yield in Percent Per Annum, Constant Maturity Rates for 2024

	3 Mo.	1 Yr	2 Yr	3 Yr	5 Yr	7 Yr	10 Yr	20 Yr	30 Yr
January	5.45	4.79	4.32	4.11	3.98	4.03	4.06	4.39	4.26
February	5.44	4.92	4.54	4.33	4.19	4.21	4.21	4.49	4.38
March	5.47	4.99	4.59	4.38	4.20	4.21	4.21	4.46	4.36
April	5.44	5.14	4.87	4.71	4.56	4.56	4.54	4.77	4.66
May	5.46	5.16	4.86	4.66	4.50	4.49	4.48	4.71	4.62
June	5.51	5.11	4.74	4.50	4.32	4.30	4.31	4.54	4.44
July	5.43	4.90	4.50	4.29	4.16	4.19	4.25	4.56	4.46
August	5.30	4.43	3.97	3.79	3.71	3.77	3.87	4.25	4.15
September	4.92	4.03	3.62	3.51	3.50	3.60	3.72	4.10	4.04
October	4.72	4.20	3.97	3.90	3.91	3.99	4.10	4.44	4.38
November	4.62	4.33	4.26	4.21	4.23	4.29	4.36	4.63	4.54
December	4.39	4.23	4.23	4.22	4.25	4.32	4.39	4.66	4.58
Average	**5.18**	**4.69**	**4.37**	**4.22**	**4.13**	**4.16**	**4.21**	**4.50**	**4.41**



Source: Federal Reserve statistical release H.15, Treasury Constant Maturities, Nominal

Equipment Trust Certificates for CSX

Modeled ETCs

	ETC ID	Maturity	Balance For 2024 ($000) Beg.	Ending	Avg O/S	Current Valuation Interest Rate	Valuation Factor	Current Market Value	Interest
1.	[None]				--			--	--
2.					--			--	--
3.					--			--	--
4.					--			--	--
5.					--			--	--
6.					--			--	--
7.					--			--	--
8.					--			--	--
9.					--			--	--
10.					--			--	--
11.					--			--	--
12.					--			--	--
13.					--			--	--
14.					--			--	--
15.					--			--	--
	Total		$0	$0	$0	--		**$0**	$0

Non-Modeled ETCs

	ETC ID	Maturity	Balance For 2024 ($000) Beg.	Ending
1.	[None]			
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
	Total		$0	$0

Equipment Trust Certificates for CSX (continued)

Entire ETC Current – Not Used for Cost or Market Value

	ETC ID	Maturity	Balance 2024 ($000) Beg.	Ending
1.	[None]			
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
	Total		$0	$0

Grand Totals (for reconciliation to carrier data)

	Balance For 2024 ($000) Beg.	Ending
Total Modeled	$0	$0
Total Non-Modeled	0	0
Sub Total	0	0
Total All Current	0	0
Grand Total	$0	$0
From CSX:		
Total ETCs		$0
Difference		$0

Equipment Trust Certificates for NS

Modeled ETCs

	ETC ID	Maturity	Balance For 2024 ($000) Beg.	Ending	Avg O/S	Current Valuation Interest Rate	Valuation Factor	Current Market Value	Interest
1.	[None]				--			--	--
2.					--			--	--
3.					--			--	--
4.					--			--	--
5.					--			--	--
6.					--			--	--
7.					--			--	--
8.					--			--	--
9.					--			--	--
10.					--			--	--
11.					--			--	--
12.					--			--	--
13.					--			--	--
14.					--			--	--
15.					--			--	--
	Total		$0	$0	$0	--		**$0**	$0

Non-Modeled ETCs

	ETC ID	Maturity	Balance For 2024 ($000) Beg.	Ending
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
	Total		$0	$0

Equipment Trust Certificates for NS (continued)

Entire ETC Current – Not Used for Cost or Market Value

	ETC ID	Maturity	Balance 2024 ($000) Beg.	Ending
1.	[None]			
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
	Total		$0	$0

Grand Totals (for reconciliation to carrier data)

	Balance For 2024 ($000) Beg.	Ending
Total Modeled	$0	$0
Total Non-Modeled	0	0
Sub Total	0	0
Total All Current	0	0
Grand Total	$0	$0
From NS:		
Total ETCs		$0
Difference		$0

Equipment Trust Certificates for UP

Modeled ETCs

	ETC ID	Maturity	Balance For 2024 ($000) Beg.	Ending	Avg O/S	Current Valuation Interest Rate	Valuation Factor	Current Market Value	Interest
1.	ETC UPC Series J	1/2/2031	21,458	19,030	20,244	4.808%	1.05571	21,372	1,027
2.	ETC UPC Series A	5/14/2026	344,608	328,190	336,399	5.178%	0.96487	324,581	16,805
3.	ETC UPC Series 2015 A	5/12/2027	288,296	275,510	281,903	5.037%	0.94762	267,138	13,456
4.	ETC UPC Series 2016 A	11/9/2029	113,782	109,143	111,463	4.867%	0.92759	103,392	5,033
5.					--			--	--
6.					--			--	--
7.					--			--	--
8.					--			--	--
9.					--			--	--
10.					--			--	--
11.					--			--	--
12.					--			--	--
13.					--			--	--
14.					--			--	--
15.					--			--	--
	Total		$768,144	$731,873	$750,009	**5.069%**		**$716,483**	$36,322

Non-Modeled ETCs

	ETC ID	Maturity	Balance For 2024 ($000) Beg.	Ending
1.	[None]			
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
	Total		$0	$0

Equipment Trust Certificates for UP (continued)

Entire ETC Current – Not Used for Cost or Market Value

	ETC ID	Maturity	Balance 2024 ($000) Beg.	Ending
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
	Total		$0	$0

Grand Totals (for reconciliation to carrier data)

	Balance For 2024 ($000) Ending
Total Modeled	$731,873
Total Non-Modeled	0
Sub Total	731,873
Total All Current	0
Grand Total	$731,873
From UP:	
Total ETCs	$731,873
Difference	$0

2024 Market Value of Debt ($000)

Type of Debt	Market Value: Traded or Modeled	Market Value: Non-Traded or Non-Modeled	Market Value: Total	Percent of: Subtotal	Percent of: Total
Bonds, Notes & Debentures	$55,820,986	$591,679	$56,412,666	98.75%	100.71%
Equipment Trust Certificates	716,483		716,483	1.25%	1.28%
Conditional Sales Agreements	0		0	0.00%	0.00%
Sub Total	$56,537,469	$591,679	$57,129,148	100.00%	101.99%
All Other — Capital Leases		$123,507	$123,507	-11.08%	0.22%
All Other — Misc. Debt		-1,238,453	-1,238,453	111.08%	-2.21%
All Other — Non-Modeled ETC		0	0	0.00%	0.00%
All Other — Non-Modeled CSA		0	0	0.00%	0.00%
Sub Total			-$1,114,946	100.00%	-1.99%
Total Market Value			**$56,014,202**		100.00%

General Notes:

Bonds, Notes, and Debentures from Appendix A. Securities that did not trade were assigned a market value equal to their book value. The traded portion accounts for 98.95 percent of the total market value for this category.

Equipment Trust Certificates from Appendix C.

All Conditional Sales Agreements have been retired.

Capital Leases and Miscellaneous Debt listed in work papers.

The capital leases and miscellaneous debt portion of the All Other debt category was assigned a market value equal to its book value, and totals to -$1,114,946 thousand. The non-modeled ETCs and CSAs are typically also assigned a market value equal to their book value, but there were none for this year. The All Other category totals to -$1,114,946 thousand, or -2.0 percent of total debt.

If negative numbers appear in Miscellaneous Debt, they typically are related to debt premiums and discounts.

2024 Flotation Costs for Bonds

	CSX Sr Notes
From 424(b)	**9/16/2024**
Face Amount	$550,000,000
Coupon Rate	4.900%
Maturity Date	3/15/2055
Frequency of Coupon Payment	2
Interest Accrual Date	9/18/2024
Price To Investors	99.875
Proceeds from Sale (before expenses)	$549,312,500
Underwriter Fee as % of Gross Proceeds	0.875%
Underwriter's Fee	$4,812,500
Railroad Expenses Excluding Fee	$450,000.00
Page in 424(b) for Expenses	S-22
Calculated	
Yield Based on Price to Investors	4.908%
Issue Price Per $100 Less Flotation	$98.92
Yield on New Issue Including Flotation	4.969%
Flotation Costs (Diff. in Pct Pts)	**0.061%**
Avg. Flotation Cost (Pct. Points)	**0.061%**
(includes costs on page 2)	
Previous Year's Average	0.098%

Source: SEC 424(b)(5) or 424(b)(2) filings.

In cases where multiple series of notes were issued with one set of expenses (excluding underwriting fee), the expenses are allocated by the face amount of the notes involved.

Example of Source for Bond Flotation Costs

Prospectus Supplement
(To Prospectus dated February 16, 2022)

CSX

$550,000,000 4.900% Notes due 2055

CSX Corporation is offering $550,000,000 aggregate principal amount of 4.900% Notes due 2055 (the "Notes").

The Notes will mature on March 15, 2055. Interest is payable on the Notes on March 15 and September 15 of each year, commencing on March 15, 2025. Interest on the Notes will accrue from September 18, 2024. We may, at our option, redeem the Notes, in whole or in part, at any time at the applicable redemption price set forth under the caption "Description of Notes—Optional Redemption."

The Notes will be unsecured senior obligations of CSX and will rank equally with all of CSX's other unsecured senior indebtedness.

The Notes will be represented by one or more permanent global Notes in definitive, fully registered form without interest coupons, registered in the name of a nominee for The Depository Trust Company. The Notes will be issued in denominations of $2,000 and integral multiples of $1,000 in excess thereof.

Investing in these Notes involves risks. See risks described as risk factors in Item 1A of our Annual Report on Form 10-K for the fiscal year ended December 31, 2023, as they may be amended, updated and modified periodically in our reports filed with the Securities and Exchange Commission (the "SEC").

Neither the SEC nor any state securities commission has approved or disapproved of these securities or determined if this prospectus supplement or the accompanying prospectus is truthful or complete. Any representation to the contrary is a criminal offense.

	Price to Public(1)	Underwriting Discount	Proceeds to Us(1)
Per Note	99.875%	0.875%	99.000%
Total	$549,312,500	$4,812,500	$544,500,000

(1) Plus accrued interest from September 18, 2024 to the settlement date, if settlement occurs after that date.

CSX will not make application to list the Notes on any securities exchange or to include them in any automated quotation system.

We expect that delivery of the Notes will be made, against payment for the Notes, in book-entry form through the facilities of The Depository Trust Company and its participants, including Euroclear Bank SA/NV and Clearstream Banking, *société anonyme*, on or about September 18, 2024, which will be the second business day following the date of the pricing of the Notes. Under Rule 15c6-1 of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), trades in the secondary market generally are required to settle in one business day (T+1), unless the parties to a trade expressly agree otherwise. Accordingly, purchasers who wish to trade the Notes prior to one business day before delivery of the Notes will be required by virtue of the fact that the Notes initially will settle in two business days (T+2) to specify alternative settlement arrangements to prevent a failed settlement. Such purchasers should consult their own advisors in this regard.

Joint Book-Running Managers

Citigroup **J.P. Morgan** **Morgan Stanley** **UBS Investment Bank**

Senior Co-Managers

Barclays **BofA Securities** **Mizuho**

Co-Managers

Example of Source for Bond Flotation Costs

stabilizing transactions. Over-allotment involves syndicate sales of the Notes in excess of the principal amount of the Notes to be purchased by the underwriters in the offering, which creates a syndicate short position. Syndicate covering transactions involve purchases of the Notes in the open market after the distribution has been completed, in order to cover syndicate short positions. Stabilizing transactions consist of certain bids or purchases of the Notes made for the purpose of preventing or retarding a decline in the market price of such Notes while the offering is in progress.

The representatives, on behalf of the underwriters, may also impose a penalty bid. Penalty bids permit the underwriters to reclaim a selling concession from a syndicate member when the representatives, in covering syndicate short positions or making stabilizing purchases, repurchase Notes originally sold by that syndicate member.

Any of these activities may have the effect of preventing or retarding a decline in the market price of the Notes. They may also cause the price of the Notes to be higher than the price that otherwise would exist in the open market in the absence of these transactions. The underwriters may conduct these transactions in the over-the-counter market or otherwise. If the underwriters commence any of these transactions, they may discontinue them at any time.

We estimate that our total expenses (excluding the underwriting discount) for this offering will be approximately $450,000.

Certain of the underwriters and their affiliates have in the past provided, are currently providing and may in the future from time to time provide investment banking and other financing, trading, banking, research, transfer agent and trustee services to us or our subsidiaries, for which they have in the past received, and may currently or in the future receive, customary fees and expenses.

Certain of the underwriters or their affiliates engage in commercial lending activities with us and are lenders under our bank credit facilities.

In addition, in the ordinary course of their various business activities, the underwriters and their respective affiliates may make or hold a broad array of investments and actively trade debt and equity securities (or related derivative securities) and financial instruments (including bank loans) for their own account and for the accounts of their customers. Such investments and securities activities may involve our or our affiliates' securities and/or instruments. If any of the underwriters or their affiliates has a lending relationship with us, certain of those underwriters or their affiliates routinely hedge, and certain other of those underwriters or their affiliates may hedge, their credit exposure to us consistent with their customary risk management policies. Typically, these underwriters and their affiliates would hedge such exposure by entering into transactions which consist of either the purchase of credit default swaps or the creation of short positions in our securities, including potentially the Notes offered hereby. Any such credit default swaps or short positions could adversely affect future trading prices of the Notes offered hereby. The underwriters and their respective affiliates may also make investment recommendations and/or publish or express independent research views in respect of such securities or instruments and may at any time hold, or recommend to clients that they acquire, long and/or short positions in such securities and instruments.

We have agreed to indemnify the underwriters against certain liabilities, including liabilities under the Securities Act, or to contribute to payments the underwriters may be required to make because of any of those liabilities.

We expect that delivery of the Notes will be made, against payment for the Notes, on or about September 18, 2024, which will be the second business day following the date of the pricing of the Notes. Under Rule 15c6-1 of the Exchange Act, trades in the secondary market generally are required to settle in one business day (T+1), unless the parties to a trade expressly agree otherwise. Accordingly, purchasers who wish to trade the Notes prior to one business day before delivery of the Notes will be required by virtue of the fact that the Notes initially will settle in two business days (T+2) to specify alternative settlement arrangements to prevent a failed settlement. Such purchasers should consult their own advisors in this regard.

2024 Current Cost of Debt

Type of Debt	Cost Reference	Appendix D Weight	Current Cost	Weighted Cost
Type of Instrument				
Bonds, Notes & Debentures	App. A & Table 3	98.75%	5.176%	5.111%
Equipment Trust Certificates	App. C & Table 5	1.25%	5.069%	0.063%
Conditional Sales Agreements	Railroad Data	0.00%	--	--
Total Without Floatation Costs		100.00%		5.175%
Floatation Costs				
Bonds, Notes & Debentures	App. F & Table 8	98.75%	0.061%	0.060%
Equipment Trust Certificates	Tables 7 and 8	1.25%	0.086%	0.001%
Conditional Sales Agreements	Table 8	0.00%	not calculated	--
Total Floatation Costs		100.00%		0.061%
Weighted Cost of Debt				5.236%
Weighted Cost of Debt (rounded)				**5.24%**

Historical Weighted Cost of Debt (for comparison purposes only)

Item	Year	Reference	Weighted Cost
Previous Year	2024	EP 558 (Sub-No. 27) Served August 6, 2024	5.34%
Highest	1982	EP 436 Decided July 22, 1983	14.0%
Lowest	2020	EP 558 (Sub-No. 24) Served August 6, 2021	2.54%

Market Value for Common Equity

CSX Data from Bloomberg 2-10-2025

Bloomberg's stock prices had already been adjusted for the split, but the shares outstanding need to also be adjusted, done below.

End of Wk. Date	End of Wk Close	Shares Outstanding	Capitalization ($000)
Friday, January 5, 2024	34.62	1,976,131,035	68,413,656
Friday, January 12, 2024	34.86	1,976,131,035	68,887,928
Friday, January 19, 2024	34.55	1,976,131,035	68,275,327
Friday, January 26, 2024	35.39	1,976,131,035	69,935,277
Friday, February 2, 2024	36.53	1,959,134,342	71,567,178
Friday, February 9, 2024	36.89	1,959,134,342	72,272,466
Friday, February 16, 2024	36.72	1,959,134,342	71,939,413
Friday, February 23, 2024	38.33	1,959,134,342	75,093,619
Friday, March 1, 2024	38.23	1,959,134,342	74,897,706
Friday, March 8, 2024	38.19	1,959,134,342	74,819,341
Friday, March 15, 2024	36.97	1,959,134,342	72,429,197
Friday, March 22, 2024	37.35	1,959,134,342	73,173,668
Thursday, March 28, 2024	37.07	1,959,134,342	72,625,110
Friday, April 5, 2024	36.30	1,954,927,162	70,963,856
Friday, April 12, 2024	35.34	1,954,927,162	69,087,126
Friday, April 19, 2024	34.34	1,954,927,162	67,132,199
Friday, April 26, 2024	33.99	1,954,927,162	66,447,974
Friday, May 3, 2024	33.85	1,954,927,162	66,174,284
Friday, May 10, 2024	34.38	1,954,927,162	67,210,396
Friday, May 17, 2024	33.52	1,954,927,162	65,529,158
Friday, May 24, 2024	33.78	1,954,927,162	66,037,440
Friday, May 31, 2024	33.75	1,954,927,162	65,978,792
Friday, June 7, 2024	32.75	1,954,927,162	64,023,865
Friday, June 14, 2024	32.18	1,954,927,162	62,909,556
Friday, June 21, 2024	33.41	1,954,927,162	65,314,116
Friday, June 28, 2024	33.45	1,954,927,162	65,392,314
Friday, July 5, 2024	33.30	1,938,739,661	64,560,031
Friday, July 12, 2024	33.79	1,938,739,661	65,510,013
Friday, July 19, 2024	34.69	1,938,739,661	67,254,879
Friday, July 26, 2024	34.32	1,938,739,661	66,537,545
Friday, August 2, 2024	34.08	1,938,739,661	66,072,248
Friday, August 9, 2024	34.00	1,938,739,661	65,917,148
Friday, August 16, 2024	33.42	1,938,739,661	64,792,679
Friday, August 23, 2024	33.69	1,938,739,661	65,316,139
Friday, August 30, 2024	34.27	1,938,739,661	66,440,608
Friday, September 6, 2024	33.37	1,938,739,661	64,695,742
Friday, September 13, 2024	33.52	1,938,739,661	64,986,553
Friday, September 20, 2024	34.93	1,938,739,661	67,720,176
Friday, September 27, 2024	34.53	1,938,739,661	66,944,680
Friday, October 4, 2024	34.49	1,928,419,153	66,511,177
Friday, October 11, 2024	34.96	1,928,419,153	67,417,534
Friday, October 18, 2024	34.12	1,928,419,153	65,797,662
Friday, October 25, 2024	33.27	1,928,419,153	64,158,505
Friday, November 1, 2024	33.39	1,928,419,153	64,389,916
Friday, November 8, 2024	36.00	1,928,419,153	69,423,090
Friday, November 15, 2024	35.13	1,928,419,153	67,745,365
Friday, November 22, 2024	35.78	1,928,419,153	68,998,837
Friday, November 29, 2024	36.55	1,928,419,153	70,483,720
Friday, December 6, 2024	34.45	1,928,419,153	66,434,040
Friday, December 13, 2024	33.24	1,928,419,153	64,100,653
Friday, December 20, 2024	31.85	1,928,419,153	61,420,150
Friday, December 27, 2024	32.46	1,928,419,153	62,596,486
Friday, January 3, 2025	32.34	1,928,419,153	62,365,075

Note: Capitalization calulated using close of week price multiplied by the number of shares outstanding.

Market Value for Common Equity

NSC Data from Bloomberg 2-10-2025

End of Wk. Date	End of Wk Close	Shares Outstanding	Capitalization ($000)
Friday, January 5, 2024	229.02	226,136,334	51,789,743
Friday, January 12, 2024	229.53	226,136,334	51,905,073
Friday, January 19, 2024	234.05	226,136,334	52,927,209
Friday, January 26, 2024	234.26	226,136,334	52,974,698
Friday, February 2, 2024	251.08	226,136,334	56,778,311
Friday, February 9, 2024	254.83	225,881,508	57,561,385
Friday, February 16, 2024	252.04	225,881,508	56,931,175
Friday, February 23, 2024	258.01	225,881,508	58,279,688
Friday, March 1, 2024	257.49	225,881,508	58,162,229
Friday, March 8, 2024	259.54	225,881,508	58,625,287
Friday, March 15, 2024	255.83	225,881,508	57,787,266
Friday, March 22, 2024	254.12	225,881,508	57,401,009
Thursday, March 28, 2024	254.87	225,881,508	57,570,420
Friday, April 5, 2024	250.03	225,881,508	56,477,153
Friday, April 12, 2024	245.74	225,914,028	55,516,113
Friday, April 19, 2024	241.28	225,914,028	54,508,537
Friday, April 26, 2024	239.94	225,914,028	54,205,812
Friday, May 3, 2024	235.55	225,914,028	53,214,049
Friday, May 10, 2024	230.29	225,914,028	52,025,742
Friday, May 17, 2024	231.47	225,914,028	52,292,320
Friday, May 24, 2024	226.86	225,914,028	51,250,856
Friday, May 31, 2024	224.80	225,914,028	50,785,473
Friday, June 7, 2024	224.07	225,914,028	50,620,556
Friday, June 14, 2024	219.90	225,914,028	49,678,495
Friday, June 21, 2024	224.87	225,914,028	50,801,287
Friday, June 28, 2024	214.69	225,914,028	48,501,483
Friday, July 5, 2024	215.86	225,914,028	48,765,802
Friday, July 12, 2024	221.35	226,096,433	50,046,445
Friday, July 19, 2024	227.95	226,096,433	51,538,682
Friday, July 26, 2024	247.22	226,096,433	55,895,560
Friday, August 2, 2024	243.41	226,096,433	55,034,133
Friday, August 9, 2024	239.62	226,096,433	54,177,227
Friday, August 16, 2024	240.44	226,096,433	54,362,626
Friday, August 23, 2024	240.65	226,096,433	54,410,107
Friday, August 30, 2024	256.16	226,096,433	57,916,862
Friday, September 6, 2024	250.01	226,096,433	56,526,369
Friday, September 13, 2024	245.80	226,096,433	55,574,503
Friday, September 20, 2024	247.86	226,096,433	56,040,262
Friday, September 27, 2024	246.47	226,096,433	55,725,988
Friday, October 4, 2024	247.92	226,096,433	56,053,828
Friday, October 11, 2024	250.17	226,239,662	56,598,376
Friday, October 18, 2024	252.37	226,239,662	57,096,103
Friday, October 25, 2024	251.09	226,239,662	56,806,517
Friday, November 1, 2024	250.09	226,239,662	56,580,277
Friday, November 8, 2024	271.67	226,239,662	61,462,529
Friday, November 15, 2024	261.26	226,239,662	59,107,374
Friday, November 22, 2024	268.95	226,239,662	60,847,157
Friday, November 29, 2024	275.85	226,239,662	62,408,211
Friday, December 6, 2024	260.78	226,239,662	58,998,779
Friday, December 13, 2024	246.22	226,239,662	55,704,730
Friday, December 20, 2024	234.15	226,239,662	52,974,017
Friday, December 27, 2024	235.25	226,239,662	53,222,880
Friday, January 3, 2025	235.88	226,239,662	53,365,411

Note: Capitalization calulated using close of week price multiplied by the number of shares outstanding.

Market Value for Common Equity

UNP Data from Bloomberg 2-10-2025

End of Wk. Date	End of Wk Close	Shares Outstanding	Capitalization ($000)
Friday, January 5, 2024	239.91	609,597,495	146,248,535
Friday, January 12, 2024	237.71	609,597,495	144,907,421
Friday, January 19, 2024	239.27	609,597,495	145,858,393
Friday, January 26, 2024	240.39	609,597,495	146,541,142
Friday, February 2, 2024	248.33	609,777,914	151,426,149
Friday, February 9, 2024	249.45	609,777,914	152,109,101
Friday, February 16, 2024	246.59	609,777,914	150,365,136
Friday, February 23, 2024	256.91	609,777,914	156,658,044
Friday, March 1, 2024	252.98	609,777,914	154,261,617
Friday, March 8, 2024	250.96	609,777,914	153,029,865
Friday, March 15, 2024	244.13	609,777,914	148,865,082
Friday, March 22, 2024	244.97	609,777,914	149,377,296
Thursday, March 28, 2024	245.93	609,777,914	149,962,682
Friday, April 5, 2024	242.01	609,777,914	147,572,353
Friday, April 12, 2024	234.40	609,777,914	142,931,943
Friday, April 19, 2024	232.08	610,122,122	141,597,142
Friday, April 26, 2024	242.79	610,122,122	148,131,550
Friday, May 3, 2024	240.36	610,122,122	146,648,953
Friday, May 10, 2024	247.40	610,122,122	150,944,213
Friday, May 17, 2024	244.97	610,122,122	149,461,616
Friday, May 24, 2024	232.05	610,122,122	141,578,838
Friday, May 31, 2024	232.82	610,122,122	142,048,632
Friday, June 7, 2024	227.97	610,122,122	139,089,540
Friday, June 14, 2024	222.10	610,122,122	135,508,123
Friday, June 21, 2024	226.11	610,122,122	137,954,713
Friday, June 28, 2024	226.26	610,122,122	138,046,231
Friday, July 5, 2024	225.17	610,122,122	137,381,198
Friday, July 12, 2024	230.22	610,122,122	140,462,315
Friday, July 19, 2024	242.32	609,197,628	147,620,769
Friday, July 26, 2024	240.36	609,197,628	146,426,742
Friday, August 2, 2024	239.97	609,197,628	146,189,155
Friday, August 9, 2024	237.52	609,197,628	144,696,621
Friday, August 16, 2024	244.53	609,197,628	148,967,096
Friday, August 23, 2024	246.85	609,197,628	150,380,434
Friday, August 30, 2024	256.09	609,197,628	156,009,421
Friday, September 6, 2024	249.63	609,197,628	152,074,004
Friday, September 13, 2024	249.12	609,197,628	151,763,313
Friday, September 20, 2024	245.39	609,197,628	149,491,006
Friday, September 27, 2024	244.22	609,197,628	148,778,245
Friday, October 4, 2024	238.86	609,197,628	145,512,945
Friday, October 11, 2024	242.31	609,197,628	147,614,677
Friday, October 18, 2024	244.10	606,256,627	147,987,243
Friday, October 25, 2024	230.30	606,256,627	139,620,901
Friday, November 1, 2024	232.69	606,256,627	141,069,855
Friday, November 8, 2024	241.49	606,256,627	146,404,913
Friday, November 15, 2024	235.57	606,256,627	142,815,874
Friday, November 22, 2024	242.39	606,256,627	146,950,544
Friday, November 29, 2024	244.66	606,256,627	148,326,746
Friday, December 6, 2024	233.57	606,256,627	141,603,360
Friday, December 13, 2024	234.98	606,256,627	142,458,182
Friday, December 20, 2024	226.32	606,256,627	137,208,000
Friday, December 27, 2024	229.93	606,256,627	139,396,586
Friday, January 3, 2025	231.50	606,256,627	140,348,409

Note: Capitalization calulated using close of week price multiplied by the number of shares outstanding.

Market Value for Common Equity

Total Market Value for CSX, NSC, and UNP combined

Based on close price on last trading day of week and shares outstanding from 10-K and 10-Q.

	Days For Week (actual trading days)		Capitalization	
	Beginning	End	($000)	Holiday (M or F)
1.	Tuesday, January 2, 2024	Friday, January 5, 2024	$266,451,935	New Year's Day
2.	Monday, January 8, 2024	Friday, January 12, 2024	$265,700,421	
3.	Tuesday, January 16, 2024	Friday, January 19, 2024	$267,060,929	Martin Luther King Day
4.	Monday, January 22, 2024	Friday, January 26, 2024	$269,451,117	
5.	Monday, January 29, 2024	Friday, February 2, 2024	$279,771,638	
6.	Monday, February 5, 2024	Friday, February 9, 2024	$281,942,951	
7.	Monday, February 12, 2024	Friday, February 16, 2024	$279,235,724	
8.	Tuesday, February 20, 2024	Friday, February 23, 2024	$290,031,351	Washington's Birthday
9.	Monday, February 26, 2024	Friday, March 1, 2024	$287,321,552	
10.	Monday, March 4, 2024	Friday, March 8, 2024	$286,474,492	
11.	Monday, March 11, 2024	Friday, March 15, 2024	$279,081,545	
12.	Monday, March 18, 2024	Friday, March 22, 2024	$279,951,972	
13.	Monday, March 25, 2024	Thursday, March 28, 2024	$280,158,212	Good Friday
14.	Monday, April 1, 2024	Friday, April 5, 2024	$275,013,362	
15.	Monday, April 8, 2024	Friday, April 12, 2024	$267,535,182	
16.	Monday, April 15, 2024	Friday, April 19, 2024	$263,237,877	
17.	Monday, April 22, 2024	Friday, April 26, 2024	$268,785,336	
18.	Monday, April 29, 2024	Friday, May 3, 2024	$266,037,287	
19.	Monday, May 6, 2024	Friday, May 10, 2024	$270,180,350	
20.	Monday, May 13, 2024	Friday, May 17, 2024	$267,283,095	
21.	Monday, May 20, 2024	Friday, May 24, 2024	$258,867,134	
22.	Tuesday, May 28, 2024	Friday, May 31, 2024	$258,812,898	Memorial Day
23.	Monday, June 3, 2024	Friday, June 7, 2024	$253,733,961	
24.	Monday, June 10, 2024	Friday, June 14, 2024	$248,096,174	
25.	Monday, June 17, 2024	Friday, June 21, 2024	$254,070,117	
26.	Monday, June 24, 2024	Friday, June 28, 2024	$251,940,028	
27.	Monday, July 1, 2024	Friday, July 5, 2024	$250,707,031	
28.	Monday, July 8, 2024	Friday, July 12, 2024	$256,018,774	
29.	Monday, July 15, 2024	Friday, July 19, 2024	$266,414,330	
30.	Monday, July 22, 2024	Friday, July 26, 2024	$268,859,847	
31.	Monday, July 29, 2024	Friday, August 2, 2024	$267,295,535	
32.	Monday, August 5, 2024	Friday, August 9, 2024	$264,790,996	
33.	Monday, August 12, 2024	Friday, August 16, 2024	$268,122,402	
34.	Monday, August 19, 2024	Friday, August 23, 2024	$270,106,680	
35.	Monday, August 26, 2024	Friday, August 30, 2024	$280,366,891	
36.	Tuesday, September 3, 2024	Friday, September 6, 2024	$273,296,116	Labor Day
37.	Monday, September 9, 2024	Friday, September 13, 2024	$272,324,370	
38.	Monday, September 16, 2024	Friday, September 20, 2024	$273,251,444	
39.	Monday, September 23, 2024	Friday, September 27, 2024	$271,448,913	
40.	Monday, September 30, 2024	Friday, October 4, 2024	$268,077,950	
41.	Monday, October 7, 2024	Friday, October 11, 2024	$271,630,587	
42.	Monday, October 14, 2024	Friday, October 18, 2024	$270,881,008	
43.	Monday, October 21, 2024	Friday, October 25, 2024	$260,585,923	
44.	Monday, October 28, 2024	Friday, November 1, 2024	$262,040,047	
45.	Monday, November 4, 2024	Friday, November 8, 2024	$277,290,531	
46.	Monday, November 11, 2024	Friday, November 15, 2024	$269,668,613	
47.	Monday, November 18, 2024	Friday, November 22, 2024	$276,796,538	
48.	Monday, November 25, 2024	Friday, November 29, 2024	$281,218,677	
49.	Monday, December 2, 2024	Friday, December 6, 2024	$267,036,179	
50.	Monday, December 9, 2024	Friday, December 13, 2024	$262,263,564	
51.	Monday, December 16, 2024	Friday, December 20, 2024	$251,602,167	
52.	Monday, December 23, 2024	Friday, December 27, 2024	$255,215,952	
53.	Monday, December 30, 2024	Friday, January 3, 2025	$256,078,896	
		Average	**$268,483,332.13**	

Market Value for Common Equity

List of U.S. Stock Market Full-Day Holidays in 2024

	Day	Holiday
1.	Monday, January 1, 2024	New Year's Day
2.	Monday, January 15, 2024	Martin Luther King Jr. Day
3.	Monday, February 19, 2024	Washington's Birthday
4.	Friday, March 29, 2024	Good Friday
5.	Monday, May 27, 2024	Memorial Day
6.	Wednesday, June 19, 2024	Juneteenth
7.	Thursday, July 4, 2024	Independence Day
8.	Monday, September 2, 2024	Labor Day
9.	Thursday, November 28, 2024	Thanksgiving Day
10.	Wednesday, December 25, 2024	Christmas Day

Historical Risk Free Rates and Market Risk Premiums

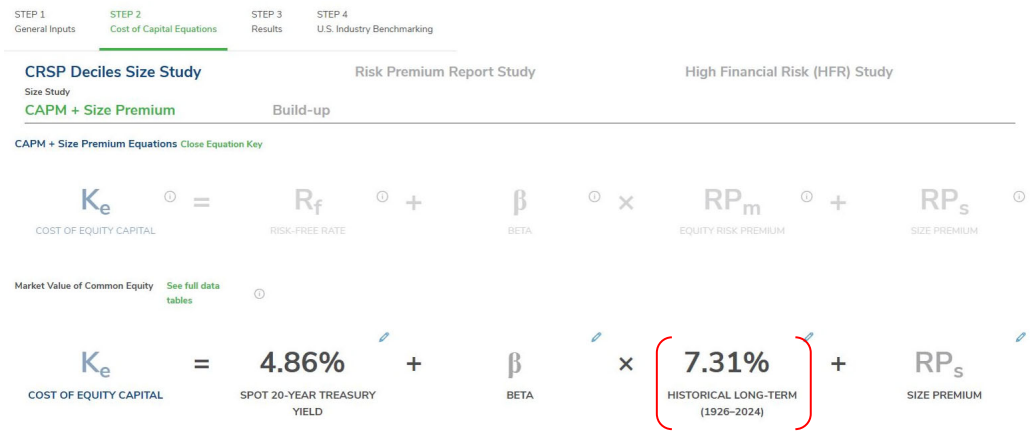
The Surface Transportation Board (STB) has used a Capital Asset Pricing Model (CAPM) as part of its cost of capital determination since 2006. Two major components of the STB's CAPM are the Risk-Free Rate, which is based on 20-Year U.S. Government Bonds, and the Market Risk Premium (a.k.a. Equity Risk Premium), as calculated by Ibbotson Associates using data beginning in 1926. The table below lists the rates used by the STB (since 2006), the rate for the current year, and earlier rates that would have been used as part of the current STB specifications.

Year	Risk-Free Rate	Market Risk Premium
1980	11.36 %	7.60 %
1981	13.72	7.20
1982	12.92	7.20
1983	11.34	7.30
1984	12.49	7.10
1985	10.97	7.30
1986	7.84	7.40
1987	n.a.	7.20
1988	n.a.	7.20
1989	n.a.	7.50
1990	n.a.	7.20
1991	n.a.	7.40
1992	n.a.	7.30
1993	6.29	7.20
1994	7.49	7.00
1995	6.95	7.40
1996	6.83	7.50
1997	6.69	7.80
1998	5.72	8.00
1999	6.20	8.10
2000	6.23	7.80
2001	5.63	7.40
2002	5.43	7.00
2003	4.96	7.20
2004	5.04	7.20
2005	4.64	7.10
2006	5.00	7.13
2007	4.91	7.05
2008	4.36	6.47
2009	4.11	6.67
2010	4.03	6.72
2011	3.62	6.62
2012	2.54	6.70
2013	3.12	6.96
2014	3.07	7.00
2015	2.55	6.90
2016	2.22	6.94
2017	2.65	7.07
2018	3.02	6.91
2019	2.40	7.15
2020	1.35	7.25
2021	1.98	7.46
2022	3.30	7.17
2023	4.26	7.17
2024	4.50	7.31

Sources: Federal Reserve Board for U.S. government 20-year bonds (Risk-Free Rate) and Morningstar's *Ibbotson SBBI Valuation Yearbook* Table A-1 for Market Risk Premiums through 2012. Morningstar's *Ibbotson SBBI Classic Yearbook* is the source for premiums beginning 2013. The Duff & Phelps *Valuation Handbook Guide to Cost of Capital* is the source for premiums in 2015 and 2016. Values for 2017-2023 are from the Duff & Phelps online Cost of Capital Navigator, which is now owned by Kroll. 2006 through 2020 match decisions by the STB. The U.S. Government did not issue 20-Year bonds in 1987 through 1992.

Historical Risk Free Rates and Market Risk Premiums

The Surface Transportation Board (STB) has always used a **long-term** equity risk premium (a.k.a. market risk premium) for its Capital Asset Pricing Model, and Kroll (previously Duff & Phelps) has been the source used in recent years. Kroll calculates this premium using the same method as the earlier source used by the STB, Morningstar/Ibbotson as found in its Ibbotson *SBBI Valuation Yearbook*. The screenshot shown below is from the 2025 *Cost of Capital Navigator by Kroll*.The latest long-term equity risk premium, as shown below, is **7.31 percent**. The years used for this calculation are 1926 through 2024.



AAR Regression for 2024 Beta

AAR Regression for 2024 Beta
STB-Style 5-Year Beta using SP 500 Price Index, Weighted RR Returns, 90-Day T-Bill as RF
CSX, NSC, and UNP

The GLM Procedure

Dependent Variable: ZRR

Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	-.0006496813	0.00153506	-0.42	0.6725
ZSP5	0.9478454593	0.05520742	17.17	<.0001

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.729584171
R Square	0.532293062
Adjusted R Square	0.530487244
Standard Error	0.024719739
Observations	261

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.180121071	0.180121071	294.765572	1.23582E-44
Residual	259	0.158265964	0.000611065		
Total	260	0.338387034			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.000649678	0.00153507	-0.423223621	0.672483326	-0.003672484	0.002373129	-0.003672484	0.002373129
X Variable 1	0.947848176	0.055207795	17.16873822	1.23582E-44	0.839134888	1.056561463	0.839134888	1.056561463

Rounded Beta = 0.9478

Cost of Common Equity using the Multi-Stage Discounted Cash Flow Model

The cost of equity for each firm (r_i) in the Surface Transportation Board's interpretation of the Morningstar/Ibbotson three-stage DCF model is the solution to the following equation:[1]

$$\mathrm{MV}_{i0} = \sum_{t=1}^{5} \frac{\mathrm{CF}_{i0}(1+g_{i1})^t}{(1+r_i)^t} + \sum_{t=6}^{10} \frac{\mathrm{CF}_{i5}(1+g_{i2})}{(1+r_i)^t} + \frac{\left(\dfrac{\mathrm{IBEI}_{i10}(1+g_{i3})}{r_i - g_{i3}}\right)}{(1+r_i)^{10}},$$

where

MV_{i0} = market value of equity for firm i in year 0 (i.e., the year for which the cost of equity is being estimated);

CF_{it} = average cash flow for firm i at the end of year t;

g_{ij} = earnings growth rate for firm i in stage j (j = 1, 2, or 3);

r_i = the cost of equity for firm i; and

$\mathrm{IBEI}_{10} = \mathrm{IBEI}_0(1+g_1)^5(1+g_2)^5$.

Note that IBEI_0 is determined by the same process as CF_0 (See Table 13 in text).

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[1] *Cost of Capital Yearbook*, 2008, Morningstar, Inc., p. 24.

Cash Flow Calculation

CSX, Corp.	1	2	3	4	5	Total
	2020	2021	2022	2023	2024	
($ in millions)						
Revenue	10,583	12,522	14,853	14,657	14,540	67,155
Net Income	2,765	3,781	4,114	3,668	3,470	17,798
Extraordinary Items	0	0	0	0	0	0
Depreciation	1,383	1,420	1,502	1,607	1,658	7,570
Deferred Taxes	180	167	100	126	12	585
Capital Expenditures	1,626	1,791	2,113	2,257	2,529	10,316
Cash Flow	2,702	3,577	3,603	3,144	2,611	15,637
Cash Flow / Revenue	0.25532	0.28566	0.24258	0.21451	0.17957	0.23285
NIBEI / Revenue	0.26127	0.30195	0.27698	0.25026	0.23865	0.26503

Ibbotson Smoothed Cash Flow = $14,540 x 0.23285 = $3,385.63
Ibbotson Smoothed Net Income BEI = $14,540 x 0.26503 = $3,853.52

Cash Flow Calculation

Norfolk Southern	1	2	3	4	5	Total
	2020	2021	2022	2023	2024	
($ in millions)						
Revenue	9,789	11,142	12,745	12,156	12,123	57,955
Net Income	2,013	3,005	3,270	1,827	2,622	12,737
Extraordinary Items	0	0	0	0		0
Depreciation	1,154	1,181	1,221	1,298	1,353	6,207
Deferred Taxes	142	184	83	-49	176	536
Capital Expenditures	1,494	1,470	1,948	2,327	2,381	9,620
Cash Flow	1,815	2,900	2,626	749	1,770	9,860
Cash Flow / Revenue	0.18541	0.26028	0.20604	0.06162	0.14600	0.17013
NIBEI / Revenue	0.20564	0.26970	0.25657	0.15030	0.21628	0.21977

Ibbotson Smoothed Cash Flow = $12,123 x 0.17013 = $2,062.51
Ibbotson Smoothed Net Income BEI = $12,123 x 0.21977 = $2,664.32

Cash Flow Calculation

Union Pacific Corp.	1	2	3	4	5	Total
	2020	2021	2022	2023	2024	
($ in millions)						
Revenue	19,533	21,804	24,875	24,119	24,250	114,581
Net Income	5,349	6,523	6,998	6,379	6,474	31,723
Extraordinary Items	0	0	0	0	0	0
Depreciation	2,210	2,208	2,246	2,318	2,398	11,380
Deferred Taxes	340	154	262	117	28	901
Capital Expenditures	2,927	2,936	3,620	3,606	3,452	16,541
Cash Flow	4,972	5,949	5,886	5,208	5,448	27,463
Cash Flow / Revenue	0.25454	0.27284	0.23662	0.21593	0.22466	0.23968
NIBEI / Revenue	0.27384	0.29917	0.28133	0.26448	0.26697	0.27686

Ibbotson Smoothed Cash Flow = $24,250 x 0.23968 = $5,812.29
Ibbotson Smoothed Net Income BEI = $24,250 x 0.27686 = $6,713.88

2024 Median Growth Rates for MSDCF

	Analyst Growth Rates from IBES December 31								
Company	**Rate 1**	**Rate 2**	**Rate 3**	**Rate 4**	**Rate 5**	**Rate 6**	**Rate 7**	**Rate 8**	**Median**
CSX	7.30	7.40	--	--	--	--	--	--	**7.35**
NSC	7.60	9.00	--	--	--	--	--	--	**8.30**
UNP	10.60	--	--	--	--	--	--	--	**10.60**

Simple Average of Medians = 8.75 percent.

2024 Median Growth Rates for MSDCF
CSX

Detail Estimates - Period Summary

Enter RIC : CSX.O **CSX Corp**

Measure : Earnings Per Share

Period : Long Term Growth

Currency: USD *(in millions except for per share items)*

	Ests	Mean	High	Low
Earnings Per Share	2	7.35	7.40	7.30
Filtered/Preliminary Mean**:	2	7.35	7.40	7.30
30 Day Ago Mean	2	7.75	8.10	7.40

	12/2023\	3/2024\	6/2024\	9/2024\	12/2023A
Reported	0.45	0.46	0.49	0.46	1.85
Surprise Mean	0.44	0.45	0.48	0.48	1.83
Surprise (%)	1.74	1.79	2.67	-3.54	0.88

* Only selected brokers below are included in the filtered mean

Check / Uncheck	Contributor	Analyst	Current Estimate	Current Estimate Date	Previous Estimate	Previous Estimate Date	Review Date
✓	Permission Denied 32	Permission Denied	7.30 ↓	Dec 09, 24	8.10	Oct 17, 24	Dec 09, 24
✓	Permission Denied 398136	Permission Denied	7.40 ↓	Nov 07, 24	7.80	Nov 06, 24	Nov 07, 24

2024 Median Growth Rates for MSDCF
NSC

Detail Estimates - Period Summary

Enter RIC : NSC **Norfolk Southern Corp**

Measure : Earnings Per Share

Period : Long Term Growth

Currency: USD *(in millions except for per share items)*

	Ests	Mean	High	Low
Earnings Per Share	2	8.30	9.00	7.60
Filtered/Preliminary Mean**:	2	8.30	9.00	7.60
30 Day Ago Mean	2	8.90	9.00	8.80

	12/2023\	3/2024\	6/2024\	9/2024\	12/2023A
Reported	2.83	2.49	3.06	3.25	11.74
Surprise Mean	2.87	2.60	2.86	3.11	11.79
Surprise (%)	-1.31	-4.05	6.93	4.54	-0.42

* Only selected brokers below are included in the filtered mean

Check / Uncheck	Contributor	Analyst	Current Estimate	Current Estimate Date	Previous Estimate	Previous Estimate Date	Review Date
✓	Permission Denied 32	Permission Denie(	7.60 ↓	Dec 19, 24	8.80	Sep 30, 24	Dec 19, 24
✓	Permission Denied 398136	Permission Denie(	9.00 ↓	Oct 22, 24	9.40	Jul 25, 24	Oct 22, 24

2024 Median Growth Rates for MSDCF
UNP

Detail Estimates - Period Summary

Enter RIC : UNP **Union Pacific Corp**

Measure : Earnings Per Share

Period : Long Term Growth

Currency: USD *(in millions except for per share items)*

	Ests	Mean	High	Low
Earnings Per Share	1	10.60	10.60	10.60
Filtered/Preliminary Mean**:	1	10.60	10.60	10.60
30 Day Ago Mean	1	10.60	10.60	10.60

	12/2023\	3/2024\	6/2024\	9/2024\	12/2023A
Reported	2.71	2.69	2.74	2.75	10.45
Surprise Mean	2.57	2.51	2.71	2.78	10.32
Surprise (%)	5.27	7.06	1.02	-0.98	1.21

* Only selected brokers below are included in the filtered mean

Check / Uncheck	Contributor	Analyst	Current Estimate	Current Estimate Date	Previous Estimate	Previous Estimate Date	Review Date
✓	Permission Denied 398136	Permission Denie(	10.60 ↓	Oct 24, 24	12.20	Jul 25, 24	Oct 24, 24
✓							

Stage 3 Growth Rate for MS-DCF
Summary

The Surface Transportation Board's Multi-Stage Discounted Cash Flow model for estimating the cost of common equity uses 3 stages of growth. The third stage is the long-run nominal growth rate of the U.S. economy, and it is estimated by adding the long-term expected growth in output (represented by the historical growth rate for U.S. Real Gross Domestic Product since 1929) to the long-run expected U.S. inflation rate.

Long Term Expected Growth in Output			3.13 %
Historical Growth Rate for Real GDP, 1929-2024		(page 2)	
Long Term Expected Inflation Rate			2.45
Rate for Long-Term U.S. Government Bonds	4.86	(page 5)	
Rate for 20-year U.S. Inflation-Indexed Bonds	2.41	(page 5)	
	2.45		
Stage 3 Growth Rate (real growth + inflation)			**5.58 %**

The purpose of this appendix is to replicate Morningstar's Stage 3 Growth Rate used by the Surface Transportation Board in its version of the Multi-Stage Discounted Cash Flow model used to estimate the cost of common equity for the railroad industry.

Morningstar's Ibbotson SBBI Valuation Yearbook has annually been used as a source for the Stage 3 growth rate of the Surface Transportation Board's Multi-Stage Discounted Cash Flow (MSDCF) model. On September 19, 2013, Morningstar customers were notified that the *SBBI Valuation Yearbook* was being discontinued, but much of the same data could be found in a different publication -- the *Ibbotson SBBI Classic Yearbook*.

Customer Service said **"We won't be publishing the long-term growth rate anymore, however it's pretty simple to calculate using data that will be in the Classic Yearbook and publicly available data."** They also said "Essentially, you would take the long-term government yield as of December (which would be included in the Classic Yearbook) and subtract the Treasury Real Yield for 20 year bonds as of the same date. This value is called the inflation estimate." "From there, you need the GDP growth rate, which you can calculate from the Current-dollar and "real" GDP link in the BEA website. Using the GDP in billions of chained 2005 dollars column, calculate an annual growth rate. One thing, however, is that we've always used GDP chained to 2005 dollars and it looks like they've since changed it to be chained to 2009 dollars. This may cause a slight change in the historical growth rates."

Beginning in 2016, Morningstar stopped publishing its Ibbotson SBBI Classic Yearbook. Calculations on page 5 of this appendix use 20-Year U.S. Treasury Bonds in lieu of the Ibbotson Long-Term Government Yields.

Stage 3 Growth Rate for MS-DCF
Long-Term Expected Growth in Output

AAR Replicates Morningstar

Year	(a) GDP in billions of chained 2005 dollars	(b) Years of Growth	(c) AAR Calc. Growth Rate	(d) SBBI Text Growth Rate
1929	976.1			
2009	12,757.9	80	3.27%	3.3%
2010	13,063.0	81	3.25%	3.3%
2011	13,299.1	82	3.24%	3.24%
2012	13,591.1	83	3.22%	3.22%

The Bureau of Economic Analysis rebased Real GDP from 2005 dollars to 2009 dollars, and may have revised recent year data. Therefore, GDP data in 2005 $ were not available for 2013. Beginning in 2024, BEA began using 2017 dollars.

(a) Real GDP in 2005 $ - 2009-2012 are from the Economic Report of the President 2013, Table B-11
1929 is from BEA table dated August 2011
(b) Year minus 1929 = number of years of growth from 1929 to year
(c) Compound growth rate from 1929 to year
(d) Ibbotson SBBI Valuation Yearbook, chapter 4. For 2012 data, 2013 edition, page 52.

AAR Calculates Growth Rate using GDP in 2017 dollars

Year	(e) GDP in billions of chained 2017 dollars	(f) Years of Growth	(g) AAR Calc. Growth Rate	(h) AAR Calc. Growth Rate using 2012 $
1929	1,191.1			
2016	19,141.7	87	3.24%	3.22%
2017	19,612.1	88	3.23%	3.21%
2018	20,193.9	89	3.23%	
2019	20,692.1	90	3.22%	
2020	20,234.1	91	3.16%	
2021	21,407.7	92	3.19%	
2022	21,822.0	93	3.18%	
2023	22,374.3	94	3.17%	
2024	22,303.5	**95**	**3.13%**	

(e) Real GDP in 2017 $ downloaded from BEA 2/27/2025.
(f) Year - 1929 = number of years of growth from 1929 to year
(g) Compound growth rate from 1929 to year
(h) Previous years' calculations used 2012 $, which have now been discontinued. This column's purpose is only for comparison purposes.

Stage 3 Growth Rate for MS-DCF
Data Sources for Real GDP in 2005 $

186 GDP and Other Major NIPA Series August 2011

Table 2A. Real Gross Domestic Product—Continues

[Billions of chained (2005) dollars; quarterly estimates are seasonally adjusted at annual rates]

Year and quarter	Gross domestic product	Personal consumption expenditures	Gross private domestic investment	Exports and imports of goods and services		Government consumption expenditures and gross investment	Residual	Final sales of domestic product	Gross domestic purchases	Final sales to domestic purchasers	Gross national product	Percent change from preceding period				
				Exports	Imports							Gross domestic product	Final sales of domestic product	Gross domestic purchases	Final sales to domestic purchasers	Gross national product
1929	976.1	736.3	101.4	37.9	49.1	146.5	3.1	986.8	994.1	1,005.2	984.6	...	...	...	...	...
1930	892.0	696.8	67.6	31.3	42.7	161.4	−22.4	919.2	911.1	939.2	900.0	−8.6	−6.8	−8.4	−6.6	−8.6
1931	834.2	674.9	42.5	26.1	37.2	168.2	−40.3	865.2	853.9	885.9	840.7	−6.5	−5.9	−6.3	−5.7	−6.6
1932	725.2	614.4	12.8	20.4	30.9	162.6	−54.1	766.6	743.9	786.5	730.5	−13.1	−11.4	−12.9	−11.2	−13.1
1933	715.8	600.8	18.9	20.5	32.2	157.2	−49.4	743.2	735.1	763.4	720.3	−1.3	−3.1	−1.2	−2.9	−1.4
1934	793.7	643.7	34.1	22.8	32.9	177.3	−51.3	814.0	812.7	833.7	797.7	10.9	9.5	10.6	9.2	10.7
1935	864.2	683.0	63.1	24.1	43.1	182.2	−45.1	864.5	892.2	892.7	868.9	8.9	6.2	9.8	7.1	8.9
1936	977.0	752.5	80.9	25.3	42.6	212.6	−51.7	978.9	1,006.1	1,008.1	981.1	13.1	13.2	12.8	12.9	12.9
1937	1,027.1	780.4	101.1	31.9	47.9	203.6	−42.0	1,019.8	1,052.9	1,045.5	1,032.5	5.1	4.2	4.7	3.7	5.2
1938	991.8	767.8	66.8	31.5	37.3	219.3	−56.3	1,005.2	1,007.3	1,021.0	997.4	−3.4	−1.4	−4.3	−2.3	−3.4
1939	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	7.4	8.1	7.4	8.1

Table B–2. Real gross domestic product, 1964–2012

[Billions of chained (2005) dollars, except as noted; quarterly data at seasonally adjusted annual rates]

Year or quarter	Gross domestic product	Personal consumption expenditures			Gross private domestic investment				
						Fixed investment			
							Nonresidential		
		Total	Goods	Services	Total	Total	Total	Structures	Equipment and software
1964	3,389.4	2,107.5	...	...	382.1	...	...	...	...
1965	3,607.0	2,240.8	...	...	435.7	...	...	...	...
1966	3,842.1	2,367.9	...	...	474.1	...	...	...	...
1967	3,939.2	2,438.8	...	...	452.4	...	...	...	...
1968	4,129.9	2,579.6	...	...	478.7	...	...	...	...
1969	4,258.2	2,676.2	...	...	506.6	...	...	...	...
1970	4,266.3	2,738.9	...	...	473.4	...	...	...	...
1971	4,409.5	2,843.3	...	...	527.3	...	...	...	...
1972	4,643.8	3,018.1	...	...	589.8	...	...	...	...
1973	4,912.8	3,167.7	...	...	658.9	...	...	...	...
1974	4,885.7	3,141.4	...	...	610.3	...	...	...	...
1975	4,875.4	3,212.6	...	...	502.2	...	...	...	...
1976	5,136.9	3,391.5	...	...	603.7	...	...	...	...
1977	5,373.1	3,534.3	...	...	694.9	...	...	...	...
1978	5,672.8	3,690.1	...	...	778.7	...	...	...	...
1979	5,850.1	3,777.8	...	...	803.5	...	...	...	...
1980	5,834.0	3,764.5	...	...	715.2	...	...	...	...
1981	5,982.1	3,821.6	...	...	779.6	...	...	...	...
1982	5,865.9	3,874.9	...	...	670.3	...	...	...	...
1983	6,130.9	4,096.4	...	...	732.8	...	...	...	...
1984	6,571.5	4,313.6	...	...	948.7	...	...	...	...
1985	6,843.4	4,538.3	...	...	939.8	...	...	...	...
1986	7,080.5	4,722.4	...	...	933.5	...	...	...	...
1987	7,307.0	4,868.0	...	...	962.2	...	...	...	...
1988	7,607.4	5,064.3	...	...	984.9	...	...	...	...
1989	7,879.2	5,207.5	...	...	1,024.4	...	...	...	...
1990	8,027.1	5,313.7	...	...	989.9	...	...	...	...
1991	8,008.3	5,321.7	...	...	909.4	...	...	...	...
1992	8,280.0	5,503.2	...	...	983.1	...	...	...	...
1993	8,516.2	5,698.6	...	...	1,070.9	...	...	...	...
1994	8,863.1	5,916.2	...	...	1,216.4	...	...	...	...
1995	9,086.0	6,076.2	1,896.0	4,208.5	1,254.3	1,231.2	787.9	342.0	489.4
1996	9,425.8	6,288.3	1,980.9	4,331.7	1,365.3	1,341.6	861.5	361.4	541.4
1997	9,845.9	6,520.4	2,075.3	4,465.3	1,535.2	1,465.4	965.5	387.9	615.9
1998	10,274.7	6,862.3	2,215.5	4,662.1	1,688.9	1,624.4	1,081.4	407.7	705.2
1999	10,770.7	7,237.6	2,392.0	4,853.1	1,837.6	1,775.5	1,194.3	408.2	805.0
2000	11,216.4	7,604.6	2,518.2	5,093.6	1,963.1	1,906.8	1,311.3	440.0	889.2
2001	11,337.5	7,810.3	2,597.3	5,219.1	1,825.2	1,870.7	1,274.8	433.3	860.6
2002	11,543.1	8,018.3	2,702.9	5,318.5	1,800.4	1,791.5	1,173.7	356.6	824.2
2003	11,836.4	8,244.5	2,827.2	5,418.2	1,870.1	1,854.7	1,189.6	343.0	850.0
2004	12,246.9	8,515.8	2,953.3	5,582.7	2,058.2	1,992.5	1,263.0	346.7	917.3
2005	12,623.0	8,803.5	3,076.7	5,726.8	2,172.3	2,122.3	1,347.3	351.8	995.6
2006	12,958.5	9,054.5	3,178.9	5,875.6	2,231.8	2,172.7	1,455.5	384.0	1,071.1
2007	13,206.4	9,262.9	3,273.5	5,990.2	2,159.5	2,130.6	1,550.0	438.2	1,106.8
2008	13,161.9	9,211.7	3,192.9	6,017.0	1,939.8	1,978.6	1,537.6	466.4	1,059.4
2009	12,757.9	9,032.6	3,098.2	5,930.6	1,458.1	1,602.2	1,259.8	368.1	885.2
2010	13,063.0	9,196.2	3,209.1	5,987.6	1,658.0	1,598.7	1,268.5	310.6	963.9
2011	13,299.1	9,428.8	3,331.0	6,101.5	1,744.0	1,704.5	1,378.2	319.2	1,070.0
2012 p	13,591.1	9,604.9	3,433.0	6,178.0	1,911.0	1,850.1	1,484.9	351.3	1,143.5

"Survey of Current Business", August 2011, U.S. Bureau of Economic Analysis

"Economic Report of the President", March 2013

Stage 3 Growth Rate for MS-DCF
Data Sources for Real GDP in 2017 $

Current-Dollar and "Real" Gross Domestic Product 27-Feb-25

Annual			Quarterly (Seasonally adjusted annual rates)		
	GDP in billions of current dollars	GDP in billions of chained 2017 dollars		GDP in billions of current dollars	GDP in billions of chained 2017 dollars
1929	104.6	1,191.1	1947Q1	243.2	2,182.7
1930	92.2	1,089.8	1947Q2	246.0	2,176.9
1931	77.4	1,020.0	1947Q3	249.6	2,172.4
1932	59.5	888.4	1947Q4	259.7	2,206.5
2016	18,804.9	19,141.7	1968Q4	968.0	5,202.2
2017	19,612.1	19,612.1	1969Q1	993.3	5,283.6
2018	20,656.5	20,193.9	1969Q2	1,009.0	5,299.6
2019	21,540.0	20,715.7	1969Q3	1,030.0	5,334.6
2020	21,354.1	20,267.6	1969Q4	1,038.1	5,308.6
2021	23,681.2	21,494.8	1970Q1	1,051.2	5,300.7
2022	26,006.9	22,034.8	1970Q2	1,067.4	5,308.2
2023	27,720.7	22,671.1	1970Q3	1,086.1	5,357.1
2024	29,183.8	23,303.5	1970Q4	1,088.6	5,299.7

Download for Bureau of Economic Analysis web site. Middle years and some quarters omitted to enable data to fit on this page. Use the 2017 dollars column (annual), circled values.

Stage 3 Growth Rate for MS-DCF
Long-Term Inflation Rate

	(a)	(b)	(c)	(d)	(e)	(f)	(g)
	Long-Term Gov. Yields			Inflation Indexed		Long Term	
	From SBBI		T-Bonds	20-Yr T-Bonds		Inflation Rate	
Year	Text	Appendix	20-Yr	SBBI Text	Daily	SBBI Text	AAR Calc
2011	2.48	2.48	2.57	0.5	0.53	1.95	1.95 %
2012	2.41	2.41	2.54	0.15	0.15	2.26	2.26
2013	n/a	3.67	3.72	n/a	1.36	n/a	2.31
2014	n/a	2.4	2.47	n/a	0.68	n/a	1.72
2015	n/a	n/a	2.67	n/a	1.07	n/a	1.60
2016	n/a	n/a	2.79	n/a	0.82	n/a	1.97
2017	n/a	n/a	2.58	n/a	0.61	n/a	1.97
2018	n/a	n/a	2.87	n/a	1.09	n/a	1.78
2019	n/a	n/a	2.25	n/a	0.39	n/a	1.86
2020	n/a	n/a	1.45	n/a	-0.61	n/a	2.06
2021	n/a	n/a	1.94	n/a	-0.63	n/a	2.57
2022	n/a	n/a	4.14	n/a	1.62	n/a	2.52
2023	n/a	n/a	4.20	n/a	1.84	n/a	2.36
2024	n/a	n/a	4.86	n/a	2.41	n/a	2.45

n/a = no longer available

Sources:

(a) Ibbotson SBBI Valuation Yearbook, chapter 4. For 2012 data, 2013 edition, page 52.

(b) SBBI Appendix B, Table B-9 (Long-Term Government Bonds), December
Beginning in 2014, data from Ibbotson® SBBI® Classic Yearbook (Classic Yearbook).
2013 is from Table 2-2 of the Classic Yearbook, on page 42. The 2013 and 2014 numbers are also found in the Ibbotson SBBI Market Report with data as of December, in Table 3 on page 9.

(c) Treasury Constant Maturities, Nominal, 20-Year, Business Day, last day of year
https://www.federalreserve.gov/datadownload/Choose.aspx?rel=H15 (See workpapers)

(d) Ibbotson SBBI Valuation Yearbook, chapter 4. For 2012 data, 2013 edition, page 52.

(e) Treasury Constant Maturities, Inflation Indexed, 20-Year, Business Day,
last (business) day of year
https://www.federalreserve.gov/datadownload/Choose.aspx?rel=H15 (See workpapers)

(f) Ibbotson SBBI Valuation Yearbook, chapter 4. For 2012 data, 2013 edition, page 52.

(g) Column (b) less column (e) except for 2015 to 2024, which is column (c) less column (e)

List of Stage 3 Growth Rates for MS-DCF

The Surface Transportation Board's Multi-Stage Discounted Cash Flow model for estimating the cost of common equity uses 3 stages of growth. The third stage is the long-run nominal growth rate of the U.S. economy, and it is estimated by adding the long-term expected real growth in output (represented by the historical growth rate for U.S. Real Gross Domestic Product since 1929) to the long-run expected U.S. inflation rate. Listed below are the rates used by the Board since the 2010 Cost of Capital determination.

	Long-Term Expected		Stage 3
	Real Growth	Inflation	Growth
Year	in Output	Rate	Rate
2010	3.3	2.6	5.80 %
2011	3.24	1.95	5.19
2012	3.22	2.26	5.48
2013	3.27	2.31	5.58
2014	3.26	1.72	4.98
2015	3.24	1.6	4.84
2016	3.22	1.97	5.19
2017	3.21	1.97	5.18
2018	3.22	1.78	5
2019	3.21	1.86	5.07
2020	3.14	2.06	5.20
2021	3.16 %	2.57 %	5.73
2022	3.16 %	2.52 %	5.68
2023	3.17 %	2.36 %	5.53
2024	3.13 %	2.45 %	5.58 %

Notes:
The Stage 3 Growth Rate for years 2010 through 2012 are from the Ibbotson SBBI Valuation Yearbooks for those years. Ibbotson displayed 1 digit after the decimal in 2010 for the long-term expected growth rate in output and inflation rate.

Market Value Data for MSDCF
Stock Price for CSX - End of 2024

NasdaqGS - Nasdaq Real Time Price • USD

CSX Corporation (CSX) ☆ Follow Compare

32.00 -0.09 (-0.30%)

As of 11:48:43 AM EST. Market Open.

Dec 29, 2024 - Jan 04, 2025 | Historical Prices | Daily

Currency in USD | Download

Date	Open	High	Low	Close	Adj Close	Volume
Jan 3, 2025	32.40	32.51	32.12	32.34	32.34	17,511,800
Jan 2, 2025	32.55	32.68	32.07	32.16	32.16	13,995,700
Dec 31, 2024	32.22	32.40	32.18	32.27	32.27	8,424,300
Dec 30, 2024	32.27	32.34	31.92	32.15	32.15	6,598,900

Retrieved February 26,2025
Link to web page: http://finance.yahoo.com/quote/CSX/history

Market Value Data for MSDCF
Stock Price for NSC - End of 2024

NYSE - Nasdaq Real Time Price • USD

Norfolk Southern Corporation (NSC) Follow Compare

244.09 -1.01 (-0.41%)

As of 11:51:26 AM EST. Market Open.

Dec 29, 2024 - Jan 04, 2025 | Historical Prices | Daily

Currency in USD | Download

Date	Open	High	Low	Close	Adj Close	Volume
Jan 3, 2025	235.07	236.99	233.57	235.88	234.61	1,001,300
Jan 2, 2025	237.50	237.50	232.87	234.60	233.34	1,049,100
Dec 31, 2024	234.17	236.44	233.80	234.70	233.44	942,500
Dec 30, 2024	233.57	234.37	231.19	233.49	232.24	643,200

Retrieved February 26,2025
Link to web page: http://finance.yahoo.com/quote/NSC/history

Market Value Data for MSDCF
Stock Price for UNP - End of 2024

NYSE - Nasdaq Real Time Price • USD

Union Pacific Corporation (UNP) Follow Compare

246.29 +0.40 (+0.16%)

As of 11:54:43 AM EST. Market Open.

Dec 29, 2024 - Jan 04, 2025 | Historical Prices | Daily

Currency in USD | Download

Date	Open	High	Low	Close	Adj Close	Volume
Jan 3, 2025	229.81	232.37	228.85	231.50	231.50	1,994,500
Jan 2, 2025	229.98	230.62	228.33	229.12	229.12	3,177,200
Dec 31, 2024	228.00	229.50	226.95	228.04	228.04	1,784,700
Dec 30, 2024	228.18	229.63	226.78	227.79	227.79	1,659,700

Retrieved February 26,2025
Link to web page: http://finance.yahoo.com/quote/UNP/history

Market Value Data for MSDCF
Shares Outstanding for CSX - End of 2024

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 10-Q

(☒) QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the quarterly period ended September 30, 2024

OR

(☐) TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the transition period from _____ to _____

Commission File Number 1-8022

CSX CORPORATION

(Exact name of registrant as specified in its charter)

Virginia	62-1051971
(State or other jurisdiction of incorporation or organization)	*(I.R.S. Employer Identification No.)*

500 Water Street 15th Floor Jacksonville FL	32202	904 359-3200
(Address of principal executive offices)	*(Zip Code)*	*(Telephone number, including area code)*

No Change
(Former name, former address and former fiscal year, if changed since last report.)

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol(s)	Name of exchange on which registered
Common Stock, $1 Par Value	CSX	Nasdaq Global Select Market

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days.

Yes (X) No ( )

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files).

Yes (X) No ( )

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company (as defined in Exchange Act Rule 12b-2).

Large Accelerated Filer (X) Accelerated Filer ( ) Non-accelerated Filer ( ) Smaller Reporting Company (☐) Emerging growth company (☐)

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ( )

Indicate by a check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act).

Yes (☐) No (X)

There were 1,928,419,153 shares of common stock outstanding on September 30, 2024 (the latest practicable date that is closest to the filing date).

Market Value Data for MSDCF
Shares Outstanding for NSC - End of 2024

UNITED STATES SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549
FORM 10-Q

☒ QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the quarterly period ended **September 30, 2024**

☐ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the transition period from _____ to_____

Commission File Number: 1-8339

NORFOLK SOUTHERN CORPORATION
(Exact name of registrant as specified in its charter)

Virginia	**52-1188014**
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)

650 West Peachtree Street NW
Atlanta, Georgia **30308-1925**
(Address of principal executive offices) (Zip Code)

(855) 667-3655
(Registrant's telephone number, including area code)

No change
(Former name, former address and former fiscal year, if changed since last report)

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol	Name of each exchange on which registered
Norfolk Southern Corporation Common Stock (Par Value $1.00)	**NSC**	**New York Stock Exchange**

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.
Large accelerated filer ☒ Accelerated filer ☐ Non-accelerated filer ☐ Smaller reporting company ☐ Emerging growth company ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☒

https://www.sec.gov/Archives/edgar/data/702165/000070216524000035/nsc-20240930.htm 1/66

2/12/25, 1:37 PM nsc-20240930

Indicate the number of shares outstanding of each of the issuer's classes of common stock, as of the latest practicable date.

Class	Outstanding at September 30, 2024
Common Stock ($1.00 par value per share)	226,239,662 (excluding 20,320,777 shares held by the registrant's consolidated subsidiaries)

Market Value Data for MSDCF
Shares Outstanding for UNP - End of 2024

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 10-Q

(Mark One)

☑ QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the quarterly period ended September 30, 2024

OR

☐ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the transition period from _____ to _____

Commission File Number 1-6075

UNION PACIFIC CORPORATION

(Exact name of registrant as specified in its charter)

Utah	**13-2626465**
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)
1400 Douglas Street, Omaha, Nebraska	**68179**
(Address of principal executive offices)	(Zip Code)

(402) 544-5000
(Registrant's telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Act:

Title of each Class	Trading Symbol	Name of each exchange on which registered
Common Stock (Par Value $2.50 per share)	UNP	New York Stock Exchange

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days.

☑ Yes ☐ No

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files).

☑ Yes ☐ No

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large Accelerated Filer	☑	Accelerated Filer	☐	Non-Accelerated Filer	☐
Smaller Reporting Company	☐	Emerging Growth Company	☐		

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act).

☐ Yes ☑ No

As of October 18, 2024, there were 606,256,627 shares of the Registrant's Common Stock outstanding.

2024 Cost of Equity Using STB's MSDCF

Company	CSX		NSC		UNP	
Year	2024		2024		2024	
Inputs						
Initial Cash Flow	$3,385.63		$2,062.51		$5,870.07	
Input for Terminal C.F.	$3,853.52		$2,664.32		$6,771.65	
Stage One Growth	7.350%		8.300%		10.600%	
Stage Two Growth	8.750%		8.750%		8.750%	
Stage Three Growth*	5.580%		5.580%		5.580%	
Year	Val. 12/31	Pres Val.	Val. 12/31	Pres Val.	Val. 12/31	Pres Val.
1	$3,634	$3,220	$2,234	$2,002	$6,492	$5,789
2	3,902	3,062	2,419	1,944	7,180	5,710
3	4,188	2,912	2,620	1,887	7,942	5,631
4	4,496	2,769	2,837	1,832	8,783	5,554
5	4,827	2,634	3,073	1,778	9,714	5,477
6	5,249	2,537	3,342	1,733	10,564	5,312
7	5,708	2,444	3,634	1,690	11,489	5,151
8	6,208	2,355	3,952	1,647	12,494	4,995
9	6,751	2,269	4,298	1,606	13,587	4,844
10	7,342	2,186	4,674	1,565	14,776	4,698
Terminal	120,845	35,977	106,565	35,682	274,250	87,187
Sum of Pres. Values		$62,365.08		$53,365.41		$140,348.41
Market Value (input)		$62,365.08		$53,365.41		$140,348.41
Cost of Equity	**12.88%**		**11.56%**		**12.14%**	
Prev. Yr. Cost of Equity	15.15%		12.84%		13.03%	