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BEFORE THE
SURFACE TRANSPORTATION BOARD

RAILROAD COST OF CAPITAL — 2020	)	STB Docket No. EP 558 (Sub-No. 24)

COMMENTS OF THE ASSOCIATION OF AMERICAN RAILROADS AND ITS MEMBER RAILROADS

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April 19, 2021

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VERIFIED STATEMENT

Witness*	Subject
John T. Gray	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., V.S. Gray at _____

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COMMENTS OF THE ASSOCIATION OF AMERICAN RAILROADS
AND ITS MEMBER RAILROADS

By a decision served on February 5, 2021, the Surface Transportation Board ("STB" or "Board") instituted this proceeding to determine the railroad industry's cost of capital for the year 2020. The Board noted that this determination will enable it to make the required annual individual railroad revenue adequacy determination for 2020. 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 – 2020*, EP 558 (Sub-No. 24) (STB served Feb. 5, 2021).

The railroads, through the Association of American Railroads ("AAR"), are submitting their calculation of: (1) the railroads' 2020 cost of common equity capital; (2) the railroads' 2020 current cost of preferred equity capital; (3) the railroads' current 2020 cost of debt capital; and (4) the 2020 capital structure mix of the railroad industry on a market value basis.

The AAR's calculations are discussed in the attached verified statement of John T. Gray, Senior Vice President, Policy and Economics of the AAR. Mr. Gray's statement establishes the following:

1. The 2020 cost of common equity capital is 9.33 percent.

2. The 2020 cost of preferred equity capital is 3.42 percent.

3. The 2020 cost of debt capital is 2.54 percent.

4. The capital structure of the railroad industry is 21.16 percent debt, 0.00 percent preferred equity,[1] and 78.84 percent common equity.

From these data, Mr. Gray concludes that the overall railroad industry cost of capital for 2020 is 7.89 percent.[2]

I. Introduction

The sole purpose of this proceeding is to determine the railroad industry's cost of capital for 2020. 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: (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

[1] The weight for preferred equity is small enough that it rounds to 0.00.

[2] Gray V.S. at 2, 55.

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 (2020).[3]

This year there are four railroad corporations or holding companies in the sample meeting the Board's criteria: CSX Corporation, Kansas City Southern, Norfolk Southern Corporation, and Union Pacific Corporation. These railroad companies are the same four companies included in the 2019 sample.

II. The Cost of Common Equity Capital

In its February 5, 2021, order instituting this proceeding, the Board directed that the cost of capital components be calculated "using the methodology followed in Railroad Cost of Capital – 2019." *See Railroad Cost of Capital – 2020,* EP 558 (Sub-No. 24), slip op. at 2 (STB served Feb. 5, 2021). In *Railroad Cost of Capital – 2019*, 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 Railroad Cost of Capital – 2019,* EP 558

[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. *See 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 4 (STB served Jan. 28, 2009).

(Sub-No. 23), slip op. at 7-13 (STB served Aug. 5, 2020).[5] Mr. Gray 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. The CAPM Methodology

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.

Mr. Gray's attached Verified Statement explains how the AAR calculated the cost of equity using the CAPM methodology. The risk-free rate was retrieved directly from the Federal Reserve Board website as approved by the Board in earlier proceedings, including the 2019 cost of capital proceeding. *Railroad Cost of Capital – 2019,* EP 558 (Sub-No. 23), slip op. at 7. Since

[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).

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] Gray V.S. at 30. 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 2020 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 the 2018 and 2019 cost of capital proceedings. Gray V.S. at 31-35.

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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 Mr. Gray for the elements of the CAPM methodology were 1.35 percent for the risk-free rate, 7.25 percent for the market risk premium, and 1.0741 for beta.

Based on the four-railroad composite described above and the procedures used by the STB in the last cost of capital proceeding, Mr. Gray estimates that under the CAPM methodology the cost of common equity capital for 2020 is 9.14 percent. Gray V.S. at 36.

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 Mr. Gray. 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), Mr. Gray's calculations used only IBES growth estimates (distributed by Refinitiv) available as of December 31, 2020, and stock market values were based on shares outstanding and stock prices as of the last trading day of the last full week for 2020 – December 31, 2020 (Thursday). Gray V.S. at 41-45.[8]

Mr. Gray calculates the cost of common equity capital for 2020, using the STB's version of the Morningstar/Ibbotson MSDCF model, as 9.52 percent. Gray V.S. at 48.

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[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, Mr. Gray's calculations used data inputs in the cash flow formula as retrieved from the railroads' 2016-2020 10-K filings with the SEC (and used restated data where set forth in any subsequently filed 10-K filings with the SEC). *See* Gray V.S. at 38-40.

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 9.33 percent for 2020. Gray V.S. at 49-50.

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 2003 until 2012, no railroads in the composite had preferred stock outstanding. Since then and continuing in 2020, one railroad in the group had preferred stock outstanding. The estimated cost of preferred equity is 3.42 percent for 2020. Gray V.S. at 53.

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 – 2019*, EP 558 (Sub-No. 23), slip op. at 3. To determine the cost of debt for bonds,[9] Mr. Gray has computed the average current bond yield for 131 bonds from the sample railroads for which data were available during 2020 according to the Board's well-established methodology. Under this approach, the bond yield is based on a sample representing 99.1 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 cost.[12] Using the Board's established methodology, the railroads' 2020 cost of new debt is 2.54 percent. Gray V.S. at 23-24.

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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. Gray V.S. at 7-8.

[11] Gray V.S. at 11, 15-16. No CSAs were modeled because none are outstanding.

[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 2020. This is the same methodology approved by the Board in *Railroad Cost of Capital –2019,* EP 558 (Sub-No. 23), slip op. at 6. Gray V.S. at 18-23.

V. The 2020 Capital Structure of the Railroad Industry and the Overall Cost of Capital

Pursuant to the Board's February 5, 2021 decision, the market values of debt, preferred equity, and common equity were compiled to compute the 2020 capital structure of the railroad industry. The railroads' market value capital structure on a market value basis is 21.16 percent debt, 78.84 percent common equity capital, and 0.00 percent preferred equity capital. Gray V.S. at 54. Based upon this capital structure, the overall 2020 cost of capital is 7.89 percent. Gray V.S. at 55.

Conclusion

The Board should determine that the railroads' cost of capital for 2020 is 7.89 percent.

Respectfully submitted,

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April 19, 2021

CERTIFICATE OF SERVICE

I hereby certify that on this 19th day of April, 2021, I caused to be served by electronic mail a copy of the foregoing on the following:

Robert D. Rosenberg
Slover & Loftus
1224 Seventeenth St., NW
Washington, DC 20036-3003

/s/ Kathleen Birch
Kathleen Birch

BEFORE THE

SURFACE TRANSPORTATION BOARD

EX PARTE NO. 558 (Sub-No. 24)

RAILROAD COST OF CAPITAL — 2020

VERIFIED STATEMENT

OF

JOHN T. GRAY

SENIOR VICE PRESIDENT — POLICY AND ECONOMICS

ASSOCIATION OF AMERICAN RAILROADS

April 19, 2021

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Verified Statement

of

John T. Gray

I. Introduction

My name is John T. Gray. I am Senior Vice President – Policy and Economics of the Association of American Railroads (AAR), with offices 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 150 additional Class II and III freight railroads, account for approximately 97 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 have conducted or directed a wide range of analyses and projects addressing regulatory, legislative and internal issues relevant to railroads. Furthermore, I have testified before federal regulatory agencies, and have been an expert witness for a railroad. 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 February 4, 2021 (served February 5), instituting a proceeding to determine the railroad industry's 2020 cost of capital — Ex Parte No. 558 (Sub-No. 24), *Railroad Cost of Capital — 2020* ("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. 23); 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. 23) – including the Board's deferred tax adjustment to 2017 data. In addition, I calculate a cost of preferred equity using the dividend yield method, as used in Ex Parte No. 558 (Sub-No. 23). 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 calculation: 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 the cost of preferred equity capital.

I conclude that the 2020 cost of capital for the railroad industry is 7.89 percent. This estimate is based on a current cost of debt of 2.54 percent, a cost of common equity capital of 9.33 percent; a cost of preferred equity of 3.42 percent; and market value weights for debt, common equity, and preferred equity of 21.16 percent, 78.84 percent, and 0.00 percent, respectively.

II. Determining the Cost of Capital

A. Defining the Cost of Capital

The cost of capital for a firm is the minimum rate of return on investment that the providers of capital require as a condition for making an investment in the firm. In essence, it is the threshold rate of return that makes investment in the firm attractive. 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. Methods used to estimate the cost of capital therefore attempt to measure investor expectations. Such models of future behavior are inherently uncertain, and cost of capital computations 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.

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. 24 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 (2020).

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
2020

Class I Railroad	Parent	Stock Symbol	Dividends Throughout 2020	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	---	
KCS	Kansas City Southern	KSU	Yes	Yes	Yes	Yes
NS	Norfolk Southern Corporation	NSC	Yes	Yes	Yes	Yes
CPSL*	Canadian Pacific Railway Ltd.	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). CPSL is Soo Line Corporation, and consists of the U.S. operations of Canadian Pacific (CP). Following STB precedent, CN and Canadian Pacific were not included in the sample because both CN and Canadian Pacific 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 four railroad corporations or holding companies in the sample meeting the Board's criteria: CSX Corporation, Kansas City Southern, Norfolk Southern Corporation, and Union Pacific Corporation. These are the same railroad companies included in the 2019 sample. 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 2020, and the railroad is less than 50% of the company's assets.[2] Based on data

[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) are still more Canadian than USA. Comparing operating revenues for 2019 as reported in the AAR's *Railroad Facts* book, 2020 edition: CNGT was 31 percent of CN, and SOO was 27 percent of Canadian Pacific.

[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 2020, BNSF accounted 10.1 percent of Berkshire Hathaway assets. Among the many other diverse subsidiaries of Berkshire

from Annual Report Form R-1 for 2020, the four-firm composite accounts for 62 percent of the operating revenues and 60 percent of the 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 2020 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 in the 2019 Cost of Capital decision. The other method is calculated using the somewhat more forward looking Multi-Stage Discounted Cash Flow model (MSDCF)

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.

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

methodology prescribed by the Board in the 2019 Cost of Capital Decision. The cost of preferred equity capital has been calculated using a simple dividend yield method, as used in the 2019 Cost of Capital Decision. Calculations for all three types of capital are based on data through 2020. 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 2020

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

[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. 23).

(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 2020, yields and prices of the sample railroads' bonds, notes and debentures were obtained from Bloomberg.[7] This source is the same data source used since the 2011 cost of capital

[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.

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

determination. We were able to find data for 130 unique CUSIPs (bond identifiers).[8] Appendix A lists market value data for 131 bonds because one set of notes was issued twice during 2020, and the portions needed to be split for prorating purposes.[9] The 131 bonds represent 99.1 percent of the book value of all railroad bonds belonging to the composite railroad.[10] 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 131 bonds with market data in 2020, 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, 2020.[11] Where market prices are not available (i.e., for instruments that did not trade or were

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[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] In one case, a portion of a series of notes was issued twice in 2020. In each case, the two portions were kept separate to enable both portions to be correctly prorated for the year and therefore follow STB procedure. Thus, Appendix A has 131 "bonds" and 130 unique CUSIPs. See bonds 95 and 96 in Appendix A, and pages 1 and 2 of Appendix E.

[10] In some cases, similar series of bonds have been assigned two CUSIPs because a privately-placed portion trades *among* qualified institutional buyers instead of *through an exchange*. This can also happen in a bond exchange offer where not all of the "old" bonds have been redeemed for the new version.

[11] 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.

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 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 2020. The market value for bonds, notes, and debentures that traded is $65.01 billion, which is 99.2 percent of the total market value of $65.51 billion.[12]

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	$18,942,310	$441,679	$19,383,989	29.14 %
KSU	$4,007,185	$66,169	4,073,354	6.17
NSC	$14,998,999	$0	14,998,999	23.07
UNP	$27,056,661	$0	27,056,661	41.62
Total	$65,005,154	$507,849	$65,513,003	100.00 %
* The traded weight for KSU, 6.164411%, was rounded up instead of down to force the total to be exactly 100.00%.				
Prior Year	$53,260,353	$324,520	$53,584,873	
Change	22.1%	56.5%	22.3%	

Total market value for bonds is up 22.3 percent from the previous year. Among the causes of this increase are new debt offerings outpacing retirements, as year-end book values of bonds are higher for all four railroads.

[12] The market value and book value percentages for traded bonds rounded to the same number.

Appendix A lists details for each of the 131 bonds, notes, and debentures belonging to the composite railroad that have trading data available for 2020 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. There is also one case where a series was split for prorating purposes. 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 2.498 percent, which is almost one percentage point (0.922) lower than 2019's figure of 3.420 percent.

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

Railroad Co.	Weight	Current Cost
CSX	29.14 %	2.608 %
KSU	6.17	2.972
NSC	23.07	2.571
UNP	41.62	2.310
Total	100.00 %	2.498 %

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 131 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 2.498 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.[13] For 2020, this percentage is 1.45 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

[13] 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.

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.

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 2020 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 in 2017, 2018, 2019, and 2020, the 70 basis point spread is our most recent calculation, and I have used that difference for 2020. For comparisons, Table 4 lists historical spreads used

since 2000 and the spread proposed for 2020.[14] Other than the spread for 2015, which appears to be an anomaly, the spread of 70 basis points is the lowest spread used in this century.

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

Data Year	Proceeding	Basis Points
2000	Ex Parte No. 558 (Sub-No. 4)	171
2001	Ex Parte No. 558 (Sub-No. 5)	114
2002	Ex Parte No. 558 (Sub-No. 6)	114
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	Proposed for EP 558 (Sub-No. 24)	70

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

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

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 2020 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 establish the current cost for ETCs. The weighted-average cost for all modeled Equipment Trust Certificates (now 4) is shown in Table 5.[15]

Table No. 5
Summary of Equipment Trust Certificates Modeled for 2020
($000)

Railroad	Amount Outstanding Beg.	Ending	Average	Yield	Current Market Value	Current Interest Amount	No. ETC
CSX	$0	$0	$0	--	$0	$0	0
KCS	0	0	0	--	0	0	0
NS	0	0	0	--	0	0	0
UP	917,759	880,688	899,224	1.397%	962,216	13,446	4
Total	$917,759	$880,688	$899,224	1.397%	$962,216	$13,446	4

[15] 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

Weighing each railroad's yield (there was only one railroad) by its current market value for modeled ETCs results in a current cost of 1.397 percent. The average rate is lower than the 2.783 percent found for 2019. In this year's case, the premium used in the model is the same as last year – so the lower yield curve for 2020 reflects the lower 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 $962.22 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 2020 – so none were

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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 1
K	=	Compute for K, values 1 to N and sum the results

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.[16] 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 2020 is $457.2 million.

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

Miscellaneous debt, such as floating rate loans, demand deposits, premiums/discounts, and various instruments with extremely small amounts outstanding are also excluded from the current cost computations. Miscellaneous debt is valued at negative $1,288.0 million because in 2020 it consists mostly of discounts and unamortized debt issuance costs.

Capital leases and miscellaneous debt net to negative $830.8 million and there were no ETCs that were not modeled. Therefore, All Other Debt as a percent of the total market value of debt of the composite railroad is negative 1.27 percent. Miscellaneous debt is lower than it was for 2019, and much of the decrease was caused by 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.[17]

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 $65,644 million.

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

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

Type of Debt	Market Value	Percent of Total	Percent of Subtotal
Bonds, Notes & Debentures	$65,513,003	99.80 %	98.55 %
Equipment Trust Certificates	962,216	1.47	1.45
Conditional Sales Agreements	0	0.00	0.00
Subtotal	66,475,219	101.27	100.00 %
All Other Debt*	-830,757	-1.27	
Total	$65,644,461	100.00 %	

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

Bonds, Notes, and Debentures (Bonds) account for 99.8 percent of the total market value. More detail can be found in Appendix D. As can be computed from that appendix, 99.2 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 2020, 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 2020 flotation costs for bonds using publicly available data from electronic filings with the Securities and Exchange Commission (SEC).[18] 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 2020, 9 new issues were reported in six filings, with some filings reporting multiple new issues. A simple average of the 9 flotation costs is 0.057 points, which is .018 lower than the figure used by the Board for 2019. As before, debt exchanges have not been included. Pages 1 and 2 of Appendix E contain a table with input data and calculations. Pages 3 and 4 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 9 new railroad debt issues,

[18] 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 .

which were issued by four different railroads, provide the best information to determine flotation costs for 2020, and I have therefore used 0.057 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 my testimony for 2012 for a discussion of the incorrect assumption used with the current method. Because ETCs are such a 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.[19] 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.

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

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)	1.397%
Assumed Duration of New Instrument (Yrs)	15
Calculated	
Price After Flotation Costs	$99.11
Effective Yield Including Flotation Costs	1.464%
Difference Between Yields With and Without Floatation Costs =	
Flotation Cost as Percentage Points	**0.067%**

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 0.067 percentage points – which is .006 percentage points lower than the value for 2019 and closer to the current flotation cost for bonds.

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 0.057 percentage points.

Table No. 8
Flotation Costs For Debt

Type of Debt	Market Weight	Flotation Cost
Bonds, Notes & Debentures	98.55%	0.057%
Equipment Trust Certificates	1.45%	0.067%
Conditional Sales Agreements	0.00%	not calculated
Total	100.00%	0.057%

This flotation cost for 2020 is 0.018 percentage points lower than the number used by the Board in its 2019 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	98.55%	2.498%
Equipment Trust Certificates	1.45%	1.397%
Conditional Sales Agreements	0.00%	--
Subtotal	100.00%	2.482%
Flotation Costs		0.057%
Weighted Cost of Debt		2.539%
Weighted Cost of Debt (Rounded)		**2.54%**

The current weighted cost of debt before flotation costs is 2.482 percent. The addition of flotation costs results in a rounded cost of debt of 2.54 percent. This cost of debt is lower than the 2012 record low of 3.29 percent.[20] A summary for the 2020 calculation of the overall cost of debt is provided in Appendix F. That appendix also has some historical costs of debt for comparisons.

IV Common Equity Capital In 2020

A. The Market Value of Common Equity Capital

The market value of common equity is based on stock prices and shares outstanding for 2020. Table 10 below summarizes the market value calculation. The Weight column, which is not used directly in our calculation, is provided as additional information.

[20] 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 2020 edition lists, on page 20, data from 1990 through 2019.

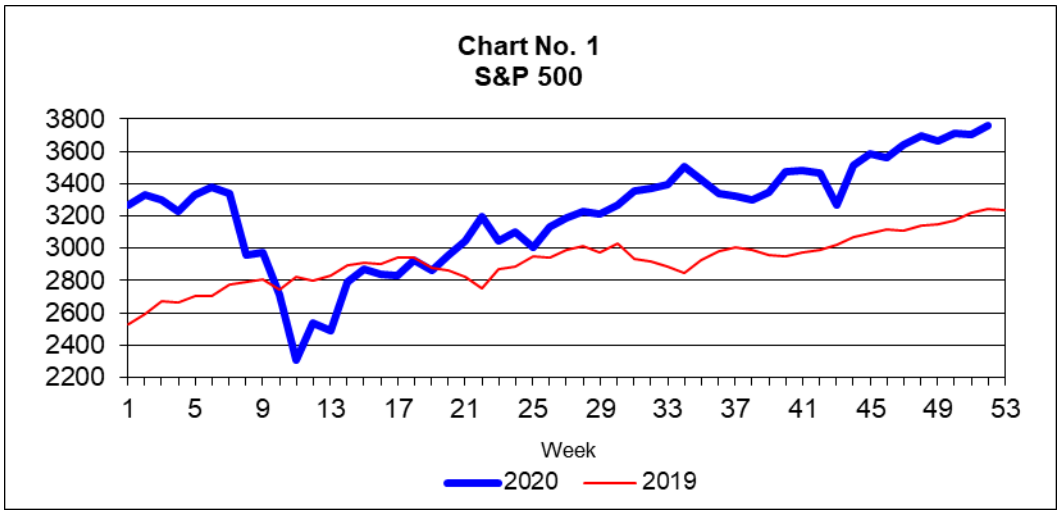
Table No. 10
Average Market Value
For Common Equity in 2020

Railroad Co.	Value ($000)	Weight %
CSX	57,135,995.5	23.36
KSU	15,622,179.0	6.39
NSC	50,274,622.2	20.55
UNP	121,545,799.3	49.70
Total	$244,578,596.0	100.00 %
*The weight for NSC, 20.5556% was rounded down instead of up to force the total to be exactly 100%		
Prior Year	$239,328,804.0	
Change	2.2%	

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 2020.[21] Note that the week beginning on April 6 ends on Thursday April 9 because of the Good Friday holiday. Thus, any railroad shares outstanding change effective on April 10 would not happen until the following week because the market was closed on April 10. Page 6 of Appendix G lists all full-day stock market holidays. Page 5 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 2020 included 52 weeks. Week 1 began on Monday January 6, 2020, and is the first week after 2019's week 53 used in last year's calculation. The week beginning Monday December 28, 2020, qualifies as the final week for 2020. Thus, 2020 is a 52-week year for the purpose of calculating the market value of common equity.

[21] 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.

The 52-week average market capitalization of the composite railroad (the four railroads that comprise the composite sample), listed in Table Number 10 and on page 5 of Appendix G, is $244.6 billion. This is a 2 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 also higher in 2020 than most of 2019.

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. 24). The CAPM is discussed herein, and the MSDCF is discussed in the next section.

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 regarded a particular firm or group of firms. In formulaic terms, the cost of equity as estimated by the CAPM may 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 = 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. 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 2019 Cost of Capital decision.[22]

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 2020.[23] 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 table shows, the average rate for 20-Year U.S. Treasury Bonds in 2020 is a decrease 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.[24]

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[22] *Railroad Cost of Capital – 2019,* EP 558 (Sub-No. 23) (STB served August 5, 2020).

[23] 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.

[24] 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.

Table No. 11
20-Year U.S. Treasury Bonds 2011 - 2020

Year	Average Annual Rate
2011	3.62 %
2012	2.54
2013	3.12
2014	3.07
2015	2.55
2016	2.22
2017	2.65
2018	3.02
2019	2.40
2020	1.35

Source: Federal Reserve

Using the average yield to maturity in 2020 for a 20-year U.S. Treasury Bond, as directed in STB Ex Parte No. 558 (Sub No. 24), the CAPM's risk-free rate is 1.35 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 & 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.[25] 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.[26] 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 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*.[27] The *Cost of Capital*

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

[26] 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)."

[27] 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.

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 2020, the online Duff & Phelps *Cost of Capital Navigator* shows this premium as 7.25 percent. This is a small increase from the 7.15 percent figure used by the Board for 2019. (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 2020 equity risk premium.) Thus, I used 7.25 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:

R – SRRF = Alpha + beta (RM – SRRF) + E

Where:

R	= merger and dividend-adjusted stock returns for the portfolio of railroads;[28]
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.

[28] 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*.

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 papers). Due to Yahoo data quality concerns in the prior years, we used Bloomberg stock price data for 2020.

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 2015 (Week 0) through the last week of 2020 (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.[29] Week 1 in the regression data set is the week ending Friday, January 8, 2016 (or beginning Monday January 4, 2016).[30] This week meets the Board's criterion to qualify as week 1 because it is the first week to contains 3 or more trading days in 2016. The last week of 2020, Week 261, began on Monday, December 28. Week 0 began in 2015 on Monday December 28, 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.[31]

Three categories of data are necessary for the raw regression data set. First, weekly stock prices for CSX, KSU, NSC, and UNP are acquired.[32] 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.[33]

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[29] In some cases, stock did not trade on Friday. For example, trading during Week 223 ended Thursday, April 9, 2020, because Friday, April 10, 2020, 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 212 began on Tuesday, January 21, because of the Martin Luther King Day holiday on January 20.

[30] Following the Board's clarification in Ex Parte No. 558 (Sub-No. 12), the week beginning January 4, 2016, is the first week in the relevant year that contains 3 or more trading days. The previous week had no trading days in 2016.

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

[32] CSX Corporation has a stock symbol of CSX, Kansas City Southern is KSU, Norfolk Southern Corporation is NSC, and Union Pacific Corporation is UNP.

[33] 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 January 14, 2021, and the range of data was from 12/20/2015 through 1/10/2021.

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.[34] 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 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.[35] 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.[36] 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

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[34] 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.

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

[36] 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.

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 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 work papers. The regression using the Bloomberg data resulted in a beta estimate of 1.074106099 using a spreadsheet, and 1.074110976 using SAS – both round to 1.0741.[37]

The 2020 beta is lower than the beta for 2019 (1.0941), and is the lowest since 2009. However, this is the twelfth consecutive year that the railroad beta has been above 1.0, further

[37] 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.

demonstrating that railroad stocks are consistently more volatile and are regarded as having more risk than does the market generally.

We have evaluated our beta calculation by comparing it to previous years and expectations. The value of 1.0741 for beta, as calculated in the spreadsheet regression where we are confident of data quality, and using SAS, 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 used by the STB in the previous cost of capital determination, Ex Parte No. 558 (Sub-No. 23). Table 12 is a summary of our CAPM cost of common equity calculation, which resulted in an average 2020 cost of equity estimate for the composite railroad of 9.14 percent. This is a decrease from 2019's 10.22 percent, despite the higher market risk premium.

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

Inputs to Model	**2020**	**2019**	
Risk-Free Rate	1.35 %	2.40 %	Table No. 11
Market Risk Premium	7.25	7.15	Appendix H
Beta	1.0741	1.0941	Appendix I
Calculation			
Risk-Free Rate	1.35	2.40	Given
Plus: Beta Adj. Risk Premium	7.79	7.82	Beta x MRP
CAPM Cost of Equity	9.14 %	10.22 %	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. These features 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. Thus, 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. As such, 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.[38] 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.[39] 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 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 2019 cost of capital.

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[38] 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.

[39] 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)

1. Cash Flows

The Morningstar/Ibbotson MSDCF model uses an initial cash flow and a terminal cash flow as inputs. The initial cash flow is defined as income before extraordinary items minus capital expenditures plus depreciation plus 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. The years used in this case are 2016 through 2020. 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. Net Income and Deferred Taxes for 2017 have been adjusted,

using the same data and methodology as the Board used in its 2017 Cost of Capital determination, to remove the accounting impacts of the Tax Cuts and Jobs Act on rail carriers' deferred tax liability. Part of the increases in Net Income after 2017 was caused by the reduction in the corporate income tax rate.

Table No. 13
Example Cash Flow Calculations for CSX in 2020
($ in millions)

	2016	2017	2018	2019	2020	Total
Net Income	$1,714	$1,840	$3,309	$3,331	$2,765	$12,959
Less Extraord. Items	0	0	0	0	0	0
Inc. Bef. Extraord. Items (+)	$1,714	$1,840	$3,309	$3,331	$2,765	$12,959
Capital Expenditures (-)	$2,398	$2,040	$1,745	$1,657	$1,626	$9,466
Depreciation (+)	1,301	1,315	1,331	1,349	1,383	6,679
Deferred Taxes (+)	405	209	279	273	180	1,346
Cash Flow	$1,022	$1,324	$3,174	$3,296	$2,702	$11,518
Revenue (a.k.a. "Sales")	$11,069	$11,408	$12,250	$11,937	$10,583	$57,247

Ratio of Cash Flow to Sales (Smoothed Ibbotson-style) = ($11,518 / $57,247) =	0.20120
Initial Cash Flow in 2020 (Smoothed Ibbotson-style) = (0.20120 x $10,583) =	**$2,129.28**
Ratio of IBEI to Sales (Smoothed Ibbotson-style) = ($12,959 / $57,247) =	0.22637
Terminal Cash Flow input (Smoothed Ibbotson-style) = (0.22637 x $10,583) =	**$2,395.67**

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 2020, which is the initial cash flow in the model, is calculated by multiplying revenue for 2020 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 $2,129.28 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, depreciation equals capital expenditures, and deferred taxes are zero. Therefore, the depreciation and capital expenditures from the initial cash flow formula cancel each other, and deferred taxes are eliminated because they are zero. 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 $2,395.67 million. The model's terminal cash flow input is calculated by multiplying revenue for 2020 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 four railroads, including more detail on the adjustments made to 2017 data to remove the accounting impacts of the Tax Cuts and Jobs Act on rail carriers' deferred tax liability. The pages from the 2020 10-K reports that were used as data sources for cash flows are included in my work papers. Data for prior years (2016-2019) used in this year's calculation are unchanged from last year's submission – unless restated/revised data were found in the 2020 10-K statements.

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 (2020) 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.[40] (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 2020, and stock prices as of December 31, 2020 – the prices at the end of the last full week for 2020.[41] Each growth rate projection was reviewed by the brokerage firm's analyst during 2020, 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 service.[42] 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

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

[41] Thursday, December 31, 2020 was the last trading day for the week.

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

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
2020 Thomson Median Growth Rate Estimates

Company	Stock Symbol	Growth Rate
CSX Corporation	CSX	6.60 %
Kansas City Southern	KSU	11.88
Norfolk Southern Corporation	NSC	7.37
Union Pacific Corporation	UNP	8.09
Simple Average		8.49

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.

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".[43] 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 8.49 percent, which is a decrease from 2019 (10.85 percent). For all railroads in the Morningstar/Ibbotson MSDCF model, a second stage growth rate of 8.49 percent is used.[44]

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 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

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

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

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 2012 dollars) up to the latest year. Pages 3 and 4 of the same Appendix show data sources used on page 2. The calculation for 2020 is 3.14 percent – a decrease from the 3.21 percent used for 2019.

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 2008 through 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,[45] 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.[46] This addition to the methodology was accepted in the 2015 through 2019 cost of capital determinations, and has been used again for 2020. Comparing yields for long-term government bonds to inflation indexed bonds, I calculate an expected long-term inflation rate of 2.06 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 2020 is 5.20 percent (3.14 +

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[45] 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.

[46] 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.

2.06 as also shown on page 1 of Appendix M), which is higher than the 5.07 used for 2019. Although real growth in output decreased from the previous year, expected inflation is up. This caused the increase in the Stage 3 Growth rate calculated for 2020. 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 December 31, 2020

Company	Stock Price	Shares Outstanding	Market Value ($mil)	Weight
CSX	$90.75	764,774,958	69,403.3	24.001 %
KSU	$204.13	93,601,549	19,106.9	6.607
NSC	$237.61	253,985,338	60,349.5	20.870
UNP	$208.22	673,868,865	140,313.0	48.522
Total		1,786,230,710	$289,172.6	100.000 %

As directed by the Board, I have used stock prices (from Yahoo Finance) for December 31, 2020, the last trading day of the week that qualifies as the last week of 2020 for cost of capital purposes. I have also used the shares outstanding for that day from the 2020 Q3 10-Q reports (the latest information available prior to December 31, 2020) 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.[47]

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 discounted value of the cash flows from the three stages of the firm's expected future growth.

[47] 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.

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.[48]

Applying the methods described above, I have calculated a cost of common equity for each of the four railroads specified using a spreadsheet like the one utilized in the 2019 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 December 31, 2020, 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.[49] 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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[48] 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.

[49] As noted in Appendix K, cash flow data for 2017 utilizes the Board's adjustments to net income and deferred taxes that remove the impact of the Tax Cuts and Jobs Act.

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

Company	Weight	Cost of Equity	Weighted Calculation
CSX	24.001%	9.41 %	2.26
KSU	6.607%	9.31	0.62
NSC	20.870%	9.33	1.95
UNP	48.522%	9.68	4.70
Total	100.000%		
Weighted Current Cost of Equity			**9.52 %**

Thus, the MSDCF produces a cost of common equity of 9.52 percent for 2020 – a decrease from the 11.12 percent used by the Board for 2019. Given lower interest rates, it is logical that investors expect lower returns on their investments. This is the lowest cost of common equity calculated using the MSDCF since it began being used by the Board for 2008.

D. Conclusion as to the Cost of Common Equity Capital

In the STB's Ex Parte No. 558 (Sub-No. 24) decision served February 5, 2021, the Board specified that comments "should focus … using the methodology followed in *Railroad Cost of Capital – 2019",* 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. Observing the estimates for the two cost of equity models, one can notice a difference between them that is larger than that for 2015, when the two models were almost identical. In the current year's case, we believe that the CAPM would have difficulty capturing the impact of the Tax Cuts and Jobs Act. It would therefore be wrong to claim the estimate using the MSDCF was too high by

wrongly assuming the CAPM was the better model. In all probability, the CAPM is too low this year because it has no way to account for the lower corporate tax rate and increased investor expectations as the railroads incorporate new efficiency programs.[50] Once again, it should 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.[51]

The cost of common equity for 2020 is 9.33 percent, which is below the 10.67 percent decided for 2019.

Table No. 17
Cost of of Common Equity Capital

Model		
Capital Asset Pricing Model	9.14 %	From Table No. 12
Multi-Stage Discounted Cash Flow	9.52	From Table No. 16
Cost of Common Equity	9.33 %	Average

V. Preferred Equity Capital in 2020

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. This continues in 2020, although the market value of the preferred stock remains very small.

[50] 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."

[51] 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.

A. Overview of Preferred Stock

Preferred stock is a hybrid security which has some characteristics of debt and some characteristics of equity. The general characteristics of preferred stock are as follows:

1. It is an equity security similar to common stock in that it represents ownership in the corporation.
2. It has dividend preference over common stock in that it has prior claim on the corporation's earnings before dividends are paid to holders of common stock.
3. It is a security which typically has a stated rate of return or fixed dividend. (If the stock has a par value, it will state the annual dividend payments in terms of percentage of par value – for example, a 6 percent preferred. No-par value preferred stock has a dividend stated in a dollar amount, for example, a $6 preferred.)
4. It is a security that pays dividends only if they are declared by the board of directors. (If there are no earnings, the dividends may be paid out of earned surplus. In any event, dividends must be declared by the board.)
5. It has prior claim over assets at dissolution. If the corporation is liquidated, the holders of preferred stock, like bondholders, have a prior claim on assets over common stock shareholders. Therefore, preferred stock is also referred to as a senior security.
6. Ownership privileges are limited. (Preferred stock usually carries no voting right. In most instances, it does not participate in earnings above a set amount. The preemptive right to buy new securities is limited.)
7. It generally has no maturity date or maturity value. (The exception is sinking fund preferred issues which effectively must be retired at some future date.)

There are numerous types of preferred stock. The chief distinction among different types of preferred stock is the method and amount of dividend payment to the investor. In addition, there are specific privileges related to each type. Major types of preferred stock are listed below.

1. *Cumulative* - Occasionally, a board will decide not to pay dividends. If the stock is cumulative, unpaid dividends accumulate and the total accumulated (in arrears) must be paid to the holder of cumulative preferred stock before any dividends can be paid to the common stockholders. Most preferred stocks are cumulative.

2. *Noncumulative* - When business is such that the corporation's board of directors decides not to pay dividends, holders of noncumulative preferred stock lose their dividends. These dividends cannot be claimed in the future.
3. *Participating* - Owners of participating preferred stock receive – in addition to their fixed dividend – a share in the earnings remaining after all senior securities have been paid. If any additional dividend is declared, it is generally declared along with the common stock dividend. Participating preferred stock may also be cumulative, noncumulative or convertible.
4. *Redeemable* - Preferred stock is usually callable immediately. This means that the issuer can retire the stock at any time, if the company has the necessary cash. In some instances, as with so-called sinking fund preferred, the issuer is required to redeem the stock over a specified period of time. Generally, when redemption occurs, the firm must pay a premium price to the holder of the instrument.
5. *Auction Market* - This stock represents a new variety of variable-rate preferred stock. This security is generally appropriate for corporations with "temporary" idle corporate funds. The dividends, payable every seven weeks in the case of most issues, are determined by bids from current holders and potential buyers. The Auction Market Preferred shares are redeemable at the issuer's option, in whole or in part, on or near the interest payment date.
6. *Convertible* - A preferred stock is convertible if the holder has the privilege of converting the preferred stock into common stock at specified prices. This is an advantage to the holder if the market price of common stock increases. Often the convertible preferred will sell at a premium (above conversion parity) because of the conversion feature, especially as the selling price of common issues increase. Dividends of convertible preferred stock can also be cumulative or noncumulative.

B. The Market Value of Preferred Equity Capital

The market value of preferred equity is based on stock prices and shares outstanding for 2020. Kansas City Southern is the only railroad included in the composite railroad sample that has preferred stock. Table 18 below summarizes the market value calculation. The Weight column, which is not used directly in our calculation, is provided as additional information (which would be more useful if more than one railroad had preferred stock). Calculations are shown in Appendix P.

Table No. 18
Average Market Value
For Preferred Equity in 2020

Railroad Co.	Value ($000)	Weight %
CSX	$0.0	0.00
KSU	6,295.7	100.00
NSC	0.0	0.00
UNP	0.0	0.00
Total	$6,295.7	100.00 %
Prior Year	$6,108.3	

C. The Cost of Preferred Equity Capital

The cost of preferred equity depends, in large part, on its specific features. Three methods for determining the cost of preferred equity capital are listed below.

1. *The Dividend Yield Method* is used when the preferred stock is not convertible and there is no specific requirement to redeem the preferred. It is also used to cost preferred issues retired or redeemed during the year. The current cost in this instance is computed by dividing the stated dividend by the current market price. This method was used for all preferred stock in the 2002 cost of capital proceeding. This was also the method used for Kansas City Southern preferred stock in 1999, which was the last time Kansas City Southern was part of the composite railroad until 2013.
2. The *Internal Rate of Return Method* is used for preferred stocks which are not convertible but are subject to a mandatory redemption schedule providing a premium over the stated/par value. The current cost is equal to rate of return which equates the current price with the present value of dividends plus the redemption price.
3. The *Common Equity Method* is used when the preferred stock is convertible at the option of the holder, and the market values of the preferred and common stock indicate that conversion is likely to occur or the conversion right is influencing the price of the preferred stock. In this case, the preferred equity has the same cost as common equity.

The preferred stock that is part of the composite railroad belongs to Kansas City Southern. This stock is not convertible, and is non-cumulative. Therefore, I have used the Dividend Yield Method to estimate the cost of preferred equity. This is the same method used for 2013 through 2019. The formula for the Dividend Yield Method is simply the annual dividends divided by the average price for the year. In this year's case, the cost of preferred equity is 3.42 percent, a decrease from the 3.64 percent calculated for 2019. Appendix P provides more detail for this calculation. The Kansas City Southern 10-K report did not list quarterly high and low stock prices for its preferred stock as it had in the past, so data from Yahoo Finance was used to get the highs and lows that appear in the appendix.[52] The source data are included in my work papers. Table 19 summarizes my findings.

Table No. 19
Cost of Preferred Equity Capital

Company	Weight	Cost of Equity	Weighted Calculation
CSX	0.00%	-- %	0.00
KSU	100.00%	3.42	3.42
NSC	0.00%	--	0.00
UNP	0.00%	--	0.00
Total	100.00%		
Weighted Current Cost of Equity			**3.42 %**

VI. The Overall Cost of Capital In 2020

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 $65.6 billion, $244.6 billion, and $6.3 million (not

[52] Dividend-adjusted stock prices are not needed in this cost of preferred equity calculation.

billion), respectively. More market value detail are provided in Appendixes D, G, and P. 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 2020 has weights for debt, common equity, and preferred equity of 21.16 percent, 78.84 percent, and 0.00 percent, respectively. Table 20 contains the weights computation and a comparison to the previous year. Note that the weight for preferred equity again rounds to zero.

Table No. 20
Capital Structure and Weights

		2020		2019	
	Source Table	Market Value (mil)	Capital Structure Weight	Market Value (mil)	Capital Structure Weight
Debt	6	$65,644.5	21.16 %	$54,484.2	18.54 %
Common Equity	10	244,578.6	78.84	239,328.8	81.46 *
Preferred Equity	18	6.3	0.00	6.1	0.00
Total		$310,229.4	100.00 %	$293,819.1	100.00 %

* .01 added to force total to exactly 100.00%. Unrounded value is 81.4545%.

The market value for debt, common equity, and preferred stock increased from the prior year. Weights shifted closer to their values for 2016. Debt increased 2.62 percentage points from 2019, while common equity decreased 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 2020 overall cost of capital of 7.89 percent, as shown in Table 21. This is the lowest cost of capital ever calculated. The drop was caused by low interest rates and the shift in capital structure.

Table No. 21
Weighted Current Cost of Capital for 2020

	Source Table	Capital Structure Weight	Current Cost
Debt	11	21.16 %	2.54 %
Common Equity	18	78.84	9.33
Preferred Equity	20	0.00	3.42
Total		100.000 %	
Weighted Current Cost of Capital			**7.89 %**

VII. Qualifications of John T. Gray

My name is John T. Gray. I am Senior Vice President, Policy and Economics for the Association of American Railroads (AAR), with offices located at 425 Third Street SW, Suite 1000, Washington, DC 20024. Among other responsibilities, my duties include the collection, analysis, and presentation of economic data related to railroads and their economic environment. One of my principal duties is conducting and supervising economic, financial, statistical and cost studies dealing with various aspects of the rail industry.

Prior to joining the AAR, I worked for Union Pacific Railroad where my most recent position was as Executive Director, responsible for the commercial relationship with other transportation carriers and ports, and for strategic policy analysis on issues involving regulatory

proposals, legislation and potential litigation. I have also held marketing, planning, and operating positions with other railroads including the Southern Pacific, the Burlington Northern and the Alaska Railroad. I began my railroad career at Atchison, Topeka, and Santa Fe in their cost analysis organization. Additionally, I have also worked for ARCO Alaska.

At Southern Pacific, I was responsible for network planning, analysis, and management, as well as the company's cost analysis organization. I provided testimony on behalf of Southern Pacific regarding the economic impact to the company of the proposed combination of the Chicago and North Western Transportation Company with Union Pacific Railroad. Later, I provided extensive testimony on the economic position of Southern Pacific during the STB's review of the merger application for Union Pacific and Southern Pacific.

I hold both a Bachelors and Masters degree in Civil Engineering from Tulane University and did post-graduate work in mathematical modeling of transportation networks and rail cost systems at Northwestern University. I have also served on the faculty at the University of Alaska, where my work included network modeling and research concerning the interrelationship of transportation and economic development.

VERIFICATION

WASHINGTON, D.C.)
) SS.

I, John T. Gray, being duly sworn, state that I have read the foregoing statement, that I know its contents, and that those contents are true as stated.

JOHN T. GRAY

Appendix A
Bonds, Notes and Debentures

Summaries

CSX Corporation	**A-1**
Kansas City Southern	**A-4**
Norfolk Southern Corporation	**A-7**
Union Pacific Corporation	**A-10**

Individual Bonds, Notes, and Debentures

CSX Corporation	**A-14**
Kansas City Southern	**A-47**
Norfolk Southern Corporation	**A-61**
Union Pacific Corporation	**A-92**

CSX Corporation
12/31/2020

	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 (New)	CSX Corp.	1	126408HT3	2.500%	5/15/2051	$500,000	**$41,667**	99.550	$41,479	2.520%	$1,045
2	Notes (New)	CSX Corp.	2	126408HS5	3.800%	4/15/2050	$500,000	**$375,000**	119.132	$446,744	2.850%	$12,732
3	Notes	CSX Corp.	3	126408AQ6	8.100%	9/15/2022	$69,081	$69,081	110.429	$76,286	3.060%	$2,334
4	Notes	CSX Corp.	4	126408AM5	8.625%	5/15/2022	$81,517	$81,517	112.306	$91,549	1.700%	$1,556
5	Notes	CSX Corp.	5	126408HB2	3.400%	8/1/2024	$550,000	$550,000	108.908	$598,994	1.110%	$6,649
6	Notes	CSX Corp.	6	126408HD8	3.350%	11/1/2025	$600,000	$600,000	111.256	$667,536	1.130%	$7,543
7	Notes	CSX Corp.	7	126408HE6	2.600%	11/1/2026	$700,000	$700,000	107.406	$751,843	1.360%	$10,225
8	Notes	CSX Corp.	8	126408BP7	7.250%	5/1/2027	$83,312	$83,312	125.942	$104,925	3.000%	$3,148
9	Notes	CSX Corp.	9	126408BM4	7.950%	5/1/2027	$64,266	$64,266	131.951	$84,800	2.740%	$2,324
10	Notes	CSX Corp.	10	126408HH9	3.250%	6/1/2027	$850,000	$850,000	110.682	$940,793	1.590%	$14,959
11	Notes	CSX Corp.	11	12641LBU6	6.800%	12/1/2028	$200,000	$200,000	131.409	$262,818	2.600%	$6,833
12	Notes	CSX Corp.	12	126408HJ5	3.800%	3/1/2028	$800,000	$800,000	114.401	$915,204	1.770%	$16,199
13	Notes	CSX Corp.	13	126408HM8	4.250%	3/15/2029	$950,000	$950,000	118.581	$1,126,521	1.910%	$21,517
14	Notes	CSX Corp.	14	126408HQ9	2.400%	2/15/2030	$400,000	$400,000	104.680	$418,721	1.860%	$7,788
15	Notes	CSX Corp.	15	126408GH0	6.000%	10/1/2036	$400,000	$400,000	138.062	$552,249	3.020%	$16,678
16	Notes	CSX Corp.	16	126408GK3	6.150%	5/1/2037	$700,000	$700,000	140.648	$984,534	3.050%	$30,028
17	Notes	CSX Corp.	17	126408GP2	7.450%	4/1/2038	$79,226	$79,226	145.502	$115,276	3.880%	$4,473
18	Notes	CSX Corp.	18	126408GS6	6.220%	4/30/2040	$660,000	$660,000	146.076	$964,103	3.090%	$29,791
19	Notes	CSX Corp.	19	126408GU1	5.500%	4/15/2041	$550,000	$550,000	135.788	$746,835	3.150%	$23,525
20	Notes	CSX Corp.	20	126408GW7	4.750%	5/30/2042	$600,000	$600,000	127.312	$763,870	3.040%	$23,222
21	Notes	CSX Corp.	21	126408GX5	4.400%	3/1/2043	$300,000	$300,000	122.218	$366,653	3.040%	$11,146
22	Notes	CSX Corp.	22	126408GY3	4.100%	3/15/2044	$800,000	$800,000	119.619	$956,952	2.950%	$28,230
23	Notes	CSX Corp.	23	126408HF3	3.800%	11/1/2046	$800,000	$800,000	115.714	$925,711	2.950%	$27,308
24	Notes	CSX Corp.	24	126408HK2	4.300%	3/1/2048	$850,000	$850,000	124.388	$1,057,297	3.010%	$31,825
25	Notes	CSX Corp.	25	126408HN6	4.750%	11/15/2048	$650,000	$650,000	132.736	$862,786	3.030%	$26,142
26	Notes	CSX Corp.	26	126408HP1	4.500%	3/15/2049	$400,000	$400,000	128.771	$515,084	3.010%	$15,504
27	Notes	CSX Corp.	27	126408HR7	3.350%	9/15/2049	$600,000	$600,000	109.866	$659,197	2.860%	$18,853
28	Notes	CSX Corp.	28	126408HC0	3.950%	5/1/2050	$600,000	$600,000	120.829	$724,973	2.910%	$21,097
29	Notes	CSX Corp.	29	126408HA4	4.500%	8/1/2054	$450,000	$450,000	127.011	$571,551	3.210%	$18,347
30	Notes	CSX Corp.	30	126408HG1	4.250%	11/1/2066	$700,000	$700,000	121.352	$849,465	3.360%	$28,542
31	Notes	CSX Corp.	31	126408HL0	4.650%	3/1/2068	$350,000	$350,000	129.609	$453,632	3.410%	$15,469
32	Notes	CSXT - Conrail	32	126410LL1	7.875%	5/15/2043	$99,989	$99,989	166.199	$166,181	3.600%	$5,983
33	Sec'd Eq Notes	CSXT	33	126410LM9	6.251%	1/15/2023	$160,336	$160,336	110.860	$177,749	1.710%	$3,040
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Total							**$16,097,727**	**$15,514,394**		**$18,942,310**	**2.608%**	**$494,054**

CSX Corporation
12/31/2020

	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		
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Total							**$441,679**	**$441,679**		**$441,679**		

CSX Corporation
12/31/2020

	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 2021							
1	Notes	CSX Corp.		12641LBD4	9.870%	2/12/2021	10,000					
2	Notes	CSX Corp.		126408GV9	4.250%	6/1/2021	350,000					
3	Other Notes	TORCO Toledo Ore Railroad Co.			6.450%	12/15/2021	29,700					
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Total							**$389,700**					

	Grand Totals		
Total Traded and Trading Data Not Available	**$16,539,406**	**$15,956,073**	**$19,383,989**
Grand Total (for reconciliation to carrier data only)	**$16,929,106**		

From CSX:

Corporate Notes	$16,270,706
Convertible Debt	0
CSXT Notes	468,364
Secured Equipment Notes	160,336
Other Notes	29,700
Total	**$16,929,106**

Kansas City Southern Corporation

12/31/2020

	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	Sr Note	KCSR	34	485188AN6	4.300%	5/15/2043	$1,179	$1,179	107.404	$1,266	3.840%	$49
2	Sr Note	KCSR	35	485188AM8	3.850%	11/15/2023	$776	$776	103.181	$801	2.830%	$23
3	Sr Note	KCSR	36	485188AP1	4.950%	8/15/2045	$792	$792	109.954	$871	4.310%	$38
4	Sr Note	KCS	37	485170AF1	7.000%	12/15/2025	$221	$221	117.722	$260	3.380%	$9
5	Sr Note	KCS	38	485170AQ7	4.300%	5/15/2043	$448,651	$448,651	113.790	$510,519	3.440%	$17,562
6	Sr Note	KCS	39	485170AR5	3.850%	11/15/2023	$199,224	$199,224	105.739	$210,656	2.030%	$4,276
7	Sr Note	KCS	40	485170AS3	4.950%	8/15/2045	$499,165	$499,165	123.464	$616,290	3.550%	$21,878
8	Sr Note	KCS	41	485170AV6	3.000%	5/15/2023	$439,123	$439,123	103.445	$454,249	1.710%	$7,768
9	Sr Note	KCS	42	485170BA1	3.125%	6/1/2026	$250,000	$250,000	106.620	$266,549	1.920%	$5,118
10	Sr Note	KCS	43	485170BB9	4.700%	5/1/2048	$500,000	$500,000	121.535	$607,673	3.510%	$21,329
11	Sr Note	KCS	44	485170BD5	2.875%	11/15/2029	$425,000	$425,000	104.955	$446,058	2.280%	$10,170
12	Sr Note	KCS	45	485170BC7	4.200%	11/15/2069	$425,000	$425,000	110.185	$468,285	3.770%	$17,654
13	Sr Note (New)	KCS	46	485170BE3	3.500%	5/1/2050	$550,000	**$389,583**	107.317	$418,087	3.130%	$13,086
14	Sr Note	KCSM	47	485161AS2	3.000%	5/15/2023	$5,560	$5,560	101.099	$5,621	2.570%	$144
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Total							**$3,744,691**	**$3,584,274**		**$4,007,185**	**2.972%**	**$119,104**

Kansas City Southern Corporation

12/31/2020

	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	RRIF Loan	KCSR			2.960%	2/24/2037	39,893.2	39,893	100.000	$39,893		
2	FRA RRIF	TexMex			4.290%	7/13/2030	26,276.2	26,276	100.000	$26,276		
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Total							**$66,169**	**$66,169**		**$66,169**		

Kansas City Southern Corporation

12/31/2020

	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 2021						
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Total							**$0**					

	Grand Totals		
Total Traded and Trading Data Not Available	**$3,810,860**	**$3,650,444**	**$4,073,354**
Grand Total (for reconciliation to carrier data only)	**3,810,860.4**		

From KSU:

KCSR	$42,640.2
TexMex	26,276.2
KCS	3,736,384.0
KCSM	5,560.0
Total	**3,810,860.4**

Norfolk Southern Corporation
12/31/2020

	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	Debenture	Southern Railway	48	655855FB5	7.875%	5/15/2043	$138,085	$138,085	162.047	$223,762	3.800%	$8,503
2	Notes (New)	Senior	49	655844CF3	3.050%	5/15/2050	$800,000	**$533,333**	107.103	$571,218	2.700%	$15,423
3	Notes	Senior	50	655844AQ1	7.250%	2/15/2031	$284,028	$284,028	143.817	$408,480	2.510%	$10,253
4	Notes (New)	Senior	51	655844CH9	3.155%	5/15/2055	$799,997	**$466,665**	106.709	$497,975	2.850%	$14,192
5	Notes	Senior	52	655844BJ6	3.000%	4/1/2022	$547,658	$547,658	102.949	$563,809	1.170%	$6,597
6	Notes	Senior	53	655844BL1	2.903%	2/15/2023	$596,450	$596,450	104.492	$623,240	1.080%	$6,731
7	Notes	Senior 144A	54	655844BK3	2.903%	2/15/2023	$3,550	$3,550	104.511	$3,710	1.070%	$40
8	Notes	Senior	55	655844BD9	6.000%	5/23/2111	$79,726	$79,726	143.124	$114,107	4.170%	$4,758
9	Notes	Senior 2105	56	655844AV0	6.000%	3/15/2105	$157,780	$157,780	142.757	$225,242	4.170%	$9,393
10	Notes	Senior	57	655844AX6	5.640%	5/17/2029	$210,316	$210,316	124.797	$262,468	2.490%	$6,535
11	Notes	Senior	58	655844AW8	5.590%	5/17/2025	$251,172	$251,172	117.451	$295,005	1.780%	$5,251
12	Notes	Senior	59	655844BH0	4.837%	10/1/2041	$595,504	$595,504	129.849	$773,256	2.940%	$22,734
13	Notes	Senior	60	655844BM9	3.950%	10/1/2042	$600,000	$600,000	117.533	$705,201	2.880%	$20,310
14	Notes	Senior	61	655844BN7	4.800%	8/15/2043	$291,829	$291,829	124.780	$364,143	3.270%	$11,907
15	Notes	Senior	62	655844BP2	3.850%	1/15/2024	$400,000	$400,000	108.683	$434,733	1.270%	$5,521
16	Notes	Senior	63	655844BQ0	4.450%	6/15/2045	$500,000	$500,000	125.997	$629,986	2.970%	$18,711
17	Notes	Senior	64	655844BR8	4.650%	1/15/2046	$600,000	$600,000	128.884	$773,302	3.020%	$23,354
18	Notes	Senior	65	655844BS6	2.900%	6/15/2026	$600,000	$600,000	108.826	$652,958	1.330%	$8,684
19	Notes	Senior	66	655844BT4	3.150%	6/1/2027	$300,000	$300,000	109.656	$328,967	1.650%	$5,428
20	Notes	Senior	67	655844BX5	3.942%	11/1/2047	$749,997	$749,997	118.573	$889,293	2.950%	$26,234
21	Notes	Senior	68	655844BV9	4.050%	8/15/2052	$749,994	$749,994	120.551	$904,128	3.050%	$27,576
22	Notes	Senior	69	655844BY3	4.150%	2/28/2048	$700,000	$700,000	122.173	$855,209	2.980%	$25,485
23	Notes	Senior	70	655844CA4	3.650%	8/1/2025	$300,000	$300,000	111.080	$333,239	1.350%	$4,499
24	Notes	Senior	71	655844CC0	4.100%	5/15/2049	$400,000	$400,000	121.733	$486,930	2.980%	$14,511
25	Notes	Senior	72	655844BZ0	3.800%	8/1/2028	$600,000	$600,000	115.112	$690,670	1.770%	$12,225
26	Notes	Senior	73	655844CB2	5.100%	8/1/2118	$350,521	$350,521	128.259	$449,576	4.000%	$17,983
27	Notes	Senior	74	655844CE6	2.550%	11/1/2029	$400,000	$400,000	105.768	$423,070	1.880%	$7,954
28	Notes	Senior	75	655844CD8	3.400%	11/1/2049	$400,000	$400,000	110.409	$441,637	2.880%	$12,719
29	Conrail Notes	CR NSC 2027	76	655844AJ7	7.800%	5/15/2027	$319,135	$319,135	136.170	$434,565	2.080%	$9,039
30	Conrail Notes	CR NSC 2037	77	655844AF5	7.050%	5/1/2037	$171,750	$171,750	152.226	$261,448	3.060%	$8,000
31	Conrail Notes	CR NSC 2097	78	655844AK4	7.900%	5/15/2097	$196,302	$196,302	192.395	$377,674	4.010%	$15,145
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Total							**$13,093,794**	**$12,493,795**		**$14,998,999**	**2.571%**	**$385,694**

Norfolk Southern Corporation

12/31/2020

	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												
2												
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Total							$0	$0		$0		

Norfolk Southern Corporation
12/31/2020

	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 2021							
1	Notes	Series A NSC		655844AA6	9.000%	3/1/2021	$83,372					
2	Notes	Senior		655844BG2	3.250%	12/1/2021	490,365					
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Total							**$573,737**					

	Grand Totals		
Total Traded and Trading Data Not Available	**$13,093,794**	**$12,493,795**	**$14,998,999**
Grand Total (for reconciliation to carrier data only)	**$13,667,531**		

From NSC:

Income Debentures	$138,085
Medium Term Notes & Conrail Notes	13,529,446
Other Debt (Poca Dev)	0
Total	**$13,667,531**

Union Pacific Corporation
12/31/2020

	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	Debentures	UP Corp.	79	907818CS5	5.375%	6/1/2033	$148,084	$148,084	130.895	$193,835	2.550%	$4,943
2	Debentures	UP Corp.	80	907818CX4	6.150%	5/1/2037	$89,794	$89,794	144.379	$129,644	2.820%	$3,656
3	Debentures	UP Corp.	81	907818CU0	6.250%	5/1/2034	$157,438	$157,438	142.534	$224,403	2.570%	$5,767
4	Debentures	UP Corp.	82	907818CF3	6.625%	2/1/2029	$394,428	$394,428	135.791	$535,599	2.030%	$10,873
5	Debentures	UP Corp.	83	907818BY3	7.125%	2/1/2028	$173,939	$173,939	134.148	$233,335	2.180%	$5,087
6	Notes (New)	UP Corp.	84	907818FJ2	2.150%	2/5/2027	$496,348	**$454,986**	104.659	$476,182	1.400%	$6,667
7	Notes (New)	UP Corp.	85	907818FH6	2.400%	2/5/2030	$741,911	**$680,085**	105.276	$715,967	1.790%	$12,816
8	Notes	UP Corp.	86	907818DN5	2.750%	4/15/2023	$323,869	$323,869	104.586	$338,722	1.010%	$3,421
9	Notes	UP Corp.	87	907818EH7	2.750%	3/1/2026	$648,014	$648,014	107.589	$697,193	1.330%	$9,273
10	Notes	UP Corp.	88	907818EZ7	2.950%	3/1/2022	$498,964	$498,964	103.360	$515,730	0.760%	$3,920
11	Notes	UP Corp.	89	907818DM7	2.950%	1/15/2023	$299,465	$299,465	104.397	$312,633	1.110%	$3,470
12	Notes (New)	UP Corp. 144A	90	907818FM5	2.973%	9/16/2062	$711,208	**$207,436**	101.943	$211,465	2.900%	$6,132
13	Notes	UP Corp.	91	907818EP9	3.000%	4/15/2027	$492,791	$492,791	109.368	$538,954	1.520%	$8,192
14	Notes	UP Corp.	92	907818FA1	3.150%	3/1/2024	$497,363	$497,363	107.569	$535,006	0.990%	$5,297
15	Notes	UP Corp.	93	907818DY1	3.250%	1/15/2025	$348,387	$348,387	108.804	$379,060	1.210%	$4,587
16	Notes	UP Corp.	94	907818ED6	3.250%	8/15/2025	$499,223	$499,223	110.174	$550,015	1.160%	$6,380
17	Notes (New)	UP Corp.	95	907818FK9 *	3.250%	2/5/2050	$967,030	**$886,444**	108.693	$963,498	2.820%	$27,171
18	Notes (New)	UP Corp.	96	907818FK9 *	3.250%	2/5/2050	$725,272	**$543,954**	111.100	$604,335	2.700%	$16,317
19	Notes	UP Corp.	97	907818EK0	3.350%	8/15/2046	$296,201	$296,201	109.370	$323,955	2.840%	$9,200
20	Notes	UP Corp.	98	907818EB0	3.375%	2/1/2035	$445,506	$445,506	113.235	$504,468	2.300%	$11,603
21	Notes	UP Corp.	99	907818EU8	3.500%	6/8/2023	$647,258	$647,258	107.035	$692,790	0.980%	$6,789
22	Notes	UP Corp.	100	907818FD5	3.550%	8/15/2039	$493,860	$493,860	112.397	$555,085	2.720%	$15,098
23	Notes	UP Corp.	101	907818EQ7	3.600%	9/15/2037	$495,161	$495,161	112.470	$556,907	2.690%	$14,981
24	Notes	UP Corp.	102	907818DR6	3.646%	2/15/2024	$403,901	$403,901	108.507	$438,262	1.180%	$5,171
25	Notes	UP Corp.	103	907818FB9	3.700%	3/1/2029	$993,083	$993,083	114.793	$1,139,985	1.830%	$20,862
26	Notes	UP Corp.	104	907818DV7	3.750%	3/15/2024	$397,807	$397,807	109.015	$433,668	1.190%	$5,161
27	Notes	UP Corp.	105	907818ES3	3.750%	7/15/2025	$497,464	$497,464	111.976	$557,038	1.250%	$6,963
28	Notes (New)	UP Corp.	106	907818FL7	3.750%	2/5/2070	$742,140	**$680,295**	111.519	$758,659	3.300%	$25,036
29	Notes	UP Corp.	107	907818EM6	3.799%	10/1/2051	$703,388	$703,388	117.971	$829,794	2.930%	$24,313
30	Notes	UP Corp.	108	907818FG8	3.839%	3/20/2060	$1,408,667	$1,408,667	116.117	$1,635,707	3.140%	$51,361
31	Notes	UP Corp. 144A	109	907818FF0	3.839%	3/20/2060	$184	$184	116.028	$213	3.140%	$7
32	Notes	UP Corp.	110	907818EC8	3.875%	2/1/2055	$444,071	$444,071	117.186	$520,388	3.080%	$16,028
33	Notes	UP Corp.	111	907818EY0	3.950%	9/10/2028	$1,488,096	$1,488,096	116.313	$1,730,853	1.790%	$30,982
34	Notes	UP Corp.	112	907818FE3	3.950%	8/15/2059	$491,116	$491,116	117.446	$576,795	3.180%	$18,342
35	Notes	UP Corp.	113	907818EN4	4.000%	4/15/2047	$489,087	$489,087	119.999	$586,897	2.920%	$17,137
36	Notes	UP Corp.	114	907818EF1	4.050%	11/15/2045	$490,053	$490,053	119.402	$585,133	2.960%	$17,320
37	Notes	UP Corp.	115	907818EJ3	4.050%	3/1/2046	$587,388	$587,388	118.777	$697,683	3.010%	$21,000
38	Notes	UP Corp.	116	907818ER5	4.100%	9/15/2067	$494,390	$494,390	118.348	$585,102	3.340%	$19,542
39	Notes	UP Corp.	117	907818DZ8	4.150%	1/15/2045	$342,311	$342,311	120.473	$412,392	2.970%	$12,248
40	Notes	UP Corp.	118	907818DK1	4.163%	7/15/2022	$718,043	$718,043	105.702	$758,983	1.200%	$9,108
41	Notes	UP Corp.	119	907818DP0	4.250%	4/15/2043	$208,415	$208,415	120.276	$250,673	3.020%	$7,570
42	Notes	UP Corp.	120	907818DL9	4.300%	6/15/2042	$220,161	$220,161	120.480	$265,249	3.020%	$8,011
43	Notes	UP Corp.	121	907818FC7	4.300%	3/1/2049	$676,659	$676,659	126.848	$858,327	2.920%	$25,063
44	Notes	UP Corp.	122	907818EV6	4.375%	9/10/2038	$324,782	$324,782	122.063	$396,438	2.820%	$11,180
45	Notes	UP Corp.	123	907818EG9	4.375%	11/15/2065	$569,480	$569,480	123.696	$704,421	3.360%	$23,669
46	Notes	UP Corp.	124	907818EW4	4.500%	9/10/2048	$448,670	$448,670	128.460	$576,363	3.010%	$17,349
47	Notes	UP Corp.	125	907818DJ4	4.750%	9/15/2041	$212,242	$212,242	130.547	$277,075	2.830%	$7,841
48	Notes	UP Corp.	126	907818DU9	4.750%	12/15/2043	$182,680	$182,680	124.896	$228,159	3.230%	$7,370
49	Notes	UP Corp.	127	907818EX2	4.800%	9/10/2058	$75,739	$75,739	132.788	$100,573	3.290%	$3,309
50	Notes	UP Corp.	128	907818DT2	4.821%	2/1/2044	$130,268	$130,268	127.863	$166,565	3.140%	$5,230
51	Notes	UP Corp.	129	907818DX3	4.850%	6/15/2044	$83,267	$83,267	129.527	$107,853	3.100%	$3,343
52	Notes	UP Corp.	130	907818DF2	5.780%	7/15/2040	$63,456	$63,456	139.654	$88,619	3.110%	$2,756
53	Notes	UP Corp. 144A	131	907818DE5	5.780%	7/15/2040	$10	$10	129.238	$13	3.710%	$0
54												
55												
56												

Union Pacific Corporation
12/31/2020

	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)
57												
58												
59												
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62												
Total							**$24,478,532**	**$23,547,823**		**$27,056,661**	**2.310%**	**$624,910**

* CUSIP 907818FK9 was offered during 2020 in two portions at differing times, and is therefore split

Union Pacific Corporation

12/31/2020

	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												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
Total							$0	$0		$0		

Union Pacific Corporation
12/31/2020

	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 2021							
1	Notes	UP Corp.		907818ET1	3.200%	6/8/2021	599,451					
2												
3												
4												
5												
6												
7												
8												
9												
10												
Total							**$599,451**					

Grand Totals			
Total Traded and Trading Data Not Available	**$24,478,532**	**$23,547,823**	**$27,056,661**
Grand Total (for reconciliation to carrier data only)	**$25,077,983**		

From UNP:

Corporate Debentures, Notes, Floating Rate Loans, and Commercial Paper	$25,402,975
Removal of Floating Rate Loans & Commercial Paper	-324,992
UP RR Debt Securities Outstanding	-557
Removal of unamortized SOR Fees	557
Removal of Sale of Receivables	0
Total	**$25,077,983**

CSX Corporation

1

Type:	Notes (New)
Description:	CSX Corp.
CUSIP:	126408HT3
Coupon Rate:	2.500%
Maturity Date:	5/15/2051
Amount Outstanding ($ 000)	$500,000
Months Outstanding	1.0

End of Month in 2020	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	Not Traded	-
October	Not Traded	-
November	Not Traded	-
December	99.550	2.52
Average	99.550	2.52 %

Source: Bloomberg

Prospectus supplement dated December 1, 2020
Interest accrues from December 10, 2020

CSX Corporation

2

Type:	Notes (New)
Description:	CSX Corp.
CUSIP:	126408HS5
Coupon Rate:	3.800%
Maturity Date:	4/15/2050
Amount Outstanding ($ 000)	$500,000
Months Outstanding	9.0

End of Month in 2020	Price	Yield
January	Not Traded	- %
February	Not Traded	-
March	104.759	3.54
April	115.802	3.00
May	117.418	2.92
June	118.552	2.87
July	127.639	2.48
August	120.421	2.78
September	119.715	2.81
October	117.259	2.92
November	125.648	2.55
December	124.105	2.62
Average	119.132	2.85 %

Source: Bloomberg

Prospectus supplement dated March 26, 2020
Interest accrues from March 30, 2020

CSX Corporation

3

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408AQ6
Coupon Rate:	8.100%
Maturity Date:	9/15/2022
Amount Outstanding ($ 000)	$69,081
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	114.030	2.52 %
February	113.792	2.45
March	110.789	3.47
April	111.882	2.86
May	109.837	3.58
June	109.599	3.53
July	109.215	3.53
August	108.686	3.63
September	108.686	3.46
October	109.607	2.78
November	109.732	2.49
December	109.294	2.46
Average	110.429	3.06 %

Source: Bloomberg

CSX Corporation

4

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408AM5
Coupon Rate:	8.625%
Maturity Date:	5/15/2022
Amount Outstanding ($ 000)	$81,517
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	115.022	1.86 %
February	114.591	1.83
March	112.308	2.62
April	113.173	1.97
May	113.290	1.68
June	112.822	1.63
July	112.375	1.55
August	112.048	1.44
September	111.243	1.57
October	110.577	1.61
November	110.403	1.37
December	109.825	1.32
Average	112.306	1.70 %

Source: Bloomberg

CSX Corporation

5

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408HB2
Coupon Rate:	3.400%
Maturity Date:	8/1/2024
Amount Outstanding ($ 000)	$550,000
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	107.032	1.77 %
February	107.172	1.71
March	101.864	2.94
April	109.682	1.06
May	109.967	0.95
June	110.841	0.70
July	110.931	0.62
August	110.366	0.71
September	110.303	0.67
October	109.615	0.79
November	109.658	0.72
December	109.465	0.71
Average	108.908	1.11 %

Source: Bloomberg

CSX Corporation

6

Type:	Notes
Description:	CSX Corp.
CUSIP:	126408HD8
Coupon Rate:	3.350%
Maturity Date:	11/1/2025
Amount Outstanding ($ 000)	$600,000
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	107.858	1.90 %
February	108.748	1.72
March	107.130	1.99
April	110.730	1.32
May	111.549	1.14
June	112.927	0.86
July	114.252	0.59
August	113.275	0.73
September	112.625	0.81
October	111.701	0.95
November	112.102	0.83
December	112.174	0.77
Average	111.256	1.13 %

Source: Bloomberg

CSX Corporation

7

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 2020	Price	Yield
January	103.920	1.98 %
February	105.340	1.75
March	99.887	2.62
April	105.839	1.65
May	107.577	1.36
June	108.999	1.12
July	110.753	0.83
August	109.763	0.97
September	109.283	1.02
October	108.707	1.10
November	109.314	0.98
December	109.491	0.92
Average	107.406	1.36 %

Source: Bloomberg

CSX Corporation

8

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 2020	Price	Yield
January	128.705	2.84 %
February	129.238	2.73
March	123.243	3.51
April	126.447	3.03
May	126.690	2.95
June	127.133	2.85
July	127.827	2.71
August	126.553	2.85
September	125.808	2.91
October	122.959	3.29
November	123.545	3.16
December	123.157	3.18
Average	125.942	3.00 %

Source: Bloomberg

CSX Corporation

9

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 2020	Price	Yield
January	129.139	3.38 %
February	130.048	3.22
March	124.152	4.00
April	127.340	3.51
May	133.503	2.62
June	133.510	2.57
July	134.178	2.42
August	132.858	2.56
September	132.605	2.54
October	131.263	2.67
November	137.605	1.73
December	137.211	1.71
Average	131.951	2.74 %

Source: Bloomberg

CSX Corporation

10

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 2020	Price	Yield
January	107.576	2.13 %
February	107.879	2.07
March	103.267	2.74
April	108.078	2.02
May	110.325	1.68
June	112.385	1.37
July	114.402	1.06
August	113.040	1.23
September	113.078	1.20
October	112.104	1.32
November	113.097	1.15
December	112.948	1.15
Average	110.682	1.59 %

Source: Bloomberg

CSX Corporation

11

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 2020	Price	Yield
January	133.514	2.54 %
February	134.219	2.43
March	127.426	3.16
April	131.425	2.67
May	131.588	2.63
June	132.153	2.53
July	133.379	2.36
August	131.856	2.50
September	131.107	2.55
October	129.411	2.72
November	130.628	2.54
December	130.203	2.56
Average	131.409	2.60 %

Source: Bloomberg

CSX Corporation

12

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 2020	Price	Yield
January	111.869	2.19 %
February	111.436	2.23
March	106.556	2.87
April	111.542	2.19
May	113.983	1.85
June	115.085	1.69
July	118.584	1.22
August	117.033	1.40
September	116.998	1.38
October	115.746	1.52
November	117.090	1.32
December	116.884	1.32
Average	114.401	1.77 %

Source: Bloomberg

CSX Corporation

13

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 2020	Price	Yield
January	115.372	2.37 %
February	116.025	2.28
March	111.135	2.83
April	116.603	2.18
May	118.253	1.98
June	119.654	1.80
July	122.553	1.46
August	120.655	1.65
September	120.598	1.63
October	119.449	1.74
November	121.355	1.50
December	121.322	1.48
Average	118.581	1.91 %

Source: Bloomberg

$350,000
600,000
$950,000

same CUSIP

CSX Corporation

14

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 2020	Price	Yield
January	100.877	2.30 %
February	101.876	2.19
March	96.801	2.77
April	102.471	2.12
May	104.208	1.92
June	105.843	1.74
July	107.919	1.51
August	106.685	1.63
September	106.802	1.62
October	106.181	1.68
November	108.307	1.43
December	108.194	1.44
Average	104.680	1.86 %

Source: Bloomberg

CSX Corporation

15

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 2020	Price	Yield
January	136.356	3.17 %
February	137.585	3.09
March	125.280	3.91
April	133.011	3.37
May	135.546	3.19
June	136.665	3.11
July	144.137	2.63
August	138.845	2.95
September	138.549	2.96
October	139.220	2.90
November	145.378	2.51
December	146.174	2.45
Average	138.062	3.02 %

Source: Bloomberg

CSX Corporation

16

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 2020	Price	Yield
January	138.875	3.20 %
February	140.674	3.08
March	125.193	4.09
April	136.088	3.35
May	138.357	3.20
June	141.083	3.02
July	147.032	2.65
August	141.725	2.96
September	142.692	2.89
October	140.949	2.99
November	145.996	2.67
December	149.109	2.47
Average	140.648	3.05 %

Source: Bloomberg

CSX Corporation

17

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 2020	Price	Yield
January	147.499	3.80 %
February	150.063	3.64
March	139.332	4.29
April	146.599	3.83
May	146.216	3.84
June	147.606	3.75
July	150.815	3.55
August	146.726	3.79
September	145.711	3.84
October	142.254	4.05
November	142.391	4.03
December	140.816	4.12
Average	145.502	3.88 %

Source: Bloomberg

CSX Corporation

18

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 2020	Price	Yield
January	144.509	3.21 %
February	146.891	3.08
March	136.572	3.64
April	140.875	3.39
May	142.304	3.30
June	144.983	3.15
July	152.277	2.77
August	148.623	2.94
September	146.792	3.03
October	143.663	3.19
November	152.627	2.71
December	152.799	2.70
Average	146.076	3.09 %

Source: Bloomberg

CSX Corporation

19

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 2020	Price	Yield
January	133.539	3.29 %
February	135.030	3.20
March	118.129	4.19
April	134.027	3.25
May	134.017	3.24
June	137.348	3.06
July	143.922	2.71
August	137.649	3.03
September	136.778	3.07
October	135.904	3.11
November	141.799	2.80
December	141.317	2.81
Average	135.788	3.15 %

Source: Bloomberg

$300,000
250,000
$550,000

same CUSIP

CSX Corporation

20

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 2020	Price	Yield
January	124.250	3.22 %
February	125.357	3.16
March	114.674	3.77
April	125.888	3.12
May	125.113	3.16
June	126.787	3.06
July	134.843	2.64
August	129.425	2.91
September	128.487	2.96
October	126.851	3.04
November	133.614	2.68
December	132.450	2.74
Average	127.312	3.04 %

Source: Bloomberg

CSX Corporation

21

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 2020	Price	Yield
January	118.510	3.25 %
February	119.609	3.19
March	111.733	3.64
April	120.118	3.16
May	119.817	3.17
June	123.311	2.98
July	130.761	2.59
August	123.300	2.97
September	122.800	3.00
October	121.631	3.06
November	127.564	2.74
December	127.459	2.74
Average	122.218	3.04 %

Source: Bloomberg

CSX Corporation

22

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 2020	Price	Yield
January	114.260	3.24 %
February	115.911	3.15
March	108.247	3.58
April	116.692	3.10
May	118.243	3.02
June	121.854	2.83
July	128.393	2.50
August	122.723	2.78
September	119.876	2.92
October	118.735	2.98
November	125.541	2.63
December	124.953	2.65
Average	119.619	2.95 %

Source: Bloomberg

CSX Corporation

23

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 2020	Price	Yield
January	110.458	3.21 %
February	111.377	3.17
March	104.579	3.53
April	113.842	3.04
May	114.210	3.02
June	116.719	2.89
July	124.802	2.51
August	116.976	2.87
September	116.782	2.88
October	115.213	2.96
November	122.537	2.60
December	121.071	2.67
Average	115.714	2.95 %

Source: Bloomberg

CSX Corporation

24

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 2020	Price	Yield
January	119.808	3.22 %
February	120.209	3.20
March	107.816	3.84
April	122.888	3.07
May	123.554	3.04
June	125.499	2.95
July	134.197	2.56
August	127.822	2.84
September	125.475	2.94
October	123.458	3.03
November	131.700	2.66
December	130.229	2.72
Average	124.388	3.01 %

Source: Bloomberg

CSX Corporation

25

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 2020	Price	Yield
January	127.375	3.27 %
February	129.290	3.19
March	117.947	3.73
April	131.085	3.10
May	130.459	3.13
June	134.186	2.96
July	142.941	2.60
August	135.307	2.91
September	133.867	2.97
October	132.676	3.02
November	139.910	2.71
December	137.792	2.79
Average	132.736	3.03 %

Source: Bloomberg

CSX Corporation

26

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 2020	Price	Yield
January	123.199	3.26 %
February	124.901	3.18
March	112.662	3.78
April	126.531	3.10
May	127.262	3.07
June	129.837	2.95
July	139.292	2.56
August	131.670	2.87
September	129.926	2.94
October	127.901	3.03
November	136.361	2.66
December	135.711	2.69
Average	128.771	3.01 %

Source: Bloomberg

CSX Corporation

27

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 2020	Price	Yield
January	103.637	3.16 %
February	104.834	3.10
March	96.983	3.52
April	107.482	2.97
May	108.394	2.92
June	112.152	2.74
July	117.978	2.48
August	113.319	2.69
September	111.578	2.77
October	109.890	2.85
November	116.970	2.52
December	115.177	2.60
Average	109.866	2.86 %

Source: Bloomberg

CSX Corporation

28

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 2020	Price	Yield
January	114.020	3.22 %
February	116.690	3.10
March	106.658	3.59
April	118.996	2.99
May	120.001	2.94
June	121.025	2.89
July	130.682	2.48
August	124.225	2.75
September	122.628	2.82
October	120.482	2.91
November	127.968	2.59
December	126.570	2.64
Average	120.829	2.91 %

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 2020	Price	Yield
January	122.096	3.41 %
February	122.554	3.39
March	111.586	3.89
April	120.227	3.48
May	126.574	3.21
June	129.207	3.11
July	136.704	2.82
August	129.629	3.09
September	129.657	3.08
October	127.739	3.16
November	134.118	2.91
December	134.046	2.91
Average	127.011	3.21 %

Source: Bloomberg

CSX Corporation

30

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 2020	Price	Yield
January	114.050	3.62 %
February	114.783	3.59
March	100.900	4.21
April	115.239	3.58
May	115.577	3.56
June	121.733	3.33
July	134.490	2.89
August	124.905	3.21
September	124.160	3.24
October	122.500	3.30
November	133.990	2.91
December	133.898	2.91
Average	121.352	3.36 %

Source: Bloomberg

CSX Corporation

31

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 2020	Price	Yield
January	123.075	3.63 %
February	126.548	3.50
March	110.296	4.15
April	119.919	3.75
May	128.126	3.45
June	130.429	3.36
July	142.172	2.98
August	133.176	3.27
September	131.956	3.31
October	128.397	3.43
November	140.193	3.04
December	141.024	3.01
Average	129.609	3.41 %

Source: Bloomberg

CSX Corporation

32

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 2020	Price	Yield
January	162.059	3.82 %
February	164.979	3.68
March	151.747	4.32
April	163.077	3.76
May	164.181	3.70
June	168.132	3.52
July	177.509	3.10
August	167.791	3.52
September	166.752	3.56
October	165.330	3.61
November	173.261	3.25
December	169.570	3.41
Average	166.199	3.60 %

Source: Bloomberg

CSX Corporation

33

Type:	Sec'd Eq Notes
Description:	CSXT
CUSIP:	126410LM9
Coupon Rate:	6.251%
Maturity Date:	1/15/2023
Amount Outstanding ($ 000)	$160,336
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	111.758	2.11 %
February	111.539	2.08
March	108.923	2.89
April	109.339	2.64
May	109.439	2.50
June	110.927	1.82
July	112.317	1.13
August	112.006	1.10
September	111.644	1.08
October	111.101	1.13
November	110.916	1.03
December	110.415	1.05
Average	110.860	1.71 %

Source: Bloomberg

Kansas City Southern Corp.

34

Type:	Sr Note
Description:	KCSR
CUSIP:	485188AN6
Coupon Rate:	4.300%
Maturity Date:	5/15/2043
Amount Outstanding ($ 000)	$1,179
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	115.715	3.33 %
February	118.343	3.18
March	103.438	4.07
April	109.453	3.69
May	108.649	3.74
June	112.350	3.51
July	117.490	3.21
August	98.165	4.43
September	97.444	4.48
October	98.204	4.43
November	103.742	4.05
December	105.853	3.91
Average	107.404	3.84 %

Source: Bloomberg

Kansas City Southern Corp.

35

Type:	Sr Note
Description:	KCSR
CUSIP:	485188AM8
Coupon Rate:	3.850%
Maturity Date:	11/15/2023
Amount Outstanding ($ 000)	$776
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	103.400	2.89 %
February	104.072	2.69
March	101.223	3.49
April	101.998	3.25
May	102.709	3.02
June	102.380	3.10
July	104.910	2.29
August	103.226	2.79
September	102.792	2.91
October	103.524	2.63
November	103.973	2.45
December	103.960	2.41
Average	103.181	2.83 %

Source: Bloomberg

Kansas City Southern Corp.

36

Type:	Sr Note
Description:	KCSR
CUSIP:	485188AP1
Coupon Rate:	4.950%
Maturity Date:	8/15/2045
Amount Outstanding ($ 000)	$792
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	114.389	4.04 %
February	118.049	3.83
March	101.818	4.83
April	110.305	4.28
May	111.432	4.21
June	115.199	3.99
July	121.225	3.65
August	101.678	4.83
September	101.569	4.84
October	103.020	4.74
November	110.012	4.29
December	110.755	4.24
Average	109.954	4.31 %

Source: Bloomberg

Kansas City Southern Corp.

37

Type:	Sr Note
Description:	KCS
CUSIP:	485170AF1
Coupon Rate:	7.000%
Maturity Date:	12/15/2025
Amount Outstanding ($ 000)	$221
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	118.111	3.55 %
February	119.293	3.31
March	115.010	4.03
April	115.863	3.83
May	117.014	3.58
June	116.411	3.65
July	120.791	2.80
August	117.238	3.41
September	117.040	3.40
October	117.636	3.23
November	119.186	2.88
December	119.066	2.84
Average	117.722	3.38 %

Source: Bloomberg

Kansas City Southern Corp.

38

Type:	Sr Note
Description:	KCS
CUSIP:	485170AQ7
Coupon Rate:	4.300%
Maturity Date:	5/15/2043
Amount Outstanding ($ 000)	$448,651
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	116.178	3.30 %
February	118.653	3.16
March	100.698	4.25
April	115.609	3.33
May	113.947	3.42
June	120.473	3.05
July	127.796	2.66
August	107.586	3.80
September	107.668	3.79
October	108.303	3.75
November	112.905	3.47
December	115.661	3.30
Average	113.790	3.44 %

Source: Bloomberg

Kansas City Southern Corp.

39

Type:	Sr Note
Description:	KCS
CUSIP:	485170AR5
Coupon Rate:	3.850%
Maturity Date:	11/15/2023
Amount Outstanding ($ 000)	$199,224
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	105.897	2.22 %
February	106.557	2.00
March	100.563	3.68
April	104.904	2.39
May	105.680	2.14
June	105.703	2.09
July	106.713	1.74
August	106.132	1.87
September	106.207	1.80
October	106.496	1.65
November	106.948	1.44
December	107.062	1.33
Average	105.739	2.03 %

Source: Bloomberg

Kansas City Southern Corp.

40

Type:	Sr Note
Description:	KCS
CUSIP:	485170AS3
Coupon Rate:	4.950%
Maturity Date:	8/15/2045
Amount Outstanding ($ 000)	$499,165
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	126.591	3.39 %
February	130.276	3.20
March	117.472	3.86
April	122.569	3.59
May	126.313	3.39
June	128.557	3.27
July	138.446	2.80
August	109.759	4.31
September	112.257	4.15
October	115.919	3.94
November	125.027	3.44
December	128.385	3.26
Average	123.464	3.55 %

Source: Bloomberg

Kansas City Southern Corp.

41

Type:	Sr Note
Description:	KCS
CUSIP:	485170AV6
Coupon Rate:	3.000%
Maturity Date:	5/15/2023
Amount Outstanding ($ 000)	$439,123
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	103.381	1.93 %
February	103.945	1.73
March	101.451	2.51
April	102.050	2.30
May	102.468	2.13
June	102.609	2.06
July	104.262	1.43
August	104.006	1.48
September	103.854	1.49
October	104.190	1.31
November	104.533	1.12
December	104.585	1.03
Average	103.445	1.71 %

Source: Bloomberg

Kansas City Southern Corp.

42

Type:	Sr Note
Description:	KCS
CUSIP:	485170BA1
Coupon Rate:	3.125%
Maturity Date:	6/1/2026
Amount Outstanding ($ 000)	$250,000
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	105.117	2.25 %
February	105.969	2.10
March	105.884	2.10
April	105.297	2.19
May	106.132	2.03
June	107.261	1.82
July	109.091	1.49
August	105.058	2.18
September	104.998	2.18
October	106.342	1.92
November	108.879	1.44
December	109.406	1.32
Average	106.620	1.92 %

Source: Bloomberg

Kansas City Southern Corp.

43

Type:	Sr Note
Description:	KCS
CUSIP:	485170BB9
Coupon Rate:	4.700%
Maturity Date:	5/1/2048
Amount Outstanding ($ 000)	$500,000
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	125.702	3.30 %
February	129.785	3.11
March	100.682	4.66
April	120.166	3.56
May	126.085	3.27
June	127.363	3.21
July	138.707	2.71
August	111.474	4.01
September	111.816	3.99
October	114.722	3.83
November	125.074	3.30
December	126.838	3.22
Average	121.535	3.51 %

Source: Bloomberg

Kansas City Southern Corp.

44

Type:	Sr Note
Description:	KCS
CUSIP:	485170BD5
Coupon Rate:	2.875%
Maturity Date:	11/15/2029
Amount Outstanding ($ 000)	$425,000
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	103.560	2.46 %
February	104.114	2.40
March	97.721	3.15
April	101.663	2.68
May	104.407	2.35
June	106.003	2.16
July	109.915	1.72
August	104.274	2.36
September	106.129	2.13
October	105.241	2.23
November	107.932	1.91
December	108.498	1.83
Average	104.955	2.28 %

Source: Bloomberg

Kansas City Southern Corp.

45

Type:	Sr Note
Description:	KCS
CUSIP:	485170BC7
Coupon Rate:	4.200%
Maturity Date:	11/15/2069
Amount Outstanding ($ 000)	$425,000
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	111.580	3.69 %
February	115.643	3.53
March	91.814	4.62
April	100.899	4.16
May	106.370	3.91
June	112.079	3.67
July	125.745	3.17
August	104.174	4.01
September	107.162	3.87
October	109.834	3.76
November	118.194	3.43
December	118.723	3.41
Average	110.185	3.77 %

Source: Bloomberg

Kansas City Southern Corp.

46

Type:	Sr Note (New)
Description:	KCS
CUSIP:	485170BE3
Coupon Rate:	3.500%
Maturity Date:	5/1/2050
Amount Outstanding ($ 000)	$550,000
Months Outstanding	8.5

End of Month in 2020	Price	Yield
January	Not Traded	- %
February	Not Traded	-
March	Not Traded	-
April	100.410	3.48
May	106.169	3.18
June	109.102	3.03
July	116.674	2.68
August	103.097	3.34
September	104.872	3.24
October	103.503	3.31
November	110.480	2.96
December	111.542	2.91
Average	107.317	3.13 %

Source: Bloomberg

Prospectus supplement dated April 20, 2020
Interest accrues from April 22, 2020

Kansas City Southern Corp.

47

Type:	Sr Note
Description:	KCSM
CUSIP:	485161AS2
Coupon Rate:	3.000%
Maturity Date:	5/15/2023
Amount Outstanding ($ 000)	$5,560
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	100.797	2.74 %
February	101.517	2.50
March	99.645	3.12
April	99.202	3.28
May	100.744	2.74
June	100.403	2.85
July	102.837	1.95
August	101.240	2.52
September	100.952	2.62
October	101.722	2.30
November	102.039	2.14
December	102.091	2.09
Average	101.099	2.57 %

Source: Bloomberg

Norfolk Southern Corp.

48

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 2020	Price	Yield
January	159.217	3.96 %
February	163.209	3.77
March	157.024	4.05
April	166.139	3.62
May	150.892	4.35
June	151.509	4.31
July	155.921	4.08
August	167.816	3.51
September	167.001	3.54
October	164.764	3.64
November	170.809	3.36
December	170.257	3.37
Average	162.047	3.80 %

Source: Bloomberg

Norfolk Southern Corp.

49

Type:	Notes (New)
Description:	Senior
CUSIP:	655844CF3
Coupon Rate:	3.050%
Maturity Date:	5/15/2050
Amount Outstanding ($ 000)	$800,000
Months Outstanding	8.0

End of Month in 2020	Price	Yield
January	Not Traded	- %
February	Not Traded	-
March	Not Traded	-
April	Not Traded	-
May	101.826	2.96
June	105.169	2.79
July	113.363	2.42
August	106.045	2.75
September	106.293	2.74
October	103.938	2.85
November	110.735	2.53
December	109.458	2.59
Average	107.103	2.70 %

Source: Bloomberg

Prospectus supplement dated April 30, 2020
Interest accrues from May 11, 2020

Norfolk Southern Corp.

50

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 2020	Price	Yield
January	143.131	2.70 %
February	144.007	2.61
March	132.946	3.57
April	139.925	2.91
May	141.334	2.76
June	142.763	2.61
July	150.041	1.97
August	147.741	2.13
September	146.425	2.21
October	145.023	2.31
November	146.626	2.14
December	145.838	2.18
Average	143.817	2.51 %

Source: Bloomberg

Norfolk Southern Corp.

51

Type:	Notes (New)
Description:	Senior
CUSIP:	655844CH9
Coupon Rate:	3.155%
Maturity Date:	5/15/2055
Amount Outstanding ($ 000)	$799,997
Months Outstanding	7.0

End of Month in 2020	Price	Yield
January	Not Traded	- %
February	Not Traded	-
March	Not Traded	-
April	Not Traded	-
May	100.490	3.13
June	104.151	2.96
July	112.468	2.61
August	105.495	2.90
September	105.497	2.90
October	103.490	2.99
November	112.827	2.59
December	109.256	2.74
Average	106.709	2.85 %

Source: Bloomberg

Announced 4/30/2020

$799,996
1
$799,997

same CUSIP

Norfolk Southern Corp.

52

Type:	Notes
Description:	Senior
CUSIP:	655844BJ6
Coupon Rate:	3.000%
Maturity Date:	4/1/2022
Amount Outstanding ($ 000)	$547,658
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	102.535	1.80 %
February	102.858	1.60
March	99.694	3.16
April	103.359	1.21
May	103.473	1.08
June	103.963	0.71
July	103.787	0.70
August	103.462	0.79
September	103.388	0.72
October	103.117	0.78
November	103.025	0.71
December	102.728	0.78
Average	102.949	1.17 %

Source: Bloomberg

Norfolk Southern Corp.

53

Type:	Notes
Description:	Senior
CUSIP:	655844BL1
Coupon Rate:	2.903%
Maturity Date:	2/15/2023
Amount Outstanding ($ 000)	$596,450
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	103.273	1.79 %
February	103.839	1.57
March	101.392	2.40
April	103.740	1.52
May	105.166	0.96
June	105.583	0.75
July	105.677	0.64
August	105.470	0.65
September	104.958	0.79
October	105.026	0.68
November	104.915	0.65
December	104.860	0.58
Average	104.492	1.08 %

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.

53	Exchange traded	**$596,450**
54	Rule 144-A	3,550
		$600,000

Norfolk Southern Corp.

54

Type:	Notes
Description:	Senior 144A
CUSIP:	655844BK3
Coupon Rate:	2.903%
Maturity Date:	2/15/2023
Amount Outstanding ($ 000)	$3,550
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	103.202	1.81 %
February	103.905	1.54
March	101.245	2.45
April	103.970	1.44
May	105.549	0.82
June	105.567	0.75
July	105.621	0.66
August	105.452	0.66
September	104.919	0.80
October	104.972	0.70
November	104.991	0.62
December	104.742	0.64
Average	104.511	1.07 %

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.

53	Exchange traded	$596,450
54	Rule 144-A	**3,550**
		$600,000

Norfolk Southern Corp.

55

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 2020	Price	Yield
January	139.567	4.27 %
February	142.408	4.18
March	133.152	4.49
April	142.361	4.19
May	143.940	4.14
June	147.761	4.03
July	154.103	3.85
August	144.879	4.11
September	142.994	4.17
October	140.636	4.24
November	144.378	4.12
December	141.304	4.22
Average	143.124	4.17 %

Source: Bloomberg

$63,923
15,803
$79,726

same CUSIP

Norfolk Southern Corp.

56

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 2020	Price	Yield
January	143.524	4.14 %
February	141.236	4.21
March	129.792	4.60
April	138.802	4.29
May	143.979	4.13
June	148.498	3.99
July	154.739	3.82
August	144.870	4.10
September	140.953	4.22
October	138.598	4.30
November	145.956	4.07
December	142.139	4.18
Average	142.757	4.17 %

Source: Bloomberg

Traded during all months of 2017

$86,062
71,718
$157,780

same CUSIP

Norfolk Southern Corp.

57

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 2020	Price	Yield
January	124.932	2.60 %
February	125.682	2.50
March	116.427	3.52
April	121.894	2.87
May	122.776	2.75
June	123.919	2.60
July	128.641	2.06
August	127.356	2.17
September	126.515	2.24
October	125.548	2.32
November	127.317	2.10
December	126.554	2.15
Average	124.797	2.49 %

Source: Bloomberg

Norfolk Southern Corp.

58

Type:	Notes
Description:	Senior
CUSIP:	655844AW8
Coupon Rate:	5.590%
Maturity Date:	5/17/2025
Amount Outstanding ($ 000)	$251,172
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	117.800	2.02 %
February	118.529	1.84
March	108.198	3.81
April	113.156	2.77
May	116.793	2.01
June	119.046	1.52
July	119.275	1.41
August	118.924	1.42
September	119.347	1.27
October	119.234	1.22
November	119.662	1.06
December	119.453	1.02
Average	117.451	1.78 %

Source: Bloomberg

Norfolk Southern Corp.

59

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 2020	Price	Yield
January	125.904	3.17 %
February	127.795	3.07
March	118.143	3.62
April	126.223	3.14
May	126.772	3.11
June	129.456	2.96
July	138.305	2.50
August	131.938	2.82
September	131.226	2.85
October	129.683	2.93
November	136.197	2.58
December	136.546	2.56
Average	129.849	2.94 %

Source: Bloomberg

$595,502
2
$595,504
same CUSIP

Norfolk Southern Corp.

60

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 2020	Price	Yield
January	113.358	3.12 %
February	116.031	2.97
March	108.408	3.41
April	113.774	3.09
May	114.463	3.05
June	118.185	2.84
July	125.492	2.45
August	119.685	2.75
September	119.693	2.75
October	117.472	2.87
November	122.025	2.62
December	121.815	2.63
Average	117.533	2.88 %

Source: Bloomberg

Norfolk Southern Corp.

61

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 2020	Price	Yield
January	123.202	3.37 %
February	124.448	3.30
March	114.182	3.87
April	123.274	3.35
May	126.972	3.15
June	126.390	3.18
July	129.293	3.03
August	126.126	3.19
September	126.241	3.18
October	124.261	3.28
November	127.119	3.12
December	125.847	3.19
Average	124.780	3.27 %

Source: Bloomberg

Norfolk Southern Corp.

62

Type:	Notes
Description:	Senior
CUSIP:	655844BP2
Coupon Rate:	3.850%
Maturity Date:	1/15/2024
Amount Outstanding ($ 000)	$400,000
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	107.571	1.85 %
February	108.356	1.61
March	103.698	2.81
April	107.509	1.74
May	109.285	1.22
June	109.888	1.00
July	110.607	0.73
August	109.919	0.86
September	109.769	0.83
October	109.346	0.88
November	109.103	0.89
December	109.149	0.79
Average	108.683	1.27 %

Source: Bloomberg

Norfolk Southern Corp.

63

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 2020	Price	Yield
January	120.364	3.26 %
February	124.017	3.08
March	114.637	3.57
April	122.821	3.13
May	123.802	3.08
June	127.344	2.90
July	134.286	2.57
August	127.959	2.87
September	127.800	2.87
October	125.678	2.97
November	131.812	2.67
December	131.446	2.69
Average	125.997	2.97 %

Source: Bloomberg

Norfolk Southern Corp.

64

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 2020	Price	Yield
January	124.937	3.22 %
February	127.444	3.10
March	115.298	3.72
April	126.618	3.13
May	127.474	3.09
June	129.906	2.97
July	137.492	2.62
August	130.370	2.94
September	130.160	2.95
October	127.939	3.05
November	134.532	2.74
December	134.434	2.74
Average	128.884	3.02 %

Source: Bloomberg

Norfolk Southern Corp.

65

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 2020	Price	Yield
January	105.564	1.97 %
February	107.033	1.71
March	100.506	2.81
April	106.805	1.72
May	109.542	1.25
June	110.992	0.99
July	111.808	0.83
August	111.198	0.91
September	110.537	1.00
October	110.154	1.03
November	110.880	0.88
December	110.897	0.85
Average	108.826	1.33 %

Source: Bloomberg

Norfolk Southern Corp.

66

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 2020	Price	Yield
January	107.103	2.10 %
February	108.289	1.92
March	102.913	2.70
April	107.465	2.01
May	110.811	1.52
June	111.326	1.42
July	112.377	1.25
August	111.057	1.43
September	111.707	1.31
October	110.275	1.50
November	111.185	1.35
December	111.361	1.30
Average	109.656	1.65 %

Source: Bloomberg

Norfolk Southern Corp.

67

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 2020	Price	Yield
January	113.607	3.20 %
February	116.199	3.07
March	107.808	3.50
April	115.060	3.12
May	117.716	2.99
June	119.664	2.90
July	126.760	2.57
August	120.584	2.85
September	120.235	2.86
October	117.629	2.99
November	124.611	2.66
December	123.001	2.73
Average	118.573	2.95 %

Source: Bloomberg

Norfolk Southern Corp.

68

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 2020	Price	Yield
January	116.377	3.23 %
February	119.021	3.11
March	104.586	3.80
April	117.623	3.17
May	116.243	3.23
June	120.318	3.05
July	130.543	2.63
August	121.553	3.00
September	122.517	2.95
October	121.345	3.00
November	129.161	2.68
December	127.330	2.75
Average	120.551	3.05 %

Source: Bloomberg

Norfolk Southern Corp.

69

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 2020	Price	Yield
January	118.883	3.13 %
February	120.673	3.05
March	104.062	3.91
April	119.299	3.11
May	121.284	3.01
June	123.021	2.93
July	130.321	2.60
August	124.977	2.84
September	124.865	2.84
October	121.741	2.98
November	128.861	2.66
December	128.086	2.69
Average	122.173	2.98 %

Source: Bloomberg

Norfolk Southern Corp.

70

Type:	Notes
Description:	Senior
CUSIP:	655844CA4
Coupon Rate:	3.650%
Maturity Date:	8/1/2025
Amount Outstanding ($ 000)	$300,000
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	108.945	1.93 %
February	110.119	1.69
March	101.575	3.32
April	109.197	1.80
May	111.865	1.27
June	113.284	0.96
July	113.993	0.79
August	113.379	0.86
September	113.191	0.86
October	112.443	0.96
November	112.594	0.89
December	112.369	0.88
Average	111.080	1.35 %

Source: Bloomberg

Norfolk Southern Corp.

71

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 2020	Price	Yield
January	117.393	3.18 %
February	119.526	3.08
March	105.368	3.79
April	118.578	3.12
May	120.126	3.05
June	123.785	2.88
July	130.791	2.58
August	124.527	2.84
September	124.804	2.83
October	121.182	2.99
November	128.200	2.68
December	126.510	2.75
Average	121.733	2.98 %

Source: Bloomberg

Norfolk Southern Corp.

72

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 2020	Price	Yield
January	112.488	2.18 %
February	113.571	2.04
March	106.839	2.87
April	111.500	2.26
May	114.278	1.90
June	116.216	1.65
July	118.917	1.30
August	118.010	1.39
September	117.966	1.37
October	116.459	1.54
November	117.287	1.41
December	117.808	1.32
Average	115.112	1.77 %

Source: Bloomberg

$400,000
200,000
$600,000

same CUSIP

Norfolk Southern Corp.

73

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 2020	Price	Yield
January	129.853	3.91 %
February	131.412	3.86
March	92.671	5.51
April	121.199	4.20
May	130.897	3.87
June	129.223	3.93
July	140.595	3.60
August	130.426	3.89
September	137.543	3.68
October	127.489	3.98
November	140.257	3.60
December	127.547	3.98
Average	128.259	4.00 %

Source: Bloomberg

$262,891
87,630
$350,521

same CUSIP

Norfolk Southern Corp.

74

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 2020	Price	Yield
January	102.517	2.26 %
February	104.101	2.08
March	92.454	3.48
April	104.650	2.01
May	104.619	2.01
June	107.346	1.70
July	110.723	1.31
August	109.317	1.46
September	109.012	1.49
October	107.531	1.65
November	108.594	1.52
December	108.346	1.54
Average	105.768	1.88 %

Source: Bloomberg

Norfolk Southern Corp.

75

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 2020	Price	Yield
January	105.546	3.11 %
February	107.291	3.03
March	98.764	3.47
April	107.125	3.03
May	108.100	2.98
June	111.408	2.83
July	120.252	2.43
August	112.333	2.78
September	112.034	2.79
October	110.019	2.89
November	116.467	2.59
December	115.571	2.63
Average	110.409	2.88 %

Source: Bloomberg

Norfolk Southern Corp.

76

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 2020	Price	Yield
January	136.660	2.30 %
February	137.548	2.14
March	128.346	3.30
April	133.083	2.62
May	136.291	2.15
June	137.008	2.01
July	139.675	1.60
August	138.121	1.75
September	137.855	1.72
October	136.114	1.90
November	136.875	1.74
December	136.458	1.72
Average	136.170	2.08 %

Source: Bloomberg

Norfolk Southern Corp.

77

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 2020	Price	Yield
January	147.868	3.37 %
February	149.288	3.27
March	150.323	3.20
April	159.836	2.65
May	161.124	2.57
June	163.810	2.41
July	155.271	2.87
August	151.343	3.09
September	150.281	3.14
October	144.812	3.46
November	147.092	3.31
December	145.665	3.39
Average	152.226	3.06 %

Source: Bloomberg

Norfolk Southern Corp.

78

Type:	Conrail 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 2020	Price	Yield
January	190.593	4.05 %
February	195.161	3.95
March	181.308	4.28
April	194.797	3.96
May	191.759	4.03
June	197.122	3.90
July	205.872	3.72
August	192.905	4.00
September	190.611	4.05
October	187.307	4.13
November	193.126	3.99
December	188.174	4.11
Average	192.395	4.01 %

Source: Bloomberg

Union Pacific Corp.

79

Type:	Debentures
Description:	UP Corp.
CUSIP:	907818CS5
Coupon Rate:	5.375%
Maturity Date:	6/1/2033
Amount Outstanding ($ 000)	$148,084
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	126.459	2.96 %
February	128.520	2.79
March	123.935	3.14
April	130.179	2.63
May	130.361	2.61
June	132.242	2.45
July	136.100	2.14
August	133.086	2.36
September	132.563	2.38
October	130.995	2.49
November	133.261	2.30
December	133.044	2.30
Average	130.895	2.55 %

Source: Bloomberg

Union Pacific Corp.

80

Type:	Debentures
Description:	UP Corp.
CUSIP:	907818CX4
Coupon Rate:	6.150%
Maturity Date:	5/1/2037
Amount Outstanding ($ 000)	$89,794
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	139.040	3.19 %
February	141.848	3.01
March	135.685	3.38
April	143.551	2.89
May	143.722	2.87
June	146.129	2.72
July	151.464	2.40
August	147.327	2.63
September	146.676	2.65
October	144.583	2.77
November	146.867	2.62
December	145.654	2.68
Average	144.379	2.82 %

Source: Bloomberg

Union Pacific Corp.

81

Type:	Debentures
Description:	UP Corp.
CUSIP:	907818CU0
Coupon Rate:	6.250%
Maturity Date:	5/1/2034
Amount Outstanding ($ 000)	$157,438
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	138.006	2.96 %
February	140.327	2.78
March	135.027	3.15
April	141.981	2.64
May	142.320	2.60
June	143.936	2.48
July	148.354	2.16
August	144.933	2.38
September	144.368	2.40
October	142.683	2.50
November	144.679	2.35
December	143.798	2.39
Average	142.534	2.57 %

Source: Bloomberg

Union Pacific Corp.

82

Type:	Debentures
Description:	UP Corp.
CUSIP:	907818CF3
Coupon Rate:	6.625%
Maturity Date:	2/1/2029
Amount Outstanding ($ 000)	$394,428
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	132.775	2.53 %
February	134.645	2.30
March	133.348	2.41
April	138.517	1.84
May	134.986	2.17
June	136.141	2.02
July	138.436	1.74
August	136.854	1.87
September	136.304	1.89
October	135.234	1.97
November	136.321	1.82
December	135.934	1.82
Average	135.791	2.03 %

Source: Bloomberg

Union Pacific Corp.

83

Type:	Debentures
Description:	UP Corp.
CUSIP:	907818BY3
Coupon Rate:	7.125%
Maturity Date:	2/1/2028
Amount Outstanding ($ 000)	$173,939
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	134.154	2.40 %
February	135.407	2.22
March	133.042	2.46
April	138.062	1.83
May	132.529	2.44
June	133.827	2.25
July	135.590	1.99
August	134.245	2.11
September	133.714	2.13
October	132.731	2.21
November	133.291	2.10
December	133.180	2.06
Average	134.148	2.18 %

Source: Bloomberg

Union Pacific Corp.

84

Type:	Notes (New)
Description:	UP Corp.
CUSIP:	907818FJ2
Coupon Rate:	2.150%
Maturity Date:	2/5/2027
Amount Outstanding ($ 000)	$496,348
Months Outstanding	11.0

End of Month in 2020	Price	Yield
January	100.381	2.09 %
February	102.015	1.84
March	97.958	2.48
April	103.056	1.67
May	105.282	1.32
June	105.825	1.23
July	107.825	0.91
August	107.032	1.02
September	106.736	1.05
October	106.211	1.12
November	106.745	1.02
December	106.838	0.99
Average	104.659	1.40 %

Source: Bloomberg

Prospectus supplement dated January 28, 2020
Interest accrues from January 31, 2020

Union Pacific Corp.

85

Type:	Notes (New)
Description:	UP Corp.
CUSIP:	907818FH6
Coupon Rate:	2.400%
Maturity Date:	2/5/2030
Amount Outstanding ($ 000)	$741,911
Months Outstanding	11.0

End of Month in 2020	Price	Yield
January	100.697	2.32 %
February	102.502	2.12
March	97.733	2.66
April	102.938	2.07
May	105.201	1.81
June	106.874	1.62
July	109.481	1.33
August	107.802	1.51
September	107.490	1.54
October	106.575	1.63
November	108.384	1.42
December	107.636	1.50
Average	105.276	1.79 %

Source: Bloomberg

Prospectus supplement dated January 28, 2020
Interest accrues from January 31, 2020

Union Pacific Corp.

86

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DN5
Coupon Rate:	2.750%
Maturity Date:	4/15/2023
Amount Outstanding ($ 000)	$323,869
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	102.762	1.86 %
February	103.532	1.58
March	103.179	1.67
April	104.250	1.28
May	105.061	0.96
June	105.357	0.80
July	105.540	0.67
August	105.456	0.65
September	105.230	0.67
October	104.938	0.71
November	104.959	0.64
December	104.769	0.64
Average	104.586	1.01 %

Source: Bloomberg

Union Pacific Corp.

87

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EH7
Coupon Rate:	2.750%
Maturity Date:	3/1/2026
Amount Outstanding ($ 000)	$648,014
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	104.113	2.03 %
February	105.173	1.84
March	100.489	2.66
April	106.144	1.64
May	108.329	1.24
June	109.076	1.09
July	110.316	0.85
August	109.852	0.91
September	109.543	0.94
October	108.976	1.02
November	109.573	0.88
December	109.486	0.87
Average	107.589	1.33 %

Source: Bloomberg

Union Pacific Corp.

88

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EZ7
Coupon Rate:	2.950%
Maturity Date:	3/1/2022
Amount Outstanding ($ 000)	$498,964
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	102.560	1.69 %
February	102.824	1.51
March	100.807	2.52
April	103.662	0.92
May	104.225	0.52
June	104.481	0.25
July	104.187	0.28
August	103.962	0.30
September	103.650	0.36
October	103.439	0.35
November	103.287	0.31
December	103.239	0.14
Average	103.360	0.76 %

Source: Bloomberg

Union Pacific Corp.

89

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DM7
Coupon Rate:	2.950%
Maturity Date:	1/15/2023
Amount Outstanding ($ 000)	$299,465
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	103.075	1.87 %
February	103.689	1.63
March	101.359	2.44
April	104.272	1.33
May	105.110	0.97
June	105.342	0.82
July	105.502	0.68
August	105.269	0.70
September	104.994	0.74
October	104.861	0.72
November	104.809	0.66
December	104.485	0.72
Average	104.397	1.11 %

Source: Bloomberg

Union Pacific Corp.

90

Type:	Notes (New)
Description:	UP Corp. 144A
CUSIP:	907818FM5
Coupon Rate:	2.973%
Maturity Date:	9/16/2062
Amount Outstanding ($ 000)	$711,208
Months Outstanding	3.5

End of Month in 2020	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	98.409	3.04
October	97.081	3.10
November	106.981	2.69
December	105.299	2.76
Average	101.943	2.90 %

Source: Bloomberg

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

Union Pacific Corp.

91

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EP9
Coupon Rate:	3.000%
Maturity Date:	4/15/2027
Amount Outstanding ($ 000)	$492,791
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	106.451	2.03 %
February	107.059	1.93
March	101.662	2.74
April	108.480	1.70
May	109.425	1.55
June	110.800	1.33
July	112.522	1.06
August	111.911	1.13
September	111.264	1.20
October	110.267	1.33
November	111.160	1.18
December	111.411	1.11
Average	109.368	1.52 %

Source: Bloomberg

Union Pacific Corp.

92

Type:	Notes
Description:	UP Corp.
CUSIP:	907818FA1
Coupon Rate:	3.150%
Maturity Date:	3/1/2024
Amount Outstanding ($ 000)	$497,363
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	105.251	1.81 %
February	105.927	1.61
March	104.479	1.96
April	107.382	1.17
May	108.278	0.90
June	108.726	0.73
July	109.004	0.60
August	108.711	0.63
September	108.229	0.71
October	108.255	0.64
November	108.167	0.61
December	108.413	0.46
Average	107.569	0.99 %

Source: Bloomberg

Union Pacific Corp.

93

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DY1
Coupon Rate:	3.250%
Maturity Date:	1/15/2025
Amount Outstanding ($ 000)	$348,387
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	106.234	1.92 %
February	107.238	1.69
March	105.762	1.98
April	107.839	1.51
May	108.889	1.26
June	110.668	0.85
July	110.389	0.86
August	109.987	0.91
September	109.794	0.91
October	109.663	0.90
November	109.672	0.86
December	109.518	0.84
Average	108.804	1.21 %

Source: Bloomberg

Union Pacific Corp.

94

Type:	Notes
Description:	UP Corp.
CUSIP:	907818ED6
Coupon Rate:	3.250%
Maturity Date:	8/15/2025
Amount Outstanding ($ 000)	$499,223
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	107.479	1.82 %
February	108.336	1.64
March	109.421	1.42
April	108.621	1.54
May	110.448	1.17
June	110.907	1.06
July	111.707	0.87
August	111.453	0.88
September	111.195	0.90
October	110.467	1.00
November	110.925	0.87
December	111.132	0.79
Average	110.174	1.16 %

Source: Bloomberg

Union Pacific Corp.

95

Type:	Notes (New)
Description:	UP Corp.
CUSIP:	907818FK9
Coupon Rate:	3.250%
Maturity Date:	2/5/2050
Amount Outstanding ($ 000)	$967,030
Months Outstanding	11.0

End of Month in 2020	Price	Yield
January	101.269	3.18 %
February	102.975	3.10
March	100.163	3.24
April	104.742	3.01
May	108.400	2.83
June	109.844	2.76
July	118.786	2.36
August	110.187	2.74
September	110.481	2.73
October	108.091	2.84
November	115.452	2.50
December	113.920	2.57
Average	108.693	2.82 %

Source: Bloomberg

Prospectus supplement dated January 28, 2020
Interest accrues from January 31, 2020

Union Pacific Corp.

96

Type:	Notes (New)
Description:	UP Corp.
CUSIP:	907818FK9
Coupon Rate:	3.250%
Maturity Date:	2/5/2050
Amount Outstanding ($ 000)	$725,272
Months Outstanding	9.0

End of Month in 2020	Price	Yield
January		%
February	*	*
March		
April	104.742	3.01
May	108.400	2.83
June	109.844	2.76
July	118.786	2.36
August	110.187	2.74
September	110.481	2.73
October	108.091	2.84
November	115.452	2.50
December	113.920	2.57
Average	111.100	2.70 %

Source: Bloomberg

Prospectus supplement dated March 31, 2020
Interest accrues from January 31, 2020

* A portion of this set of notes (ID = 95) was offered earlier and traded beginning January. This portion (ID = 96) was offered later, and traded beginning April. Both have the same CUSIP.

Union Pacific Corp.

97

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EK0
Coupon Rate:	3.350%
Maturity Date:	8/15/2046
Amount Outstanding ($ 000)	$296,201
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	103.790	3.14 %
February	105.403	3.05
March	107.718	2.93
April	106.050	3.02
May	105.244	3.06
June	109.077	2.85
July	117.411	2.44
August	111.267	2.74
September	110.876	2.76
October	108.568	2.88
November	114.260	2.59
December	112.776	2.66
Average	109.370	2.84 %

Source: Bloomberg

Union Pacific Corp.

98

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EB0
Coupon Rate:	3.375%
Maturity Date:	2/1/2035
Amount Outstanding ($ 000)	$445,506
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	109.100	2.64 %
February	110.809	2.50
March	107.037	2.79
April	112.008	2.40
May	110.919	2.48
June	113.807	2.26
July	118.409	1.91
August	115.882	2.09
September	115.623	2.11
October	113.480	2.26
November	115.795	2.08
December	115.950	2.06
Average	113.235	2.30 %

Source: Bloomberg

Union Pacific Corp.

99

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EU8
Coupon Rate:	3.500%
Maturity Date:	6/8/2023
Amount Outstanding ($ 000)	$647,258
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	105.538	1.79 %
February	106.250	1.53
March	102.628	2.63
April	106.952	1.20
May	107.882	0.85
June	108.352	0.62
July	108.427	0.51
August	108.166	0.52
September	107.760	0.58
October	107.505	0.58
November	107.613	0.45
December	107.342	0.45
Average	107.035	0.98 %

Source: Bloomberg

Union Pacific Corp.

100

Type:	Notes
Description:	UP Corp.
CUSIP:	907818FD5
Coupon Rate:	3.550%
Maturity Date:	8/15/2039
Amount Outstanding ($ 000)	$493,860
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	108.747	2.96 %
February	110.132	2.87
March	100.701	3.50
April	108.206	2.99
May	111.396	2.78
June	112.262	2.72
July	120.140	2.24
August	117.190	2.41
September	115.130	2.54
October	112.496	2.70
November	116.926	2.42
December	115.441	2.51
Average	112.397	2.72 %

Source: Bloomberg

Union Pacific Corp.

101

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EQ7
Coupon Rate:	3.600%
Maturity Date:	9/15/2037
Amount Outstanding ($ 000)	$495,161
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	109.752	2.89 %
February	110.809	2.82
March	103.097	3.36
April	108.684	2.96
May	110.303	2.84
June	111.468	2.76
July	118.718	2.27
August	114.510	2.55
September	115.200	2.50
October	113.014	2.64
November	117.549	2.33
December	116.534	2.39
Average	112.470	2.69 %

Source: Bloomberg

Union Pacific Corp.

102

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DR6
Coupon Rate:	3.646%
Maturity Date:	2/15/2024
Amount Outstanding ($ 000)	$403,901
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	106.703	1.91 %
February	107.139	1.77
March	106.410	1.92
April	108.073	1.44
May	108.993	1.16
June	109.390	1.00
July	109.890	0.80
August	109.568	0.83
September	109.291	0.84
October	108.859	0.90
November	108.954	0.81
December	108.816	0.77
Average	108.507	1.18 %

Source: Bloomberg

Union Pacific Corp.

103

Type:	Notes
Description:	UP Corp.
CUSIP:	907818FB9
Coupon Rate:	3.700%
Maturity Date:	3/1/2029
Amount Outstanding ($ 000)	$993,083
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	111.464	2.29 %
February	112.073	2.21
March	108.047	2.68
April	112.630	2.12
May	114.390	1.91
June	116.852	1.61
July	118.773	1.37
August	117.027	1.55
September	116.464	1.60
October	115.776	1.66
November	117.253	1.47
December	116.761	1.51
Average	114.793	1.83 %

Source: Bloomberg

Union Pacific Corp.

104

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DV7
Coupon Rate:	3.750%
Maturity Date:	3/15/2024
Amount Outstanding ($ 000)	$397,807
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	107.186	1.92 %
February	107.943	1.70
March	106.196	2.11
April	108.790	1.40
May	109.707	1.12
June	110.227	0.93
July	110.272	0.86
August	109.947	0.89
September	109.695	0.89
October	109.360	0.92
November	109.501	0.81
December	109.352	0.78
Average	109.015	1.19 %

Source: Bloomberg

Union Pacific Corp.

105

Type:	Notes
Description:	UP Corp.
CUSIP:	907818ES3
Coupon Rate:	3.750%
Maturity Date:	7/15/2025
Amount Outstanding ($ 000)	$497,464
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	109.331	1.94 %
February	110.337	1.73
March	104.528	2.82
April	111.284	1.49
May	112.745	1.18
June	113.344	1.03
July	114.222	0.81
August	113.720	0.87
September	113.798	0.81
October	113.272	0.86
November	113.596	0.75
December	113.529	0.71
Average	111.976	1.25 %

Source: Bloomberg

Union Pacific Corp.

106

Type:	Notes (New)
Description:	UP Corp.
CUSIP:	907818FL7
Coupon Rate:	3.750%
Maturity Date:	2/5/2070
Amount Outstanding ($ 000)	$742,140
Months Outstanding	11.0

End of Month in 2020	Price	Yield
January	102.801	3.63 %
February	104.467	3.56
March	95.135	3.98
April	108.004	3.41
May	112.591	3.24
June	113.891	3.19
July	123.805	2.85
August	114.258	3.18
September	113.191	3.22
October	109.265	3.36
November	119.814	2.98
December	121.008	2.94
Average	111.519	3.30 %

Source: Bloomberg

Prospectus supplement dated January 28, 2020
Interest accrues from January 31, 2020

Union Pacific Corp.

107

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EM6
Coupon Rate:	3.799%
Maturity Date:	10/1/2051
Amount Outstanding ($ 000)	$703,388
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	111.457	3.22 %
February	111.512	3.22
March	107.740	3.40
April	114.231	3.09
May	118.070	2.92
June	119.835	2.84
July	129.782	2.43
August	120.711	2.80
September	118.670	2.88
October	116.544	2.98
November	124.515	2.63
December	122.585	2.71
Average	117.971	2.93 %

Source: Bloomberg

Union Pacific Corp.

108

Type:	Notes
Description:	UP Corp.
CUSIP:	907818FG8
Coupon Rate:	3.839%
Maturity Date:	3/20/2060
Amount Outstanding ($ 000)	$1,408,667
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	107.733	3.48 %
February	109.475	3.40
March	106.449	3.54
April	112.337	3.28
May	116.161	3.13
June	117.773	3.06
July	128.529	2.67
August	116.783	3.10
September	116.459	3.11
October	113.975	3.21
November	124.206	2.82
December	123.528	2.84
Average	116.117	3.14 %

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.

108	$1,408,667
109	184
	$1,408,851

Union Pacific Corp.

109

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 2020	Price	Yield
January	107.733	3.48 %
February	109.475	3.40
March	106.449	3.54
April	112.337	3.28
May	115.505	3.15
June	117.702	3.07
July	127.532	2.70
August	116.793	3.10
September	117.323	3.08
October	114.296	3.20
November	123.779	2.83
December	123.416	2.84
Average	116.028	3.14 %

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.

108	$1,408,667
109	$184
	$1,408,851

Union Pacific Corp.

110

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EC8
Coupon Rate:	3.875%
Maturity Date:	2/1/2055
Amount Outstanding ($ 000)	$444,071
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	110.310	3.37 %
February	112.446	3.27
March	100.550	3.85
April	116.195	3.11
May	114.364	3.19
June	120.843	2.91
July	128.409	2.62
August	120.762	2.92
September	119.335	2.97
October	116.280	3.10
November	123.444	2.80
December	123.292	2.81
Average	117.186	3.08 %

Source: Bloomberg

Union Pacific Corp.

111

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EY0
Coupon Rate:	3.950%
Maturity Date:	9/10/2028
Amount Outstanding ($ 000)	$1,488,096
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	113.155	2.26 %
February	113.600	2.19
March	107.590	2.93
April	114.059	2.11
May	116.375	1.81
June	118.788	1.50
July	120.200	1.31
August	118.539	1.49
September	118.213	1.51
October	117.391	1.59
November	118.767	1.39
December	119.082	1.33
Average	116.313	1.79 %

Source: Bloomberg

Union Pacific Corp.

112

Type:	Notes
Description:	UP Corp.
CUSIP:	907818FE3
Coupon Rate:	3.950%
Maturity Date:	8/15/2059
Amount Outstanding ($ 000)	$491,116
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	111.099	3.44 %
February	112.277	3.38
March	102.002	3.85
April	113.281	3.34
May	115.332	3.26
June	118.450	3.13
July	129.874	2.71
August	120.199	3.06
September	120.217	3.06
October	116.297	3.21
November	125.954	2.84
December	124.367	2.90
Average	117.446	3.18 %

Source: Bloomberg

Union Pacific Corp.

113

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EN4
Coupon Rate:	4.000%
Maturity Date:	4/15/2047
Amount Outstanding ($ 000)	$489,087
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	114.703	3.19 %
February	116.942	3.07
March	109.577	3.45
April	117.350	3.05
May	117.097	3.06
June	119.626	2.94
July	129.817	2.47
August	122.130	2.81
September	121.906	2.82
October	119.491	2.94
November	126.474	2.61
December	124.870	2.68
Average	119.999	2.92 %

Source: Bloomberg

Union Pacific Corp.

114

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EF1
Coupon Rate:	4.050%
Maturity Date:	11/15/2045
Amount Outstanding ($ 000)	$490,053
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	115.167	3.18 %
February	116.773	3.10
March	106.694	3.65
April	116.246	3.12
May	118.402	3.01
June	120.874	2.88
July	129.229	2.49
August	121.405	2.85
September	120.906	2.88
October	118.307	3.00
November	125.173	2.66
December	123.648	2.73
Average	119.402	2.96 %

Source: Bloomberg

Union Pacific Corp.

115

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EJ3
Coupon Rate:	4.050%
Maturity Date:	3/1/2046
Amount Outstanding ($ 000)	$587,388
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	114.729	3.21 %
February	116.401	3.12
March	102.189	3.92
April	116.359	3.12
May	117.613	3.06
June	120.178	2.93
July	127.771	2.56
August	122.488	2.81
September	121.661	2.85
October	119.684	2.94
November	123.169	2.77
December	123.085	2.77
Average	118.777	3.01 %

Source: Bloomberg

Union Pacific Corp.

116

Type:	Notes
Description:	UP Corp.
CUSIP:	907818ER5
Coupon Rate:	4.100%
Maturity Date:	9/15/2067
Amount Outstanding ($ 000)	$494,390
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	110.026	3.65 %
February	112.934	3.54
March	104.721	3.88
April	116.891	3.38
May	115.855	3.42
June	120.183	3.26
July	131.104	2.89
August	121.177	3.22
September	118.884	3.31
October	116.444	3.40
November	125.488	3.07
December	126.471	3.04
Average	118.348	3.34 %

Source: Bloomberg

Union Pacific Corp.

117

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DZ8
Coupon Rate:	4.150%
Maturity Date:	1/15/2045
Amount Outstanding ($ 000)	$342,311
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	115.686	3.23 %
February	118.303	3.09
March	111.458	3.46
April	116.864	3.16
May	117.482	3.13
June	123.116	2.84
July	128.883	2.55
August	122.833	2.85
September	121.874	2.89
October	119.550	3.01
November	125.755	2.69
December	123.871	2.78
Average	120.473	2.97 %

Source: Bloomberg

Union Pacific Corp.

118

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DK1
Coupon Rate:	4.163%
Maturity Date:	7/15/2022
Amount Outstanding ($ 000)	$718,043
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	105.335	1.92 %
February	105.612	1.73
March	103.921	2.39
April	106.405	1.20
May	106.581	1.02
June	106.486	0.94
July	106.415	0.84
August	106.054	0.89
September	105.927	0.81
October	105.481	0.91
November	105.264	0.88
December	104.938	0.90
Average	105.702	1.20 %

Source: Bloomberg

Union Pacific Corp.

119

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DP0
Coupon Rate:	4.250%
Maturity Date:	4/15/2043
Amount Outstanding ($ 000)	$208,415
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	117.489	3.18 %
February	119.800	3.05
March	110.827	3.56
April	120.838	2.99
May	115.801	3.26
June	120.558	3.00
July	128.297	2.59
August	123.510	2.84
September	122.763	2.87
October	119.723	3.03
November	122.573	2.88
December	121.134	2.95
Average	120.276	3.02 %

Source: Bloomberg

Union Pacific Corp.

120

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DL9
Coupon Rate:	4.300%
Maturity Date:	6/15/2042
Amount Outstanding ($ 000)	$220,161
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	118.961	3.12 %
February	120.147	3.05
March	113.815	3.41
April	117.537	3.19
May	117.798	3.17
June	122.044	2.93
July	127.862	2.62
August	122.762	2.89
September	122.102	2.92
October	119.717	3.05
November	122.424	2.89
December	120.587	2.99
Average	120.480	3.02 %

Source: Bloomberg

Union Pacific Corp.

121

Type:	Notes
Description:	UP Corp.
CUSIP:	907818FC7
Coupon Rate:	4.300%
Maturity Date:	3/1/2049
Amount Outstanding ($ 000)	$676,659
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	120.007	3.23 %
February	121.124	3.18
March	116.718	3.39
April	122.395	3.12
May	126.424	2.93
June	128.705	2.83
July	137.968	2.45
August	128.340	2.84
September	128.761	2.82
October	125.633	2.96
November	133.676	2.61
December	132.423	2.66
Average	126.848	2.92 %

Source: Bloomberg

Union Pacific Corp.

122

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EV6
Coupon Rate:	4.375%
Maturity Date:	9/10/2038
Amount Outstanding ($ 000)	$324,782
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	118.215	3.08 %
February	120.206	2.95
March	110.894	3.56
April	118.241	3.07
May	121.444	2.86
June	122.918	2.76
July	130.148	2.33
August	124.738	2.64
September	123.511	2.71
October	122.102	2.79
November	126.496	2.52
December	125.840	2.55
Average	122.063	2.82 %

Source: Bloomberg

Union Pacific Corp.

123

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EG9
Coupon Rate:	4.375%
Maturity Date:	11/15/2065
Amount Outstanding ($ 000)	$569,480
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	115.076	3.69 %
February	117.862	3.58
March	110.176	3.90
April	119.770	3.50
May	123.193	3.37
June	124.203	3.34
July	136.625	2.91
August	127.311	3.22
September	126.715	3.24
October	122.155	3.41
November	129.218	3.15
December	132.042	3.06
Average	123.696	3.36 %

Source: Bloomberg

Union Pacific Corp.

124

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EW4
Coupon Rate:	4.500%
Maturity Date:	9/10/2048
Amount Outstanding ($ 000)	$448,670
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	123.408	3.24 %
February	124.633	3.18
March	112.252	3.79
April	122.630	3.27
May	125.931	3.11
June	127.609	3.04
July	140.962	2.47
August	132.807	2.80
September	132.415	2.82
October	129.067	2.96
November	136.139	2.65
December	133.670	2.75
Average	128.460	3.01 %

Source: Bloomberg

Union Pacific Corp.

125

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DJ4
Coupon Rate:	4.750%
Maturity Date:	9/15/2041
Amount Outstanding ($ 000)	$212,242
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	125.980	3.09 %
February	129.353	2.91
March	122.701	3.27
April	130.767	2.82
May	130.600	2.83
June	133.307	2.68
July	139.500	2.36
August	131.915	2.74
September	131.228	2.78
October	128.982	2.89
November	131.831	2.73
December	130.395	2.80
Average	130.547	2.83 %

Source: Bloomberg

Union Pacific Corp.

126

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DU9
Coupon Rate:	4.750%
Maturity Date:	12/15/2043
Amount Outstanding ($ 000)	$182,680
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	121.259	3.44 %
February	123.827	3.30
March	116.697	3.69
April	125.287	3.21
May	124.931	3.23
June	124.187	3.27
July	132.428	2.84
August	127.246	3.10
September	126.422	3.14
October	123.927	3.27
November	127.247	3.09
December	125.288	3.19
Average	124.896	3.23 %

Source: Bloomberg

Union Pacific Corp.

127

Type:	Notes
Description:	UP Corp.
CUSIP:	907818EX2
Coupon Rate:	4.800%
Maturity Date:	9/10/2058
Amount Outstanding ($ 000)	$75,739
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	126.191	3.55 %
February	129.712	3.41
March	124.293	3.62
April	134.976	3.21
May	129.970	3.40
June	136.970	3.13
July	144.605	2.87
August	137.108	3.13
September	137.008	3.13
October	128.814	3.43
November	133.768	3.24
December	130.046	3.38
Average	132.788	3.29 %

Source: Bloomberg

Union Pacific Corp.

128

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DT2
Coupon Rate:	4.821%
Maturity Date:	2/1/2044
Amount Outstanding ($ 000)	$130,268
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	127.190	3.19 %
February	130.825	3.00
March	123.510	3.38
April	132.478	2.92
May	123.194	3.39
June	123.960	3.34
July	129.472	3.05
August	129.734	3.04
September	128.866	3.08
October	126.219	3.21
November	129.584	3.03
December	129.328	3.04
Average	127.863	3.14 %

Source: Bloomberg

Union Pacific Corp.

129

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DX3
Coupon Rate:	4.850%
Maturity Date:	6/15/2044
Amount Outstanding ($ 000)	$83,267
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	124.723	3.36 %
February	128.344	3.17
March	120.035	3.60
April	128.680	3.14
May	128.642	3.14
June	131.318	3.01
July	137.939	2.69
August	132.241	2.95
September	131.372	2.99
October	128.645	3.13
November	132.132	2.95
December	130.247	3.04
Average	129.527	3.10 %

Source: Bloomberg

Union Pacific Corp.

130

Type:	Notes
Description:	UP Corp.
CUSIP:	907818DF2
Coupon Rate:	5.780%
Maturity Date:	7/15/2040
Amount Outstanding ($ 000)	$63,456
Months Outstanding	12.0

End of Month in 2020	Price	Yield
January	136.837	3.29 %
February	139.923	3.12
March	132.975	3.50
April	141.651	3.01
May	141.505	3.01
June	144.200	2.87
July	144.936	2.82
August	139.903	3.08
September	139.111	3.12
October	136.740	3.24
November	139.803	3.07
December	138.262	3.14
Average	139.654	3.11 %

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.

130	$63,456
131	10
	$63,466

Union Pacific Corp.

131

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 2020	Price	Yield
January	136.450	3.31 %
February	138.762	3.18
March	114.725	4.65
April	121.302	4.20
May	122.526	4.12
June	125.382	3.94
July	132.461	3.50
August	130.912	3.59
September	131.426	3.55
October	129.464	3.67
November	134.068	3.39
December	133.378	3.42
Average	129.238	3.71 %

Source: Bloomberg

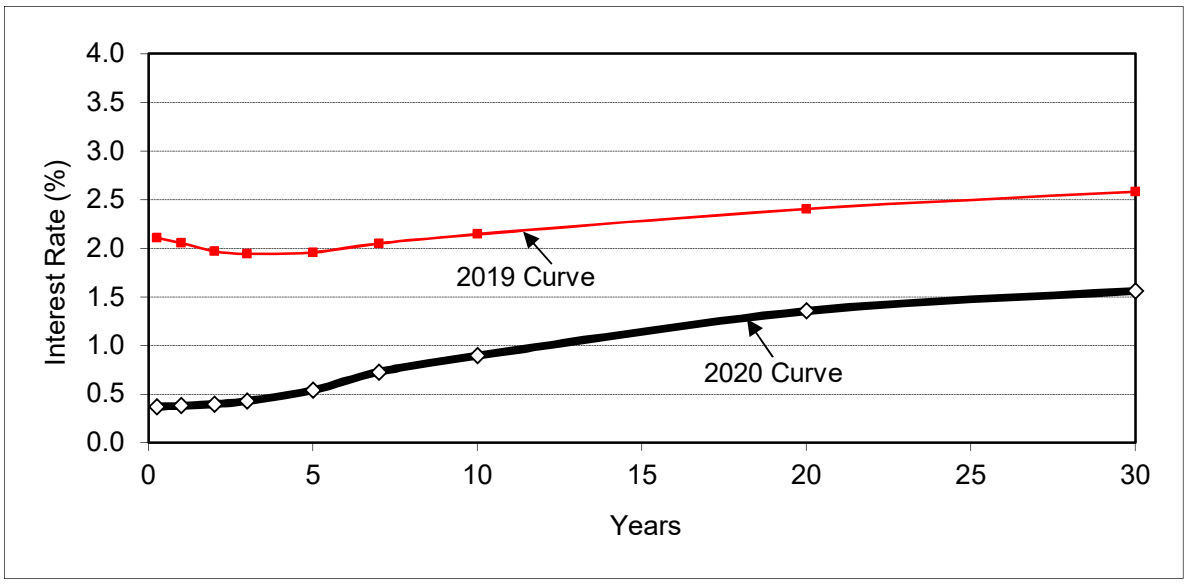
Note: These are Rule 144-A notes, which trade among qualified institutional buyers and have their own CUSIP. The exchange-traded notes similar to these are on the proceeding page.

130	$63,456
131	10
	$63,466

Interest Rates on Selected Government Instruments

Yield in Percent Per Annum, Constant Maturity Rates for 2020

	3 Mo.	1 Yr	2 Yr	3 Yr	5 Yr	7 Yr	10 Yr	20 Yr	30 Yr
January	1.55	1.53	1.52	1.52	1.56	1.67	1.76	2.07	2.22
February	1.54	1.41	1.33	1.31	1.32	1.42	1.50	1.81	1.97
March	0.30	0.33	0.45	0.50	0.59	0.78	0.87	1.26	1.46
April	0.14	0.18	0.22	0.28	0.39	0.55	0.66	1.06	1.27
May	0.13	0.16	0.17	0.22	0.34	0.53	0.67	1.12	1.38
June	0.16	0.18	0.19	0.22	0.34	0.55	0.73	1.27	1.49
July	0.13	0.15	0.15	0.17	0.28	0.46	0.62	1.09	1.31
August	0.10	0.13	0.14	0.16	0.27	0.46	0.65	1.14	1.36
September	0.11	0.13	0.13	0.16	0.27	0.46	0.68	1.21	1.42
October	0.10	0.13	0.15	0.19	0.34	0.55	0.79	1.34	1.57
November	0.09	0.12	0.17	0.22	0.39	0.63	0.87	1.40	1.62
December	0.09	0.10	0.14	0.19	0.39	0.66	0.93	1.47	1.67
Average	**0.37**	**0.38**	**0.40**	**0.43**	**0.54**	**0.73**	**0.89**	**1.35**	**1.56**



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

Equipment Trust Certificates for CSX

Modeled ETCs

	ETC ID	Maturity	Balance For 2020 ($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 2020 ($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 2020 ($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 2020 ($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 KCS

Modeled ETCs

	ETC ID	Maturity	Balance For 2020 ($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 2020 ($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 KCS (continued)

Entire ETC Current – Not Used for Cost or Market Value

	ETC ID	Maturity	Balance 2020 ($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 2020 ($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 KCS:		
Total ETCs		$0
Difference		$0

Equipment Trust Certificates for NS

Modeled ETCs

	ETC ID	Maturity	Balance For 2020 ($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 2020 ($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 NS (continued)

Entire ETC Current – Not Used for Cost or Market Value

	ETC ID	Maturity	Balance 2020 ($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 2020 ($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 2020 ($000) Beg.	Ending	Avg O/S	Current Valuation Interest Rate	Valuation Factor	Current Market Value	Interest
1.	ETC UPC Series J	1/2/2031	29,489	27,814	28,652	1.582%	1.27927	36,653	580
2.	ETC UPC Series A	5/14/2026	412,088	395,218	403,653	1.346%	1.07271	433,004	5,829
3.	ETC UPC Series 2015 A	5/12/2027	341,971	328,552	335,262	1.401%	1.05603	354,046	4,959
4.	ETC UPC Series 2016 A	11/9/2029	134,211	129,104	131,658	1.500%	1.05207	138,513	2,078
5.					--			--	--
6.					--			--	--
7.					--			--	--
8.					--			--	--
9.					--			--	--
10.					--			--	--
11.					--			--	--
12.					--			--	--
13.					--			--	--
14.					--			--	--
15.					--			--	--
	Total		$917,759	$880,688	$899,224	**1.397%**		**$962,216**	$13,446

Non-Modeled ETCs

	ETC ID	Maturity	Balance For 2020 ($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 2020 ($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 2020 ($000) Ending
Total Modeled	$880,688
Total Non-Modeled	0
Sub Total	880,688
Total All Current	0
Grand Total	$880,688
From UP:	
Total ETCs	$880,688
Difference	$0

2020 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	$65,005,154	$507,849	$65,513,003	98.55%	99.80%
Equipment Trust Certificates	962,216		962,216	1.45%	1.47%
Conditional Sales Agreements	0		0	0.00%	0.00%
Sub Total	$65,967,370	$507,849	$66,475,219	100.00%	101.27%
All Other — Capital Leases		$457,225	$457,225	-55.04%	0.70%
All Other — Misc. Debt		-1,287,982	-1,287,982	155.04%	-1.96%
All Other — Non-Modeled ETC		0	0	0.00%	0.00%
All Other — Non-Modeled CSA		0	0	0.00%	0.00%
Sub Total			-$830,757	100.00%	-1.27%
Total Market Value			**$65,644,461**		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 99.22 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 -$830,757 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 -$830,757 thousand, or -1.3 percent of total debt.

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

2020 Flotation Costs for Bonds

	UNP Sr Notes	UNP Sr Notes	UNP Sr Notes	UNP Sr Notes	CSX Notes
From 424(b)	**1/28/2020**	**1/28/2020**	**1/28/2020**	**1/28/2020**	**3/26/2020**
Face Amount	$500,000,000	$750,000,000	$1,000,000,000	$750,000,000	$500,000,000
Coupon Rate	2.150%	2.400%	3.250%	3.750%	3.800%
Maturity Date	2/5/2027	2/5/2030	2/5/2050	2/5/2070	4/15/2050
Frequency of Coupon Payment	2	2	2	2	2
Interest Accrual Date	1/31/2020	1/31/2020	1/31/2020	1/31/2020	3/30/2020
Price To Investors	99.929	99.611	99.961	99.955	99.536
Proceeds from Sale (before expenses)	$499,645,000	$747,082,500	$999,610,000	$749,662,500	$497,680,000
Underwriter Fee as % of Gross Proceeds	0.625%	0.650%	0.875%	0.875%	0.875%
Underwriter's Fee	$3,125,000	$4,875,000	$8,750,000	$6,562,500	$4,375,000
Railroad Expenses Excluding Fee	$16,666.67	$25,000.00	$33,333.33	$25,000.00	$250,000.00
Page in 424(b) for Expenses	S-16	S-16	S-16	S-16	S-21
Calculated					
Yield Based on Price to Investors	2.161%	2.444%	3.252%	3.752%	3.826%
Issue Price Per $100 Less Flotation	$99.30	$98.96	$99.08	$99.08	$98.61
Yield on New Issue Including Flotation	2.258%	2.518%	3.298%	3.791%	3.879%
Flotation Costs (Diff. in Pct Pts)	**0.097%**	**0.074%**	**0.046%**	**0.039%**	**0.053%**
Avg. Flotation Cost (Pct. Points)	**0.057%**				
(includes costs on page 2 and 3)					
Previous Year's Average	0.075%				

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.

2020 Flotation Costs for Bonds

	UNP Sr Notes*	KSU Sr Notes	NSC Sr Notes	CSX Notes
From 424(b)	**3/31/2020**	**4/20/2020**	**4/30/2020**	**12/1/2020**
Face Amount	$750,000,000	$550,000,000	$800,000,000	$500,000,000
Coupon Rate	3.250%	3.500%	3.050%	2.500%
Maturity Date	2/5/2050	5/1/2050	5/15/2050	5/15/2051
Frequency of Coupon Payment	2	2	2	2
Interest Accrual Date	1/31/2020	4/22/2020	5/11/2020	12/10/2020
Price To Investors	94.451	99.208	99.765	99.199
Proceeds from Sale (before expenses)	$708,382,500	$545,644,000	$798,120,000	$495,995,000
Underwriter Fee as % of Gross Proceeds	0.750%	0.875%	0.875%	0.875%
Underwriter's Fee	$5,625,000	$4,812,500	$7,000,000	$4,375,000
Railroad Expenses Excluding Fee	$100,000.00	$1,600,000.00	$1,400,000.00	$250,000.00
Page in 424(b) for Expenses	S-12	S-31	S-17	S-20
Calculated				
Yield Based on Price to Investors	3.552%	3.543%	3.062%	2.538%
Issue Price Per $100 Less Flotation	$93.69	$98.04	$98.72	$98.27
Yield on New Issue Including Flotation	3.596%	3.607%	3.116%	2.582%
Flotation Costs (Diff. in Pct Pts)	**0.043%**	**0.064%**	**0.054%**	**0.044%**

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

* The 2050 UNP Sr Notes are a further issuance of the 3.250% senior notes issued January 2020 (Appendix E Page 1 current year filing).

Example of Source for Bond Flotation Costs

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PROSPECTUS SUPPLEMENT
(To Prospectus Dated February 5, 2018)

$800,000,000

NORFOLK SOUTHERN®

3.050% Senior Notes due 2050

We are offering $800 million aggregate principal amount of our 3.050% senior notes due 2050 (the "Notes"). The Notes will bear interest at a rate of 3.050% per year. We will pay interest semi-annually in arrears on the Notes on May 15 and November 15 of each year, beginning on November 15, 2020. The Notes will mature on May 15, 2050. We may redeem the Notes prior to maturity in whole at any time or in part from time to time, at our option, as described in this prospectus supplement.

The Notes will be unsecured obligations and rank equally with our other unsecured senior indebtedness. The Notes will be issued only in registered form in denominations of $2,000 and integral multiples of $1,000 in excess thereof.

Investing in the Notes involves risks that are described in the "Risk Factors" section beginning on page S-4 of this prospectus supplement and similar sections in our filings with the Securities and Exchange Commission that are incorporated or deemed incorporated by reference herein.

	Per Note	Total
Price to Public (1)	99.765%	$ 798,120,000
Underwriting Discount	0.875%	$ 7,000,000
Proceeds to us (before expenses) (1)	98.890%	$ 791,120,000

(1) Plus accrued interest, if any, from May 11, 2020.

The Securities and Exchange Commission and state securities regulators have not approved or disapproved 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.

The Notes will be ready for delivery in book-entry form through the facilities of The Depository Trust Company and its participants, including Euroclear Bank, SA/NV, and Clearstream Banking, S.A., on or about May 11, 2020.

Joint Book-Running Managers

Citigroup **Goldman Sachs & Co. LLC** **US Bancorp**

Co-Managers

Capital One Securities **Fifth Third Securities** **MUFG**
PNC Capital Markets LLC **Siebert Williams Shank** **SMBC Nikko**

The date of this prospectus supplement is April 30, 2020.

Example of Source for Bond Flotation Costs

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UNDERWRITING

Under the terms and subject to the conditions contained in the underwriting agreement dated the date of this prospectus supplement, the underwriters named below, for whom Citigroup Global Markets Inc., Goldman Sachs & Co. LLC, and U.S. Bancorp Investments, Inc. are acting as representatives, have severally and not jointly agreed to purchase, and we have agreed to sell to them, severally, the respective principal amount of the Notes set forth opposite their names below:

Underwriters	Principal Amount of Notes
Citigroup Global Markets Inc.	$ 200,000,000
Goldman Sachs & Co. LLC	200,000,000
U.S. Bancorp Investments, Inc.	200,000,000
Capital One Securities, Inc.	33,334,000
Fifth Third Securities, Inc.	33,334,000
MUFG Securities Americas Inc.	33,333,000
PNC Capital Markets LLC	33,333,000
Siebert Williams Shank & Co., LLC	33,333,000
SMBC Nikko Securities America, Inc.	33,333,000
Total	$ 800,000,000

The underwriting agreement provides that the obligations of the underwriters to pay for and accept delivery of the Notes offered hereby are subject to the approval of certain legal matters by their counsel and to certain other conditions. The underwriters are obligated to take and pay for all of the Notes if any Notes are taken. The offering of the Notes by the underwriters is subject to receipt and acceptance and subject to the underwriters' right to reject any order in whole or in part.

The underwriters have advised us that they propose initially to offer the Notes to the public at the public offering price on the cover page of this prospectus supplement, and to dealers at that price less a concession not in excess of 0.525% of the principal amount of the Notes. The underwriters may allow, and the dealers may reallow, a discount not in excess of 0.350% of the principal amount of the Notes to other dealers. After the Notes are released to the public, the offering price and other selling terms may from time to time be varied by the underwriters.

The expenses of the offering payable by us, not including the underwriting discount, are estimated to be $1.4 million.

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

In order to facilitate the offering of these securities, the underwriters may engage in transactions that stabilize, maintain or otherwise affect the price of the Notes or any other notes the prices of which may be used to determine payments on the Notes. Specifically, the underwriters may sell more Notes than they are obligated to purchase in connection with the offering, creating a short position for their own accounts. A short sale is covered by purchasing the Notes in the open market. A short position is more likely to be created if the underwriters are concerned that there may be downward pressure on the price of the Notes in the open market after pricing that could adversely affect investors who purchase in the offering. As an additional means of facilitating the offering, the underwriters may bid for, and purchase, the Notes or any other notes in the open market to stabilize the price of the Notes or of any other notes. Finally, in any offering of the Notes through a syndicate of underwriters or dealer group, the underwriters acting on behalf of the underwriting syndicate or for themselves may impose a penalty bid, whereby the underwriters reclaim selling concessions allowed to an

2020 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	98.55%	2.498%	2.462%
Equipment Trust Certificates	App. C & Table 5	1.45%	1.397%	0.020%
Conditional Sales Agreements	Railroad Data	0.00%	--	--
Total Without Floatation Costs		100.00%		2.482%
Floatation Costs				
Bonds, Notes & Debentures	App. F & Table 8	98.55%	0.057%	0.056%
Equipment Trust Certificates	Tables 7 and 8	1.45%	0.067%	0.001%
Conditional Sales Agreements	Table 8	0.00%	not calculated	--
Total Floatation Costs		100.00%		0.057%
Weighted Cost of Debt				2.539%
Weighted Cost of Debt (rounded)				**2.54%**

Historical Weighted Cost of Debt (for comparison purposes only)

Item	Year	Reference	Weighted Cost
Previous Year	2019	EP 558 (Sub-No. 23) Served August 5, 2020	3.48%
Highest	1982	EP 436 Decided July 22, 1983	14.0%
Lowest	2012	EP 558 (Sub-No. 16) Served August 30, 2013	3.29%

Market Value for Common Equity

CSX Data from Bloomberg 1-14-2021

End of Wk. Date	End of Wk Close	Shares Outstanding	Capitalization ($000)
Friday, January 10, 2020	73.36	782,336,546	57,392,209
Friday, January 17, 2020	76.40	782,336,546	59,770,512
Friday, January 24, 2020	76.70	782,336,546	60,005,213
Friday, January 31, 2020	76.34	773,825,565	59,073,844
Friday, February 7, 2020	77.87	773,825,565	60,257,797
Friday, February 14, 2020	79.59	773,825,565	61,588,777
Friday, February 21, 2020	79.56	773,825,565	61,565,562
Friday, February 28, 2020	70.45	773,825,565	54,516,011
Friday, March 6, 2020	68.25	773,825,565	52,813,595
Friday, March 13, 2020	57.94	773,825,565	44,835,453
Friday, March 20, 2020	49.87	773,825,565	38,590,681
Friday, March 27, 2020	56.29	773,825,565	43,558,641
Friday, April 3, 2020	56.77	765,465,894	43,455,499
Thursday, April 9, 2020	64.00	765,465,894	48,989,817
Friday, April 17, 2020	62.77	765,465,894	48,048,294
Friday, April 24, 2020	63.82	765,465,894	48,852,033
Friday, May 1, 2020	65.00	765,465,894	49,755,283
Friday, May 8, 2020	66.11	765,465,894	50,604,950
Friday, May 15, 2020	62.00	765,465,894	47,458,885
Friday, May 22, 2020	68.53	765,465,894	52,457,378
Friday, May 29, 2020	71.58	765,465,894	54,792,049
Friday, June 5, 2020	75.08	765,465,894	57,471,179
Friday, June 12, 2020	69.57	765,465,894	53,253,462
Friday, June 19, 2020	67.99	765,465,894	52,044,026
Friday, June 26, 2020	65.91	765,465,894	50,451,857
Thursday, July 2, 2020	68.86	765,052,549	52,681,519
Friday, July 10, 2020	67.54	765,052,549	51,671,649
Friday, July 17, 2020	72.16	765,052,549	55,206,192
Friday, July 24, 2020	71.34	765,052,549	54,578,849
Friday, July 31, 2020	71.34	765,052,549	54,578,849
Friday, August 7, 2020	72.93	765,052,549	55,795,282
Friday, August 14, 2020	74.25	765,052,549	56,805,152
Friday, August 21, 2020	74.13	765,052,549	56,713,345
Friday, August 28, 2020	77.07	765,052,549	58,962,600
Friday, September 4, 2020	75.51	765,052,549	57,769,118
Friday, September 11, 2020	77.17	765,052,549	59,039,105
Friday, September 18, 2020	79.83	765,052,549	61,074,145
Friday, September 25, 2020	78.08	765,052,549	59,735,303
Friday, October 2, 2020	77.15	764,774,958	59,002,388
Friday, October 9, 2020	78.48	764,774,958	60,019,539
Friday, October 16, 2020	80.11	764,774,958	61,266,122
Friday, October 23, 2020	81.29	764,774,958	62,168,556
Friday, October 30, 2020	78.94	764,774,958	60,371,335
Friday, November 6, 2020	86.18	764,774,958	65,908,306
Friday, November 13, 2020	90.60	764,774,958	69,288,611
Friday, November 20, 2020	91.54	764,774,958	70,007,500
Friday, November 27, 2020	91.29	764,774,958	69,816,306
Friday, December 4, 2020	91.85	764,774,958	70,244,580
Friday, December 11, 2020	90.43	764,774,958	69,158,599
Friday, December 18, 2020	90.66	764,774,958	69,334,498
Thursday, December 24, 2020	90.05	764,774,958	68,867,985
Thursday, December 31, 2020	90.75	764,774,958	69,403,327

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

Market Value for Common Equity

KSU Data from Bloomberg 1-14-2021

End of Wk. Date	End of Wk Close	Shares Outstanding	Capitalization ($000)
Friday, January 10, 2020	158.25	99,119,608	15,685,678
Friday, January 17, 2020	166.52	96,150,940	16,011,055
Friday, January 24, 2020	166.58	96,150,940	16,016,824
Friday, January 31, 2020	168.69	96,150,940	16,219,702
Friday, February 7, 2020	171.86	96,150,940	16,524,501
Friday, February 14, 2020	173.64	96,150,940	16,695,649
Friday, February 21, 2020	174.23	96,150,940	16,752,378
Friday, February 28, 2020	150.68	96,150,940	14,488,024
Friday, March 6, 2020	147.08	96,150,940	14,141,880
Friday, March 13, 2020	127.61	96,150,940	12,269,821
Friday, March 20, 2020	108.52	96,150,940	10,434,300
Friday, March 27, 2020	127.96	96,150,940	12,303,474
Friday, April 3, 2020	123.00	96,150,940	11,826,566
Thursday, April 9, 2020	136.60	96,150,940	13,134,218
Friday, April 17, 2020	139.36	95,020,228	13,242,019
Friday, April 24, 2020	131.41	95,020,228	12,486,608
Friday, May 1, 2020	128.36	95,020,228	12,196,796
Friday, May 8, 2020	136.63	95,020,228	12,982,614
Friday, May 15, 2020	133.85	95,020,228	12,718,458
Friday, May 22, 2020	147.25	95,020,228	13,991,729
Friday, May 29, 2020	150.52	95,020,228	14,302,445
Friday, June 5, 2020	162.56	95,020,228	15,446,488
Friday, June 12, 2020	147.27	95,020,228	13,993,629
Friday, June 19, 2020	144.27	95,020,228	13,708,568
Friday, June 26, 2020	145.71	95,020,228	13,845,397
Thursday, July 2, 2020	147.18	95,020,228	13,985,077
Friday, July 10, 2020	143.74	94,349,268	13,561,764
Friday, July 17, 2020	160.30	94,349,268	15,124,188
Friday, July 24, 2020	154.70	94,349,268	14,595,832
Friday, July 31, 2020	171.85	94,349,268	16,213,922
Friday, August 7, 2020	187.04	94,349,268	17,647,087
Friday, August 14, 2020	183.93	94,349,268	17,353,661
Friday, August 21, 2020	182.78	94,349,268	17,245,159
Friday, August 28, 2020	184.25	94,349,268	17,383,853
Friday, September 4, 2020	188.00	94,349,268	17,737,662
Friday, September 11, 2020	186.06	94,349,268	17,554,625
Friday, September 18, 2020	182.84	94,349,268	17,250,820
Friday, September 25, 2020	183.37	94,349,268	17,300,825
Friday, October 2, 2020	180.92	94,349,268	17,069,670
Friday, October 9, 2020	186.64	93,601,549	17,469,793
Friday, October 16, 2020	179.01	93,601,549	16,755,613
Friday, October 23, 2020	184.46	93,601,549	17,265,742
Friday, October 30, 2020	176.14	93,601,549	16,486,977
Friday, November 6, 2020	183.43	93,601,549	17,169,332
Friday, November 13, 2020	187.07	93,601,549	17,510,042
Friday, November 20, 2020	188.45	93,601,549	17,639,212
Friday, November 27, 2020	189.50	93,601,549	17,737,494
Friday, December 4, 2020	194.20	93,601,549	18,177,421
Friday, December 11, 2020	196.57	93,601,549	18,399,256
Friday, December 18, 2020	197.62	93,601,549	18,497,538
Thursday, December 24, 2020	199.73	93,601,549	18,695,037
Thursday, December 31, 2020	204.13	93,601,549	19,106,884

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

Market Value for Common Equity

NSC Data from Bloomberg 1-14-2021

End of Wk. Date	End of Wk Close	Shares Outstanding	Capitalization ($000)
Friday, January 10, 2020	197.55	260,746,663	51,510,503
Friday, January 17, 2020	209.32	260,746,663	54,579,491
Friday, January 24, 2020	207.86	260,746,663	54,198,801
Friday, January 31, 2020	208.21	257,844,180	53,685,737
Friday, February 7, 2020	210.18	257,844,180	54,193,690
Friday, February 14, 2020	209.35	257,844,180	53,979,679
Friday, February 21, 2020	208.05	257,844,180	53,644,482
Friday, February 28, 2020	182.35	257,844,180	47,017,886
Friday, March 6, 2020	174.60	257,844,180	45,019,594
Friday, March 13, 2020	146.86	257,844,180	37,866,996
Friday, March 20, 2020	123.71	257,844,180	31,897,904
Friday, March 27, 2020	143.36	257,844,180	36,964,542
Friday, April 3, 2020	142.32	256,179,130	36,459,414
Thursday, April 9, 2020	159.30	256,179,130	40,809,335
Friday, April 17, 2020	160.67	256,179,130	41,160,301
Friday, April 24, 2020	160.68	256,179,130	41,162,863
Friday, May 1, 2020	170.73	256,179,130	43,737,463
Friday, May 8, 2020	174.75	256,179,130	44,767,303
Friday, May 15, 2020	160.36	256,179,130	41,080,885
Friday, May 22, 2020	171.47	256,179,130	43,927,035
Friday, May 29, 2020	178.29	256,179,130	45,674,177
Friday, June 5, 2020	194.25	256,179,130	49,762,796
Friday, June 12, 2020	178.18	256,179,130	45,645,997
Friday, June 19, 2020	170.26	256,179,130	43,617,059
Friday, June 26, 2020	169.81	256,179,130	43,501,778
Thursday, July 2, 2020	174.51	255,109,247	44,519,115
Friday, July 10, 2020	170.85	255,109,247	43,585,415
Friday, July 17, 2020	188.25	255,109,247	48,024,316
Friday, July 24, 2020	187.01	255,109,247	47,707,980
Friday, July 31, 2020	192.21	255,109,247	49,034,548
Friday, August 7, 2020	198.99	255,109,247	50,764,189
Friday, August 14, 2020	206.61	255,109,247	52,708,122
Friday, August 21, 2020	208.93	255,109,247	53,299,975
Friday, August 28, 2020	215.03	255,109,247	54,856,141
Friday, September 4, 2020	209.10	255,109,247	53,343,344
Friday, September 11, 2020	217.55	255,109,247	55,499,017
Friday, September 18, 2020	221.03	255,109,247	56,386,797
Friday, September 25, 2020	219.16	255,109,247	55,909,743
Friday, October 2, 2020	212.66	253,985,338	54,012,522
Friday, October 9, 2020	218.39	253,985,338	55,467,858
Friday, October 16, 2020	218.75	253,985,338	55,559,293
Friday, October 23, 2020	215.40	253,985,338	54,708,442
Friday, October 30, 2020	209.12	253,985,338	53,113,414
Friday, November 6, 2020	223.16	253,985,338	56,679,368
Friday, November 13, 2020	239.26	253,985,338	60,768,532
Friday, November 20, 2020	240.80	253,985,338	61,159,669
Friday, November 27, 2020	242.72	253,985,338	61,647,321
Friday, December 4, 2020	240.19	253,985,338	61,004,738
Friday, December 11, 2020	235.25	253,985,338	59,750,051
Friday, December 18, 2020	232.39	253,985,338	59,023,653
Thursday, December 24, 2020	234.39	253,985,338	59,531,623
Thursday, December 31, 2020	237.61	253,985,338	60,349,456

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

Market Value for Common Equity

UNP Data from Bloomberg 1-14-2021

End of Wk. Date	End of Wk Close	Shares Outstanding	Capitalization ($000)
Friday, January 10, 2020	177.94	694,199,885	123,525,928
Friday, January 17, 2020	185.32	694,199,885	128,649,123
Friday, January 24, 2020	185.68	694,199,885	128,899,035
Friday, January 31, 2020	179.42	690,261,490	123,846,717
Friday, February 7, 2020	183.83	690,261,490	126,890,770
Friday, February 14, 2020	184.00	690,261,490	127,008,114
Friday, February 21, 2020	181.72	690,261,490	125,434,318
Friday, February 28, 2020	159.81	690,261,490	110,310,689
Friday, March 6, 2020	156.09	690,261,490	107,742,916
Friday, March 13, 2020	143.85	690,261,490	99,294,115
Friday, March 20, 2020	117.84	690,261,490	81,340,414
Friday, March 27, 2020	139.05	690,261,490	95,980,860
Friday, April 3, 2020	138.57	690,261,490	95,649,535
Thursday, April 9, 2020	148.73	690,261,490	102,662,591
Friday, April 17, 2020	149.89	678,568,053	101,710,565
Friday, April 24, 2020	156.09	678,568,053	105,917,687
Friday, May 1, 2020	156.64	678,568,053	106,290,900
Friday, May 8, 2020	158.26	678,568,053	107,390,180
Friday, May 15, 2020	151.24	678,568,053	102,626,632
Friday, May 22, 2020	165.16	678,568,053	112,072,300
Friday, May 29, 2020	169.86	678,568,053	115,261,569
Friday, June 5, 2020	184.83	678,568,053	125,419,733
Friday, June 12, 2020	166.18	678,568,053	112,764,439
Friday, June 19, 2020	167.85	678,568,053	113,897,648
Friday, June 26, 2020	162.64	678,568,053	110,362,308
Thursday, July 2, 2020	169.08	678,568,053	114,732,286
Friday, July 10, 2020	166.39	678,568,053	112,906,938
Friday, July 17, 2020	181.25	678,838,800	123,039,533
Friday, July 24, 2020	176.12	678,838,800	119,557,089
Friday, July 31, 2020	173.35	678,838,800	117,676,706
Friday, August 7, 2020	182.93	678,838,800	124,179,982
Friday, August 14, 2020	191.92	678,838,800	130,282,742
Friday, August 21, 2020	191.57	678,838,800	130,045,149
Friday, August 28, 2020	195.13	678,838,800	132,461,815
Friday, September 4, 2020	191.14	678,838,800	129,753,248
Friday, September 11, 2020	195.94	678,838,800	133,011,674
Friday, September 18, 2020	199.80	678,838,800	135,631,992
Friday, September 25, 2020	198.15	678,838,800	134,511,908
Friday, October 2, 2020	196.35	678,838,800	133,289,998
Friday, October 9, 2020	205.78	678,838,800	139,691,448
Friday, October 16, 2020	209.85	673,868,865	141,411,381
Friday, October 23, 2020	188.14	673,868,865	126,781,688
Friday, October 30, 2020	177.19	673,868,865	119,402,824
Friday, November 6, 2020	190.07	673,868,865	128,082,255
Friday, November 13, 2020	203.44	673,868,865	137,091,882
Friday, November 20, 2020	203.39	673,868,865	137,058,188
Friday, November 27, 2020	205.64	673,868,865	138,574,393
Friday, December 4, 2020	206.05	673,868,865	138,850,680
Friday, December 11, 2020	203.06	673,868,865	136,835,812
Friday, December 18, 2020	203.60	673,868,865	137,199,701
Thursday, December 24, 2020	203.39	673,868,865	137,058,188
Thursday, December 31, 2020	208.22	673,868,865	140,312,975

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, KSU, 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.	Monday, January 6, 2020	Friday, January 10, 2020	$248,114,318	
2.	Monday, January 13, 2020	Friday, January 17, 2020	$259,010,181	
3.	Tuesday, January 21, 2020	Friday, January 24, 2020	$259,119,873	Martin Luther King Day
4.	Monday, January 27, 2020	Friday, January 31, 2020	$252,825,999	
5.	Monday, February 3, 2020	Friday, February 7, 2020	$257,866,757	
6.	Monday, February 10, 2020	Friday, February 14, 2020	$259,272,219	
7.	Tuesday, February 18, 2020	Friday, February 21, 2020	$257,396,740	Washington's Birthday
8.	Monday, February 24, 2020	Friday, February 28, 2020	$226,332,610	
9.	Monday, March 2, 2020	Friday, March 6, 2020	$219,717,985	
10.	Monday, March 9, 2020	Friday, March 13, 2020	$194,266,386	
11.	Monday, March 16, 2020	Friday, March 20, 2020	$162,263,298	
12.	Monday, March 23, 2020	Friday, March 27, 2020	$188,807,517	
13.	Monday, March 30, 2020	Friday, April 3, 2020	$187,391,013	
14.	Monday, April 6, 2020	Thursday, April 9, 2020	$205,595,962	Good Friday
15.	Monday, April 13, 2020	Friday, April 17, 2020	$204,161,179	
16.	Monday, April 20, 2020	Friday, April 24, 2020	$208,419,192	
17.	Monday, April 27, 2020	Friday, May 1, 2020	$211,980,442	
18.	Monday, May 4, 2020	Friday, May 8, 2020	$215,745,047	
19.	Monday, May 11, 2020	Friday, May 15, 2020	$203,884,861	
20.	Monday, May 18, 2020	Friday, May 22, 2020	$222,448,441	
21.	Tuesday, May 26, 2020	Friday, May 29, 2020	$230,030,240	Memorial Day
22.	Monday, June 1, 2020	Friday, June 5, 2020	$248,100,197	
23.	Monday, June 8, 2020	Friday, June 12, 2020	$225,657,528	
24.	Monday, June 15, 2020	Friday, June 19, 2020	$223,267,301	
25.	Monday, June 22, 2020	Friday, June 26, 2020	$218,161,341	
26.	Monday, June 29, 2020	Thursday, July 2, 2020	$225,917,997	Independence Day
27.	Monday, July 6, 2020	Friday, July 10, 2020	$221,725,766	
28.	Monday, July 13, 2020	Friday, July 17, 2020	$241,394,228	
29.	Monday, July 20, 2020	Friday, July 24, 2020	$236,439,750	
30.	Monday, July 27, 2020	Friday, July 31, 2020	$237,504,025	
31.	Monday, August 3, 2020	Friday, August 7, 2020	$248,386,540	
32.	Monday, August 10, 2020	Friday, August 14, 2020	$257,149,677	
33.	Monday, August 17, 2020	Friday, August 21, 2020	$257,303,629	
34.	Monday, August 24, 2020	Friday, August 28, 2020	$263,664,409	
35.	Monday, August 31, 2020	Friday, September 4, 2020	$258,603,372	
36.	Tuesday, September 8, 2020	Friday, September 11, 2020	$265,104,421	Labor Day
37.	Monday, September 14, 2020	Friday, September 18, 2020	$270,343,754	
38.	Monday, September 21, 2020	Friday, September 25, 2020	$267,457,779	
39.	Monday, September 28, 2020	Friday, October 2, 2020	$263,374,578	
40.	Monday, October 5, 2020	Friday, October 9, 2020	$272,648,638	
41.	Monday, October 12, 2020	Friday, October 16, 2020	$274,992,409	
42.	Monday, October 19, 2020	Friday, October 23, 2020	$260,924,428	
43.	Monday, October 26, 2020	Friday, October 30, 2020	$249,374,550	
44.	Monday, November 2, 2020	Friday, November 6, 2020	$267,839,261	
45.	Monday, November 9, 2020	Friday, November 13, 2020	$284,659,067	
46.	Monday, November 16, 2020	Friday, November 20, 2020	$285,864,569	
47.	Monday, November 23, 2020	Friday, November 27, 2020	$287,775,514	
48.	Monday, November 30, 2020	Friday, December 4, 2020	$288,277,419	
49.	Monday, December 7, 2020	Friday, December 11, 2020	$284,143,718	
50.	Monday, December 14, 2020	Friday, December 18, 2020	$284,055,389	
51.	Monday, December 21, 2020	Thursday, December 24, 2020	$284,152,834	Christmas Day
52.	Monday, December 28, 2020	Thursday, December 31, 2020	$289,172,643	New Year's Day
	Average		**$244,578,595.99**	

Market Value for Common Equity

List of U.S. Stock Market Full-Day Holidays in 2020

	Day	Holiday
1.	Wednesday, January 1, 2020	New Year's Day
2.	Monday, January 20, 2020	Martin Luther King Jr. Day
3.	Monday, February 17, 2020	Washington's Birthday
4.	Friday, April 10, 2020	Good Friday
5.	Monday, May 25, 2020	Memorial Day
6.	Friday, July 3, 2020	Independence Day
7.	Monday, September 7, 2020	Labor Day
8.	Thursday, November 26, 2020	Thanksgiving Day
9.	Friday, December 25, 2020	Christmas Day

Historical Risk Free Rates and Market Risk Premiums

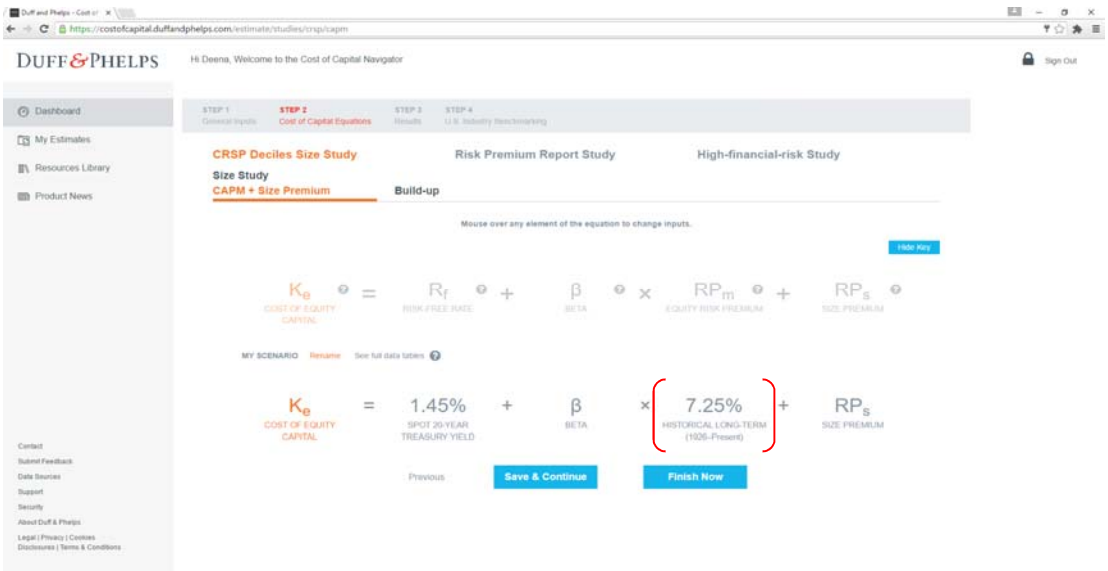
The Surface Transportation Board (STB) has used a Capital Asset Pricing Model (CAPM) as part of its cost of capital determination since 2006. Two major components of the STB's CAPM are the Risk-Free Rate, which is based on 20-Year U.S. Government Bonds, and the Market Risk Premium (a.k.a. Equity Risk 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

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 2017-2020 are from the Duff & Phelps online Cost of Capital Navigator. 2006 through 2019 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 Duff & Phelps has been the source used in recent years. Duff & Phelps 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 Duff & Phelps 2021 *Cost of Capital Navigator*.The latest long-term equity risk premium, as shown below, is **7.25 percent**. The years used for this calculation are 1926 through 2020.



AAR Regression for 2020 Beta

AAR Regression for 2020 Beta
STB-Style 5-Year Beta using SP 500 Price Index, Weighted RR Returns, 90-Day T-Bill as RF
CSX, KSU, NSC, and UNP

The GLM Procedure

Dependent Variable: ZRR

Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	0.002202459	0.00137374	1.60	0.1101
ZSP5	1.074110976	0.05477937	19.61	<.0001

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).

---

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

Cash Flow Calculation

CSX, Corp.	1	2	3	4	5	Total
	2016	2017	2018	2019	2020	
($ in millions)						
Revenue	11,069	11,408	12,250	11,937	10,583	57,247
Net Income	1,714	1,840	3,309	3,331	2,765	12,959
Extraordinary Items	0	0	0	0	0	0
Depreciation	1,301	1,315	1,331	1,349	1,383	6,679
Deferred Taxes	405	209	279	273	180	1,346
Capital Expenditures	2,398	2,040	1,745	1,657	1,626	9,466
Cash Flow	1,022	1,324	3,174	3,296	2,702	11,518
Cash Flow / Revenue	0.09233	0.11606	0.25910	0.27612	0.25532	0.20120
NIBEI / Revenue	0.15485	0.16129	0.27012	0.27905	0.26127	0.22637

Ibbotson Smoothed Cash Flow = $10,583 x 0.20120 = $2,129.28
Ibbotson Smoothed Net Income BEI = $10,583 x 0.22637 = $2,395.67

2017 Data	
Net Income as reported to SEC	$5,471
Net Income as requested by STB	1,840
Deferred Taxes as reported to SEC	-3,233
Deferred Taxes as requested by STB	209

Cash Flow Calculation

Kansas City Southern	1	2	3	4	5	Total
	2016	2017	2018	2019	2020	
($ in millions)						
Revenue	2,334.2	2,582.9	2,714.0	2,866.0	2,632.6	13,130
Net Income	477.9	474.2	627.2	538.7	616.8	2,735
Extraordinary Items	0.0	0.0	0.0	0.0		0
Depreciation	305.0	320.9	346.7	350.7	357.9	1,681
Deferred Taxes	104.8	186.3	91.7	53.1	49.4	485
Capital Expenditures	623.3	654.0	645.3	653.7	514.9	3,091
Cash Flow	264	327	420	289	509	1,810
Cash Flow / Revenue	0.11327	0.12676	0.15486	0.10077	0.19342	0.13786
NIBEI / Revenue	0.20474	0.18359	0.23110	0.18796	0.23429	0.20829

Ibbotson Smoothed Cash Flow = $2,633 x 0.13786 = $362.94
Ibbotson Smoothed Net Income BEI = $2,633 x 0.20829 = $548.35

Note: Net Income is net available to common stockholders after preferred dividends and non-KCS portion of Meridian Speedway.

Capital Expenditures					
Core CapX	563.6	585.4	520.3	587.2	411.9
Special programs	26.6	42.6	98.9	39.0	78.2
Meridian Speedway	33.1	26.0	26.1	27.5	24.8
Meridian, Otr RR	0.0				
Total CapX	623.3	654.0	645.3	653.7	514.9

2017 Data	
Net Income as reported to SEC	$961.8
Net Income as requested by STB	$474.2
Deferred Taxes as reported to SEC	-$301.3
Deferred Taxes as requested by STB	$186.3

Cash Flow Calculation

Norfolk Southern	1	2	3	4	5	Total
	2016	2017	2018	2019	2020	
($ in millions)						
Revenue	9,888	10,551	11,458	11,296	9,789	52,982
Net Income	1,668	1,922	2,666	2,722	2,013	10,991
Extraordinary Items	0	0	0	0	0	0
Depreciation	1,030	1,059	1,104	1,139	1,154	5,486
Deferred Taxes	227	477	173	330	142	1,349
Capital Expenditures	1,887	1,723	1,951	2,019	1,494	9,074
Cash Flow	1,038	1,735	1,992	2,172	1,815	8,752
Cash Flow / Revenue	0.10498	0.16444	0.17385	0.19228	0.18541	0.16519
NIBEI / Revenue	0.16869	0.18216	0.23268	0.24097	0.20564	0.20745

Ibbotson Smoothed Cash Flow = $9,789 x 0.16519 = $1,617.03
Ibbotson Smoothed Net Income BEI = $9,789 x 0.20745 = $2,030.71

2017 Data	
Net Income as reported to SEC	$5,404
Net Income as requested by STB	1,922
Deferred Taxes as reported to SEC	-2,859
Deferred Taxes as requested by STB	477

Cash Flow Calculation

Union Pacific Corp.	1	2	3	4	5	Total
	2016	2017	2018	2019	2020	
($ in millions)						
Revenue	19,941	21,240	22,832	21,708	19,533	105,254
Net Income	4,233	4,638	5,966	5,919	5,349	26,105
Extraordinary Items	0	0	0	0	0	0
Depreciation	2,038	2,105	2,191	2,216	2,210	10,760
Deferred Taxes	831	868	338	566	340	2,943
Capital Expenditures	3,505	3,238	3,437	3,453	2,927	16,560
Cash Flow	3,597	4,373	5,058	5,248	4,972	23,248
Cash Flow / Revenue	0.18038	0.20589	0.22153	0.24175	0.25454	0.22088
NIBEI / Revenue	0.21228	0.21836	0.26130	0.27266	0.27384	0.24802

Ibbotson Smoothed Cash Flow = $19,533 x 0.22088 = $4,314.36
Ibbotson Smoothed Net Income BEI = $19,533 x 0.24802 = $4,844.56

2017 Data	
Net Income as reported to SEC	$10,712
Net Income as requested by STB	4,638
Deferred Taxes as reported to SEC	-5,067
Deferred Taxes as requested by STB	868

2020 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	5.55	6.60	8.30	--	--	--	--	--	**6.60**
KSU	11.88	12.29	11.00	--	--	--	--	--	**11.88**
NSC	7.37	6.10	8.50	--	--	--	--	--	**7.37**
UNP	8.68	7.50	--	--	--	--	--	--	**8.09**

Simple Average of Medians = 8.49 percent.

2020 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	3	6.82	8.30	5.55
Filtered/Preliminary Mean**:	1	5.55	5.55	5.55
30 Day Ago Mean	4	4.91	8.30	-0.80

	12/2019\	3/2020\	6/2020\	9/2020\	12/2019A
Reported	0.99	1.00	0.65	0.96	4.17
Surprise Mean	0.96	0.94	0.64	0.93	4.15
Surprise (%)	2.94	6.42	2.23	3.55	0.56

* 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
✔	CREDIT SUISSE	Landry, Allison M	5.55 ↑	Nov 15, 20	5.17	Oct 22, 20	Nov 15, 20
	Permission Denied 32	Permission Denie(	6.60 ↑	Sep 30, 20	6.20	Jul 22, 20	Dec 07, 20
	Permission Denied 398136	Permission Denie(	8.30 ↑	Oct 21, 20	4.80	Jul 23, 20	Oct 21, 20

2020 Median Growth Rates for MSDCF
KSU

Detail Estimates - Period Summary

Enter RIC : KSU **Kansas City Southern**

Measure : Earnings Per Share

Period : Long Term Growth

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

	Ests	Mean	High	Low
Earnings Per Share	3	11.72	12.29	11.00
Filtered/Preliminary Mean**:	1	11.88	11.88	11.88
30 Day Ago Mean	3	11.72	12.29	11.00

	12/2019\	3/2020\	6/2020\	9/2020\	12/2019A
Reported	1.82	1.96	1.15	1.96	6.90
Surprise Mean	1.84	1.78	1.12	1.90	6.90
Surprise (%)	-1.27	10.33	2.52	3.11	-0.01

* 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
✓	CREDIT SUISSE	Landry, Allison M	11.88 ↓	Nov 25, 20	12.09	Oct 19, 20	Nov 25, 20
	Permission Denied 392	Permission Denied	12.29 ↑	Nov 30, 20	12.00	Jun 14, 85	Nov 30, 20
	Permission Denied 398136	Permission Denied	11.00 ↑	Sep 14, 20	8.40	May 28, 20	Oct 19, 20

2020 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	3	7.32	8.50	6.10
Filtered/Preliminary Mean**:	1	7.37	7.37	7.37
30 Day Ago Mean	3	7.32	8.50	6.10

	12/2019\	3/2020\	6/2020\	9/2020\	12/2019A
Reported	2.55	2.58	1.53	2.51	10.25
Surprise Mean	2.28	2.25	1.33	2.38	10.03
Surprise (%)	11.85	14.75	14.67	5.35	2.19

* 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
✓	CREDIT SUISSE	Landry, Allison M	7.37 ↑	Nov 25, 20	6.93	Oct 28, 20	Nov 25, 20
	Permission Denied 32	Permission Denied	6.10 ↑	Oct 28, 20	5.50	Oct 28, 20	Oct 28, 20
	Permission Denied 398136	Permission Denied	8.50 ↑	Oct 07, 20	4.80	Jul 29, 20	Oct 28, 20

2020 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	2	8.09	8.68	7.50
Filtered/Preliminary Mean**:	1	8.68	8.68	8.68
30 Day Ago Mean	3	7.49	8.68	6.30

	12/2019\	3/2020\	6/2020\	9/2020\	12/2019A
Reported	2.02	2.15	1.67	2.01	8.38
Surprise Mean	2.04	1.90	1.55	2.06	8.47
Surprise (%)	-1.11	13.31	7.45	-2.41	-1.04

* 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
✓	CREDIT SUISSE	Landry, Allison M	8.68 ↓	Nov 25, 20	8.93	Oct 23, 20	Nov 25, 20
	Permission Denied 398136	Permission Denied	7.50 ↑	Oct 22, 20	4.60	Jul 23, 20	Oct 22, 20

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			3.14 %
Historical Growth Rate for Real GDP, 1929-2020		(page 2)	
Long Term Expected Inflation Rate			2.06
Rate for Long-Term U.S. Government Bonds	1.45	(page 5)	
Rate for 20-year U.S. Inflation-Indexed Bonds	-0.61	(page 5)	
	2.06		
Stage 3 Growth Rate (real growth + inflation)			**5.20 %**

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 2019, BEA began using 2012 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 2012 dollars

Year	(e) GDP in billions of chained 2012 dollars	(f) Years of Growth	(g) AAR Calc. Growth Rate	(h) AAR Calc. Growth Rate using 2009 $
1929	1,109.4			
2013	16,495.4	84	3.27%	3.26%
2014	16,912.0	85	3.26%	3.25%
2015	17,432.2	86	3.25%	3.25%
2016	17,730.5	87	3.24%	3.22%
2017	18,144.1	88	3.23%	3.21%
2018	18,687.8	89	3.22%	
2019	19,091.7	90	3.21%	
2020	**18,423.4**	**91**	**3.14%**	

(e) Real GDP in 2012 $ downloaded from BEA 3/3/2021.
(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 2009 $, 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	5,562.7	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 2012 $

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

Annual			Quarterly (Seasonally adjusted annual rates)		
	GDP in billions of current dollars	GDP in billions of chained 2012 dollars		GDP in billions of current dollars	GDP in billions of chained 2012 dollars
1929	104.6	1,109.4	1947Q1	243.2	2,033.1
1930	92.2	1,015.1	1947Q2	246.0	2,027.6
1931	77.4	950.0	1947Q3	249.6	2,023.5
1932	59.5	827.5	1947Q4	259.7	2,055.1
2013	16,784.9	16,495.4	1968Q1	909.4	4,710.0
2014	17,527.3	16,912.0	1968Q2	934.3	4,788.7
2015	18,238.3	17,432.2	1968Q3	950.8	4,825.8
2016	18,745.1	17,730.5	1968Q4	968.0	4,844.8
2017	19,543.0	18,144.1	1969Q1	993.3	4,920.6
2018	20,611.9	18,687.8	1969Q2	1,009.0	4,935.6
2019	21,433.2	19,091.7	1969Q3	1,030.0	4,968.2
2020	20,934.9	18,423.4	1969Q4	1,038.1	4,943.9

Download for Bureau of Economic Analysis web site. Middle years and some quarters omitted to enable data to fit on this page. Use the 2012 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
2008	3.0 %	3.03 %	3.05 %	2.4 %	2.36 %	0.6 %	0.67 %
2009	4.6	4.58	4.58	2.0	2.03	2.6	2.55
2010	4.1	4.14	4.13	1.6	1.59	2.6	2.55
2011	2.48	2.48	2.57	0.53	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	2.40	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

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 2019, 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 it began using the MSDCF in the 2008 Cost of Capital determination, plus the numbers calculated for 2020.

	Long-Term Expected		Stage 3
Year	Real Growth in Output	Inflation Rate	Growth Rate
2008	3.3 %	0.6 %	3.90 %
2009	3.3	2.6	5.80
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	1.60	4.84
2016	3.22	1.97	5.19
2017	3.21	1.97	5.18
2018	3.22	1.78	5.00
2019	3.21	1.86	5.07
2020	3.14 %	2.06 %	5.20 %

Notes:
The Stage 3 Growth Rate for years 2008 through 2012 are from the Ibbotson SBBI Valuation Yearbooks for those years. Ibbotson displayed 1 digit after the decimal for years 2008 through 2010 for the long-term expected growth rate in output and inflation rate. Figures for 2009 and 2010 rounded to the same numbers.

Market Value Data for MSDCF
Stock Price for CSX - End of 2020

CSX Corporation (CSX)
NasdaqGS - NasdaqGS Real Time Price. Currency in USD

Add to watchlist Visitors tre

91.55 -0.64 (-0.69%)
At close: February 26 4:00PM EST

Summary Company Outlook Chart Conversations Statistics **Historical Dat**

Time Period: Dec 22, 2020 - Jan 07, 2021 Show: Historical Prices Frequ

Currency in USD

Date	Open	High	Low	Close*
Jan 07, 2021	92.70	94.46	92.06	94.03
Jan 06, 2021	89.28	92.03	89.24	91.86
Jan 05, 2021	87.88	90.09	87.81	89.48
Jan 04, 2021	90.66	91.04	87.39	87.99
Dec 31, 2020	89.96	90.91	89.66	90.75
Dec 30, 2020	89.69	90.49	89.50	90.33
Dec 29, 2020	90.95	91.23	88.69	89.33
Dec 28, 2020	90.56	91.25	90.35	90.64
Dec 24, 2020	89.79	90.22	89.15	90.05
Dec 23, 2020	89.89	90.51	89.22	89.67

Retrieved February 27, 2021.
Link to web page: http://finance.yahoo.com/quote/CSX/history

Market Value Data for MSDCF
Stock Price for KSU - End of 2020

Kansas City Southern (KSU)
NYSE - Nasdaq Real Time Price. Currency in USD

Add to watchlist Visitors trend 2W

212.34 -1.17 (-0.55%)
At close: February 26 4:00PM EST

Summary | Company Outlook | Chart | Conversations | Statistics | **Historical Data**

Time Period: Dec 22, 2020 - Jan 07, 2021 Show: Historical Prices Frequen

Currency in USD

Date	Open	High	Low	Close*
Jan 07, 2021	212.65	218.50	211.55	215.62
Jan 06, 2021	204.28	212.28	204.28	210.82
Jan 05, 2021	200.03	205.10	200.00	204.05
Jan 04, 2021	205.28	207.23	199.55	200.98
Dec 31, 2020	202.35	204.53	201.37	204.13
Dec 30, 2020	200.11	202.00	200.11	201.37
Dec 30, 2020			**0.44** Dividend	
Dec 29, 2020	201.18	203.30	199.52	199.79
Dec 28, 2020	201.90	202.75	200.15	201.09
Dec 24, 2020	199.22	200.27	197.05	199.73
Dec 23, 2020	196.80	200.59	196.38	199.22

Retrieved February 27, 2021.
Link to web page: http://finance.yahoo.com/quote/KSU/history

Market Value Data for MSDCF
Stock Price for NSC - End of 2020

Norfolk Southern Corporation (NSC)
NYSE - Nasdaq Real Time Price. Currency in USD

Add to watchlist | Visitors trend

252.06 -2.04 (-0.80%)
At close: February 26 4:03PM EST

Summary | Company Outlook | Chart | Conversations | Statistics | **Historical Data**

Time Period: Dec 22, 2020 - Jan 07, 2021 Show: Historical Prices Frequenc

Currency in USD

Date	Open	High	Low	Close*
Jan 07, 2021	245.00	250.03	244.30	249.85
Jan 06, 2021	235.54	244.55	235.54	243.35
Jan 05, 2021	233.00	237.58	232.83	235.71
Jan 04, 2021	238.31	239.82	231.18	233.44
Dec 31, 2020	236.45	238.05	234.39	237.61
Dec 30, 2020	234.34	236.94	234.00	235.98
Dec 29, 2020	236.93	238.37	232.45	233.99
Dec 28, 2020	236.22	238.47	235.19	236.71
Dec 24, 2020	233.22	234.94	231.63	234.39
Dec 23, 2020	231.92	234.20	230.50	233.12

Retrieved February 27, 2021.
Link to web page: http://finance.yahoo.com/quote/NSC/history

Market Value Data for MSDCF
Stock Price for UNP - End of 2020

Union Pacific Corporation (UNP)
NYSE - Nasdaq Real Time Price. Currency in USD

Add to watchlist Visitors trend 2W ↑

205.96 -2.71 (-1.30%)
At close: February 26 4:00PM EST

Summary | Company Outlook | Chart | Conversations | Statistics | **Historical Data**

Time Period: Dec 22, 2020 - Jan 07, 2021 Show: Historical Prices Frequency

Currency in USD

Date	Open	High	Low	Close*
Jan 07, 2021	210.61	213.35	209.12	212.72
Jan 06, 2021	205.55	211.61	205.13	209.80
Jan 05, 2021	202.90	206.44	202.86	205.50
Jan 04, 2021	208.04	209.03	201.38	203.01
Dec 31, 2020	206.35	208.65	205.66	208.22
Dec 30, 2020	204.87	206.50	204.61	205.98
Dec 29, 2020	206.30	206.83	203.38	204.42
Dec 28, 2020	203.97	206.54	203.55	205.65
Dec 24, 2020	201.26	203.85	200.48	203.39
Dec 23, 2020	202.83	203.51	201.05	201.17

Retrieved February 27, 2021.
Link to web page: http://finance.yahoo.com/quote/UNP/history

Market Value Data for MSDCF
Shares Outstanding for CSX - End of 2020

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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, 2020

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**	
					(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 764,774,958 shares of common stock outstanding on September 30, 2020 (the latest practicable date that is closest to the filing date).

Market Value Data for MSDCF
Shares Outstanding for KSU - End of 2020

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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, 2020

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 1-4717

KANSAS CITY SOUTHERN

(Exact name of registrant as specified in its charter)

Delaware *(State or other jurisdiction of incorporation or organization)*		**44-0663509** *(I.R.S. Employer Identification No.)*
427 West 12th Street **Kansas City , Missouri** *(Address of principal executive offices)*		**64105** *(Zip Code)*

816.983.1303
(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(s)	Name of Each Exchange on Which Registered
Preferred Stock, Par Value $25 Per Share, 4%, Noncumulative	**KSU**	**New York Stock Exchange**
Common Stock, $.01 Per Share Par Value	**KSU**	**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 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. (Check one):

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 ☒

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

Class	October 9, 2020
Common Stock, $0.01 per share par value	93,601,549 Shares

Market Value Data for MSDCF
Shares Outstanding for NSC - End of 2020

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, DC 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, 2020**

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

Three Commercial Place
Norfolk, Virginia — (Address of principal executive offices)
23510-2191 — (Zip Code)

(757) 629-2680
(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/702165/000070216520000042/nsc-20200930.htm 11/9/2020

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, 2020
Common Stock ($1.00 par value per share)	253,985,338 (excluding 20,320,777 shares held by the registrant's consolidated subsidiaries)

Market Value Data for MSDCF
Shares Outstanding for UNP - End of 2020

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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, 2020

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
(Address of principal executive offices)

68179
(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 Act).

☐ Yes ☒ No

As of October 16, 2020, there were 673,868,865 shares of the Registrant's Common Stock outstanding.

2020 Cost of Equity Using STB's MSDCF

Company	CSX		KSU		NSC		UNP	
Year	2020		2020		2020		2020	
Inputs								
Initial Cash Flow	$2,129.28		$362.94		$1,617.03		$4,314.36	
Input for Terminal C.F.	$2,395.67		$548.35		$2,030.71		$4,844.56	
Stage One Growth	6.600%		11.880%		7.370%		8.090%	
Stage Two Growth	8.490%		8.490%		8.490%		8.490%	
Stage Three Growth*	5.200%		5.200%		5.200%		5.200%	
Year	Val. 12/31	Pres Val.	Val. 12/31	Pres Val.	Val. 12/31	Pres Val.	Val. 12/31	Pres Val.
1	$2,270	$2,075	$406	$371	$1,736	$1,588	$4,663	$4,252
2	2,420	2,021	454	380	1,864	1,560	5,041	4,190
3	2,579	1,970	508	389	2,002	1,532	5,448	4,130
4	2,750	1,919	569	398	2,149	1,504	5,889	4,070
5	2,931	1,870	636	408	2,307	1,477	6,366	4,011
6	3,180	1,854	690	405	2,503	1,466	6,906	3,968
7	3,450	1,839	749	401	2,716	1,455	7,492	3,925
8	3,743	1,823	812	398	2,946	1,443	8,129	3,882
9	4,060	1,808	881	395	3,197	1,432	8,819	3,840
10	4,405	1,793	956	392	3,468	1,421	9,567	3,799
Terminal	123,929	50,433	36,952	15,168	110,947	45,471	252,465	100,245
Sum of Pres. Values		$69,403.33		$19,106.88		$60,349.46		$140,312.98
Market Value (input)		$69,403.33		$19,106.88		$60,349.46		$140,312.98
Cost of Equity	**9.41%**		**9.31%**		**9.33%**		**9.68%**	
Prev. Yr. Cost of Equity	11.10%		10.97%		11.06%		11.17%	

Preferred Stock

Cost of Preferred Equity Capital

Step 1: Calculate Average Stock Price and Annual Dividend

			Stock Price			
KSU	$25 par pref., 4%, noncumm.		**High**	**Low**	**Avg.**	**Dividend**
		Q1	$31.57	$24.88	$28.225	$0.25
		Q2	$29.64	$25.97	$27.804	$0.25
		Q3	$30.60	$27.46	$29.030	$0.25
		Q4	$35.01	$28.92	$31.963	$0.25
		Year			**$29.255**	**$1.00**

Step 2: Calculate Cost of Preferred Equity Capital Using Dividend Yield method

		Annual Dividend	Average Price	Yield
KSU	$25 par preferred, 4%, noncummulative	$1.00	$29.255	3.418%
Cost of Preferred Equity	→			**3.42%**
Previous Year Cost of Preferred Equity				3.64%

Market Value of Preferred Equity

		Outstanding Shares	Average Price	Market Value
KSU	$25 par preferred, 4%, noncummulative	215,199	$29.255	**$6,295,717**

Sources: Kansas City Southern Form 10-K for 2020, Balance Sheet
Yahoo Finance (stock prices)